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THE FUTURE OF FINANCIAL REGULATION

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Regulating finance after the crisis

CHRISTIAN NOYER

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Any explanation of the current crisis should factor in the way finance was or was not regulated prior to the crisis. All in all, the fact that some markets participants, or some products were not regulated was a major factor in the origin of the crisis.

Reforming the way finance is regulated involves some trade-offs. One is between increasing the resilience of financial systems and ensuring they remain responsive to risks. In other words, we have to clarify our appetite for risk. Another trade-off is between financial competition and innovation, on the one hand, and standardisation and regulatory homogeneity, on the other hand. This means that we need to have a view on the degree of diversity in the financial industry that is optimal for financial stability.

Going forward, three important and intertwined policy issues deserve attention: How to design a policy framework to limit procyclicality of financial systems? How to foster more resilient financial infrastructures and institutions? Where to strike the balance between rules and discretion in terms of regulation? Within these policy issues, two of them emerge as particularly relevant: the necessity to implement a macroprudential surveillance and the question whether specific activities (CDS trading for example) or entities (systemic ones) would warrant specific rules.

Any explanation of the current trends of instability should factor in the way finance was, or was not, regulated prior to the crisis. It is now well accepted that regulatory choices played a role in shaping the stage for the turmoil.¹

The G20 summit, at the beginning of April in London, clearly insisted on the necessity to improve financial regulation in order to encompass all market participants (including rating agencies and hedge funds) and to dampen procyclical impacts of accounting and prudential rules.

This is the backdrop of the present issue of Banque de France's *Financial Stability Review*. It is also the starting point of this article. It discusses two questions: What are the priors to changes in financial regulation? What are the main policy issues going forward?

1 | PRIORS OF FINANCIAL REGULATION

The Heads of State and governments of the G20 have mandated reforms in the way finance is regulated. The broad principle is to find a new balance between, on the one hand, market discipline, competition, dynamism and financial innovation and, on the other hand, the necessity to limit spill-over across countries and prevent regulatory arbitrage. The G20 places heavy weight on expanding regulation and oversight across financial institutions, instruments, and marketplaces.

Turning these broad guidelines into practical reforms involves some trade-offs. Two stands out. One is between increasing the resilience of financial systems and ensuring they remain responsive to risks. In other words, we have to clarify our appetite for risk. Another trade-off is between financial competition and innovation, on the one hand, and standardisation and regulatory homogeneity, on the other hand. This means that we need to have a view on the degree of diversity in the financial industry that is optimal for financial stability.

1|1 Risk tolerance and resilience to shocks

Ideally, financial regulation should capture risks in a systematic way so as to mitigate them. At the same time, regulation should ensure that financial intermediaries respond to price and risk signals. Achieving both is a difficult task. Risks are evolving, multi-faceted, and correlated. Also, risks in the financial system are both endogenous and contingent upon regulatory choices.² This makes accurate risk capture through regulation very challenging.

As the crisis has shown, systemic risk is **THE** risk financial regulation failed to capture. It is now a well established fact that supervising and regulating individual firms does not ensure that the whole system is resilient *per se*. Micro-level prudential regulation is not a substitute for a macroprudential policy.

Systemic risk has at least two dimensions from a regulatory perspective. First, it is a quantity that needs to be valued by either specifically measuring the exposure to this risk or through internal control systems, which lead financial intermediaries to better price in this risk. Mathematical models are available to try and measure market risk and credit risk at one firm's level, notwithstanding their reliability and performance in this crisis. By contrast, no clear, widely accepted metrics are available yet to measure systemic risk if this risk is able to be captured. Attempts exist to develop tools to that effect.³ Some of them use standard techniques, with CoVaR being an illustration of this.⁴ Others seek to import in finance tools developed in other areas of knowledge, such as physics, epidemiology or social networking.⁵ This is an area for research, one aim being that the marginal contribution to systemic risk of an individual firm can be assessed and factored in financial sector policies.

Second, systemic risk also implicitly shapes the scope of financial regulation. There is a growing consensus around the presumption that those agents whose failure may destabilise the whole financial system should be more heavily supervised and regulated.

¹ See FSF (2008), G20 (2009).

² See Danielsson (2009) in this issue.

³ Borio (2009) offers a discussion of the several strands of work.

⁴ See Adrian and Brunnermeier (2008) and Brunnermeier et alii (2009).

⁵ See Haldane (2009), Allen and Babus (2008).

This raises several important issues: Who is systemic? Under which circumstances? According to which criteria? This crisis has taught us three useful lessons: As said above, the legal form of a firm and its systemic importance do not match. Also, an institution's size, whether in the absolute or relative to another metric (e.g. a market's size, national income), does matter and remains a very relevant criterion to identify its systemic role but is not sufficient. However, when a single institution's balance sheet exceeds a country's annual GDP by a large margin, its failure is very likely to cause havoc in the economy. But more importantly, the crisis proved that interconnectedness is the typical feature of systemic institutions, even more so when it is compounded by a size effect.

Beyond those related to systemic risk, questions have also surfaced on how more "standard" risks should be captured by financial regulation. Some fundamental questions have emerged. They include how to better harmonise the definition of capital, to what extent should regulation rely on private ratings? How extensively should it incorporate directly private sector risk management techniques? The Basel Committee is already actively working to enhance the Basel II framework⁶ and has made some proposals to better capture risks in the trading book for example. These efforts will be instrumental in strengthening prudential frameworks.

1|2 Incentives and diversity

Risk-taking is a by-product not only of profit maximisation, but more broadly of incentives financial intermediaries face.

With slight exaggeration, one interpretation of the crisis could be that it is linked with misaligned incentives. Three sorts of misalignments warrant attention.

Incentives were misaligned both across and within financial intermediaries. Misalignments across intermediaries were partly the result of innovation and of the development of securitisation. Just recall how new forms of securitisation and the multiplication of intermediaries changed credit discipline throughout the securitisation process. In the end, nobody really

was able to monitor underlying risks. To cope with this issue, regulators need to better monitor risk management and capital adequacy. Importantly, they also need to look at and assess the business models of financial firms and other not yet regulated players, such as credit rating agencies. Misalignments *within* firms also warrant attention. The crisis showed starkly that incentives of risk managers, traders, top management, or shareholders differed. The industry has already produced various sets of recommendations. They need to be levered up. Certainly, corporate governance and compensation schemes need now to be a part of supervisors' health checks.

Second, incentives of private sector stakeholders and those of the official sector were also at odds. This is natural during boom times. Regulators and supervisors have a harder time trying to limit risk-taking when apparent threats to financial stability are unclear and when competition is harsh. Profit maximisation and level-playing field considerations naturally stand in the way of prudence and risk prevention.

Finally, incentives were not fully converging across public authorities. This proved to be true in particular across borders and within international fora. The robustness of frameworks in place to ensure smooth cooperation to deal with a distressed firm has been tested. Globalisation and financial interconnectedness require that robust and smooth channels for cooperation exist internationally. Regulation is first and foremost the responsibility of national regulators who constitute the first line of defense against market instability; yet, actions to prevent and resolve crises have to be global. In Europe, a push towards an enhanced financial architecture is clearly needed. In the international arena, better coordination among standard setters is also warranted to ensure all relevant standards truly factor in financial stability concerns. This is true in particular regarding accounting rules, which proved to be non-neutral and played a role in the dynamics of financial markets.

The crisis also highlights what happens when financial behaviours become too homogenous. To some extents, the rapid development of structured finance and complex securitised assets and the subsequent crash share some of the features of the

⁶ See Wellink (2009) in this issue.

standard innovation cycle, notably the clustering effect. One financial innovation (e.g. securitisation) triggered a wave of subsequent related innovations (collateralised debt obligations of asset-backed securities – CDOs of ABSs, or CDO square, cube...). Also, as the innovation proved profitable more investors entered the business, with more and more of them lacking the commensurate sophistication to manage such products adequately. Regulation has not been neutral in fostering increasingly, if not homogenous, clearly converging business models. Profit recognition rules and capital consumption associated with some investment strategies did play a role. A key issue going forward is that financial regulation needs to safeguard diversity in financial system.

2| POLICY ISSUES

The crisis provides evidence of a need to better regulate. The free play of market discipline has been proven to be associated with negative externalities. Also, the past months have shown that, when balancing systemic risk and moral hazard concerns, policymakers tend to give priority to the former over the latter. Large amounts of public money have rightly been committed to stabilise financial institutions. Such public interventions to prevent systemic failures need to have counterparts, be it in the form of enhanced/expanded scrutiny of firms or a wider set of regulatory constraints.

Going forward, three important and intertwined policy issues deserve attention: How to design a policy framework to limit procyclicality of financial systems? How to foster more resilient financial infrastructures and institutions? Where to strike the balance between rules and discretion in terms of regulation?

2|1 The need to implement a macroprudential approach

It is now a shared concern that regulation (should it be prudential, accounting or market related) may amplify business cycles. Basel II, while a major improvement

in terms of mitigating regulatory arbitrage and measuring risks, exhibits some procyclical features. These can be alleviated and the Basel Committee currently looks into this. Smoothing input parameters by using cycle averages would make risk measures less cyclical. Further, the Basel II framework could be complemented with countercyclical overlays that would help build up capital cushions in good times and allow them to be drawn down in bad times. In the same vein, accounting rules should better take into account the need of through the cycle provisioning and develop a longer term view by restricting the use of fair value.

However, such adjustments only go some way towards addressing some of the root causes of risks to financial stability. More far-reaching reforms are needed to prevent the dangerous parallel rise of leverage and maturity transformation, both major factors fueling procyclicality and its syndrome, asset price bubbles. In addition, there is a need to widen the scope of regulation in order to encompass all market activities and participants.

In this context, a macroprudential framework should be created in order to complement the microprudential perspective and to mitigate its potential negative externalities at the financial system level. By monitoring systemic risks with the view to try and mitigate spillovers on the business cycle, it should serve two purposes. One is to alert public authorities and the financial industry about the build-up of imbalances across institutions and across markets. Another is to assess the consequences on financial stability of the failure of an individual institution. To that aim, it is unclear if an explicit definition of systemic entities, based on predefined criteria, is strictly necessary or simply opportune. Rather, a macroprudential framework should help policymakers, to develop an informed view on the implications of bailing out (or not) any individual institution. Much work will be needed to develop adequate tools flexible enough to adapt to specific circumstances and collect data comprehensive and relevant enough to pass such a judgment. Both the European Systemic Risk Council proposed by the Larosière Report and the Financial Stability Board are concrete and welcome illustrations of that need.

2|2 A specific monitoring of systemic markets and actors

In this crisis, a major factor of instability has been the uncertainty associated with the functioning of some critical financial markets. The consequences of Lehman Brothers' failure have made it clear that global financial stability is jeopardised when systemic financial markets lack the shock absorption capacity a central counterparty can provide.⁷ By allowing the system to withstand the failure of major participants, it plays a role similar to an insurer. It is therefore necessary to set up such an institution for the CDS market. I am pleased to note that efforts are well engaged both in the United States and in Europe.

More generally, some of the proposals to strengthen financial stability policies suggest building on some of the same logic. Several call for an insurance perspective,⁸ applied to either capital or liquidity. In a way, these proposals reckon that, in a major financial crisis, public capital support and/or liquidity injections are very likely to take place. They also take the view that systemic capital or liquidity shortages are negative externalities arising from risk, liquidity and capital management practices at some firms level. An insurance premium in this perspective would act as a tax, i.e. an explicit cost on each individual firm to factor in their marginal contribution to systemic risks. In such a system, regulation will be based not only on each institution's own risks but also on the risks that this institution imposes to the whole financial system.

Investigating whether specific activities or specific (systemic) entities should be taxed or differently (higher) regulated is worth doing in my view. This issue is much more promising, according to me, than the solution advocated by some economists that would insist in segregating (like in the Glass-Steagall Act), traditional banking activities from investment banking. At the opposite, the current crisis showed the resilience of a universal banking system.

⁷ See Banziger (2009).

⁸ See Kashyap et alii (2008), Perotti and Suarez (2009), and Acharia et alii (2009).

⁹ See Bair (2009) in this issue.

2|3 Rules and discretion

Prudential policies, whether micro or macro, face some incentive problems.

To cope with these problems, the authorities in charge of prudential surveillance and of triggering commensurate policy actions need to be independent, credible and transparent. As far as macroprudential surveillance is concerned, of the existing institutions, the central bank best matches this description. This is the view underpinning the Larosière Report, which offers a very innovative and pragmatic agenda for reforms of the way supervision is done in Europe.

Beyond, policy-makers need to find the right balance between predetermined rules for action and discretion to prevent and manage financial instability at the firm or the system level. The US framework of prompt corrective action (PCA) leans towards a rules-based supervisory framework for banks.⁹ Whether a similar approach could be replicated in a way or another for the whole financial system needs to be assessed. At a very abstract level, one could think of a macroprudential policy framework as having two layers. One would build on existing micro-level regulation and would be aimed at limiting the cyclicity of financial activities. Some aspects of it can be automatic, such as a form of dynamic provisioning or expected losses for banking book activities and some valuation reserve for the trading book. Others may rely more on a so-called "Pillar 2" approach like in Basel II. A second layer of measures may not, and probably should not, be automatic or compulsory for financial entities. Like for monetary policy, macroprudential policies must deal with uncertainty and mix art and science. For both, credibility requires that a clear target be assigned to the authority in charge. In both cases, however, there would be significant costs in setting excessively strict or binding rules on the conduct of the policy on a day-to-day basis.

The crisis is a reminder that, after an expansion phase, an event that is not of unusual size or duration, e.g. the rise in delinquencies on US subprime loans, can trigger a sharp financial reaction. One reason for this is that structural characteristics of financial systems change during periods of prolonged expansion. As these changes cumulate, "the domain of stability of the system"¹⁰ decreases.

Regulating an evolving financial system is challenging. To be successful, the financial regulation that will emerge after this crisis should achieve three objectives. It should set the incentives right for private financial intermediaries as well as for public authorities. It should be broad and flexible enough to encompass all sources of risks and regulated them "as appropriate".¹¹ And above all, it should adopt a system-wide approach to financial stability that means the necessity to complement the micro approach by a macro perspective that may include specific treatment for specific entities.

¹⁰ Minsky (1982).

¹¹ G20 (2009).

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The shadow banking system: implications for financial regulation

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The current financial crisis has highlighted the changing role of financial institutions and the growing importance of the “shadow banking system” that grew on the back of the securitisation of assets and the integration of banking with capital market developments. This trend has been most pronounced in the United States, but has had a profound influence for the global financial system as a whole. In a market-based financial system, banking and capital market developments are inseparable, and funding conditions are closely tied to the fluctuations of leverage of market-based financial intermediaries. Balance sheet growth of market-based financial intermediaries provides a window on liquidity in the sense of availability of credit, while contractions of balance sheets have tended to precede the onset of financial crises. Securitisation was intended as a way to disperse credit risk to those who were better able to absorb losses, but instead securitisation served to increase the fragility of the financial system as a whole by allowing banks and other intermediaries to leverage up by buying each others’ securities. In the new, post-crisis financial system, the role of securitisation is likely to be held in check by more stringent financial regulation and the recognition of the importance of preventing excessive leverage and maturity mismatch in undermining financial stability.

NB: The views expressed in this paper are those of the authors alone, and not necessarily those of the Federal Reserve Bank of New York or the Federal Reserve System.

The distinguishing mark of a modern financial system is the increasingly intimate ties between banking and the capital markets. The success of macroprudential regulation will depend on being able to internalise the externalities that are generated in the shadow banking system. Before the current financial crisis, the global economy was often described as being "awash with liquidity", meaning that the supply of credit was plentiful. The financial crisis has led to a drying up of this particular metaphor. Understanding the nature of liquidity in this sense leads us to the importance of financial intermediaries in a financial system built around capital markets, and the critical role played by monetary policy in regulating credit supply.

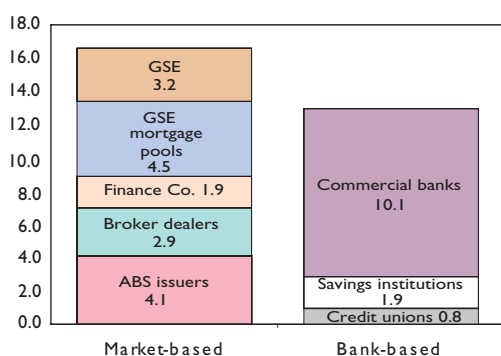
An important background is the growing importance of the capital market in the supply of credit, especially in the United States. Traditionally, banks were the dominant suppliers of credit, but their role has increasingly been supplanted by market-based institutions – especially those involved in the securitisation process.

For the United States, Chart 1 compares total assets held by banks with the assets of securitisation pools or at institutions that fund themselves mainly by issuing securities. By the end of the second quarter of 2007 (just before the current crisis), the assets of this latter group, the "market-based assets", were substantially larger than bank assets.

The growing importance of the market-based system can be seen from Chart 2, which charts the growth of four sectors in the United States – the household

Chart 1
Total assets at 2007Q2

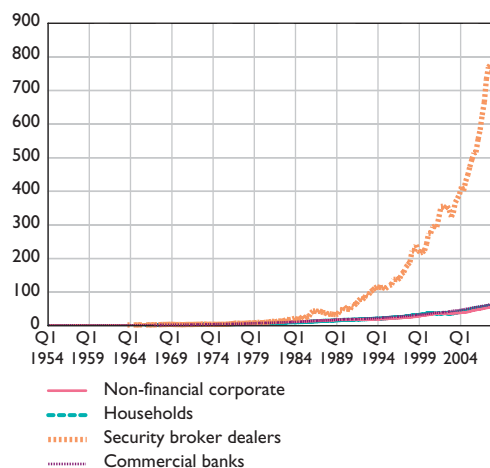
(USD trillions)



Source: US Flow of Funds, Federal Reserve.

Chart 2
Growth of assets of four sectors in the United States

(March 1954 = 1)



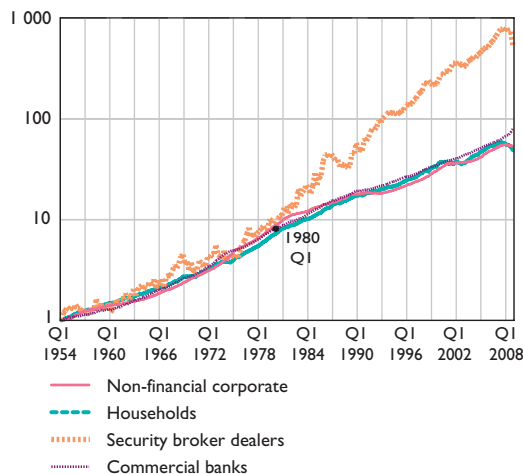
Source: US Flow of Funds, Federal Reserve.

sector, non-financial corporate sector, commercial banking sector and the security broker dealer sector. All series have been normalised to 1 for March, 1954.

We see the astonishingly rapid growth of the securities sector relative to the other sectors in the economy. Chart 3 contains the same series as in Chart 2, except that the vertical axis is in log scale. We see from Chart 3 that the rapid increase in the securities sector began around 1980.

Chart 3
Growth of assets of four sectors in the United States

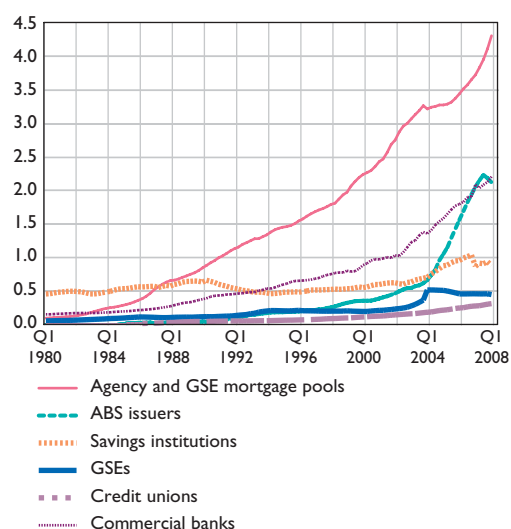
(Log scale ; March 1954 = 1)



Source: US Flow of Funds, Federal Reserve.

Chart 4
Total holdings of US home mortgages
by type of financial institution

(USD trillions)

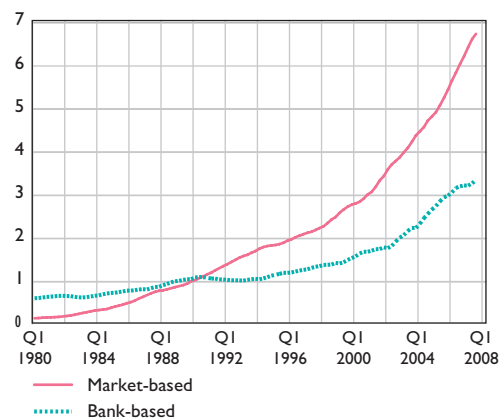


Source: US Flow of Funds, Federal Reserve.

This take-off of the securities sector can be explained by the changing structure of the US financial system, and in particular by the changing nature of the residential mortgage market and the growing importance of securitisation.

Chart 5
Market-based and bank-based holdings
of home mortgages

(USD trillions)



Source: US Flow of Funds, Federal Reserve.

Until the early 1980s, banks were the dominant holders of home mortgages, but bank-based holdings were overtaken by market-based holders (Chart 4). In Chart 5, "bank-based holdings" add up the holdings of commercial banks, savings institutions and credit unions. Market-based holdings are the remainder – the Government sponsored enterprises (GSE) mortgage pools, private label mortgage pools and the GSE holdings themselves. Market-based holdings now constitute two thirds of the 11 trillion dollar total of home mortgages.

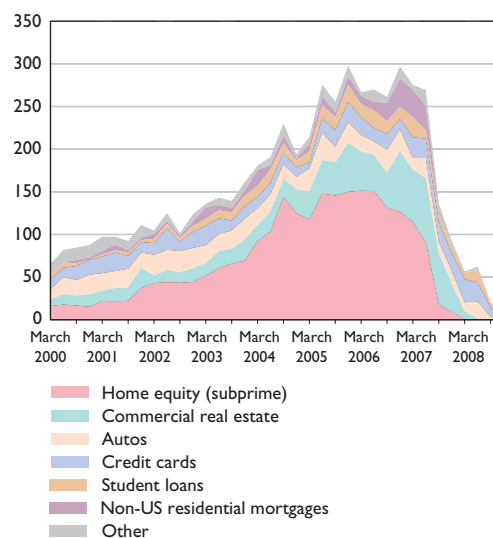
1 | CREDIT CRUNCH

In the current crisis, it is the market-based supply of credit that has seen the most dramatic contraction. Chart 6 plots the flow of new credit from the issuance of new asset-backed securities. The most dramatic fall is in the subprime category, but credit supply of all categories has collapsed, ranging from auto loans to credit card loans and student loans.

However, the drying up of credit in the capital markets would have been missed if one paid attention to bank-based lending only. As can be seen from

Chart 6
New issuance of asset-backed securities
in previous three months

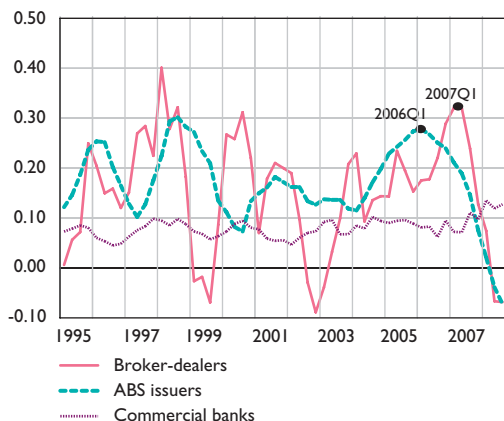
(USD billions)



Sources: JP Morgan Chase and Adrian and Shin (2009).

Chart 7
Annual growth rates of assets

(Asset growth: 4 Qtr)



Source: US Flow of Funds, Federal Reserve.

Chart 7, commercial bank lending has picked up pace after the start of the financial crisis, even as market-based providers of credit have contracted rapidly. Banks have traditionally played the role of a buffer for their borrowers in the face of deteriorating market conditions (as during the 1998 crisis) and appear to be playing a similar role in the current crisis.

2 | MARKET-BASED INTERMEDIARIES

The long-term development of the US financial system and its vulnerability to the current crisis raises several questions. At the margin, all financial intermediaries (including commercial banks) have to borrow in capital markets, since deposits are insufficiently responsive to funding needs. But for a commercial bank, its large balance sheet masks the effects operating at the margin. In contrast, securities firms have balance sheets that reflect much more sensitively the effects operating in the capital markets. Below, we summarise the balance sheet of Lehman Brothers, as at the end of the 2007 financial year, when total assets were USD 691 billion (Chart 8).

The two largest classes of assets are (i) long positions in trading assets and other financial inventories

and (ii) collateralised lending. The collateralised lending reflected Lehman's role as prime broker to hedge funds, and consisted of reverse repos and other types of collateralised lending. Much of the collateralised lending was short term, often overnight. The other feature of the asset side of the balance sheet is how small the holding of cash is. The cash holding is USD 7.29 billion out of a total balance sheet size of USD 691 billion.

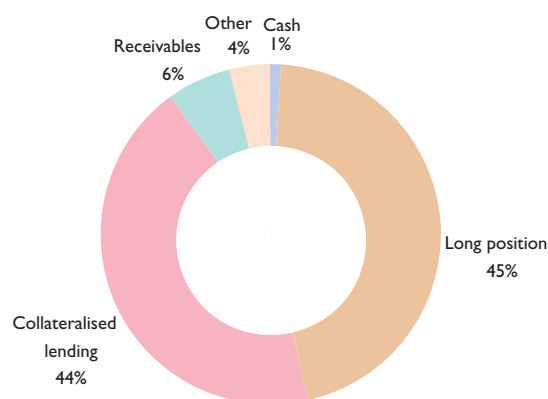
The liabilities of Lehman Brothers reflected the short-term nature of much of its liabilities. The largest component is collateralised borrowing, including repos. Short positions ("financial instruments and other inventory positions sold but not yet purchased") is the next largest component. Long-term debt is only 18% of total liabilities. One notable item is the "payables" category, which is 12% of total balance sheet size. Payables include the cash deposits of Lehman's customers, especially its hedge fund clientele. It is for this reason that "payables" are much larger than "receivables" on the asset side of the balance sheet (only 6%). Hedge fund customers' deposits are subject to withdrawal on demand, and proved to be an important source of funding instability.

In this way, broker-dealers (securities firms) have balance sheets that are in stark contrast to conventional deposit funded banks. Broker-dealers have traditionally played market-making and underwriting roles in securities markets, but their importance in the supply of credit has increased in step with securitisation. For this reason, broker dealers may be seen as a barometer of overall funding conditions in a market-based financial system.

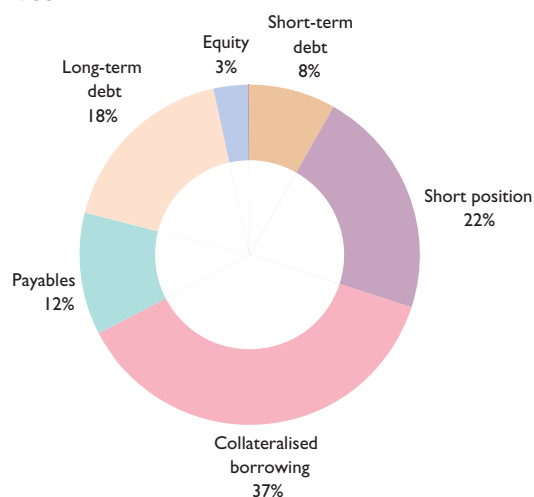
Chart 9 is taken from Adrian and Shin (2007) and shows the scatter chart of the weighted average of the quarterly change in assets against the quarterly change in leverage of the (then) five stand-alone US investment banks (Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley). The striking feature is that leverage is procyclical in the sense that leverage is high when balance sheets are large, while leverage is low when balance sheets are small. This is exactly the opposite finding compared to households, whose leverage is high when balance sheets are *small*. For instance, if a household owns a house that is financed by a mortgage, leverage falls when the house price increases, since the equity of the household is increasing at a faster rate than assets.

Chart 8
Balance sheet of Lehman Brothers

Assets



Liabilities

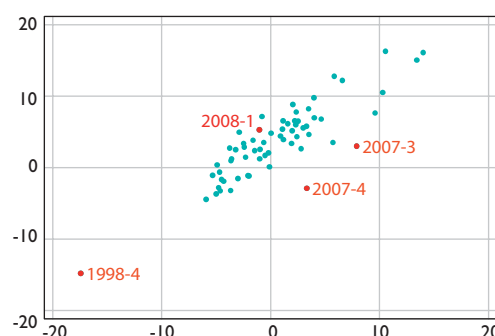


Procyclical leverage offers a window on financial system liquidity. In chart 9, the horizontal axis measures the (quarterly) growth in leverage, as measured by the change in log assets minus the change in log equity. The vertical axis measures the change in log assets. Hence, the 45-degree line indicates the set of points where (log) equity is unchanged. Above the 45-degree line equity is increasing, while below the 45-degree line, equity is decreasing. Any straight line with slope equal to 1 indicates constant growth of equity, with the intercept giving the growth rate of equity.

In Chart 9 the slope of the scatter chart is close to 1, implying that equity is increasing at a constant rate on average. Thus, equity plays the role of the forcing variable, and the adjustment in

Chart 9
Leverage growth and asset growth of US investment banks

(Y axis: Total asset growth, % quarterly; X axis: Leverage growth, % quarterly)



Sources: SEC; Adrian and Shin (2007).

leverage primarily takes place through expansions and contractions of the balance sheet rather than through the raising or paying out of equity. We can understand the fluctuations in leverage in terms of the implicit maximum leverage permitted by creditors in collateralised borrowing transactions such as repurchase agreements (repos). In a repo, the borrower sells a security today for a price below the current market price on the understanding that it will buy it back in the future at a pre-agreed price. The difference between the current market price of the security and the price at which it is sold is called the "haircut" in the repo. The fluctuations in the haircut largely determine the degree of funding available to a leveraged institution, since the haircut determines the maximum permissible leverage achieved by the borrower. If the haircut is 2%, the borrower can borrow USD 98 for USD 100 worth of securities pledged. Then, to hold USD 100 worth of securities, the borrower must come up with USD 2 of equity. Thus, if the repo haircut is 2%, the maximum permissible leverage (ratio of assets to equity) is 50.

Suppose the borrower leverages up the maximum permitted level, consistent with maximising the return on equity. The borrower then has leverage of 50. If a shock raises the haircut, then the borrower must either sell assets, or raise equity. Suppose that the haircut rises to 4%. Then, permitted leverage halves from 50 to 25. Either the borrower must double equity or sell half its assets, or some combination of both. Times of financial stress are associated with sharply higher haircuts, necessitating substantial reductions in leverage through asset

Table 1
Haircuts on repo agreements

(%)

Securities	April 2007	August 2008
US treasuries	0.25	3
Investment-grade bonds	0-3	8-12
High-yield bonds	10-15	25-40
Equities	15	20
Senior leveraged loans	10-12	15-20
Mezzanine leveraged loans	18-25	35+
Prime MBS	2-4	10-20
ABS	3-5	50-60

Source: IMF Global Financial Stability Report, October 2008.

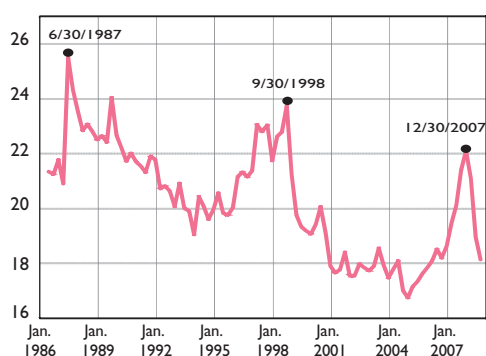
disposals or raising of new equity. Table 1 is taken from IMF (2008), and shows the haircuts in secured lending transactions at two dates – in April 2007 before the financial crisis and in August 2008 in the midst of the crisis. Haircuts are substantially higher during the crises than before.

The fluctuations in leverage resulting from shifts in funding conditions are closely associated with epochs of financial booms and busts. Chart 10 plots the leverage US primary dealers – the set of 18 banks that has a daily trading relationship with the Fed. They consist of US investment banks and US bank holding companies with large broker subsidiaries (such as Citigroup and JP Morgan Chase).

The plot shows two main features. First, leverage has tended to decrease since 1986. This decline in leverage is due to the bank holding companies in

Chart 10
Mean leverage of US primary dealers

(June 1986 to September 2008)



Sources: SEC 10-K and 10-Q filings and Adrian and Shin (2009).

the sample – a sample consisting only of investment banks shows no such declining trend in leverage (see Adrian and Shin, 2007). Secondly, each of the peaks in leverage is associated with the onset of a financial crisis (the peaks are 1987Q2, 1998Q3, 2007Q4). Financial crises tend to be preceded by marked increases of leverage.

The fluctuations of credit in the context of secured lending expose the fallacy of the “lump of liquidity” in the financial system. The language of “liquidity” suggests a stock of available funding in the financial system which is redistributed as needed. However, when liquidity dries up, it disappears altogether rather than being re-allocated elsewhere. When haircuts rise, all balance sheets shrink in unison, resulting in a generalised decline in the willingness to lend. In this sense, liquidity should be understood in terms of the growth of balance sheets (i.e. as a flow), rather than as a stock.

3 | ROLE OF SECURITISATION

The fluctuations of market funding conditions have important implications for financial stability and international capital flows. Indeed, there is an intimate connection between the emergence of subprime mortgages and the large US external deficits in the middle years of this decade. The chain that ties the two is securitisation.

Securitisation refers to the practice of parcelling and selling of loans to investors. It was intended as a way to disperse risks associated with bank lending so that deep-pocketed investors who were better able to absorb losses would share the risks. But in reality, securitisation worked to concentrate risks in the banking sector. There was a simple reason for this. Banks and other intermediaries wanted to increase their leverage – to become more indebted – so as to spice up their short-term profit. So, rather than dispersing risks evenly throughout the economy, banks and other intermediaries bought each other's securities with borrowed money. As a result, far from dispersing risks, securitisation had the perverse effect of concentrating all the risks in the banking system itself.

In the process, increased leverage fuelled by securitisation exacerbated global imbalances. To understand the role of securitisation, it is

important to take a system-wide perspective on financial intermediation. In a traditional banking system that intermediates between retail depositors and ultimate borrowers, the total quantity of deposits represents the obligation of the banking system to creditors outside the banking system. However, securitisation opens up potentially new sources of funding for the banking system by tapping new creditors. The new creditors who buy the securitised claims include pension funds, mutual funds and insurance companies, as well as foreign investors such as foreign central banks. Foreign central banks have been a particularly important funding source for residential mortgage lending in the United States.

When the claims and obligations between leveraged entities have been netted out, the lending to ultimate borrowers must be funded either from the equity of the intermediary sector or by borrowing from creditors outside the intermediary sector. To see this, consider a simplified balance sheet of an **individual bank**, as follows:

Assets	Liabilities
Loans to firms, households	Liabilities to non-banks (e.g. deposits)
Claims on other banks	Liabilities to other banks
	Equity

By "bank" we mean any leveraged institution. In the US context, this includes securities firms, hedge funds and the government sponsored enterprises (GSEs) such as Fannie Mae and Freddie Mac. When balance sheets are aggregated across banks, all the claims and obligations between banks cancel out. So, the aggregate balance sheet for the **banking sector** as a whole looks as follows:

Assets	Liabilities
↑ Total lending to firms and households	↑ Liabilities to non-banks (deposits + securitised debt)
	Total equity

Aggregate lending to end-user borrowers by the banking system must be financed either by the equity in the banking system or by borrowing from creditors outside the banking system. For any fixed profile

of equity and leverage across individual banks, the total supply of credit to ultimate borrowers is larger when the banks borrow more from creditors outside the banking system. Put differently, the leverage of the financial sector as a whole is increasing as banks resort to greater securitisation.

The supply of credit is the outcome of increased leverage of the banking sector as a whole. As balance sheets expand, new borrowers must be found. In other words, new assets must be generated that will fill expanding balance sheets. When all prime borrowers have a mortgage, but still balance sheets need to expand, then banks have to lower their lending standards in order to lend to subprime borrowers. The seeds of the subsequent downturn in the credit cycle are thus sown.

When the downturn arrives, the bad loans are either sitting on the balance sheets of the large financial intermediaries, or they are in special purpose vehicles (SPVs) that are sponsored by them. This is so, since the bad loans were taken on precisely in order to expand total assets and raise leverage. Although final investors such as pension funds and insurance companies will suffer losses, too, the large financial intermediaries are more exposed in the sense that they face the danger of seeing their capital wiped out. The severity of the current credit crisis lies precisely in the fact that the bad loans were not all passed on to final investors.

In this way, the subprime crisis has its origin in the increased supply of loans – or equivalently, in the imperative to find new assets to fill the expanding balance sheets. This explains two features of the subprime crisis – first, why apparently sophisticated financial intermediaries continued to lend to borrowers of dubious creditworthiness, and second, why such sophisticated financial intermediaries held the bad loans on their own balance sheets, rather than passing them on to other unsuspecting investors. Both facts are explained by the imperative to use up slack in balance sheet capacity during an upturn in the credit cycle.

Table 2 shows that of the approximately USD 1.4 trillion total exposure to subprime mortgages, around half of the potential losses were borne by US leveraged financial institutions, such as commercial banks, securities firms, and hedge funds. When foreign leveraged institutions are included, the total exposure of leveraged financial institutions rises to two-thirds.

Table 2
Total exposure to losses from subprime mortgages

	Total reported subprime exposure (USD billions)	Percent of reported exposure
Investment banks	75	5
Commercial banks	418	31
GSEs	112	8
Hedge funds	291	21
Insurance companies	319	23
Finance companies	95	7
Mutual and pension funds	57	4
Leveraged sector	896	66
Unleveraged sector	472	34
Total	1,368	100

Source: Greenlaw, Hatzius, Kashyap and Shin (2008).

4 | FINANCIAL REGULATION

Having identified the problem as the excessive growth of leverage during the boom, the remedy that has gained recent support by policy makers is the imposition of tighter regulation, especially regulation that targets the procyclical nature of the current system of capital regulation under the Basel II system. Many ideas have been advanced, of which we will discuss four.¹ The first is an explicit leverage ratio bound that restrains growth of leverage at the peak of cycles. Switzerland has recently implemented such a system, and the Financial Stability Forum (2009) has recommended a broader review of such a leverage ratio. The second is the forward-looking provisioning scheme used by Spain, where a provision is created at the time that a bank makes a loan, and the provision goes through the income statement of the bank. This system of forward-looking provisioning has been credited with maintaining a more robust banking system thus far in Spain relative to other European countries, in spite of the Spanish housing boom. Third, several recent policy reports have advocated explicit countercyclical capital rules (see, for instance, the Geneva Report, 2009, and the Joint Financial Stability Forum (FSF)–Committee on the Global Financial System (CGFS) Working Group, 2009, on the role of valuation and leverage in procyclicality). Fourth, Adrian and Brunnermeier (2009) propose to

base capital adequacy rules explicitly on measures of systemic risk of particular institutions.

Whether the binding regulatory constraints come through leverage bounds, forward-looking provisioning, explicit countercyclical capital rules, or systemic capital rules, is a matter of implementation. The underlying spirit is the same: financial system risk caused by market failure provides a rationale for public policy. Regulation with the aim of mitigating financial system risk must aim at reducing the adverse effects of the market failures that are the root cause of the crisis. Policy that is guided by the right economic theory are giving rise to philosophy of regulation with the best chance of living up to the task. Only a regulatory system that has the system-wide perspective can meet the challenges ahead.

Currently, financial regulation combines two distinct activities. One is the monitoring of individual institutions for their impact on system stability, another is the investor and consumer protection regulation. As important as business and consumer protection roles are, their purpose is very different from that of a systemic regulator, and need a different set of skills as well as a different mindset. Consumer advocacy and prosecuting market abuse involve setting and then enforcing the appropriate rules under a transparent legal framework. Such work is best done by lawyers and accountants who specialise in rule-making and enforcement. The Securities and Exchange Commission in the United States is a good example of such a regulator. However a conduct of business regulator is ill-equipped to cope with a systemic crisis where the problem is not one of enforcing rules.

One element of improved regulation will be a macroprudential systemic regulator who could take on two important tasks. First, the systemic regulator should gather, analyse, and report systemic information. This will require reporting from a broader range of financial institutions, such as hedge funds. Second, the systemic regulator will operate capital rules with a systemic focus. The G20 meeting in London has affirmed both principles, and the reform of the regulatory framework is likely to incorporate both. Given the central bank's intimate connections with the financial market through its monetary policy role, it is likely to have the best market intelligence in

¹ The consensus that emerged at the G20 summit in London on April 2nd 2009 is that capital requirements should be designed so that regulations restrain excesses when market-determined capital ratios fail to do so.

performing the role of the macroprudential regulator. Furthermore, the fact that the central bank is the lender of last resort (LOLR) gives it the capacity to intervene in the market when necessary. In any event, if the central bank is likely to be called upon during times of crisis to play its role in the resolution of problem institutions, it should be in a position to assess the true conditions of the problem institution. The best way that such information can be gained is through on-site examinations, perhaps together with the main regulatory agency.

In the new, post-crisis financial system, many familiar features of the system before the crisis will cease to be in place. The role of securitisation is likely to be held in check by more stringent financial regulation and the

recognition of the importance of preventing excessive leverage and maturity mismatch in undermining financial stability. Institutional changes and the conduct of monetary policy will flow from the recognition of the role of the financial system as the servant of the real economy, rather than an end in itself. In particular, we might see the return of a more staid "utilities" version of banking based on the model of banking as a support to the real economy.

In retrospect, the boom in the securities sector seen in Charts 2 and 3 earlier could be seen as the emergence of a thirty-year bubble that began in 1980, and which burst with the first outbreak of the subprime in the summer of 2007. We are still feeling the after effects of that bursting.

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Managing the transition to a safer financial system

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The current financial crisis demonstrates the need for changes in the supervision and resolution of financial institutions, especially those that are systemically important to the financial system. The challenge is to find ways to impose greater market discipline on these firms by giving them incentives to reduce their size and complexity through capital standards, leverage limits, systemic risk insurance premia and other measures. Foremost in the reform agenda is the need for a special legal framework to ensure the orderly resolution of a complex financial institution. There must also be incentives to protect consumer interests, as there can no longer be any doubt that abusive products and practices pose threats to the safety and soundness of the financial system.

We are in the midst of the most challenging financial crisis since the Great Depression. Many financial organisations, both supervised and unsupervised, have grown in size and complexity to the point that they have become sources of systemic risk. The increasing complexity of financial products and frequently opaque marketing and disclosure practices have also been revealed to pose serious risks for consumers, institutions, and investors. The widespread economic damage that has been wrought from this financial crisis has called into question the fundamental assumptions regarding financial institutions and their supervision that have directed our regulatory efforts for decades.

This article will examine some steps that can be taken to reduce systemic vulnerabilities by strengthening regulation and supervision and improving financial market transparency.

First and foremost, should be the creation of a new special resolution authority for systemically important non-bank financial firms. Changes in regulation and supervision are also needed to give firms incentives to limit their size and complexity. Equally important, there must be new incentives created to protect consumer interests, as there can no longer be any doubt that abusive products and practices endanger the safety and soundness of the financial system.

1 | THE CRISIS UNFOLDS

The past two years have brought extraordinary changes to financial markets. What began with an announcement of losses for two investment funds managed by Bear Stearns in June 2007 has progressed into the most challenging financial crisis since the Great Depression. A cascade of downgrades closed the securitisation and structured credit markets and created a funding crisis for financial intermediaries. Credit losses have weakened investor confidence and frozen liquidity in all but the most transparent of markets. By the end of 2007, the financial stress was clearly evident as bank failures increased and the Federal Reserve announced unprecedented measures to inject liquidity into US markets.

As 2008 unfolded, conditions in the mortgage and other markets continued to deteriorate. In March, Bear Stearns was acquired by JPMorgan Chase (with assistance by the Federal Reserve), and in July, IndyMac Bank, which had over USD 30 billion in assets, was closed and the Federal Deposit Insurance Corporation (FDIC) was appointed conservator of the successor institution. The failure is the most costly in the history of the FDIC.¹ Waning investor confidence forced Fannie Mae and Freddie Mac into conservatorship, Lehman Brothers to file for bankruptcy protection, insurance giant AIG to seek and obtain USD 85 billion under a temporary liquidity facility from the Federal Reserve Bank of New York, and the FDIC to invoke the first use of the systemic risk exception.² Immediately following the Lehman bankruptcy, liquidity in the inter-bank market evaporated. In response, the US Treasury instituted temporary guarantees for money market mutual funds and the Federal Reserve expedited approval of Goldman Sachs and Morgan Stanley applications to become bank holding companies.

Congress responded by passing the Emergency Economic Stabilisation Act (EESA) in October, which funded the US Treasury's Temporary Asset Relief Program (TARP). That program immediately recapitalised nine of the largest bank holding companies (BHCs) in the United States and has since invested capital in numerous other banks. The EESA also temporarily increased the deposit insurance limit to USD 250,000. The Federal Reserve opened several new lending facilities to provide funding using asset-backed securities as collateral. The FDIC established the Temporary Liquidity Guarantee Program, which guarantees bank debt in order to improve bank liquidity. The newest program established by the US Treasury uses the FDIC and the Federal Reserve to provide guarantees to the private sector for the purchase of legacy loans and securities, respectively.³

During the current crisis, many countries in the European Union as well as the United States have had to develop *ad hoc* responses and use public funds to address problems in their large, troubled institutions. The European Union has raised minimum deposit insurance levels, allowed governments to guarantee

¹ The FDIC estimated that losses to the deposit insurance fund from the IndyMac Bank failure would total approximately USD 11 billion.

² By law, the FDIC is required to resolve a failed bank using the resolution method that is least costly to the deposit insurance fund. A systemic risk exception to the least-cost test was established for extraordinary circumstances when the least-cost method would have serious adverse effects on economic conditions or financial stability. The systemic risk exception requires approval of two thirds of the members of the FDIC Board of Directors, two thirds of the members of the Board of Governors of the Federal Reserve System, and the Secretary of the US Treasury, who must first consult with the President of the United States. As of March 31, 2009, the FDIC has invoked the systemic risk exception on four occasions during this financial crisis.

³ For information on programs created to address the current crisis, see <http://www.financialstability.gov/>.

short-term bank debt and recapitalise fundamentally sound banks. For example, Belgian authorities have rescued several banks by injecting capital and by guaranteeing all new loans of their banks considered to be systemic. The French government announced a plan to provide loan guarantees and may buy stakes in banks in need of capital. The German government announced a stabilisation fund to provide banks with capital support and to purchase troubled assets. In the United Kingdom, the Bank of England announced plans to swap banks' risky mortgage assets for government debt, provided recapitalisation assistance, and loaned funds to banks through liquidity auctions.

Clearly, government efforts to stabilise the financial system both in the United States and in Europe have resulted in an unprecedented broadening of the safety net beyond its traditional role. These actions have been justified by the need to prevent the failure of individual institutions from shutting down financial intermediation channels, which otherwise would have had severe systemic repercussions on the global financial system and the real economy. Economic and financial integration has reached a level where no country can ignore developments elsewhere in the world.

The financial crisis is ongoing and central banks and regulatory agencies are fully engaged in efforts to restore investor confidence and restart financial intermediation.

Beyond these pressing challenges is the broader question of how best to oversee the financial system, particularly the largest financial firms that can pose systemic risk. In the United States, attention is being focused on financial system changes and reforms that will promote financial stability and reduce our vulnerabilities to systemic risk.

2 | THE FAILURE TO UNDERSTAND FINANCIAL RISK

Financial markets channel funds between savers and investors either directly through capital markets or indirectly through financial intermediaries. Traditionally, consumers have relied on regulated financial institutions, such as commercial banks and thrifts to provide mortgages and other retail loans,

on broker-dealers for securities and other investment vehicles and on insurance companies for insurance and surety products. In more recent times, various non-bank entities, which are subject to widely varying ranges of regulation or even no regulation, have become important participants in the financial services markets. The largest financial institutions have grown rapidly in size and complexity, fueled in part by the elimination of Glass-Steagall and other regulatory restrictions. While there are still large numbers of traditional financial institutions, a number of very large financial conglomerates engage in a broad range of activities and have become increasingly interconnected.

The decade preceding the current crisis was characterised by a rapid expansion in credit and by uncharacteristically low interest rates and credit spreads. In an effort to reap greater returns, credit was made available to ever-more-risky borrowers and narrow credit spreads were offset by increasing leverage. To manage the risk posed by these borrowers and to facilitate the leverage needed to generate desired returns, the financial markets developed increasingly complex financial products intended to reduce risk by shifting that risk to those best able to bear it. Leverage was increased by funding credits off-balance-sheet through securitisations and special purpose entities. The mix of reduced underwriting standards and increased leverage rapidly expanded credit and ultimately pushed up the values of equities, commodities, and especially real estate to unsustainable levels.

Once the bubble burst, the decline in the price of housing led to a large-scale downgrade in the ratings of subprime mortgage-backed securities and collateralised debt obligations that were linked to these securities. Ultimately, these losses caused failure or distress in a number of financial institutions that were over-exposed to this market.

The US financial regulatory system failed in many instances to appreciate the gravity of the situation and subsequently did not limit risk properly. This was partly because the prevailing belief that financial markets, through financial engineering, had created a system where risks were easily identified and transferred from parties who were risk averse to those who were willing, ready and capable to assume these risks. The collapse of these markets calls these beliefs into question.

What began as well-understood, risk-reducing transactions between two parties, became in the aggregate, opaque risky transactions when they were multiplied many times over and conducted between multiple parties. The unprecedented size and complexity of many of today's financial institutions and financial products have raised serious issues regarding whether they can be properly managed and effectively supervised through existing mechanisms and techniques. In addition, the significant size and growth of unsupervised financial activities outside the traditional banking system—in what is termed the shadow financial system—has made it increasingly difficult for regulators or market participants to understand the real dynamics of either bank credit markets or public capital markets.⁴

US regulators already have broad powers to supervise financial institutions and markets and to limit many of the activities that undermined our financial system. For various reasons, these powers were not used effectively and, as a consequence, supervision was not sufficiently proactive. Insufficient attention was paid to the adequacy of complex institutions' risk management capabilities. Too much reliance was placed on mathematical models to drive risk management decisions. Off-balance-sheet vehicles were permitted to be operated beyond the reach of prudential regulation, effectively avoiding bank and holding company capital requirements in the United States. Perhaps most importantly, failure to ensure that financial products were appropriate and sustainable for consumers caused significant problems not only for those consumers but for the safety and soundness of financial institutions.

Problems of supervising large, complex financial institutions are compounded by the absence of procedures and structures to effectively resolve those institutions in an orderly fashion outside the normal bankruptcy process. Unlike the clearly defined and proven special statutory powers that the FDIC has for resolving insured depository institutions, the current US bankruptcy framework was not designed to protect the stability of the financial system.

3 | ADDRESSING SYSTEMIC RISK

Having a mechanism for the orderly resolution of institutions that pose a systemic risk to the financial system is critical. Creating a resolution regime that could apply to any financial institution that becomes a source of systemic risk should be an urgent priority. Beyond the necessity of having an orderly resolution regime for systemically important financial firms, additional changes in our regulatory and supervisory approach are clearly warranted. Changes that fill regulatory voids and improve cooperation should be implemented quickly.

3|1 Resolution of systemically important financial firms

In a typical bank failure, where the bank and the BHC are smaller and not engaged in complex capital-market operations, the FDIC steps in to resolve the bank under its special authorities. The FDIC has only the authority to take control of the failing bank, protecting the insured depositors. Because the bank is typically the only significant asset of the BHC and most of the holding company's operations reside within the bank, seizing the bank and separating it from its BHC is simple and efficient. Taking over the bank usually renders the holding company insolvent, and forces it into the bankruptcy process. When most of the important functions of the bank are within the bank or bank subsidiaries, the FDIC can resolve the institution through its normal practices.

However, there are two problems the FDIC confronts in trying to resolve larger, more complex holding companies. The first concerns how to deal with a non-bank holding company subsidiary whose operations are essential to the day-to-day operations of the bank. The second is how to prevent a systemically important holding company from declaring bankruptcy. So although the FDIC has the power to resolve any failed bank, it is often impossible to accomplish this in the case of a bank within a large complex BHC.

⁴ This shadow financial system includes unregulated financial instruments, such as over-the-counter (OTC) derivatives and off-balance-sheet entities including structured investment vehicles (SIVs), and non-bank institutions, such as hedge funds and private equity funds. See, Congressional Oversight Panel, Special Report on Regulatory Reform, Washington DC, 2009, p. 28.

Large complex BHCs, as well as a number of other large non-bank financial firms, engage in operations that pose systemic risk to the financial system. If one of these entities becomes troubled, there is no alternative resolution mechanism outside of bankruptcy. A bankruptcy filing would trigger the close-out and netting provisions of the BHCs derivatives contracts.

In a bankruptcy, an automatic stay is placed on most creditor claims, which imposes a time-out to prevent the untimely and inefficient liquidation of assets. The automatic stay creates liquidity problems for creditors, as they must wait to receive their funds. The enforceability of contractual rights to terminate and net specified financial contracts (futures and options contracts and certain types of derivatives), however, remain exceptions to the normal bankruptcy process. This carve-out for specified financial contracts creates a "rush to the door" as counterparties invoke their netting and settling arrangements, leaving fewer assets available to settle other creditor claims. These exceptions are designed to preserve financial stability by limiting the failure of one bank from affecting its healthy counterparties. However, during periods of market instability the immediate close-out and netting of specified financial contracts can overwhelm the market and depress market prices for the underlying assets.

By contrast, the powers that are available to the FDIC under its special resolution authority prevent financial contracts of an insured depository institution from being automatically terminated and netted. The FDIC has 24 hours after its appointment as receiver to decide whether to transfer the contracts to another bank or to an FDIC-operated bridge bank. As a result, the potential for instability or contagion from immediate termination and netting can be tempered by transferring the financial contracts to a more stable counterparty. Such a temporary delay on close-out is explicitly ruled out in other jurisdictions, including the European Union.

The consequences of a large systemic financial firm filing for bankruptcy protection are aptly demonstrated by the Lehman Brothers experience. In the case of Lehman, the bankruptcy filing triggered the close-out and netting of Lehman's financial contracts. This was only avoided in the case of Bear Stearns, because the Federal Reserve lent USD 30 billion to JPMorgan Chase to acquire the company. The acquisition allowed the

contracts to transfer to a counterparty. Once Lehman sought the protection of the bankruptcy court (Chapter 11) —a clear insolvency event— close-out and netting applied. Because of Lehman's significant size, the bankruptcy resulted in the freezing of global credit markets. This effect was compounded as creditors realised that a "too big to fail" institution had failed. The differences in outcomes from the handling of Bear Stearns and Lehman Brothers demonstrate that authorities have no real alternative but to avoid the bankruptcy process in the case of systemically important firms. When the public interest is at stake, the resolution process should support an orderly unwinding of the institution in a way that protects the broader economic and taxpayer interests, not just private financial interests.

3|2 Creating a new resolution regime

In creating a new resolution regime, the roles and responsibilities must be clearly defined and care must be taken to avoid creating new conflicts of interest. In the case of banks, Congress gave the FDIC backup supervisory authority and the power to self-appoint as receiver, recognising there might be conflicts between a primary regulator's prudential responsibilities and its willingness to recognise when an institution it supervises needs to be closed. Thus, the new resolution authority should be independent of the new systemic risk regulator.

This new authority should also be designed to limit subsidies to private investors, that is to limit moral hazard. If financial assistance outside of the resolution process is granted to systemically important firms, the process should be open, transparent and subject to a system of checks and balances that are in the systemic-risk exception to the least-cost test that applies to insured financial institutions. No single government entity should be able to unilaterally trigger a resolution strategy outside the defined parameters of the established resolution process.

Clear guidelines for this process are needed and must be adhered to in order to gain investor confidence and protect public and private interests. This will require careful thought. The guidelines should have enough flexibility to accommodate unforeseen situations, while promoting confidence in the outcome. For example, there should be a clearly defined priority

structure for settling claims, depending on the type of firm.⁵ Any resolution should be subject to a cost test to minimise public loss and impose losses according to the established claims priority. Additionally, the process must allow continuation of any systemically significant operations. The rules that govern the process, and set priorities for the imposition of losses on shareholders and creditors should be clearly articulated and closely adhered to so that the markets can understand the resolution process and anticipate the outcome with some confidence.

The FDIC's authority to act as receiver and to establish a bridge bank in order to maintain key functions and sell assets offers a good model. A bridge bank allows the government to preserve systemically significant functions. It enables losses to be imposed on market players who should appropriately bear the risk. It also creates the possibility of multiple bidders for the bank and its assets, which can reduce losses to the receivership.

The FDIC has the authority to terminate contracts upon an insured depository institution's failure, including contracts with senior management whose services are no longer required. Through its repudiation powers, as well as enforcement powers, termination of such management contracts can often be accomplished at little cost to the FDIC. Moreover, when the FDIC establishes a bridge bank, it is able to contract with individuals to serve in senior management positions at the bridge institution subject to the oversight of the FDIC. The new resolution authority should be granted similar statutory authorities.

While many details of a special resolution authority for systemically important financial firms would have to be worked out, a new systemic resolution regime could be funded by fees or assessments charged to systemically important firms. In addition, consistent with the FDIC's powers with regard to insured institutions, the resolution authority should have backup supervisory authority over those firms which it may have to resolve.

There is clearly a need for a special resolution regime, outside the bankruptcy process, for financial firms that pose a systemic risk, just as there is for commercial

banks and thrifts. Without a system that provides for the orderly resolution of activities outside of the depository institution, the failure of a systemically important holding company or non-bank financial entity will create additional instability as claims outside the depository institution become completely illiquid under the current system.

3|3 Systemic risk regulator

In addition to calling for a resolution regime for institutions that pose a systemic risk to the financial system, many studies are now calling for the creation of a systemic risk regulator that would add a macroprudential approach to regulation.⁶ In the United States, arguments have been put forth for the creation of a systemic risk regulator to address key flaws in the current supervisory system. According to the proposals, this new regulator would be tasked with monitoring large or rapidly increasing exposures – such as subprime mortgages and collateralised debt obligations – across firms and markets, rather than only at the level of individual firms or sectors. The regulator would also analyse possible spillovers among financial firms or between firms and markets, such as the mutual exposures of highly interconnected firms. Additionally, the proposals call for such a regulator to have the authority to obtain information and examine banks and key financial market participants, including non-bank financial institutions that may not be currently subject to regulation. Finally, the systemic risk regulator would be responsible for setting standards for capital, liquidity, and risk management practices for the financial sector.

Although there could be benefits in creating a systemic risk regulator, it is far from clear that a systemic risk regulator alone would be able to prevent a future crisis. Creation of such a regulator presumes that the financial system would continue to be characterised by a number of large, complex financial institutions. In the long run, however, we cannot hope that management of these large systemically important firms and their systemic risk regulator will always develop the right strategy at the right time. Financial institutions should be discouraged from becoming so large or complex

5 Questions will arise concerning what types of financial products should receive priority. For example, would insurance policies, annuities or other consumer contracts be given priority as is the case with insured deposits?

6 See J. de Larosière, "The high-level group report on financial supervision in the EU". See also, *The G30, Financial Reform: A Framework for Financial Stability*, Washington DC, 15 January 2009.

that they pose a systemic risk to the financial system and the economy. Instead, we should promote a system that does not depend on the behaviour of managers or their regulators. Rather, the system should be designed so that the failure of one of the largest financial institutions has little or no effect on the other parts of the system. In order to move in this direction, we need to create incentives that limit the size and complexity of institutions whose failure would otherwise pose a systemic risk.

3|4 Limiting risk by limiting size and complexity

Over the past two decades, a number of arguments have been advanced about why financial organisations should be allowed to become larger and more complex. These reasons include being able to take advantage of economies of scale and scope, diversify risk across a broad range of markets and products, and gain access to global capital markets.

It was alleged that the increased size and complexity of these resulting organisations could be effectively managed using new innovations in quantitative risk management techniques. Not only did institutions claim that they could manage their complex structures, they also argued that the combination of diversification and advanced risk management practices would allow them to operate with markedly lower capital buffers than were necessary in smaller, less-sophisticated institutions. Indeed many of these concepts were inherent in the Basel II Advanced Approaches, resulting in reduced capital requirements for these banks. In hindsight, it is now clear that the international regulatory community relied too heavily on the supposed benefits of diversification

and modern risk management practices when setting minimum regulatory capital requirements for large complex financial institutions.

Notwithstanding expectations and industry projections for gains in financial efficiencies, economies of scale seem to be reached at levels far below the size of today's largest financial institutions.⁷ Also, efforts designed to realise economies of scope have not lived up to their promise.⁸ In some instances, the complex institutional combinations permitted by the Gramm-Leach-Bliley (GLB) legislation were unwound because they failed to realise anticipated economies of scope.⁹ Studies of the economies produced by increased scale and scope have consistently found that most banks could improve their cost efficiency more by concentrating their efforts on reducing operational inefficiencies than through growth.¹⁰

There also are limits to the ability to diversify risk using securitisation, structured finance and derivatives. No one disputes that there are benefits to diversification for smaller and less-complex institutions, but as institutions become larger and more complex, the ability to diversify risk is diminished. When a financial system includes a small number of very large complex organisations, the system cannot be well-diversified. As institutions grow in size and importance, they not only take on a risk profile that mirrors the risk of the market and general economic conditions, but they also concentrate risk as they become the only important counterparties to many transactions that facilitate financial intermediation in the economy.¹¹ The fallacy of the diversification argument becomes apparent in the midst of financial crisis when these large complex financial organisations —because they are so interconnected— reveal themselves as a source of risk in the system.

7 Boyd and Graham (1998) examined the effects of mergers and found evidence of cost-efficiency gains for only the smallest of banks. The gains disappeared quickly with increases in size and were negative for larger banks.

8 A number of studies have found little or no evidence of scope economies. Among these are Stiroh (2004), Amel et al. (2002), and DeLong (2001). For thorough discussions of the literature on the effects of consolidation in banking, see Jones and Critchfield (2005) and Berger, Demsetz, and Strahan (1999).

9 The Gramm-Leach-Bliley Financial Modernisation Act of 1999 eliminated restrictions on the mixing of commercial and investment banking, and insurance that had been in effect since 1933.

10 Reviewing this literature, Kwan (1997) observed that efficiency appeared to vary substantially across banks and that: "On average, the deviation from the minimum cost is found to be quite large, in the neighborhood of 20 to 25 percent of total costs, and it seems to dominate the effect of scale inefficiency. The findings suggest that for an average bank, the biggest room for efficiency gains lies in improving its operating efficiency, that is, doing things right, rather than on scale efficiency, that is, being the right size."

11 G10, 2001, Consolidation in the financial sector: working group, Report to the Governors of the Group of Ten. See also, De Nicolo and Kwast (2002).

3|5 Incentives to limit size: focus on capital adequacy

One suggestion for controlling the size and complexity of systemically important financial firms is to impose increasing financial obligations that mirror their heightened risk. Therefore, we should revisit the capital standards faced by these firms.

Obviously, those systemically important firms that are not subject to regulatory capital standards should be made subject to them. Additionally, the current capital standards under the Basel II Accord are not sufficient to reflect the risk inherent in today's systemically important financial firms—all firms should face a minimum leverage ratio. Moreover, additional capital charges should be imposed based on both size and complexity. Regulators should not only increase required capital, but should also judge the capital adequacy of these firms, taking into account off-balance-sheet assets and conduits as if these risks were on the balance sheet.

At present, regulatory capital standards do not explicitly consider the stage of the economic cycle in which financial institutions are operating. As institutions seek to improve returns on equity, there is often an incentive to reduce capital and increase leverage when economic conditions are favorable and earnings are strong. However, when a downturn inevitably occurs and losses arising from credit and market risk exposures increase, these institutions' capital ratios may fall to levels that no longer appropriately support their risk profiles.

Therefore, it is important for regulators to institute counter-cyclical capital policies. For example, financial institutions could be required to limit dividends in profitable times to build capital above regulatory minimums or build some type of regulatory capital buffer to cover estimated through-the-cycle credit losses in excess of those reflected in their loan loss allowances under current accounting standards. The Basel Committee on Banking Supervision is working to strengthen capital to ensure bank resilience to future episodes of economic and financial stress. The FDIC also strongly encourages the accounting standard-setters to revise the existing accounting

model for loan losses to better reflect the economics of lending activity and enable lenders to recognize credit impairment earlier in the credit cycle.

A final area of consideration in the United States is to subject large systemically important firms to higher Prompt Corrective Action (PCA) limits.¹² When PCA standards were first implemented they were designed for regulators to take action against a troubled financial institution before it became critically undercapitalised. As current events have demonstrated, these limits are not adequate to reflect the risk inherent in large systemically important financial firms.

3|6 Other measures to limit systemic risk

In addition to the measures discussed above, there are a number of measures that could be taken fairly quickly to limit systemic risk. Over-the-counter (OTC) market contracts could be encouraged to trade on nationally recognised exchanges, originate-to-distribute models could be subject to greater disclosure requirements, and steps could be taken to reform the credit rating agencies.

CREDIT DERIVATIVES MARKETS AND SYSTEMIC RISK

One area of particular concern is the need to revisit the regulation and oversight of credit derivative markets. Credit derivatives provide investors with instruments and markets that can be used to create tremendous leverage and risk concentration without any means for monitoring the trail of exposure created by these instruments. For example, in the years leading up to the crisis, an individual firm could take a security from a pool of loans and, through the OTC markets for credit default swaps (CDS), leverage that debt many times in individual CDS contracts. At the same time, the debt could be referenced in CDS Index contracts created by OTC dealers, thus creating additional exposure to that debt. If the referenced security defaults, its bond holders will likely lose some fraction its par value, but CDS holders would face losses that are many times that amount.

¹² The Federal Deposit Insurance Corporation Improvement Act of 1991 created a new supervisory framework—known as Prompt Corrective Action or PCA—that links enforcement actions to the level of capital held by a bank. PCA represents an attempt to provide a timely and nondiscretionary trigger for supervisory actions.

Events have shown that the CDS markets are a source of systemic risk. The market for CDS was originally set up as an inter-bank market to exchange credit risk without selling the underlying loans, but it has since expanded massively to include hedge funds, insurance companies, municipalities, public pension funds and other financial institutions. The CDS market has expanded to include OTC index products that are so actively traded that they spawned a Chicago Board of Trade futures market contract. CDS markets are an important tool for hedging credit risk, but they also create leverage and can multiply underlying credit risk losses. Because there are relatively few CDS dealers, absent adequate risk management practices and safeguards, CDS markets can also create counterparty risk concentrations that are opaque to regulators and financial institutions.

OTC contracts should be encouraged to trade on nationally regulated exchanges with centralised clearing and settlement systems, similar in character to those of the futures and equity option exchange markets.¹³ The regulation of the contracts that remain OTC-traded should be subject to supervision by a national regulator with jurisdiction to promulgate rules and standards regarding sound risk management practices, including those needed to manage counterparty credit risk and collateral requirements, uniform close-out practices, trade confirmation and reporting standards, and other regulatory and public reporting standards that will need to be established to improve market transparency. For example, OTC dealers could be required to report selected trade information in a Trade Reporting and Compliance Engine (TRACE)-style system, which would be made publicly available.¹⁴ OTC dealers and exchanges could also be required to report information on large exposures and risk concentrations to a regulatory authority. This could be modeled in much the same way as futures exchanges regularly report qualifying exposures to the Commodities Futures Trading Commission. The reporting system would need to provide information on concentrations in both short and long positions.

THE ORIGINATE-TO-DISTRIBUTE BUSINESS MODEL

One of the most important factors driving this financial crisis has been the decline in value, liquidity and underlying collateral performance of a wide swath

of previously highly rated asset-backed securities. In 2008, over 221,000 rated tranches of private-label asset-backed securitisations were downgraded. This has resulted in a widespread loss of confidence in agency credit ratings for securitised assets, and bank and investor write-downs on their holdings of these assets.

Many of these previously highly rated securities were never traded in secondary markets, and were subject to little or no public disclosure about the characteristics and ongoing performance of the underlying collateral. Financial incentives for short-term revenue appear to have driven the creation of large volumes of highly rated securitisation products, with insufficient attention to due diligence, and insufficient recognition of the risks being transferred to investors. Moreover, some aspects of the US regulatory framework may have encouraged banks and other institutional investors in the belief that a highly rated security is, by definition, of minimal risk.

Today, in a variety of policy-making groups around the world, there is consideration of ways to correct the incentives that led to the failure of the originate-to-distribute model. One area of focus relates to disclosure. For example, rated securitisation tranches could be subject to a requirement for disclosure of detailed loan-level characteristics and regular performance reports. Over the long term, liquidity and confidence might be improved if secondary market prices and volumes of asset-backed securities were reported on some type of system analogous to the TRACE-style report that now captures such data on corporate bonds.

Over the longer term, a more sustainable originate-to-distribute model might result if originators were required to retain some form of explicit exposure to the assets sold. This idea has been endorsed by the G30 and is being actively explored by the European Commission. Some in the United States have noted that there are implementation challenges to this idea, such as whether issuers should be prevented from hedging their exposure to their retained interests. Acknowledging these issues and correcting the problems in the originate-to-distribute model is very important, and some form of retention requirement that goes beyond the past practices of the industry should continue to be explored.

¹³ See G30 report.

¹⁴ TRACE is a vehicle that facilitates the mandatory reporting of OTC secondary market transactions in eligible fixed income securities. Broker/dealers have an obligation to report transactions in corporate bonds to TRACE.

CREDIT RATING AGENCY REFORM

The FDIC generally agrees with the Group of 30 recommendation that regulatory policies with regard to Nationally Recognised Securities Rating Organisations (NRSROs) and the use of their ratings should be reformed. Regulated entities should conduct independent evaluations of the credit risk products in which they are investing. NRSROs should evaluate the risk of potential losses from the full range of risk factors, including liquidity risk and price volatility. Regulators should examine the incentives imbedded in the current business models of NRSROs. For example, an important strand of work within the Basel Committee on Banking Supervision relates to the creation of operational standards for the use of ratings-based capital requirements. In the future, capital requirements should not give banks incentives to rely blindly on favorable agency credit ratings. Preconditions for the use of ratings-based capital requirements should ensure that investors and regulators have ready access to the loan-level data underlying the securities, and that an appropriate level of due diligence has been performed.

4 | CONSUMER PROTECTION

There can no longer be any doubt about the link between protecting consumers from abusive products and practices and the safety and soundness of the financial system. Products and practices that strip individual and family wealth undermine the foundation of the economy. As the current crisis demonstrates, increasingly complex financial products combined with frequently opaque marketing and disclosure practices result in problems not just for consumers, but for institutions and investors as well.

To protect consumers from potentially harmful financial products, a case has been made for a new independent financial product safety commission independent of regulatory and supervisory authorities—a variation of the twin peaks regulatory model. Certainly, more must be done to protect consumers. The creation of a new entity to establish consistent consumer protection standards for banks and non-banks should include the perspective of bank regulators as well as non-bank enforcement officials.

It is important to ensure that consumer protection activities are aligned and integrated with other bank supervisory information, resources, and expertise, and that enforcement of consumer protection rules for banks be left to bank regulators.

In the United States, the current system allows bank regulators to take a comprehensive view of financial institutions from both a consumer protection and safety-and-soundness perspective. Because of this, risks to consumers are closely linked with and informed by a broader understanding of other risks in financial institutions. Likewise, assessments of other risks, including safety and soundness, benefit from knowledge of basic principles, trends, and emerging issues related to consumer protection. If consumer protection regulation is separated from other regulation and supervision, it would become more difficult for each party to gather the information that is necessary to effectively perform their respective functions.

Policy development must be closely coordinated and reflect a broad understanding of institutions' management, operations, policies, and practices. Placing consumer protection policy-setting activities in a separate organisation, apart from existing expertise and examination infrastructure, could ultimately result in less effective protections for consumers.

However, if a separate, independent financial product safety commission is implemented, it should leverage the resources, experience, and legislative power of the existing regulatory authorities to enforce regulations related to institutions under their supervision and include principals from the bank regulatory agencies on the commission's board. Such a commission should be required to submit periodic reports to Congress on the effectiveness of the consumer protection activities of the commission and the bank regulators.

Whether a new commission is created, it is essential that there be uniform standards for financial products whether they are offered by banks or non-banks. These standards must apply across all jurisdictions and issuers, otherwise gaps create competitive pressures to reduce standards, as we saw with mortgage lending standards. Clear standards also permit consistent enforcement that protects consumers and the broader financial system.

Finally, it is time to examine curtailing federal preemption of state consumer protection laws in the United States. Federal preemption of state laws means that federally chartered institutions are not bound by state law. It was seen as a way to improve efficiencies for financial firms who argued that it lowered costs for consumers. While that may have been true in the short run, it has now become clear that abrogating sound state laws, particularly regarding consumer protection, created an opportunity for regulatory

arbitrage that frankly resulted in a "race-to-the-bottom" mentality. Creating a "floor" for consumer protection, based on either appropriate state or federal law, rather than the current system that establishes a ceiling on protections would significantly improve consumer protection. Perhaps reviewing the existing web of state and federal laws related to consumer protections and choosing those most appropriate for the "floor" could be one of the initial priorities for a financial products safety commission.

The current financial crisis demonstrates the need for changes in the resolution and supervision of financial institutions, especially those that are systemically important to the financial system. The choices are complex, made more so by the fact that we are trying to address problems while the whirlwind of economic problems continues to engulf us. While the need for some reforms is obvious, such as a legal framework for resolving systemically important institutions, others are less clear and we would encourage a thoughtful, deliberative approach.

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Reform of the global financial architecture: a new social contract between society and finance

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The current global crisis poses significant challenges for our financial system, our economies, and our societies. Overcoming these will require a new “social contract” between society and finance. This must include improvements to corporate governance, a reform of capital requirements, a more transparent and less procyclical accounting framework, banking laws to reflect modern financial markets, better infrastructure, and stronger supervision. Given the global nature of today’s capital markets, it will also require efforts to be coordinated, if not harmonised, internationally in order to avoid any re-fragmentation and re-nationalisation of the financial system. Addressing these challenges is essential to creating a financial framework that can support prosperous growth in the coming decades.

1 | LEARNING FROM THE PAST

It is exactly 75 years ago that a new US administration enacted sweeping regulatory changes to America's financial markets. When US President Franklin Delano Roosevelt said in his inauguration speech, that there is "nothing to fear but fear itself", he set not only the tone for his first year in office but also marked the turning point of the economic and financial crisis at the time.

Roosevelt had understood that a return of economic, financial and political stability would require co-ordinated action on several fronts: first, a stabilisation of the banking system, the basis for which was laid by the Emergency Banking Act. The Act allowed for the closure of insolvent banks and the re-opening of sound banks after a thorough assessment of their health. Second, the Federal Reserve reversed its monetary policy course and began to expand the monetary base. Third, upon request of the Roosevelt administration, the US Congress embarked on a programme of fiscal expansion. Fourth, and most crucially, the Roosevelt administration recognised that all of the afore-mentioned measures would be futile if trust in the financial system was not restored. And as the private financial sector had lost the necessary credibility to establish this trust by itself, there was no alternative but to take political action.

Efforts to restore trust had, in fact, already started in the previous year with the investigations into the causes of the 1929 stock market crash. The hearings, which unearthed evidence of wide-spread market abuse, paved the way for the 1933 Securities Act. Together with the 1934 Securities Exchange Act, which created the Securities and Exchange Commission (SEC), it restored market confidence by providing investors and the stock exchanges with more reliable information and clear rules for transparent and fair dealing in securities. Similarly, the Banking Act of June 1933, co-authored by Sen. Glass and Rep. Steagall, not only enshrined the separation of commercial and investment banking, but also created the Federal Deposit Insurance Corporation (FDIC) in an effort to bolster depositors' trust in the banking system. The institutional structure of supervision, too, was changed, when the Federal Reserve assumed supervisory powers for the first time. Thus, in essence, the Banking Act was the institutional

reinforcement of the measures Roosevelt had taken immediately upon assuming office in March 1933. In fact, the institutional legacy of the actions taken by the first Roosevelt administration shaped US financial markets for decades and provided the foundation for solid growth after the Second World War.

2 | RESTORING TRUST AND REVIVING PRIVATE CAPITAL FLOWS

Why this excursion into economic history? Essentially, because it provides an insight into the fundamental importance of trust as the basis for any effort to restore the stability of the financial system and financial institutions. Stabilising banks, easing monetary policy and the use of public money are all necessary elements for overcoming a systemic banking crisis. But necessary though they are, they alone are not sufficient. Roosevelt's reformist agenda in essence created a new "social contract" between society and bankers. Banks as private institutions were allowed to manage citizens' money and wealth provided they agreed to oversight and supervision by the government. This new "social contract" established the trust necessary for deposits to return to banks and investors to buy shares again.

Today, our challenge is not that different. A brief glimpse at the scope of the problem illustrates why: If, as some fear, losses for the financial system from the current crisis will, in the end, really amount to up to USD 4 trillion, this would clearly overwhelm the ability of public budgets to recapitalise the banking system. Put differently, in order to stabilise the financial system, a sufficient level of trust must be restored that allows for a return of private capital into the financial system. Only when the holders of the more than USD 100 trillion of financial assets worldwide are willing again to put their funds at risk (rather than keeping it in cash and government securities) will financial flows normalise and stability return.

It is this philosophy that, in my view, is the underlying rationale of the latest US plans to deal with illiquid, hard-to-value assets on the balance sheets of US banks. As the purchase of these assets by the state alone is not feasible, it is sensible to leverage public funds with private capital to deal with the problem.

However, drawing lessons from the Great Depression does not mean that we should copy blindly the legislation of the 1930s. In my view, it would be a mistake to replicate the separation of commercial and investment banking – notwithstanding the fact that some observers currently (like Nobel Prize winner Edmund Phelps) suggest doing so. Indeed, stand-alone investment banks were actually the first victims of this crisis. Investment banks *per se* were not the cause of the current financial turmoil. The world needs their capacity for underwriting debt and equity products and market-making/trading of financial instruments. The crisis was caused by large proprietary positions, regulatory arbitrage, considerable funding mismatches and a complete failure of corporate governance in several banks.

Consequently, calls for a return to a split banking system or for the introduction of a "narrow" banking system are misplaced. These concepts would create significant welfare losses without addressing the underlying causes of the crisis. Similarly, turning the banking industry into a utility – tightly regulated and subject to stringent product and pricing caps – would entail a re-nationalisation of banking markets, obliterating decades of work in efficiency and market integration. Thus, in our quest for more stable and resilient structures for global financial markets, we need not only to find solutions that are appropriate to the realities of our times, but also reinstate the "social contract" that was broken by the financial industry in the last two years.

3 | EFFORTS TO REDESIGN THE REGULATORY SYSTEM CAN BUILD ON SOUND BASIS

Fortunately, there is no lack of blueprints for reforming the international financial system. A number of reports have been issued by public sector bodies over recent months¹, which provide a wide range of measures considered appropriate to

forestall a recurrence of such problems in the future. The private sector welcomes and essentially supports the recommendations set out in these reports. They are appropriate measures to re-establish trust and functioning markets. Simultaneously, the private sector has also presented a great number of proposals.²

It is noteworthy and, indeed, very welcome that there is a large overlap between all these reports and a broad agreement between the official and the private sector on the areas in need of change. All reports identify the need for reforms in the areas of risk and liquidity management, transparency, market infrastructure, capital requirements and remuneration practices. This not only reflects a broad consensus on the causes of the crisis, but also represents the fruits of efforts made in recent years at intensifying the dialogue between the private sector and regulators. From this dialogue, a broad agreement has developed on a regulatory philosophy based on the central tenets of principles-based and risk-based supervision.

4 | BANKS' CORPORATE GOVERNANCE AND RISK MANAGEMENT NEEDS UPGRADING

Appropriately, banks' internal governance structures and risk management are at the heart of the recommendations listed in the afore-mentioned reports. The crisis revealed the need for clear improvements in these areas, such as risk management independence in all parts of the bank and increased responsibilities for Management Boards. Boards need to decide on the risk appetite, which should be based on the firm's loss tolerance, and need to be involved in the continuous monitoring of risk positions. This implies a more rigorous selection process for Senior Managers and the need for them to have frequent and transparent information on the firm's risk positions.

¹ The most important documents have been the Action Plan issued by the Financial Stability Forum (April 2008), the G20 communiqué (November 2008), the Larosière report (March 2009), and the Turner report (April 2009).

² Amongst them the report of the IIF's Committee on Market Best Practices (July 2008), the third report of the Counterparty Risk Management Policy Group (August 2008), and the Group of Thirty report (January 2009).

This, in turn, is only achievable if banks have robust information technology (IT) systems in place that allow for real-time and group-wide aggregation of risk positions. At Deutsche Bank for instance, the IT infrastructure that we have built up in recent years – including a 'golden source' for all risk positions and parameters – proved to be invaluable during this crisis, as it enabled us to continuously aggregate, report and manage our positions. The industry as a whole needs much better IT systems, which have to include global firm-wide data warehouses in order to capture all risks. Data accuracy and completeness should be audited, and all risk models and stress tests regularly back-tested. Banks also need to invest in their stress testing systems: stress tests need to be systematic and standardised and must integrate all tests as is already being done in Economic Capital calculations.

The need for continuous and improved stress testing equally applies to liquidity management, where it turned out that the stress scenarios used were not extreme enough. While better stress tests address one of the severe deficiencies in many banks' liquidity management, the crisis also demonstrated the need for strategic liquidity reserves. Such reserves should cover on- as well as off-balance sheet funding needs for at least two months. As an example, since the start of the crisis Deutsche Bank has put significant effort into systematically building up a strategic liquidity reserve. At year-end 2008, this reserve amounted to more than EUR 57 billion, which, by and large, covers all short-term liabilities.

However, improving governance and risk management is not only a function of technical infrastructure and improved processes. Sound risk management can only be achieved with experienced and well-trained staff – which is, in my view, another important lesson to be learned from this crisis. Apart from a deep understanding of the risks employees take and manage, they have to be familiar with accounting and regulatory rules as well. Consequently, mandatory training programs for every risk officer should be considered. At Deutsche Bank, we have addressed this, among other initiatives, by a comprehensive training program including mandatory accounting seminars for risk managers. Enabling easy career transfers between front and back office is a further crucial element. It should go hand-in-hand with a

harmonisation of compensation levels between front and back office.

A lot has already been said and written about the need to reform the financial industry's compensation policies. As outlined in the recently published Institute of International Finance (IIF) Principles, compensation should be performance oriented, aligned with shareholders' interests, long-term in nature, risk-adjusted with claw-back features, and transparent to all stakeholders in order to avoid excessive risk taking.

Thought should also be given to how the current proposals and enhancements will be implemented in financial institutions and how this will be monitored going forward. A potential solution could be that International Capital Adequacy Assessment Process (ICAAP) formally certifies all risk management processes. Given the banks' importance for the economy as a whole, such certifications would be justified in the same way our societies request the certification of the safety of drugs, food and nuclear power plants, etc.

5 | REFORMING CAPITAL REQUIREMENTS

Apart from risk management, capital levels in the banking industry form an essential part of the debate. The crisis revealed that the capital levels held by many banks were not commensurate with the level of risk. There is a clear message that banks individually, and the financial system as a whole, need to hold more and better quality capital. Banks should also ensure they have a large cushion of contingent capital reserves that can be converted during a downturn.³

Also, modifications must be made to the capital adequacy framework for Market Risk. At Deutsche Bank, we hold for Market Risks around 4-5x more Economic Capital than regulatory capital. Whilst insufficient capital levels are punitive during a crisis, they are even worse during good times since they allow the build up of oversized risk positions. The proposals of the Basel Committee for Banking

³ Contingent capital = senior bank debt with a conversion option to sub-debt.

Supervision to substantially increase capital levels for sales and trading are thus a logical step in the right direction. They will also prevent capital arbitrage between the trading and banking books as these proposals will entail higher capital requirements for securitisations and for credit risk in trading books. In my view, these are appropriate adjustments.

In recent months, increased attention has been paid to the concept of a minimum leverage ratio. While a simple leverage ratio represents only a very crude instrument to measure risks, it would nevertheless lead banks to put increased focus on (the growth of) their balance sheets. Had such a minimum requirement been in place before the crisis started, the failures of banks whose sheer balance sheet size contributed to their collapse might have been avoided.

6| ADDRESSING PROCYCLICALITY

Given the inherent cyclical nature of financial markets, there is a fundamental conceptual issue that needs to be solved: how to address the issue of procyclicality that is a logical concomitant of any risk-sensitive capital framework. While risk sensitivity is an appropriate tool to control risk at the level of the individual firm, if not properly designed it creates undesirable systemic implications when all institutions covered by such rules simultaneously aim to raise capital, reduce their risk-weighted assets (RWA) and exit from trading positions.

There are four significant procyclical elements in today's regulatory framework:

- value-at-risk (VaR) based capital requirements for market risks;
- credit rating based capital requirements for credit risks (Basel II);
- fair value accounting of illiquid products under both US Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS);
- procyclical reserve requirements under both US GAAP and IFRS.

The interaction of these four components contributed significantly to the downward asset price spiral that we have experienced since the outbreak of the crisis. Although the correction of these deficiencies will require a lot more detailed work, conceptually these issues are relatively easy to address.

6|1 VaR based market risk capital requirements

Instead of taking the average of the last ~250 trading days, which makes VaR volatile and understates the risk after long periods of benign markets, VaR could be calibrated using the most extreme price movements over, let's say, the last twenty years.

6|2 Credit rating based capital requirements

Equally, instead of calibrating the Basel II credit risk charge by using averaged credit data of the last five years, it could be calibrated by taking the default and recovery rates from the last three recessions.

6|3 Fair value accounting of illiquid products

If the accounting treatment for holding asset were based on "capacity to hold" rather than "intention to hold", investment portfolios could no longer be held in the trading books and would have to be financed to final maturity. This would not only address the maturity mismatches but also alleviate the pressure to sell when short-term financing is no longer available.

6|4 Procyclical reserve requirements

The current reserve requirements, which are based on observable events, could be replaced by dynamic provisioning which is based on expected events in the future; such dynamic reserves should also be tax-deductible.

At this point in time, only stress-based VaR and dynamic credit provisioning are under discussion by regulators and supervisors. Much more work still needs to be done to address all procyclical factors in our accounting and regulatory regime. It is understood that instruments such as dynamic provisioning would have to be accompanied by stringent disclosure requirements in order to prevent their misuse for manipulating financial statements. Last but not least, even if all the above issues are addressed simultaneously, the financial system will remain cyclical. To dampen the cycles, a more stability-focused monetary policy is required to mitigate financial imbalances and asset bubbles.

7 | ESTABLISHING MACROPRUDENTIAL SUPERVISION

Addressing procyclicality in the design of regulatory and risk management systems requires methodical and comprehensive monitoring of systemic risk. In recent years, financial supervision has primarily focused on microprudential supervision, looking at the health of individual financial institutions, but has neglected the aspect of macroprudential supervision, i.e. the monitoring of the health of the financial system as a whole and the identification of threats to financial stability.

Last but not least, the threats to global financial stability that were bound to result from the build-up of severe macroeconomic financial imbalances were noticed and widely commented upon, but did not lead to any concrete policy action aimed at reducing these imbalances.

There is now a broad consensus that macroprudential supervision must assume a more prominent role in the set-up of financial supervisory regimes. In fact, in both the United States and the European Union, proposals have been put forward for establishing "systemic risk supervisors". In the United States, it is widely suggested that the Federal Reserve System (Fed) assumes this role. In the European Union, the Larosière report proposes the establishment of a European Stability Risk Council (ESRC) under the auspices of the European Central Bank (ECB).

The current crisis has revealed that in a globally integrated market, financial instability is quickly transmitted from one market to another. There is therefore a need for supplementing the new macroprudential supervisory structures in the United States and the European Union with appropriate structures for coordination at the global level. The Financial Stability Board is the natural location for this.

8 | FINE-TUNING MICROPRUDENTIAL SUPERVISION

While there is a need to establish macroprudential supervision, it will only be effective if it is translated into concrete action at the political and microprudential level.

First, supervision needs to be comprehensive and extended to all market participants and infrastructures. Market participants not regulated in the past, such as asset-backed commercial paper funds, structured investment vehicles, money market funds, hedge funds, private equity, mortgage originators and financing companies must be brought into the regulated system.

Second, supervision must be risk-weighted. It must follow a risk-based approach where scarce supervisory resources are directed to the greatest risks. This would mean that large, important financial institutions – such as Deutsche Bank – need to be more intensively supervised than smaller market participants. We welcome this intensified supervision as it is in our genuine self-interest that other systemically relevant participants are supervised appropriately.

At the other end of the spectrum, hedge funds, which – contrary to perception – have not caused this crisis, could be regulated lightly. The Financial Services Authority (FSA)'s approach to require the registration of hedge fund managers, to subject funds to information requirements and intensive monitoring of their ties with prime brokers, is a very reasonable one and has rightly been commended by the Larosière report.

Third, effective microprudential supervision is only feasible if regulators are given the right set of enforcement tools. These tools should be reasonably differentiated and incentivise financial institutions to automatically comply with rules and regulations. For example, the voluntary correction of self-identified and self-notified breaches should be rewarded, while breaches that are not notified should be penalised. With such a set of enforcement tools, banks would build a self-policing culture, which would be more efficient than just a system of checks and controls.

Fourth, prudent supervision on a micro level also requires a coordinated approach and an improved exchange of information between supervisors (colleges). Here again, the Larosière report points in the right direction with the proposal of a European System of Financial Supervision (ESFS).

9 | STRENGTHENING MARKET INFRASTRUCTURE

A further element to bolster the resilience of the global financial systems is the strengthening of market infrastructure. This is not just an issue of greater efficiency; rather, it is one of financial stability. The financial infrastructure for settling and clearing of payments, securities and derivatives must be able to act as a shock absorber. It must allow the system to withstand the failure of major market participants. Unfortunately, however, most of our market infrastructure dates back to the times of nationally fragmented markets and to the days of unsophisticated, low volume markets. Clearly, such structures are no longer adequate.

Fortunately, we are not starting from scratch here. Major progress along these lines has already been achieved as regards the clearing of credit default swap (CDS) contracts. This goes back to an initiative by the New York Fed, but the implementation has been a private sector effort, with Deutsche Bank playing a leading role.

Comparable efforts would be sensible in other market segments, such as FX trading and payment

services. Indeed it can be argued that such key market infrastructures should be structured in a way that insulates them from the potential troubles of any single market participant, especially those that are systemically important. To achieve this, system designs that rely on CCP-type⁴ structures are useful. In addition, keeping the bankruptcy of network structures remote from market participants can serve a similar purpose. Incidentally, this does not mean that such infrastructures must be run as public utilities; but it does mean that they must be organised in a way that prevents a negative spill-over from other, unrelated market segments into vital, shared infrastructures of the financial system. In many societies, railway networks or power grids are already managed in a similar way.

Although often neglected, the need to improve financial market infrastructure extends beyond clearing, settlement and payment networks: the outbreak of the financial crisis revealed that the market infrastructure for the trading and pricing of complex financial instruments has not kept pace with market developments. Innovative structured products were introduced to the market, but many participants lacked the ability to price these correctly and to monitor the risk contained therein. This inability led them to rely on external judgements – specifically the opinion of rating agencies – rather than on their own judgement. This ignored the simple rule that ratings can only be a complement for one's own risk assessment, not a substitute.

The markets for these products will only revive if investors regain confidence in their investment decisions. Markets and their participants need reliable price signals and a robust pricing infrastructure. For this to happen, we need to have a pooling of information on transaction volumes and prices. We also need transparency on the underlying assets of structured products, so that investors and supervisors are able to perform their own risk assessment. Relevant information should be publicly available and regular updates should be mandatory. With today's internet, such information could be easily made available online.

In addition to better disclosure, higher standardisation is required. It will reduce complexity in structured

⁴ CCP = Central Counterparty

credit markets and would help to increase transparency and stability. Standardisation is also conducive to greater market liquidity, which, in turn, would make it more likely that market prices are available even in a difficult market environment. A comparison

with the market for *Pfandbriefe* (covered bonds) may be instructive: overall, this market segment has fared better than securitisations due to the greater transparency, liquidity, uniformity of products and longer track-record that mark these products.

We are still in the middle of a global crisis that is generally accepted as being the most severe since the 1930s. It poses significant challenges for our financial system, our economies, and our societies.

To overcome this crisis, we need a new "social contract" between society and finance. This contract has to be simple and easy to understand, provide certainty to financial markets and safety for the money that our citizens put into financial institutions. It has to address the root causes of the current crisis and provide the basis for a fundamental reform of the way the industry does business.

Such a contract has to include far-reaching measures like: improving banks' corporate governance; making the accounting framework more transparent, consistent and less procyclical; adjusting the banking laws to the realities of modern financial markets; and strengthening supervision that is both effective and efficient. Ensuring we have a sound market infrastructure will also serve as a further shock absorber for our financial markets.

All these areas must be addressed simultaneously and we must thoroughly communicate our intention to put financial markets on a new footing for our citizens and market participants. Given the global nature of today's capital markets, these efforts have to be coordinated, if not harmonised, internationally in order to avoid any re-fragmentation and re-nationalisation of the financial system.

Just as the Roosevelt administration eventually succeeded more than seventy years ago, there is no doubt that this current generation is able to develop a new financial framework that will support prosperous growth for the decades to come.

Implementing the macroprudential approach to financial regulation and supervision

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There is now a widespread recognition in the policy community of the need to strengthen the macroprudential orientation of financial regulatory and supervisory frameworks. At the same time, the usage of the term “macroprudential” remains ambiguous. This essay summarises the specific definition and characterisation of the term that was developed in the early 2000s at the BIS and outlines the policies needed for implementing the approach. The policies are discussed with reference to two dimensions of the approach. The first is the cross-sectional dimension and is concerned with how aggregate risk is distributed in the financial system at a given point in time. The policy issue here is how to calibrate prudential instruments so as to address common exposures across financial institutions and the contribution of each institution to system-wide tail risk. The second is the time dimension and is concerned with how aggregate risk evolves over time. The policy issue is how to dampen the inherent procyclicality of the financial system, seen as a key source of financial instability. The essay also briefly considers the implications of the adoption of a macroprudential approach for the institutional set-up.

NB: This paper draws in part on Borio and Drehmann (2008). The views expressed are those of the author and do not necessarily represent those of the Bank for International Settlements.

Recent international reports have recommended that financial regulatory and supervisory frameworks strengthen their macroprudential orientation (G20, 2009, and Larosière, 2009). The term has become so well accepted that, paraphrasing Milton Friedman, one could say that "we are all macroprudentialists now". And yet, a decade ago, the term was barely used. And it would have been hard for supervisors to recognise that their tasks involved a significant macroprudential dimension, let alone that it would have been desirable to strengthen it.

In fact, the term is not new. At the Bank for International Settlements (BIS), its usage goes back to at least the late 1970s, to denote a systemic or system-wide orientation of regulatory and supervisory frameworks and the link to the macroeconomy, although public references are of more recent vintage (e.g. BIS, 1986). It was already recognised then that focusing exclusively on the financial strength of individual institutions could miss an important dimension of the task of securing financial stability. However, it was only at the beginning of the new century that efforts were made to define the term more precisely, so as to derive more specific implications for the architecture of prudential arrangements (Crockett, 2000, Borio, 2003). This was a phase during which its usage was already becoming more common (e.g. International Monetary Fund, 2000). Subsequently, the macroprudential perspective slowly gained ground, until the current financial crisis gave it an extraordinary boost, as described in Knight (2006), White (2006) and Borio (2008).

At the same time, the usage of the term remains ambiguous. Sometimes, it is used synonymously with prudential approaches designed to limit the procyclicality of the financial system, seen as a key cause of financial instability. At other times, it is still vaguely used to denote approaches designed to address "systemic" or "system-wide" risk more generally. What does "macroprudential" really mean? What are its implications for policy?

Drawing on the long BIS tradition, this essay seeks to answer those two questions. It first summarises the specific definition and characterisation of the term "macroprudential" developed in the early 2000s at the BIS. It then considers the outline of policies that could strengthen the macroprudential orientation of regulatory and supervisory frameworks. In the process, it brings together what may appear as unrelated strands of analysis and policy initiatives.

1 | THE MACROPRUDENTIAL APPROACH: DEFINITION, KEY FEATURES AND IMPLICATIONS

1|1 Definition and key features

It is useful to define "macroprudential" with the help of its antonym, "microprudential", and to do so in an intentionally stylised way. So defined, by analogy with black and white, the macroprudential and microprudential orientations would normally coexist in the more natural shades of grey of regulatory and supervisory arrangements.

As defined here, the three fundamental features that distinguish the macroprudential from the microprudential approach to regulation and supervision relate to objectives, focus and the characterisation of risk (Table 1).

First, the proximate *objective* of a macroprudential approach is to limit the risk of episodes of system-wide financial distress so as to contain their cost for the macroeconomy. By contrast, the proximate objective of the microprudential approach is to limit the risk of failure of individual institutions, regardless of their impact on the overall economy. In turn, this is best rationalised in terms of consumer (depositor or investor) protection.

Table 1
The macroprudential and microprudential perspectives compared

	Macroprudential	Microprudential
Proximate objective	limit financial system-wide distress	limit distress of individual institutions
Ultimate objective	avoid output (GDP) costs	consumer (investor/depositor) protection
Characterisation of risk	Seen as dependent on collective behaviour ("endogenous")	Seen as independent of individual agents' behaviour ("exogenous")
Correlations and common exposures across institutions	important	irrelevant
Calibration of prudential controls	in terms of system-wide risk; top-down	in terms of risks of individual institutions; bottom-up

Source: Borio (2003).

Second, as a result, the *focus* of the macroprudential approach is the financial system as a whole; that of its microprudential counterpart is the individual institution. This distinguishing feature can best be illustrated with an analogy. One can think of the financial system as a portfolio of securities, with each security representing a financial institution. The microprudential approach would care equally about losses on each individual security; the macroprudential one would focus on the losses on the overall portfolio. What is crucial from a macroprudential perspective is the degree of diversification or concentration of risk not in individual institutions but in the overall system. Thus, what matters is the common (correlated) exposures *across* financial institutions, not so much those *within* the portfolios of individual institutions, which represent the main concern of the microprudential approach.

Finally, a macroprudential approach treats aggregate *risk* as dependent on the collective behaviour of institutions – in technical terms, as "*endogenous*". This is because, collectively, institutions can affect the prices of financial assets, the quantities transacted (e.g. borrowed and lent) and hence the strength of the economy itself. This, in turn, has powerful feedback effects on the soundness of the institutions. By contrast, given its focus on individual institutions, a microprudential perspective ignores such feedbacks, i.e. it treats risk as "*exogenous*". Taken in isolation, individual institutions will generally have little impact on market prices or the economy as a whole. Indeed, this is very much how individual institutions treat risk: they regard asset prices, market/credit conditions and economic activity as unaffected by their decisions. For example, risk models and stress tests take as given the possible range of asset price movements, probabilities of default and the macroeconomy.¹

1|2 Implications

The differences in focus and conception of risk have important implications for how the sources of financial distress are assessed in the two approaches.

From a macroprudential perspective, it is possible that individual institutions may appear to be safe, while the financial system as a whole is not.² This would occur, for instance, if greater diversification of risk in the portfolio of individual institutions was achieved by increasing its concentration in the overall financial system. Even as they disperse risk in their own balance sheets, institutions could be raising their exposure to common risk factors, such as through greater similarity in their portfolios. This would mean that negative shocks would affect more institutions simultaneously, i.e. that systemic, non-diversifiable risk in the system would increase.³

In addition, the endogeneity of risk highlights the possibility that actions that are optimal from the perspective of individual institutions may result in undesirable outcomes for the system as a whole, through adverse feedback effects. For example, retrenchment at times of financial strain is rational and almost irresistible for individual participants. If generalised, however, it could make everyone worse off, by inducing fire sales and tighter credit conditions. Such a possibility is ruled out by definition in the microprudential approach, as risk is treated as exogenous.

This sharp contrast between the two approaches is reflected in the fundamental disagreement over the validity of the microprudential dictum: "for the financial system to be sound it is *necessary* and *sufficient* that each individual institution is sound". From a macroprudential perspective, this condition is not *necessary*: the output costs of financial stress at individual institutions, or even groups of institutions, may not be large enough. More subtly, it is not *sufficient* either: by failing to take into account common exposures across financial institutions and the endogeneity of risk, a microprudential approach may not promote overall financial stability effectively.

The macroprudential approach to financial regulation and supervision is best thought of as consisting of two dimensions, which have different implications for the calibration of prudential tools.

¹ This also indicates that the previous analogy with the portfolio of securities is incomplete, since portfolio managers would also treat the underlying sources of risk as exogenous.

² For an early academic contribution on this, see Hellwig (1995). See also Acharya (2001) for a perspective highlighting the importance of the cross-sectional dimension of a macroprudential approach, without using this specific terminology.

³ To return to the portfolio analogy, the total variance of a portfolio is equal to the sum of the variances of the returns on each security plus that of the covariances. The return on each security (read financial institution) may have a lower variance, but that of the portfolio as a whole may in fact be larger if the covariances increase by enough. The whole is not equal to the sum of its parts.

These dimensions are often not sufficiently distinguished in the common usage of the term. The first concerns how risk is distributed in the financial system *at a given point in time* – the “cross-sectional dimension”. The second concerns how aggregate risk evolves *over time* – the “time dimension”. The first is like taking a snapshot picture of the financial system; the second is like following its evolution in a movie.

The key issue in the *cross-sectional dimension* is the existence of common (correlated) exposures. These arise either because institutions are *directly* exposed to the same or similar asset classes or because of indirect exposures associated with linkages among them (e.g. counterparty relationships). Returning to the analogy with the portfolio of securities, the main distinction is between systemic or non-diversifiable risk across institutions, on the one hand, and idiosyncratic (or institution-specific) risk, on the other.

Correspondingly, the guiding principle for the calibration of prudential tools is to tailor them to the individual institutions' contribution to system-wide risk. Ideally, this would be done in a top-down way. One would start from a measure of system-wide tail risk, calculate the contribution of each institution to it and then adjust the tools (capital requirements, insurance premia, etc.) accordingly. This would imply having tighter standards for institutions whose contribution is larger. This contrasts sharply with the microprudential approach, which would have common standards for all institutions.

The key issue in the *time dimension* is how system-wide risk can be amplified by interactions within the financial system as well as between the financial system and the real economy. This is what procyclicality is all about (e.g. BIS, 2001, Borio *et al.*, 2001, Brunnermeier *et al.*, 2009). Here feedback effects are of the essence. During expansions, the mutually reinforcing process between falling risk perceptions, rising risk tolerance, weakening financing constraints, rising leverage, higher market liquidity, booming asset prices and hence expenditures feeds into itself, potentially leading to the overextension of balance sheets. This process, then, operates in reverse, and more abruptly, as financial strains emerge, amplifying financial distress. The main policy question, therefore, is how to dampen the inherent procyclicality of the financial system.

The corresponding guiding principle is to calibrate policy tools so as to encourage the build-up of buffers in good times so that they can be used as strains materialise. This would help to limit the costs of incipient financial stress, by allowing the system to absorb the shock better. Moreover, the build-up of the buffers, to the extent that it acted as a kind of dragging anchor or “soft” speed limit, could also help to restrain the build-up of risk-taking during the expansion phase. As a result, it would also limit the risk of financial distress in the first place.

2 | THE MACROPRUDENTIAL APPROACH: IMPLEMENTATION

The previous analysis highlights how the macroprudential and microprudential perspectives inevitably coexist in current financial regulatory and supervisory frameworks. For example, tailoring the degree of prudential oversight to the systemic importance of institutions or limiting risk concentration across the system is consistent with a macroprudential perspective. By contrast, peer group analysis is micro: it seeks to identify outliers, without regard for whether average performance is appropriate. Importantly, also micro is the general practice of calibrating prudential tools uniformly with respect to the risk profile of individual institutions (e.g. calibrating capital requirements so as to achieve a common probability of failure for all institutions). The key policy challenge, therefore, is how to strengthen the macroprudential orientation of current arrangements.

The urgency of this task has been highlighted by the current financial crisis (Borio, 2008). The crisis has put a premium on the need to assess risk from a system-wide perspective. It would have been impossible to detect the threat without considering the exposures held outside the banking system. In the run-up to the current crisis, it was erroneously felt that securitising mortgage portfolios, and slicing and dicing risk in the process, would make the overall system safer. And the mistaken belief that the system was better diversified paradoxically encouraged each institution to take on more risk. Moreover, the crisis has been a quintessential example of procyclicality at work. Against the background of low interest rates and aggressive risk-taking, benign economic

conditions masked the gradual overextension in private sector balance sheets. Traditional tell-tale signs of the build-up of risk included booming credit and asset prices, especially in the residential property sector, as well as unusually low volatilities and risk premia across a broad spectrum of asset classes. Once these financial imbalances finally unwound, the process went into reverse with a vengeance. It triggered and amplified financial distress and crippled the real economy.

What follows discusses, sequentially, the outline of the efforts needed to implement the guiding principles in the cross-sectional and time dimensions, respectively. It then considers briefly the implications for the institutional set-up.

2|1 The cross-sectional dimension: common exposures

Current prudential frameworks to some extent already recognise the relevance of common exposures across financial institutions. Supervisors may, on a discretionary basis, constrain overall exposures to sectors that they regard as particularly risky at particular points in time (e.g. real estate, leveraged loans). More importantly, in several jurisdictions authorities have already sought to tailor the supervisory scrutiny of individual institutions to their systemic importance, devoting more resources to them. Steps in this direction have received greater attention since the recent financial strains. For example, a case in point is Switzerland, where the authorities have introduced tighter regulatory and supervisory requirements for the country's two large internationally active banks.

Strengthening further the macroprudential orientation would call for more systematic efforts to measure the contribution of individual institutions to system-wide risk from a top-down perspective. Such contributions would be determined by several characteristics of the institutions, notably their probability of default, relative size and their (direct and indirect) exposure to systemic risk, including that portion that reflects linkages among institutions, such as through counterparty relationships.

The main limitation here is that quantitative methodologies capable of informing such judgments are still in their infancy. Some tools, such as those for the estimation of domino effects through counterparty relationships, can provide a sense of the consequences of the failure of one or more institutions. However, they suffer from a number of drawbacks. They are exceedingly mechanical, eschewing behavioural responses; they call for information about such linkages that is generally not available, except perhaps for specific markets (e.g. organised exchanges); and they provide no information about the likelihood of a stress event (e.g. Upper, 2007). Other approaches, which generally rely on market prices (e.g. equities, credit spreads), can yield measures of system-wide tail risk, at least for groups of institutions. This is because they draw on the multivariate probability distribution that underlies asset price movements. Examples are measures of tail risk based on extreme value theory (e.g. Geluk *et al.*, 2007) or quantile regressions (Adrian and Brunnermeier, 2008). However, either it is impossible to decompose and allocate these measures to individual institutions or, even if in principle feasible, the corresponding methodologies have not been explored much.

In research with colleagues at the BIS, we are seeking to overcome these limitations (Borio *et al.*, 2009). We have developed ways of decomposing aggregate measures of tail risk for groups of institutions, such as system-wide credit value-at-risk or expected shortfall, into *additive* contributions of the individual institutions. As other methodologies for measuring credit risk, this procedure relies on estimates of probabilities of default and exposures to systemic risk that are based on market prices.⁴ Moreover, the approach to decomposition is quite general and intuitive and can be applied to various metrics of system-wide risk. The approach can help to structure policymakers' thinking about the issues. In principle, tools of this kind could also be used to inform transparent adjustments to instruments such as capital requirements, the intensity of supervisory review or insurance premia.

From an operational perspective, three issues loom large when calibrating prudential tools with reference to the contribution to system-wide risk of

⁴ While the specific implementation is based on market prices, the inputs could also be drawn from assessments of supervisors or combinations of such assessments and market prices.

individual institutions: the relationship between the cross-sectional and the time dimension; the choice of "portfolio" of institutions; and, closely related, the scope of regulation (or its "perimeter").

Approaches that estimate the marginal contribution of institutions based on market prices should take into account a fundamental limitation: these prices can be very deceptive measures of the *time dimension* of risk. This is, in fact, one of the key manifestations of procyclicality. Market price measures of risk tend to be unusually low also when risks are building up, reflecting aggressive risk-taking in the system: risk premia, measured and implied volatilities and correlations are unusually low. In other words, market prices behave more like thermometers of financial distress, measuring its temperature once it rises, than as barometers of distress, providing signals of its *future* materialisation (Borio and Drehmann, 2008). Hence the paradox of financial instability: the system appears strongest precisely when it is most vulnerable. This can easily contaminate the point-in-time measures of system-wide risk and also those of individual institutions' contributions to it.

One way of tackling this problem is to follow similar procedures to those adopted to adjust risk measures when addressing procyclicality (see below). This means using stressed parameters (derived from periods of financial strains) or averages over long time periods. More generally, the objective would be to focus on the *relative* contribution of institutions to system-wide risk, rather than on their absolute one. And the risk of estimation error could be further reduced by dividing institutions into different categories, such as through a rating system.

The definition of the correct portfolio is not straightforward. Conceptually, how much of the financial system should be captured before the estimates can be regarded as reliable guides to system-wide risk? And should the portfolio relate to domestic financial systems or to those institutions that comprise the core of the global financial system? Moreover, the data needed for the calculations may not exist for significant parts of the financial sector (e.g. equities for savings or cooperative banks). A large dose of pragmatism is required. The correct portfolio will depend on priorities as well as the scope for effective international coordination. Practical limitations on the availability of the data may be addressed by using approximations or requiring

firms to issue the instruments whose secondary market prices would be used in the estimation.

This also raises the question of the perimeter of regulation. A macroprudential framework would need to address the risks generated by all financial institutions that are capable, on their own, as a group and through system interactions, to cause material system-wide damage. To the extent that an indirect approach based on restrictions on the regulated institutions proved insufficient, whether in terms of the ability to request information or take remedial action, the extension of the coverage of the prudential framework would need to be considered. To varying degrees, recent reports point in that direction (G20, 2009, Larosière, 2009).

The analytical efforts to address the cross-sectional dimension of the macroprudential approach have so far been more directly applicable to instruments like capital or insurance schemes. Importantly, they have not targeted liquidity. To be sure, a number of suggestions have been made, including those in Brunnermeier *et al.* (2009) and Perotti and Suarez (2009). These have been portrayed as tackling mainly procyclicality, by acting as speed limits during expansions or establishing buffers that can cushion strains. However, all of these proposals are calibrated with respect to characteristics of the balance sheets of institutions *on a standalone basis*. They fail to take into account *common* liquidity exposures across institutions. This is an area that deserves further attention.

2|2 The time dimension: procyclicality

In contrast to the scarcity of work considering the cross-sectional dimension, the time dimension has benefited from major analytical efforts in recent years. It has already given rise to a number of policy initiatives to dampen procyclicality (e.g. G20, 2009, Financial Stability Forum, 2009). The goal has been to limit the degree to which the prudential framework and accounting practices may contribute to the procyclicality of the system and to introduce an element of countercyclicality into the arrangements. Rather than discussing that work in detail, what follows puts forward five general principles that could guide current efforts. In the process, it also highlights some thorny issues that deserve special attention.

First, a *holistic approach* is needed. A broad range of policies have an impact on the procyclicality of the financial system. Thus, the required adjustments in the prudential framework will depend on the characteristics of other policies and on any adjustments made to them. For example, the current trend towards fair value accounting (FVA) is likely to add to procyclicality by making valuations more sensitive to the economic cycle: it embeds evolving estimates of future cash flows and risk premia in the accounting figures (e.g. Borio and Tsatsaronis, 2004, Goodhart, 2004, Adrian and Shin, 2008). Other obvious examples are the characteristics of deposit insurance schemes, of resolution procedures and of the monetary policy regime in place. Insurance schemes that are not pre-funded require institutions to pay precisely when the system is facing strains. Resolution procedures for individual institutions that do not take into account system-wide strains could force excessive liquidation. And monetary policy regimes that do not restrain the build-up of financial imbalances, in the form of unusually rapid credit and asset price increases, when inflation is low and stable, may unwittingly accommodate their expansion (e.g. Borio *et al.*, 2001, BIS, 2008).

Second, it is important to *build on existing arrangements*. In particular, Basel II represents a major improvement over Basel I. Through Pillar 1, it has greatly improved the ability to discriminate across borrowers in the cross-section, by aligning capital charges much more closely with the relative riskiness of exposures. It has thereby greatly tightened the link between risk measures and minimum capital and reduced the scope for regulatory arbitrage. Through Pillar 2, it has substantially enhanced the scope for supervisors to require levels of capital above the minima, thereby allowing them to tailor the capital cushion to the risk incurred by institutions ("supervisory review"). Through Pillar 3, it has provided a tool to strengthen risk disclosures and market discipline. Above all, Basel II has helped to spread and hard-wire best risk management practice within the banking industry. The challenge in this area is to reduce the procyclical sensitivity of the framework without sacrificing its ability to differentiate across risks at a point in time, and to do so through simple and transparent adjustments.

Third, the spectrum of options for regulatory capital ranges from reducing its cyclical risk sensitivity to

deliberately introducing elements of countercyclicality into the framework. There are various ways in which this can be done (e.g. Gordy and Howells, 2006, Borio and Drehmann, 2008, FSF, 2009). Examples are reducing the cyclical sensitivity of minimum requirements, by further smoothing the inputs (e.g. based on through-the-cycle or stressed parameters of probabilities of default) or the outputs, and adding transparent countercyclical adjustments that would allow the build-up and release of capital buffers. The adjustments could be hard-wired to the minima (Pillar 1 in Basel II) or encouraged through the supervisory review process (Pillar 2).

Fourth, while a lot of attention has been devoted to capital requirements, *other prudential tools* are also worth considering. As a preliminary step, "prudential filters" can be applied to accounting figures to offset undesirable features, such as loan provisioning rules that are not sufficiently forward-looking and prudent (see below). As the availability of funding liquidity is procyclical, funding liquidity standards that rely on quantitative minimum requirements that are invariant to the state of the economy risk exacerbating financial strains once they emerge. In other words, just like invariant capital requirements, they would act as shock amplifiers rather than shock absorbers (Goodhart, 2008, Borio, 2009). Increasing variation margins when volatility spikes can have a similar effect. High loan-to-value ratios can add to procyclicality by increasing the sensitivity of the supply of credit to the assets used as collateral (Borio *et al.*, 2001). Arrangements could therefore be adjusted in all of these areas.

Fifth, the operational framework should rely as far as possible on built-in (*automatic*) stabilisers rather than discretion. This would help address the limitations in the measurement of aggregate risks in real time, which can make discretionary action error-prone. Admittedly, recent work at the BIS has confirmed that simple leading indicators of financial system distress can be developed and perform fairly well also out of sample. In particular, they provide warnings of the current crisis (Borio and Drehmann, 2009). Even so, the margin of error remains significant. Moreover, relying on automatic stabilisers would limit the danger that, even when risks are correctly identified, action may not be taken at all. The fear of going against the manifest view of markets can have a powerful inhibiting effect.

Once in place, automatic stabilisers can act as an effective pre-commitment device. They can help shift the burden of proof (Landau, 2009).

At the same time, automatic stabilisers and discretionary measures should not be seen as mutually exclusive. Discretionary measures could complement automatic stabilisers if the latter faced design limitations. Likewise, discretionary measures might be more easily tailored to the nature of the build-up in risk-taking and vulnerabilities as long as these are identifiable in real time. They may also be harder to arbitrage away, as circumvention becomes easier over time. The key issue would be how to constrain and discipline any such discretion.

There are a number of areas in which automatic stabilisers could be considered. As regards collateral practices, possibilities include seeking to implement through-the-cycle margining requirements (Geithner, 2006, FSF, 2009) and enforcing maximum loan-to-value ratios that are low and/or based on valuations that are less sensitive to market prices. Similarly, supervisors may consider that accounting standards do not allow for sufficiently forward-looking or prudent provisions. One notable example is obstacles to the adoption of through-the-cycle provisions for loans, sometimes known as "dynamic provisions", based on average historical experience, in place until recently in Spain (e.g. Jiménez and Saurina, 2006). In that case, supervisors can add the difference between what they find appropriate and the accounting figures to minimum capital requirements. Importantly, adjustments to capital standards within the existing framework could be made based on specific rules rather than discretion.

However, it is not hard to see how rule-based adjustments may be difficult in some cases. Consider the objective of establishing countercyclical regulatory capital buffers. It is not easy to devise rules that are equally effective during the expansion and contraction phases. For example, linking minimum requirements to credit growth, as suggested by Goodhart and Persaud (2008), could be effective during the expansion phase, but could fail to release buffers at the right time. As the current crisis has demonstrated again, the credit slowdown tends to lag the emergence of strains, not least owing to the drawdown of credit lines. Likewise, relating the minima to credit spreads may be an improvement from that perspective (Gordy, 2009), but their behaviour

has not been uniform across stress periods. To be sure, these illustrations do not rule out the possibility of developing rules. However, they do highlight that discretion and judgment may be necessary too.

Any efforts to build up and release buffers in a credible way will need to address head-on a major issue: as strains materialise, *markets* may prevent the drawdown from occurring. The recent experience has highlighted how at times of turbulence a sharp rise in the risk aversion and uncertainty of investors will require institutions to *raise* their capital cushions. There are ways in which this risk can be reduced. One is having buffers and minima that are sufficiently high, underpinned by a credible framework, so that the solvency of the institutions does not come into serious doubt. Another is communicating the rules of the game clearly, so that their application is not seen as a departure from standard practice, which could signal serious concern with the condition of the banks. Even so, it is hard to judge at this stage whether these steps would be sufficient to allow an effective operation of the buffers.

2|3 Institutional set-up

Two key issues that need to be addressed in the institutional set-up for the implementation of the framework are the needs to ensure accountability and to align objectives with the available know-how.

Accountability calls for a clear mandate, transparency and effective processes to hold policymakers responsible. Accountability is especially important to discipline any reliance on discretion that complements automatic stabilisers. It can generally be enhanced by making sure that the measures used are as simple and transparent as possible. One could imagine a set-up similar to the one now being employed for monetary policy. At the same time, given the lags involved and the inevitable "fuzziness" in definition and measurement, it would be unrealistic to expect that an equivalent degree of accountability and transparency is feasible (Borio and Drehmann, 2008).

Addressing the imperfect alignment between goals, instruments and know-how in the institutional set-up is a difficult and controversial task. At a minimum, a financial stability framework with a macroprudential

orientation requires close cooperation between a broad range of authorities with respect to both its development and its implementation. After all, a wide range of policies, under the responsibility of authorities with very different perspectives, has a bearing on financial stability.

At the same time, a key ingredient of success is to leverage the comparative advantage of the various authorities involved. This is especially important for monetary and prudential authorities. Monetary authorities have an edge in understanding the nexus between the macroeconomy and the

financial system and the functioning of financial markets. Prudential authorities have an edge in understanding the risk management practices of the regulated institutions. For instance, one could set up special committees involving these types of authority and charged with implementing those macroprudential overlays in regulatory and supervisory tools that are executed on a discretionary basis. In all of this, it is critical to ensure a sufficient degree of operational independence from the political process. As in the case of monetary policy, it is essential to "take away the punchbowl when the party gets going".

There is now a widespread recognition in the policy community of the need to strengthen the macroprudential orientation of financial regulatory and supervisory frameworks. This swell of support could not have been anticipated even as recently as a couple of years ago. The current financial crisis has been instrumental in underpinning it. So far, policy initiatives have largely focused on addressing procyclicality – the time dimension of the macroprudential approach. Looking ahead, more attention will likely also be devoted to addressing common exposures within the financial system – the cross-sectional dimension. The task now is to examine concretely the spectrum of policy options, so as to evaluate their desirability and feasibility. The BIS is actively involved in this process.

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Minimising the impact of future financial crises: six key elements of regulatory reform we have to get right

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To be as prepared as possible for the next financial crisis, we should not embark on a long list of detailed proposals that we believe might have prevented the last one. Instead, we should strengthen existing regulatory frameworks to take into account their fundamental shortcomings highlighted by the recent crisis. This improvement should focus on the essentials and be based on a few simple principles so as to be robust against unforeseen events. We have to get these key elements right to ensure that the next episode of stress in financial markets is less disruptive and costly than the current one.

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Most observers agree that the origins of the ongoing financial crisis were broad and complex.¹ First, and primarily, there was a market failure characterised by deficient risk management practices, inadequate relaxation of credit standards (especially in the US mortgage markets), uncontrolled financial innovation, lack of investor due diligence and abuses of various sorts in the financial industry. Second, excessive leverage and risk appetite were favoured by the combination of an extended period of unusually low interest rates and large global imbalances. Finally, various weaknesses of regulatory and supervisory arrangements also contributed to the crisis, not least because they were unable to address the market failures in a timely fashion. Accordingly the focus of this Special Issue of the Banque de France *Financial Stability Review* is devoted to the future of financial regulation, so I will limit myself to this last aspect.

Reflecting a growing convergence of views among private sector participants, academics, national authorities and international institutions, strengthening the regulatory framework has been an important objective of much of the work currently under way to draw lessons from the present crisis. On April 2009, for instance, the Leaders of the G20 pledged to "strengthen financial regulation to rebuild trust". The international community wants to enhance regulation to lessen the impact of future financial crises, and this is a highly commendable objective.

Strengthening financial regulation will require substantial medium-term work. This might receive less attention than the more immediate crisis resolution tasks, since restoring stability, confidence and the proper functioning of markets is a first priority. But embarking on this long journey will also have benefits today. This crisis has very distinctive features and its resolution is likely to be protracted. Time will be needed to repair balance sheets, deleverage, revamp the business models of the various types of financial institutions and allow asset prices to find a new equilibrium. From this perspective, clarifying the medium-term orientation of the regulatory framework can be very useful: it will help restore confidence in a sustainable way, thereby smoothing the adjustment process in the short-term.

If history is any guide, herding behaviour is common and people tend to be overly myopic and euphoric when things go well. This means that once the current "bust" is over –and even though it may still take substantial time– it is likely to be followed by a renewed "boom", characterised by increased risk appetite, outright optimism and excessive focus on short-term gains, not least in the financial industry. Hence it is important to start reflecting *now* on the steps needed to strengthen regulation in a way that would both reduce the probability of *future* adverse systemic events and mitigate their impact when they occur.

Against this backdrop, current regulatory reform proposals aim at meeting the following objectives:

- *Better regulation* so as to strengthen standards and promote a macroprudential approach that, by taking a system-wide view, better addresses procyclical effects and extends the perimeter of regulation and oversight.
- *Better disclosure* by enhancing market discipline and setting up a more informed monitoring of risks in the financial system.
- *Better architecture* by enhancing regulatory cooperation, through joint assessments of systemic risks, early warning exercises, supervision and resolution of cross-border firms.
- *Better market infrastructure* by favouring the creation of platforms for counterparty clearing systems for over-the-counter derivatives.
- *Better procedures for crisis management* by, for instance, conducting early warning exercises and planning for cross-border crisis management.

Had these elements been in place before the crisis, the situation of the global financial system would most likely have been much better. This is why it is important to fully support the work currently undertaken by standard-setting bodies, the G20, the International Monetary Fund, the Financial Stability Forum (FSF) –now re-established as the Financial Stability Board– etc. But we should ask ourselves

¹ See IMF, "Initial lessons of the crisis", prepared by the Research, Monetary and Capital Markets, and Strategy, Policy, and Review Departments, 6 February 2009; and Hervé Hannoun, "Policy lessons from the recent financial market turmoil", speech at the XLV Meeting of Central Bank Governors of the American Continent, Ottawa, 8-9 May 2008.

what the true test of these reforms in the future will be. In other words, what are the key points among the various elements listed above that must be firmly in place to avoid the reoccurrence of a costly systemic crisis like the current one?

While there is no simple answer to this question, the consensus view is that there is a need to work on strengthening financial regulation along the lines highlighted above. However, there is the risk of overregulation that would be detrimental to global well-being. There is a natural and unavoidable increase in risk-taking during upturns that is essential to growth and innovation. The call for *better* regulation may rapidly result in *more* regulation. It is desirable to achieve a reasonable balance between innovation and stability objectives.

Lastly, focusing our attention on too many regulatory changes raises the risk that we lose sight of the overall objective: the prevention of *excessive* risk accumulation that can have costly consequences. Hence, to be as prepared as possible for the *next* financial crisis, we should not embark on a long list of detailed proposals that we believe might have prevented the *last* one. Instead, we should strengthen existing regulatory frameworks to take into account their fundamental shortcomings highlighted by the recent crisis. This improvement should focus on the essentials and be based on a few, simple key principles so as to be robust against unforeseen events. In this spirit, I will now review the six key elements we have to get right to ensure that the next episode of stress in financial markets is less disruptive and costly than the current one.

1 | GETTING REGULATION RIGHT IS NOT ENOUGH

Strengthening regulation and supervision alone will not be sufficient to prevent the next systemic crisis. In particular, the macro policy environment should also help to moderate the build-up of excessive risk when

the economy is doing well. Indeed, macroeconomic policies should not only be used to deal with the aftermath of the collapse of an asset price bubble; they can play an instrumental role in mitigating the build-up of financial excesses in the first place.²

The role of monetary and fiscal policies clearly stands out, even though there are important limitations on how they can be implemented in practice. In the run-up to the current crisis, central banks retained their focus on maintaining price stability. Against the backdrop of low interest rates, the task of addressing the implications of surging asset prices and leverage was thus *de facto* left to the supervisory authorities. However, regulation alone cannot counteract booms. We should also focus on how monetary policies should be designed to "lean against the wind". On the fiscal side we have to redouble efforts to ensure prudent policies in good times. As the current turmoil has once more reminded us, those countries that do not take advantage of the good times to run down their deficits are ill-equipped to rescue their financial systems and stabilise output if and when the needs arise; in addition, the fiscal tool could prove quite effective in moderating demand and pre-empting financial excesses in periods of boom.

Moreover, the capacity of regulation and supervision to prevent a financial crisis should not be overstated either. We do not live in a zero probability world, and regulation will never be able to entirely eliminate the risk of a financial crisis. What well-designed regulation can do and should aim for is to lower the probability of such a tail event and, should it occur, to strengthen the financial system's ability to withstand it.

So my first key element is that getting regulation right will help achieve its objective of minimising the probability of crises and reducing their costs if, and only if, it is accompanied by "better measures": better macroeconomic policies, better risk management in the financial industry, better crisis management frameworks, better system-wide liquidity management, better market infrastructure, etc.³ All these elements should be mutually reinforcing in order to enhance financial stability.

² See William White, "Is price stability enough?", *BIS Working Papers*, No. 205, 2006.

³ One of the lessons of recent crisis is that poor consumer/investor protection regulation may also have important systemic implications. Therefore, and although the focus of this article is on prudential regulation, sound consumer/investor protection frameworks can also contribute decisively to financial stability.

2 | MAKE THE MACROPRUDENTIAL FRAMEWORK OPERATIONAL

My second key element, advocated by the BIS for many years, is that we adopt a system-wide orientation of regulatory and supervisory frameworks. Such a macroprudential approach, now widely supported, should work to capture system-wide risks and their interplay with the macro economy. The approach has two dimensions: the "cross-sectional dimension", which concerns the distribution of risk in the whole financial system at a point in time, and the "time dimension", which has to do with how aggregate risk in the financial system evolves over time.⁴ The former addresses the existence of common exposures and interlinkages in the financial system, regardless of the legal form of the financial firms involved. The latter deals with the mechanisms through which the financial system and the macroeconomy amplify business fluctuations and can generate financial instability ("procyclicality").

The key policy issue is how regulation and supervision can be adjusted to put appropriate safeguards in these two areas in place, making these concepts operational and developing the necessary tools. Let me now address separately each of the two equally important dimensions of the macroprudential approach.

2|1 The cross-sectional dimension: enlarging the regulation perimeter

In the past, financial regulation relied on two basic principles. One was that only (or almost exclusively) banks can be systemic and should therefore be regulated. The second was that a good view of what is happening in the financial system can be learned by looking through these regulated institutions. As a result, only those institutions deemed to have significant public policy importance (e.g. deposit-takers) faced well-defined prudential regulation. This was not the case for other financial firms performing similar activities or which were important counterparties. Regulation operated in silos, based on the legal form of an institution rather

than its functional activity. The industry responded by creating vehicles, instruments and entities that existed in the shadow of the formal financial system. A telling example is the shadow banking system in the United States, which is estimated to be nearly the same size as the country's regulated banking system.

The current crisis has shown that this approach to regulation must change, to:

- (i) focus on functions/objectives (e.g. financial stability, consumer protection) rather than institutions; and
- (ii) assess risks for the system as a whole and not just for individual firms. Such re-orientation has to be backed by the development of new techniques and processes allowing for a macroprudential assessment of systemic risk.

A key task is to make the scope of regulation more appropriate. Broadening the focus of regulation from the firm to the system-wide level requires expanding the existing regulatory perimeter so that risks developing in the shadows of the supervised banking system can be recognised and addressed. A tiered approach has been proposed.⁵ First, collect data capturing periodic information from an expanded set of institutions, instruments and markets that are outside the core present regulatory perimeter. Second, select those institutions that are deemed important from the point of view of their contribution to systemic risk, based on a range of parameters (e.g. size, interconnectedness, funding model). Third, apply to these selected institutions the type of (but not necessarily the same) prudential regulation that is in place for the firms belonging to the narrower, inner perimeter.

The concept is simple in design but may present significant operational challenges. One is that supervisors would require the legal ability to identify institutions in either perimeter, and clearer rules on the consolidation of off-balance sheet risks to enhance the assessment of the contribution of a single institution to system-wide risks. Supervisors would also need the capacity to act. In particular, specific procedures would have to be set up to wind down in an orderly fashion those institutions selected for

⁴ See Borio (2009) "Implementing the macroprudential approach to financial regulation and supervision".

⁵ See IMF, "Lessons of the financial crisis for future regulation of financial institutions and markets and for liquidity management", prepared by the Monetary and Capital Markets Department, 4 February 2009.

the importance of their contribution to systemic risk and considered as non-viable, in order to avoid the "too big to fail" problem and associated moral hazard issues. Lastly, consistent standards and tools would need to be developed across countries and sectors to prevent regulatory arbitrage, requiring better supervisory coordination. In particular, ensuring that a comprehensive consolidated supervision framework was applied to all the financial institutions deemed to be within the perimeter of institutions of system-wide importance would be essential.

Of course, the framework presented above should be complemented by specific arrangements for dealing with institutions that are not deemed as contributing to systemic risk, as is the case with deposit insurance coverage for commercial banks of limited size.

2|2 The time dimension: dealing with procyclicality while preserving risk sensitivity

As regards the time dimension of the macroprudential approach, the current crisis has underscored that addressing procyclicality in the financial system must be a key priority. From this perspective, some observers have focused on the higher risk sensitivity of minimum capital requirements associated with the recent evolution in banking regulation, arguing that this could lead to unwelcome procyclicality. This is a distinct possibility. At the same time, what is not sufficiently appreciated is that greater risk sensitivity is needed. Not least, if properly structured, it can encourage earlier recognition and mitigation of emerging risks, helping to forestall an unexpected and sudden call on capital later on. Indeed, one of the most procyclical forces in the current financial crisis has been the failure of risk management and capital frameworks to capture key risks. When banks and market participants realised what the true risks were, they retrenched at the worst possible time, amplifying the impact on the real economy.

In addition to risk sensitivity, another important feature of existing banking regulations that should be preserved in order to dampen procyclicality is the independence of the supervisory process. Past experience suggests that a lack of independence

of supervisory authorities can indeed contribute significantly to procyclicality in both good and bad times.

There are a number of ways to reduce any potential procyclical bias in the regulatory framework and in particular feedback effects between the financial system and the real economy. Two important ones relate to provisioning and capital standards. Together, if properly designed, they should capture both expected and unexpected losses, fully taking into account the evolution of risk during business and financial cycles. Countercyclical regulations would imply that capital and provisions would be raised above the minimum in good times, when risks are building up. This would facilitate the accumulation of buffers that could be used in the downturn, when consequences of previous risk-taking materialise, enhancing risk management at the firm level. While this approach must necessarily be forward-looking, it has to be anchored on historical data and overseen by prudential supervisors (so as to limit the risk of manipulation).

There is wide agreement on the merits of countercyclical provisioning and capital requirements. In particular, risk would be better mitigated through several channels:

(i) the *absorption capacity channel*, as a more forward-looking approach would provide more capacity to absorb losses when they occur;

(ii) the *incentives channel*, as profits would be better adjusted to longer-term risks. During a boom, under a countercyclical approach declared profits would be less prone to exaggeration and lower, leading to the distribution of smaller bonuses and less dividends and most likely resulting in a fairer valuation of stock prices. This would ensure that profits distributed during upturns do not include risk premia, as it seems to have been the case in the run-up to the current crisis;⁶ and

(iii) the *portfolio shift channel*, as banks could adjust their portfolios more smoothly if the identification of risks were done earlier in the business cycle. This means that banks would be less prone to resort to fire sales and curb lending in downturns: either the pressure on capital would be less than otherwise, or remedial action would have been taken

⁶ Although this would still not prevent excessive risk-taking in good times, it would surely help mitigate its impact.

earlier thanks to improved risk sensitivity. In turn, all this would have positive effects on long-term economic growth.

No doubt there is much work to be done to develop, agree on and implement the right methodologies linking provisions and capital to business cycle developments. Nevertheless, work has already started in earnest. The April 2009 FSF Report *Addressing procyclicality in the financial system* represents a key milestone, as it includes recommendations suggesting methods to mitigate the procyclical effects of current regulatory practices. This work has benefited from strong support from the IMF, the Committee on the Global Financial System and the Basel Committee, especially on leverage and capital issues. Standard-setting bodies have embraced this agenda and are working to develop adequate methodologies to realise it. It is reasonable to expect that, when the next boom begins, there will be explicit features in capital, liquidity and provisioning rules in place along the lines outlined above.

3 | REGULATION MUST DEAL WITH UNCERTAINTY

My third key element is that regulation should find ways to deal with uncertainty. Indeed, a key challenge highlighted by the crisis is the limitations of the existing toolkit for dealing with unexpected events, particularly those that are infrequent and therefore unlikely. We turned out to know much less than we thought we did before the crisis. Key assumptions that underlie risk management models have come under scrutiny. Examples include the assumed normal shape of the risk distribution, the exceedingly short horizons for data records, the blindness to the possibility of herd behaviour, the inability to capture correlations, and the excessive reliance on market prices and past statistical relationships. However, all the financial institutions using similar models did not take similar decisions, suggesting that the problem is larger. The governance process that should support good judgment and decisions failed as much as the models on which people relied. Boards of directors and management of financial institutions were not always asking the right questions, often

paying more attention to business volume than to risk management; profits were not analysed, and rewarded, on a risk-adjusted basis; and there were incentives to develop structures and new instruments to circumvent regulation and reduce short-term regulatory costs.

Hence, the recent crisis has shown that it is essential to both improve risk modelling techniques to factor in interactions and tail events *and* rely on judgment and experience to supplement mathematical analysis (not a new concept, but one that had tended to be forgotten).

But how can regulation help if models are inadequate, particularly in times of stress when they are needed the most, if uncertainty is difficult to manage and if governance arrangements do not favour adequate risk culture in financial institutions? The role of regulation, in short, should be to recognise the inadequacy of risk management frameworks to deal with uncertainty and to compensate for these shortcomings. Several possible ways to strengthen regulation in this respect may be considered:

- Building up larger cushions in capital, provisions and liquidity, so as to be prepared for uncertain adverse events.
- Multiple lines of defence against unexpected risks by looking at a wide array of indicators in both risk management (e.g. gross and net positions) and capital frameworks (e.g. simple and gross measures of risk, such as a leverage ratio).
- Automatic stabilisers to mitigate excessive risk-taking: given the difficulty in identifying uncertain events and avoiding delays in decision-taking as well as excessive optimism, cushions through the cycle should be built in as automatic stabilisers as much as possible, limiting the need for discretionary decision. There should, however, be an appropriate balance between automatic stabilisers and judgment by supervisors. An exclusive reliance on simple automatic rules could provide a false sense of comfort if the environment changes rapidly (e.g. financial innovation).
- Access to better information to improve market oversight.

4 | FOSTER INCENTIVES FOR GOOD RISK MANAGEMENT CONSISTENT WITH FINANCIAL STABILITY

Fourth, regulation should foster adequate incentives for good risk management. This will also contribute to the preceding key element, because adequate incentives in financial institutions to foster sound risk management, good governance, proper checks and balances, market discipline and the internalisation of interactions and systemic risk in business decisions can prove of particular importance once the unexpected happens.

A first step, already being addressed by the Basel Committee, is to enhance the aspects of banking regulation to increase the resilience of the banking system through, in particular, strengthening the level and quality of capital and enhancing the global liquidity risk management framework.

More fundamentally perhaps, the need to reform regulation so as to better align private sector incentives with public goods such as financial stability is in itself a key objective – at least as important as the need to build larger capital cushions. Certainly, making wrong investment decisions is not necessarily a market failure, provided that markets can self-correct their excesses at a perhaps painful but still tolerable cost. However, in the recent crisis market discipline was not effective enough and large-scale public intervention proved necessary – problems that would not have been resolved by simply asking for more regulatory capital.

Public attention has particularly focused on incentives within financial firms. While the boards of these institutions are entrusted with the oversight of the risk management process – including determining risk appetite, approving risk management strategies and ensuring that management takes actions commensurate with these strategies – many of them overlooked the frenzied risk accumulation and in some cases allowed irresponsible executive compensation schemes. Although the financial industry should continue to be able to attract needed talents, it is clearly recognised that compensation schemes should stop providing the distorted incentives that helped amplify the recent crisis. In particular, the Basel

Committee has worked on ways to strengthen risk management through Pillar 2 of the Basel Capital Framework. The FSF has proposed that compensation practices should be risk-adjusted and made consistent with the long-term goals of financial institutions. Financial supervisors are also being called upon to review compensation schemes as part of their supervisory exercises.

Another ingredient of market discipline that fell short during the crisis was the role of credit rating agencies. Their failure in addressing the conflict of interest between their advisory and rating roles has brought into question the use of their ratings in regulation. There were also failures in risk measurement and modelling, e.g. in the case of the ratings of structured products that had subprime mortgages embedded in them. Here, too, action has been initiated in several forums to enhance oversight of these agencies. IOSCO (International Organisation of Securities commissions) has developed a code of conduct which could form the basis of national frameworks, and the need for providing better disclosure on complex products to facilitate informed investment decisions has been highlighted. Important proposals have also been put forward by the Basel Committee to enhance market discipline in this area (enhancements of Pillar 3 of the Basel II Framework).

Yet, notwithstanding rating agencies' shortcomings, many institutional investors had adequate instruments and resources to perform their own due diligence but failed to do so and appeared blindsided in their quest for yield. The boards of these institutions overlooked the build-up of risk in their portfolios, highlighting that more remains to be done to further strengthen governance in this sector as well.

Ensuring the consistency of both prudential and accounting regulation with good risk management practices is also important, not least because these rules greatly influence the behaviour of financial institutions. It has long been argued that accounting rules aim at describing the balance sheet of an institution while the prudential approach is more forward-looking. This has led to a structural tension between the "incurred loss" model of the accounting world and the "expected loss" model of risk management and prudential regulations. On the accounting side, one worry is that a

forward-looking approach provides management with some discretion to manipulate earnings, thereby hurting investors. On the supervision side, one concern is that accounting rules that are backward-looking do not allow buffers to be built up when risks accumulate so as to meet future losses, undermining the soundness of the firm and exacerbating procyclicality. One positive outcome of this crisis is the apparent willingness to agree on a common ground which would address both concerns. Under the auspices of the FSF, both accountants and supervisors have looked deeply into the issues of valuation of financial instruments and provisioning. The International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) have been invited to reconsider the incurred loss model in order to recognise and measure loan losses that incorporate a broader range of available credit information. This would clearly narrow the gap with expected loss calculations, which incorporate past information that can be much richer than in the current, narrow, incurred loss approach.

5| ENSURE MEANINGFUL COOPERATION FOR CROSS-BORDER SUPERVISION AND OVERSIGHT

My fifth key element is that cross-border cooperation is of the essence. National solutions to financial system problems are unlikely to work effectively in today's globalised financial system, where large financial institutions straddle the world. Nor is it worthwhile to contemplate returning to a world with capital flow barriers. The solution is to find better ways to coordinate surveillance, oversight and policy responses across borders, thereby alleviating tensions between home and host countries. The importance of this issue has been highlighted during the current crisis. Uncoordinated policy actions at the national level led to defensive responses from other countries and possibly aggravated the early stage of the turmoil. Accordingly, several actions have been proposed to ensure more coordination in the future. The FSF has moved ahead with the development of principles to govern the scope, role and operations of supervisory colleges, which have been established

for most of the identified large financial firms. The Basel Committee has in addition broadened the mandate of its Standards Implementation Group to concentrate on implementation of Basel Committee guidance, and all banking supervisory standards more generally.

But progress will be difficult in part because some important issues fall outside the normal scope of supervisors and risk remaining unaddressed. These are prickly areas of national sovereignty, implying that only strong political commitment can effectively reduce cross-border differences. For instance, legislative frameworks dealing with bank rescue intervention and insolvency have to be more compatible across jurisdictions to ensure the convergence of key policies such as early remedial action and intervention in the case of the failure of cross-border firms.

As highlighted by the recent crisis, such coordination will not be effective if not underpinned by some kind of institutional arrangement and strong political support promoting the convergence of national frameworks across sectors. This is also important to ensure a level playing field in the financial industry.

6| ENFORCE REGULATION PROACTIVELY AND DEVOTE MORE RESOURCES

My sixth and final key element is that setting adequate regulation is not enough if not properly enforced. The rules of the game do not matter without the ability and/or willingness to respect them. Even though it would have been better to have clearer regulation rules before the crisis, more could have been done under the existing regulatory framework, and supervisors did not use all the room for manoeuvre at their disposal. For example, it is now widely acknowledged that the relaxation of their underwriting standards and the growth of their off-balance sheet positions in the run-up to the crisis did not attract the desired supervisory responses.

The G20 has already picked up on this issue of regulation enforcement and has called upon national authorities to ensure the independence

and effectiveness of their regulatory activities. This should be complemented by a broader discussion on what should be done to ensure stronger oversight of the financial system in practice. Specific actions should be taken to provide the regulatory function with the necessary mandate, resources, operational independence and corresponding accountability so that the rules being set up are followed.

Good regulation has to be supported by equally good supervision, which must be able to act in a timely and credible fashion. Supervisory agencies must therefore also have adequate resources, in particular the ability to hire, train and retain skilled professionals. This is still not the case in a number of jurisdictions.⁷

This last point is even more important given that the role of supervisors is changing at a rapid pace.

The last decade saw a shift in their roles, from the simple monitoring of how financial firms comply with regulation towards a more risk-focused approach. The next decade is likely to expand the supervisory focus further, from prudential regulation and firm-level risk assessment to macroprudential supervision and systemic risk determination. These changes will no doubt require significant additional resources and skills, not least to ensure the degree of operational independence required by supervisory actions to be credible and timely, and broader institutional reforms in some places. Though this issue has not yet gained visibility in the various discussions and reports emerging from the crisis, the question of resources is likely to be crucial in determining whether the reformed regulatory framework can effectively deal with the next financial crisis.

It is heartening to note that work has begun on almost all financial regulatory fronts. If properly implemented, my sense is that the roadmap presented here can provide assurance that things will be better on the next occasion of financial stress. However, cycles are an inevitable facet of the economy. The pursuit of policies to dampen procyclicality and moderate excessive risk-taking could also have a moderating effect on growth during specific periods of time. Policymakers should be prepared for these effects, taking comfort in the fact that growth would be more sustainable and stable in the longer run, and that the cost of future financial crises could be minimised.

⁷ For example, the IMF paper "Implementation of the Basel core principles for effective banking supervision: experience with assessments and implications for future work", prepared by the Staff of the Monetary and Capital Markets Department, 2 September 2008, suggests that over a third of the sample of 137 assessed countries did not meet the criteria on the principle for operational independence and adequate resources, and points to the lack of experienced supervisors, training budgets, the inability to retain qualified staff due to low salary scales, and competition from the industry.

On the efficacy of financial regulations

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Regulatory failures have been a significant contributor to the financial crisis, but that does not automatically mean more regulation is called for. The crisis happened because financial institutions and the whole economy used seemingly infinite amounts of cheap credit to create an asset price bubble. The banks played their part by creating all these complex structured products that continue causing difficulties. They did this under direct regulatory oversight.

Such excessive credit expansion is how most financial crises have played out throughout history. The exact same process can be prevented from happening in the future, but surely the next crisis will take a different form. It will be something completely unforeseen. One cannot regulate against such unforeseen events.

The crisis has its roots in the most regulated parts of the financial system, the banks, whilst the least regulated part, the hedge funds, are mostly innocent.

Is the problem lack of regulation? Or is the problem lack of understanding on how to regulate financial institutions properly? Depending upon the answer to the question, the correct approach to future financial regulations will be very different.

The unique element this time around has been the extensive use of statistical models to forecast prices, and risk as well as to price complex assets. It was the models that failed. Such models embed an assumption of risk being exogenous; market participants react to the financial system but do not change it. In practice, this is nonsense.

Market participants, especially in a crisis, receive the same signals and react in a similar way; they exert significant price impact resulting in risk being endogenous. This implies financial risk models are the least reliable when we need them the most and that regulation by risk sensitivity, such as risk sensitive bank capital, may increase financial instability.

The root causes of the crisis are the same as in most financial crises throughout history. These crises have happened under a wide range of regulatory mechanisms. Blaming the crisis on a narrow set of obvious regulatory causes, such as bonuses, hedge funds, universal banking, shadow banking, structured credit, lack of regulations, inadequate risk management is attacking a straw man. It takes the focus away from the necessary detailed examination of the causes of financial instability, which is the only way to design effective regulatory mechanisms.

We do not clearly understand what went wrong, and know even less how to design regulations to prevent such episodes from happening in the future, whilst maintaining the efficiency of the financial system.

This is why it would be preferable to study what went wrong and then in a few years carefully change regulations at a time when we know more. There is no hurry, we still haven't solved this crisis and the next one will not come immediately after the current crisis. The costs of inappropriate regulations are high and we do have the time to wait.

NB: Research papers of the author can be downloaded from www.riskresearch.org.

The financial crisis has been blamed on the failure of financial regulation, with more, and immediate, regulation the best way forward. However, the case for more regulation is not that clear. After all, the crisis has its roots in the most regulated parts of the financial system, the banks, whilst is the least regulated part, the hedge funds, are mostly innocent.

Is the problem lack of regulation? Or is the problem that we don't really know how to regulate financial institutions properly? Depending on answer to the question the correct approach to future financial regulations will be very different.

The prudent way forward is to first identify how financial regulations failed and try to find new approaches to regulation before regulating everything in sight. Inappropriate or ineffective regulation can be damaging to the economy and increase financial instability.

The crisis is from a historical context rather typical. Financial institutions increase lending in an economic upturn, positively affecting asset values, thus collateral, stimulating future lending. As banks chase increasingly bad credits, asset values are more and more out of touch with the underlying fundamentals. It takes an increasingly small event to cause a rapid reversal. We go ‘up by the escalator down by the elevator’ – banking is procyclical.

One thing that is unique this time around is the role of models in pricing, decision making and risk analysis. Indeed, a cursory glance at writings on the topic of the past years – prior to the crisis – one gets the impression that models represented a level of scientific finance, that we have managed to accurately represent the financial system by a series of equations. One of the earliest official expressions of this view is the *Amendment to the capital accord to incorporate market risks* (1996).

Models have had a profound impact on finance, both positive and negative. Many individuals have a rose tinted view of the efficacy of financial models, not realising the impacts of issues such as risk sensitive bank capital.

The nature of financial risk on a fundamental level is not known, rendering formal statistical modeling

of financial risk rather difficult at best. The reason is that the financial system is composed of intelligent human beings that react to the world around them, including what the models say.

Under observation, the financial system changes. When models are put to use, the financial system changes. Therefore, attempting to systematically forecast prices or risk using past observations is generally impossible.

The output of most risk models, especially when they aggregate a large number of positions is quite unreliable. Getting risk measurements may provide comfort, but if the numbers are unreliable the comfort is false. Relying on risk models, especially for supervisors thinking about systemic risk, is the lazy way out. Especially considering the rather poor quality of state-of-the-art models.

In particular, exploiting the banks' internal models for the purpose of measuring systemic risk is not the right way to do it. The internal models were not designed with this in mind and to do this calculation is a drain on the banks' risk management resources.

If we don't understand how the system works, generating numbers may give us comfort. But the numbers do not imply understanding.

Unfortunately, many of the proposals for reform of the financial system are based on risk measurements and risk sensitivity, proposals in areas such as systemic risk and compensation. There is considerable research going on in this area is at the moment, the next crisis is not coming anytime soon. It would be better to delay the reform until we know more about what we are trying to regulate.

1 | THE NATURE AND MEASUREMENT OF RISK

In 1921, Frank Knight made his increasingly famous distinction between *risk* and *uncertainty*. With risk we can assign mathematical probabilities to randomness whilst with *uncertainty* we can not. Stated differently, we can measure and model risk but not uncertainty.

Randomness in the financial system is either risk or uncertainty. Policy makers need to pick one. The choice leads to a very different approach to financial regulation.

The founding philosophy of most risk systems is risk measurability. The key part is a model — sort of a black box — into one end goes data, out the other comes a measurement like Value-at-Risk (VaR). VaR assumes randomness is risk in the Knightian sense. It is founded on the notion that the financial system can be represented by a sequence of mathematical equations, where one only need to find the right equations to measure risk.

VaR along with most, if not all, risk models currently in common use assumes that market data follows a stochastic process that only depends on past observations of itself and other market variables. Obviously, this facilitates modeling, but unfortunately by construction can only capture randomness when financial markets not in turmoil, at times when we can more or less safely assume that risk is *exogenous*.

These risk models assume that randomness is risk and not uncertainty in the Knightian sense. This means that the appropriate way to forecast risk is to take a chunk of historical data and feed it through a statistical model, whose purpose it is to deliver the distribution of the underlying data so that we can assign mathematical probabilities to particular outcomes. If the results are less than satisfactory, the solution is to further develop the model and/or expand the data set. All still comfortably within the universe of Knightian risk. In this particular view, the problem of imperfect risk measurement has a simple solution — more sophistication. So long as we have the right model we can measure risk. But is this really true?

Many market participants and policy makers think so, a phenomenon that may be called the *myth of the riskometer* (Daniélsson, 2009). It is based on the notion that we can stick some sort of a riskometer deep into the bowels of the financial system and get accurate measurements of the risk of complex financial products.

Where does this belief in the riskometer come from? Perhaps from applying what we know about natural

sciences — physics — to the financial system. If the laws of physics are known, it is possible to create the most sophisticated structures and understand risk of those structures on a deep fundamental level. Randomness is risk not uncertainty, and the riskometer exists. In physical systems if we don't understand the riskiness, the solution is more complexity.

1|1 Challenges in forecasting market risk

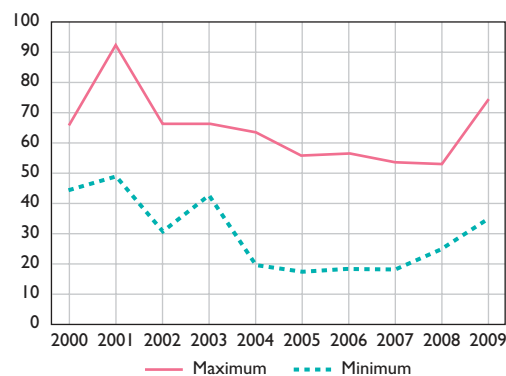
The most commonly used method for forecasting market risk is VaR, ever since its introduction to financial regulations in the 1996 Amendment to the Basel Accords.

VaR has well documented flaws. Theoretically, it is not subadditive, (see Artzner *et al.*, 1999) something that is hard to overcome in practice. The alternative risk measures that have been proposed as a replacement tend to be difficult or impossible to implement in practical use, methods such as tail VaR. For the better or worse, we seem to be stuck with VaR.

Besides the theoretic deficiencies, VaR gives surprisingly inaccurate risk forecasts, something repeatedly demonstrated, e.g. by Daniélsson (2002).

To address the accuracy of VaR consider what is one of the easiest risk forecasting exercises, daily VaR for IBM stock for the first day of the year from 2000-2009 on a portfolio of USD 1,000. The VaR is forecasted

Chart 1
Value-at-Risk
(USD)



with the most common models and assumptions used by the financial sector.¹ While the detailed results and the computer code is available for download² summary results are shown in Chart 1. It shows the maximum and minimum VaR across all the methods each year for the portfolio.

The difference between the lowest and highest VaR forecasts is lowest in 2003 at 50%. Most of the time it is more than double, reaching 320% in 2005. This points to the general unreliability of VaR as a measure of risk. Not only are the estimates very different dependent on the methods and assumptions, it is very challenging to select which estimate is best, as backtesting methods lack in robustness.

1|2 Death by a thousand cuts

One surprising result out of the Chart above, is how low the VaR is for the first day of this year, at the height of the crisis. Whilst asset values are collapsing, VaR indicates that the risk then is lower than at the beginning of the decade. Clearly, our perception of risk is much higher than then, so what is wrong?

One reason is that most risk models are dependent on some heroic assumptions. One of the most important is the focus on one-day VaR. The reason is simple, trying to forecast VaR for anything but one day is much harder than one day forecasting. The multi-day holding periods favored by some may provide the comfort of a number, but add little or no information to one day VaRs. They are either based on multi-day holding periods and hence inevitably small sampling periods, or use scaling law to get multi-day VaR, typically square root of time. In that case, the multi-day VaR is really only a single day VaR scaled up by a constant, and has exactly the same information content.

Another assumption that is usually made in VaR forecasting is that the mean is zero. This is generally reasonable, the mean is an order of magnitude lower than the VaR, and can therefore often be safely ignored. Specifying the mean would be after all quite challenging since there is no obvious number one could use.

Suppose, however, that the average return is somewhat negative, at the same time VaR is low. That will not be such a surprising state of the world, because VaR is only one point on the distribution of returns and does not capture the thickness of the tail or the real underlying risk.

In this case, we would experience multiple days of small negative returns – slowly bleeding out from thousand cuts. The signal from the risk measure is that everything is fine, whilst those in the market know it is anything but.

This often happens when markets are trending down. It is not uncommon for the markets to jump away from the trend, so that in boom markets prices trickle up and jump down. In bear markets it is the opposite. Surprisingly, the lower tails can be thinner in crisis than when things are better.

1|3 Models of systemic risk and asset dependence

The example above focuses on the problem of forecasting VaR for a single asset, and even in that case, the risk measurements are highly uncertain. Attempting to model portfolio risk is much harder still and even more so for some recent models of systemic risk based on conditional tail probabilities such as CoVar.

When modeling portfolio risk, we need to incorporate the interrelations between assets. Naïvely, one could do this with constant correlations, but then immediately run into the problem that correlations change often quite sharply over time. Two assets can be highly positively correlated one week, and sharply negatively correlated the following week, a phenomena known in the jargon as *non-linear dependence*.

Most risk models in practical use are still dependent on constant correlations as relaxing the assumption makes most models of dependence not estimable as the number of assets increases.

There is considerable research going on in more advanced methods for measuring such non-linear

¹ Estimation windows are 260, 500, 1,000 and 2,500 days, and the methods are historical simulation, moving window, exponential moving average, GARCH and fat tailed GARCH.

² risk.lse.ac.uk/rr/files/bdf-2009.zip

dependence, such as copula models, conditional tail dependence methods, conditional VaR and tail dependence. Unfortunately, they generally only work with very small portfolios, perhaps only two assets, and even in that case either rely on heroic simplifying assumptions or are quite technically involved.

Conceptually, such methods are interesting because they theoretically capture the dynamic structure of tail dependence. They do have certain attractiveness for the modeling of systemic risk and contagion. As practical methods for implementation, they are challenging as they compound three sources of error in estimation, the VaR calculation, the dependence structure, and the conditional tail probabilities.

1|4 Challenges in measuring credit risk

Credit risk presents different challenges. In the crisis, it is credit risk, and not market risk that has been the most important risk factor, in particular all the complex instruments, credit default swaps – CDSs, collateralised debt obligations – CDOs, structured investment vehicles – SIVs and the rest.

Some of the first instruments to be affected by the crisis were CDOs on US subprime mortgages. The mistakes in risk analysis of those instruments are illustrative of the subsequent difficulties in the credit markets.

Tranches of CDOs attracted credit ratings like any other corporate bond, but they are not like any other corporate bond. Coval *et al.* (2008) note that the particular prioritisation rule which allows senior tranches to have low default probabilities, and get high credit ratings, also implies that the risk in senior tranches is particularly concentrated on systematically bad economic outcomes – the CDOs are in effect economic catastrophe bonds. When default correlations increase during an economic downturn, we quickly observe that many senior tranches suffer from much higher rates of defaults than envisioned.

The subprime market took off in the early stages of the business cycle, under economic conditions

that were generally improving; implying mortgage defaults were relatively independent events, reflecting individual difficulties rather than general economic problems.

Unfortunately, the data samples used to rate the CDOs contain subprime mortgages are not long enough to include a recession. This means in the data sample correlations are low. Even if the same contained a downturn it would be difficult to estimate them, as noted by Duffie (2007), there is a serious lack of good models for estimating correlations.

The sensitivity of the senior tranches is easily demonstrated with a typical CDO. Suppose we have a portfolio of 10 bonds each containing subprime mortgages and having 25% annual default probabilities. Of course, 25% may be a bit extreme, but it demonstrates how easy it is to turn junk into gold.

Use those 10 bonds to create a CDO. By using a sample credit transition matrix,³ we can calculate the number of bonds in each tranche. Start with the assumption common before the crisis that the default correlations were zero, and increase to 50%, more typical of extreme economic downturns.

The following Table shows how many bonds would fit into the various tranches, ranging from Aaa to B, with the remainder going into the equity tranche.

When the default correlations are zero, 20% of the CDO get the highest rating Aaa, with the mezzanine tranches taking half. Simply by increasing the default correlations to 10% the Aaa tranche vanishes. By increasing the correlations to 30% the best we can do is Ba.

Table 1

Rating	Aaa	A	Baa	Ba	B	Equity
Moody's default probabilities	0%	0.02%	0.16%	1.16%	6.03%	
Default correlations	Size of tranches					
0%	2	0	1	1	3	4
10%	0	1	1	1	2	6
30%	0	0	0	2	3	6
50%	0	0	0	0	5	6

3 Obtained from the Moody's website, average one-year rating transitions: sample period: 1970–2004.

This demonstrates the extreme sensitivity of CDOs to correlations. Such instruments are even more sensitive to correlations than market risk portfolios, while at the same time the problem of measuring the correlations is even harder for structured credit products. After all, this is annual risk, and the last economic downturn was only 17 observations ago, in 1992. That was the last time correlations increased.

2| ECONOMIC ANALYSIS AND RISK FORECASTING

Statistical financial models have procyclical effects on asset prices and risk – causing bubbles. When the statistical models in widespread use are dependent on similar distributional assumptions, they will tend to give similar signals to market participants.

Suppose asset values are rising. The models will pick up on that and forecast higher asset values in the future. If financial institutions react to this, that fact by itself will endogenously cause values to increase. Similarly, measured risk will decrease. These processes become self reinforcing, eventually causing values to be seriously out of sync with the underlying economic fundamentals, whilst the risk measurements significantly underestimate the real risk.

In the end, it takes an increasingly small event to burst the bubble and everything goes into reverse but at a much faster speed. The models will then send the opposite signals, negative returns and high-risk, further exasperating the problems.

Such effects have started to make their way into formal economic models and hopefully will soon be incorporated into risk models.

2|1 How risk measurements affect the distribution of risk

Daníelsson *et al.* (2009) explicitly model the endogeneity of risk, originally proposed by Daníelsson and Shin (2003). They consider the

case where the risks impacting financial markets are attributable (at least in part) to the actions of market participants. In turn, market participants' actions depend on perceived risk. Market outcomes are directly affected by constraints on financial institutions, how financial regulations or other restrictions affect their behaviour.

The results indicate that risk constraints induce higher volatility and correlations. During times of financial turmoil, correlations of returns increase with upward shifts in volatility. The model captures a common feature of asset price bubbles followed by a financial crisis, where the markets go through long periods of high return amid low volatility. Then suddenly, with the first hint of turbulence, the bubble bursts, giving rise to a pattern described by traders as going ‘up by the escalator but down by the elevator’.

The resulting shedding of exposures results in negative spillovers on other market participants from the sale of assets or withdrawal of credit. As prices fall or measured risks rise or previous correlations break down (or some combination of these), market participants respond by further cutting exposures. The global financial crisis of 2007-9 contains many examples of such distress episodes. This category of models is likely to form the cornerstone of future systemic risk models.

2|2 Risk models are least reliable when you need them the most

One lesson from the type of economic crisis models discussed above is that financial risk models are least reliable when they are needed the most. Because they are conditional on the sample used in the estimation, they generally build in momentum type effects into the forecasts.

Bubbles are generally slow affairs, with prices increasing steadily with low volatility. When the bubbles burst the price dynamics change sharply, even overnight, implying a structural break in the statistical processes governing market prices, meaning that any risk model estimated before the bubble burst is no longer valid.

2|3 Systemic risk measurement

A significant focus of many recent proposals for the reform of the financial system is systemic risk. Presumably, regulations would be designed to minimise future systemic risk, with the supervisors tasked with measuring systemic risk and reacting appropriately when it is perceived to be high. This is one of the ideas that sounds good in theory but whose time has not come in practice.

The problem of systemic risk is much harder than risk measurements for a single financial institution, not to mention individual asset risk measurements. The risk modeler has to take into account the individual and aggregate positions within a bank and then somehow aggregate that across the financial system, explicitly incorporating feedback effects between institutions.

A key element is how financial institutions react to signals, if one perceives a negative shock and starts selling how does that affect other institutions. The feedback effects between financial institutions will have to be the key ingredient in any future systemic risk model. What matters for such models is endogenous risk. Such models are still at an early stage, with considerable research being conducted, but they are not yet ready for prime time.

3| IMPLICATIONS FOR REGULATIONS

The challenges in measuring financial risk directly affects the regulations of financial institutions. The trend in financial regulations over the past few years and decades has been an increasing reliance on *risk sensitivity*. In principle, risk sensitivity is sensible, financial institutions should hold more capital when activities are risky and measure and manage risk using state-of-the-art methods.

Such risk sensitivity, at least as envisioned in Basel II, only really is sensible if riskiness is *risk* and not *uncertainty* in the sense of Knight.

3|1 Capital, risk and Basel II

Basel I was successful for its intended objectives, but has been due for an upgrade for a long time. However, for all its flaws, it had one redeeming quality, it was not based on the notion of risk sensitivity. It does not really depend on measuring risk.

Basel II, by contrast, is founded on risk measurements. Both Pillar 2 with its emphasis on internal risk management and Pillar 1 with its focus on capital.

The calculation of bank capitalisation is a surprisingly convoluted affair. Should the focus be on tier 2 and tier 1, only tier 1, narrower measures such as core tier 1, or even tangible equity? Is the denominator composed of risk weighted assets (RWA) or total assets (TA)?

In looking at tables showing bank capitalisations and rankings, very different pictures emerge dependent on whether one looks at something like tier 1/RWA as in Europe under Basel II, or the US leverage ratio tier 1/TA. Many financial institutions have appeared well capitalised under the former measure but really poorly capitalised under the latter.

The reason is what may be called the *financial engineering premium*. Sophisticated banks can make RWA really low by judicious measurement of risk, regardless of whether the assets contain a sizable chunk of toxic assets. They can not do that with total assets.

One problem with risk weighted capital is that it is only as good as the quality of the risk measurements. If, as argued above, the problem of measuring risk is much harder than it is claimed, then immediately risk weighted capital becomes suspect. Perhaps then we don't trust banks when they tell us they were well capitalised. Subsequently, they become stigmatised. Another problem with risk weighted capital is that it is inherently procyclical.

The problems with Basel II are increasingly understood, but the criticism of it was there from

the start. For example, *An academic response to Basel II* in 2001 stated:

- “value-at-risk can destabilise an economy and induce crashes when they would not otherwise occur.”
- “The Basel Committee has chosen poor quality measures of risk when better risk measures are available.”
- “credit rating agencies ... are unregulated and the quality of their risk estimates is largely unobservable.”
- “Financial regulation is inherently procyclical. Our view is that this set of proposals will, overall, exacerbate this tendency significantly.”
- “In so far as the purpose of financial regulation is to reduce the likelihood of systemic crisis, these proposals will actually tend to negate, not promote this useful purpose.”

These views still have a resonance today.

3|2 Why are banks not lending

The basic principle of banking is that lending should reflect risk. The unfortunate consequence of that is procyclicality, i.e., that financial institutions lend too much in booms and too little in downturns. This is a basic facet of banking.

Financial regulations can either encourage or discourage this procyclicality, but generally they amplify it. Clearly, the notion of capital in Basel II is procyclical. One reason for this was noted by Daniélsson and Zigrand (2008) who model the behaviour of financial institutions when they are subject to risk constraints of the Basel type. They find that such risk constraints and the implied heightened risk sensitivity has a particular perverse impact, making banks behave more alike, they will have to sell the same risky assets and buy the

same assets. That by itself makes the prices of the risky assets fall, which further increases risk and erodes capital, causing banks to withdraw from risk activities at exactly the moment when we want them to do the opposite.

Indeed, the banks are now doing what they are supposed to do. They are being prudent. It is a bit disingenuous of regulators and politicians demanding that the banks increase lending when the banks are just following the regulations proposed and approved by the very entities.

3|3 Hedge funds

Hedge funds have remained unregulated, but now we see increasing calls for the regulations of hedge funds, e.g. within the European Union on the regulation of hedge funds. Hedge fund regulation has remained controversial. In a previous Banque de France *Financial Stability Review* article in 2007 I argue that they should remain unregulated. Those arguments still hold today.

Hedge funds have had little or no contribution to the crisis, and have in many cases been a positive influence by providing liquidity and purchasing distressed assets. By putting a floor under asset values, hedge funds and private equity firms directly help the regulated banks.

The main focus of proposals for hedge fund regulations seems to be registration and disclosure. Receiving disclosure from hedge funds is like drinking from a fire hose. Many hedge funds do operate on the edge of the technological curve. The regulator, having to receive all that disclosure and using the numbers to understand systemic risk and would therefore be operating beyond the edge.

Ill-conceived disclosure regimes provide little or no information about financial stability, but have a downside of transferring responsibility to the supervisor.

3|4 Compensation in banks

One avenue which is receiving considerable attention is compensation in financial institutions. Certain individuals have been able to make exceptionally large bets and receive similarly outsized bonuses for their efforts. Now that many of these bets have failed how can such behaviours be prevented in the future?

Many proposals are based on top executives receiving shares that are not convertible into cash for a few years, even until retirement. More junior staff might have to keep money in escrow accounts for a few years until the final profitability of the trades in aggregate is known – so-called cash claw back solutions. Both suffer from fundamental problems.

First, because of the asymmetry between reward and punishment there is a promise of immense payoffs when things go well, with the only downside the loss of the reward if things go badly. The downside pain is not as big as the upside benefit.

In the old days many financial institutions had a partnership structure, with unlimited liability, which did directly expose the most senior management to downside risks. A failure of the bank might mean personal bankruptcy. Similarly, by having traders expose their personal wealth to trading positions, with permanent blacklisting in extreme cases, it would have the same effect.

Indeed, waiting for profitability may not prevent the so-called "collecting pennies in front of a steamroller" trades, i.e., trades where the mean is small but positive, with very thick lower tail. It is quite easy to create such positions, e.g. with derivatives or credit instruments, but can be harder to detect, especially with statistical methods. If we lengthen the bonus cycle, the trader can simply lengthen the instrument cycle.

Another avenue, and one proposed recently by the UK's FSA⁴ is to risk adjust pay. The problem with such approaches is the accuracy of risk models and ability to game the models. Internal risk management financial institutions can adjust models and create Chinese walls between those taking risk and those managing risk to prevent data mining. This is much harder when models are used for compensation because they

become a part of the contractual agreement between the trader and the financial institution. Making gaming a rather simple affair.

3|5 Utility banks and casino banks

The nature of banking has become an important topic for debate on regulatory reform, with many commentators calling for banks being split up along business lines. One model often heralded is the Glass-Steagall Act in the United States, which splits banks into investment and commercial banks. A more crude manifestation is the call for banks being split up into so called *utility banks* and *casino banks*, with the former providing useful banking services, and the rest taking risks. Generally, most such discussion calls for *narrow banking*.

In the Great Depression, countries with narrow banking, such as the United States, saw significant parts of their banking systems collapse. Canada, just to name one counter example, experienced no banking failures. Its banks were comfortably universal and have remained so to this day.

Distinctions between utility banks and casino banks are arbitrary and losses can occur everywhere. Narrow banks are inevitably less diversified, less stable, and less resistant to a crisis. Splitting banks up along business lines would be a mistake.

3|6 Do we know how to regulate banks?

The Basel II process demonstrates the difficulty in designing effective financial regulations and the resistance to outside criticism. Ineffective regulations can lead to complacency and hence increase financial instability. Badly designed regulations can impose significant costs on the financial system and the real economy whilst at the same time destabilising the system.

It is clear that widespread regulatory failures contributed to the crisis. However, the part of the financial system most affected by the crisis is the most regulated, the banks. So the question of whether we did not regulate

⁴ "Reforming remuneration practices in financial services", March 2009.

enough or we don't know how to regulate financial institutions effectively has not been answered.

We are unlikely to see another banking crisis for quite a number of years. There is no immediate hurry to reform

the current regulatory structures, it would be better to be prudent, take the necessary time to study how best to regulate, and then few years down the road implement an effective system. The Larosiere and Turner reports provide useful points for discussion.

Regulations have failed. But the crisis did not happen because of a lack of regulations. The crisis is typical, banks lend to increasingly marginal credits, asset values are increasingly out of touch with the underlying economy and it takes increasingly little to burst the bubble. When that happens everything reverses but at much higher-speed.

This is how most financial crisis has played out throughout history. The exact same process can be prevented from happening in the future, but surely the next crisis will take a different form, something completely unforeseen. One cannot regulate against such unforeseen events.

This is why, it would be preferable to study what went wrong and then in a few years carefully change regulations at a time when we know more. There is no hurry, we still haven't solved this crisis and the next one will not come immediately after. The costs of inappropriate regulations are high and we have time to wait.

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The treatment of distressed banks

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This article suggests some reforms of regulatory architecture for the treatment of distressed banks. Our main recommendations are:

- *a special bankruptcy regime for banks should be implemented ;*
- *strong, truly independent supervisory agencies should be established ;*
- *the incentives of the top managers of distressed banks should not be kept unchecked ;*
- *procyclicality of solvency regulations should be dampened by the introduction of “automatic stabilisers” ;*
- *one should move toward centralised supervision in economic areas which are meant to be integrated.*

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The current financial crisis is extremely severe. It is also multidimensional, and it has already led to many analyses and policy-oriented documents.¹ This contribution focuses on the treatment of distressed banks, a key element of the regulatory architecture which has however attracted insufficient attention so far. The treatment of distressed banks can however not be treated independently of other dimensions of this architecture, which some of our recommendations will therefore indirectly address.

As far as the treatment of distressed banks is concerned, we can think of public action as pursuing two potential objectives:

- The harmonisation of the treatment of distressed banks across countries in order to ensure a level-playing field while promoting global financial stability; it is useful in this respect to distinguish individual bank distress and systemic distress.
- The promotion of cooperation between countries in the treatment of cross-border distressed banks.

This paper discusses these issues in turn. A key idea that underlies the analysis is that the current regulatory system is fragile because it has not dealt in an explicit fashion with the harmonisation of the treatment of distressed banks. This stands in contrast with the efforts in terms of harmonisation of capital ratios under Basel I and II. Of course, this harmonisation has several significant flaws which have to be addressed too. But the idea that we need harmonised capital ratios is a sound one, and it should be extended to the treatment of distressed banks. This is very important because of 'political economy' considerations: whether in good or bad times, supervisors always face pressure from lobbies and from politicians that undermine the proper functioning and stability of the financial system. There is therefore a cost in leaving things vaguely specified or unspecified and therefore at the discretion of supervisors. They need to be protected *ex ante* through a system of transparent rules. Of course, there is always a potential cost of such rules in terms of loss of flexibility. However, the current system has clearly erred in the other direction. The paper offers a number of recommendations

to try and move closer to a rule-based system that maintains enough flexibility.

1 | REFORMING PRUDENTIAL POLICY FOR DISTRESSED BANKS

Even if the Basel process has clearly contributed to the harmonisation both of risk management practices by banks and regulatory requirements across countries,² and was still undergoing important reforms (Basel II) when the crisis hit, it was insufficient to contain the crisis. We suggest that Basel II should be reformed in depth, and that the objectives of regulatory/supervisory systems should be significantly reassessed.

1|1 Implementing a special bankruptcy regime for banks

Several episodes of the crisis have revealed that banking authorities of many G20 countries did not have sufficient legal powers to treat banking distress in a timely and efficient way. Moreover the discretion given to domestic supervisors by Basel II's Pillar 2 revealed counterproductive in the management of the crisis, since it exposed them to political pressure and threats of judicial recourse by the shareholders of distressed banks. Generally speaking, it is not really useful to harmonise regulatory requirements for banks if enforcement of these requirements is left to the discretion of domestic supervisors, who act under political and legal constraints that differ a lot across countries.

Therefore, a first priority for restoring a level playing field for international banking and avoiding a race to the bottom in terms of enforcement of prudential policy is reforming and harmonising bankruptcy laws for banks. Banks are not ordinary firms: partly thanks to deposit insurance, even under extreme solvency problems, their shareholders and managers still have considerable scope for "gambling for resurrection".³ In the absence of timely supervisory action, shareholders and managers still have an interest in

¹ See for example Brunnermeier et al. (2009), Tirole (2008) or the G30 (2009) for excellent wide-ranging analyses.

² The Basel accords were initially designed for internationally active banks but they have been adopted, after some modifications, by the domestic regulators of many countries.

³ This has been well-documented for example in the case of the US Savings and Loan crisis of the 1980's; see for example Dewatripont and Tirole (1994) for an overview of this episode.

continuing the bank's activity, typically increasing the ultimate damage to the deposit insurance fund and to the financial system as a whole.

A good place to start harmonising bank insolvency procedures would be the US system put in place in 1991 under FDICIA (Federal Deposit Insurance Corporation Improvement Act), which is centered around the important notion of PCA, or 'prompt corrective action' (note that Brazil put in place a system with similar features and worth looking at). This system has the advantage of starting to address a crisis gradually, classifying banks in five categories depending on (various measures of) capital ratios: well capitalised (capital ratio > 10%); adequately capitalised (> 8%); undercapitalised (< 8%); significantly capitalised (< 6%); and critically undercapitalised (< 2%). The first two categories face no restrictions, but the bottom three categories face more and more severe restrictions on actions (eg dividend payments, asset growth, acquisitions, and, in the extreme, receivership). The key idea is to allow the supervisor to intervene *before* things become too bad.

There is broad agreement that PCA has had a beneficial effect (see for example Benston and Kaufman, 1997, and Aggarwal and Jacques, 2001), and there are also theoretical analyses in its favor (see for example Freixas and Parigi, 2008).

Our first recommendation is therefore that:

- A harmonised special bankruptcy regime should be established for banks involving PCA, i.e. giving to the supervisory agency powers to limit the freedom of bank managers (and possibly remove them) and shareholders (and possibly expropriate them) *before* the bank is technically insolvent.

1|2 Putting in place strong and independent supervisory agencies

A necessary complement to the reform of bankruptcy law for banks is the protection of supervisors from pressure by politicians and lobbies.

This is only possible with a strong, independent, well-staffed and well-paid supervisor. And it is

⁴ See Dewatripont and Tirole (1994) for a discussion.

⁵ See Wilson (1989); see also Dewatripont et al. (1999) for an incentive-theoretic perspective.

likely to be easier with consolidated supervision of all government-insured deposit taking institutions within each country. What is clearly undesirable is for example the US situation, i.e. the ability for financial institutions to choose between two *ex ante* supervisors – the OCC (Office of the Comptroller of the Currency) for banks and the OTS (Office of Thrift Supervision) for savings and loan – an ability which has led to under-regulation by the OTS, mainly due to the fact that its budget depended on the number and size of institutions under its supervision.

Consolidated supervision can however in some cases have drawbacks, even if it may allow for administrative cost savings. Since early detection of bank distress is not always possible, supervisors might be tempted to hide a bank's problems in the hope that they might disappear and therefore not reveal their failure to identify these problems early enough.⁴ This creates a potential conflict of interest between *ex ante* supervision and *ex post* intervention. In this respect, the US system is attractive, with its distinction between the institution in charge of *ex ante* supervision (the OCC for banks and the OTS for savings and loans) and the institution in charge of dealing *ex post* with distressed banks, i.e. the Federal Deposit Insurance Corporation (FDIC). Moreover, endowing supervisors with a clear, focused mission can enhance their accountability. Indeed, as shown by evidence on the behavior of public agencies,⁵ the simpler their task, the easier it is to evaluate how well they have performed, i.e. to keep them accountable.

However, note that there are various means of addressing the issue of political pressure and accountability, namely by using simple, publicly observable (and thus hard to manipulate) mandatory criteria for triggering regulatory intervention. Once again, this is an advantage of the PCA doctrine of the US FDICIA.

Our recommendations for the organisation of supervision are that:

- Supervisors should have the independence, resources and expertise to fulfill their mission properly. If public authorities are unwilling to raise supervisory budgets, this pleads, *ceteris paribus*, for

a simplification of the regulatory regime. Basel II did go in the wrong direction here, with big banks being allowed to compute risks themselves through complex internal models, a task where they had a clear conflict of interest and which proved too difficult for proper oversight by supervisors.

- In terms of the structure of regulation, one should not allow banks to 'play one regulator against the other' as has been the case in the United States with OCC and OTS. Beyond this, while consolidated supervision – bundling *ex ante* monitoring and *ex post* intervention – allows for cost savings and simpler coordination, it may reduce accountability. Guarding against this can be achieved through reduced discretion in terms of intervention by the supervisors (as in the US FDICIA).

1|3 A set of simple regulatory requirements, rather than a single, complex capital ratio

The Basel Committee on Banking Supervision (BCBS) has put too much emphasis on its Capital Adequacy Requirement. The Northern Rock episodes, and several others, have shown that a solvent bank can rapidly become distressed for lack of liquidity and that transformation risk cannot be neglected. In the case of Northern Rock for example, Blundell-Wignall *et al.* (2008) point out that in June 2007 (roughly three months before the depositors run started) its regulatory capital requirement (computed on the basis of Basel II risk weights and approved by the Financial Services Authority – FSA) was slightly above GBP 1.5 billion, while British authorities ultimately had to inject around GBP 23 billion, i.e. more than 15 times the regulatory requirement, just to maintain the bank afloat.

It is not the role of supervisors to decide on the level of capital, and more generally of the risk management strategies of all commercial banks. These are business decisions that should normally be left to the assessment of banks' managers and administrators. It is only when supervisors anticipate that a bank is likely to face distress in a near future (and therefore exert negative externalities on its depositors or on the financial system as a whole) that supervisors can and must intrude. As the crisis

has shown, indicators for such future distress cannot be summarised by a single capital ratio, even if very complex. Instead, we believe that regulatory intervention should be triggered by a whole set of relatively simple (and publicly verifiable) indicators, including measures of liquidity risk, as well as exposures to macroeconomic shocks, and bilateral exposures to other banks or systemic institutions.

The emphasis on the probability of failure of individual banks (epitomised by the use of the value-at-risk criterion) by the BCBS was obviously misplaced. Indeed, a 1% probability of failure does not have the same consequences if it means that 1% of the banks fail every year or alternatively that the whole banking system fails every hundred years. Therefore it is crucial for regulators to find ways to discourage "herding behaviour" by banks, or at least to penalise an excessive exposure to the business cycle. This means that new indicators of risks have to be designed, based on correlation with aggregate activity, rather than absolute probability of failure.

Similarly, the main reason for public intervention by Central Banks and Treasuries in the current crisis was the protection of the financial system as a whole, and in particular "core infrastructures" such as large value payment and clearing and settlement systems. Anticipating (rationally) that public authorities are bound to intervene if these infrastructures are in danger, banks have taken insufficient risk prevention activities in relation with these "core infrastructures". To contain moral hazard, it is therefore necessary to regulators to find ways to penalise or at least limit the externalities that large and complex banking organisations exert on these "core infrastructures".

Finally the notion that fine tuned capital requirements could be sufficient to limit the incentives of bank managers to take excessive risk has revealed grossly incorrect. Other instruments, such as some form of control of bank managers' remunerations as well as the implementation of appropriate internal governance measures and adequate risk management systems are certainly much more adapted to curb risk taking incentives by bankers. We find more reasonable to interpret regulatory capital requirements as defining, together with other indicators, thresholds for supervisory intervention rather than recommendations for risk management policies of banks.

Our recommendations in this section are that:

- One should think of the signals triggering intervention as admittedly crude indicators of the risk of potential problems. Therefore, simplicity is crucial, because it reduces manipulability and enhances transparency and credibility.

- A single capital requirement, even when it is very complex, is not enough to limit risk taking by banks. Therefore, a battery of indicators has to be designed by regulators, in order to provide simple signal of the various dimensions of banking risks (including liquidity and transformation risks, risks of large losses, exposure to macroeconomic shocks, ...) and used simultaneously to determine whether supervisory corrective action is needed.

- Other dimensions of regulatory control are to be explored to explicitly curb the incentives of bank managers for excessive risk taking: top managers' remunerations, shareholder representation, and internal risk management systems. This cannot remain as vaguely defined as in Pillar 2 of Basel II.

2 | MACROECONOMIC AND SYSTEMIC CONSIDERATIONS

Recent years have witnessed staggering growth of some individual banks, both nationally and internationally. The size of individual banks has grown tremendously, both in large countries like the United States and in small countries (Iceland being only the most extreme case), whose banks have become very large indeed relative to GDP. This development has several consequences for the supervision of banks. Big institutions always have bargaining power in 'normal times', through their lobbying of Governments and supervisors. The aftermath of the Lehman Brothers bankruptcy has moreover clearly indicated that one cannot afford to let big institutions fail, even if the cost of a bailout is significant and therefore politically unattractive.

Beyond this, it is important for public authorities to face the evidence: banking crises do happen in

market economies. Therefore, it is important to have in place explicit crisis-management mechanisms when they come. Three issues have to be discussed in this respect:

- (i) Who decides when we are 'in a crisis'?
- (ii) What should be done *ex post*? And
- (iii) How to reduce the probability and social cost of a crisis?

As far as the first question is concerned, it is important to involve the three main actors in the decision process, the Central Bank, the supervisor and the Treasury. Indeed, each has access to relevant information, and the Treasury brings with it democratic legitimacy. Their task would be, by declaring a crisis, to allow for the potential release of public funds, something which should not be possible in normal times. When thinking of the exact decision process by which a crisis can be declared, one has to keep in mind two objectives:

- (i) it is important on the one hand to avoid excessive use of public funds through excessively frequent crisis declaration; and
- (ii) it is also important that, when a 'real crisis' hits, it is promptly declared, so as to release needed public funds.

Clearly, achieving both objectives can only happen if a crisis-management system has been devised *ex ante*, and if regular consultations take place between the Central Bank, the supervisor and the Treasury at highest level.⁶

Concerning the second issue, that is, *ex post* crisis management, a first thing to always keep in mind is that undercapitalised banks do not function well as credit providers to the economy. While there is a natural tendency for public authorities to delay action – which is fiscally costly – in the hope that things will get better, it is typically a very bad idea. The contrast between Scandinavia and Japan in the 1990s is good evidence of that.

Ex post recapitalisation of individual banks by public authorities in times of crisis can take several forms: partial (or full) nationalisation, insurance provision

⁶ Something which does not seem to happen now (see for example Davies, 2008, page 365, for the case of the United Kingdom).

for bank loans, or the purchase of 'toxic' assets to be parked in a 'bad bank'.⁷ There is no consensus among academics about the best way to proceed here. Some principles seem natural however:

(i) at least as far as banks which are performing worse than the average of the sector are concerned, there is clearly no reason to protect shareholders or managers in the process; the goal should be to protect depositors and taxpayers;

(ii) speed matters; the goal is to get healthy banks working as soon as possible.

Finally, what about reducing *ex ante* the probability and social cost of a systemic crisis? This is connected to the debate on reducing the procyclicality of regulation. This topic has quite rightly been the subject of various analyses. See for example Brunnermeier *et al.* (2009), who describe very well the bad externalities banks in trouble exert on other banks when trying to raise their capital ratios, for example by selling assets. It is indeed important for prudential regulation to take into account economy-wide indicators and not simply individual bank solvency.

In terms of the subject of this paper, let us here just stress once again the need to avoid the danger of bank undercapitalisation in bad times. Reducing procyclicality could then mean aiming at 'adequate' capital ratios in bad times and higher ratios in good times, so as to limit the vicious circle discussed by Brunnermeier *et al.* (2009). One avenue, which they discuss among others, is Spanish-style dynamic provisioning. Alternatively, in order to limit the overall amount of capital banks need to have (and its associated cost), one could follow Kashyap *et al.* (2008) and their suggestion of capital insurance. Under this system, banks would pay an insurance premium to institutions against a promise of capital infusion in times of crisis.

The scheme put forward by Kashyap *et al.* is ingenious. They are confident that private institutions or investors would be willing to provide such capital insurance. This may be too optimistic. However, it could also be provided by Governments. This is in fact what happens anyway when Governments end up recapitalising banks in times

of crisis. The difference with what has happened so far is that the Government could, *ex ante*, charge periodic insurance premia against such 'catastrophe insurance'. Similarly, it is conceivable to require *ex ante* that banks having access to Emergency Liquidity Assistance (ELA) by the Central Banks pay a periodic fee for this service.

Our recommendations in this section are that:

- Public authorities should expect crises to happen. They should put in place a mechanism that allows a crisis to be formally declared (an event which will allow the release of public funds). This means formalising *ex ante* cooperation between the relevant actors (Central Bank, supervisor, Treasury) with this contingency in mind.
- *Ex post* crisis management should keep in mind that undercapitalised banks do not function well. One should go for 'real' recapitalisation, even if it is costly. There are several options – temporary nationalisation, insuring bank loans or parking toxic assets in bad banks – that are possible. The objective should be to get lending going again without delay by properly capitalised banks, without excessively burdening taxpayers.
- Under current regulation, maintaining adequate capitalisation in bad times has procyclical effects. Avoiding this calls for introducing 'automatic stabilizers' into the regulatory system, such as higher capital ratios in good times, dynamic provisioning, capital insurance (privately or publicly provided), or procyclical deposit insurance premia.

3 | INTERNATIONAL COOPERATION

Globalisation has underlined both the current limits of, and need for improvements in, international cooperation in the treatment of distressed banks. There is indeed a tension between the tendency to favour the growth of international banks (through global or regional pro-trade and pro-capital mobility policies) and the reliance on national (whether 'home' or 'host' country) supervisors.

⁷ Interestingly, this issue generated significant research at the time of the 'transition' from central planning to a market economy by former communist countries in the 1990s. See for example Mitchell (2001) and Aghion *et al.* (1999), who argue that a mixture of recapitalisation and the liquidation of non-performing loans can under some conditions be the optimal solutions for a Government trying to serve the interests of taxpayers while being at an informational disadvantage with respect to bank management concerning the quality of the loan portfolio.

3|1 The case of the European Union

In the European Union, the tension between the prevalence of national regulators and the emergence of cross-border banks, which has been encouraged by the Single Market initiative, is very significant. This is particularly problematic because one has witnessed two competing policy rationales over recent years: the first one saying that the potential of the Single Market, and its associated productivity gains, could only be realised through synergies resulting from cross-border mergers; and the second one worrying that it is important for Member States to retain national ownership of their big banks, for 'strategic control' reasons or mere national pride motives.

In this respect, what happened recently to the banking and insurance group Fortis is very instructive. The 2007 takeover battle over ABN-Amro, which was ultimately 'won' by the trio RBS, Santander and Fortis, was hostile and controversial (and, *ex post*, an operation that turned out to be much too expensive for the acquirers); but it was very much in line with the Single Market programme, since it accelerated cross-border banking ties. However, by breaking up a 'Dutch jewel', it was definitely not popular in the Netherlands. And the question of who should be the lead supervisor of the Belgian-Dutch Fortis was a subject of debate between the two countries. This did not facilitate cooperation between public authorities when the crisis came in September 2008, crisis which, it is fair to say, the Dutch authorities did take advantage of in order to reassert control over 'their' share of the bank.

The lesson of this episode is that one can expect competition to be at times 'controversial', especially when things go sour *ex post*, due to business mistakes or market reversals. In such circumstances, one can expect nationalistic reactions, especially since national authorities see quite differently the acquisition of national firms by foreign ones than the acquisition of foreign firms by national ones.

Just like with protectionism in general, such adverse asymmetric reactions have to be kept under control through a credible set of legal provisions. These should take as starting point the fact that national supervisors can be expected to be pressured to pursue national objectives, just like

public supervisors can be expected to face lobbying by national industry.

However, the current practices are not reassuring in this respect. Indeed, relying on national supervisors (which is currently the case, with consolidated oversight by the home country supervisor supplemented by domestic oversight by the host country supervisor), requires coordination and cooperation that is going to be tested in times of crisis, as the Fortis example demonstrates. Note that the Fortis crisis happened just after the introduction of the European 'Memorandum of Understanding' (MoU), which was meant to promote cooperation in financial stability and crisis management! While this MoU is full of good intentions (on information exchanges, involvement of all interested parties, the pursuit of the interests of the banking group as a whole, 'equity', ...), its problem is that it is 'a flexible tool that is, however, not enforceable' as stressed by Praet and Nguyen (2008, page 371; this is a view also shared by the Centre for European Policy Studies (CEPS) *Task Force Report*, 2008).

While it is certainly possible to beef up such MoU's and make them more binding, one has to face the facts: if one really wants to promote the Single Market in banking (which makes sense if one wants to pursue the Single Market in non-financial sectors), and therefore the emergence of European and not just national banks, one should simultaneously favour the emergence of a European supervisor and of a European deposit insurer. We understand this is not an obvious goal (see the CEPS *Task Force Report* (2008) for example on some obstacles on the way to centralisation, an objective it subscribes to), but we think it is necessary.

Note that this statement is related to the Single Market, that is, applies to the entire European Union and not just the Euro area. We understand that this complicates things, since there would be an asymmetry between Central Banking, which would involve several players, and EU-wide supervisor and deposit insurer. The case for Euro-area supervisor and deposit insurer seems therefore stronger. However, it is important to stress the crucial need for much stronger coordinated mechanisms of enforcement than exist now whenever two territories face significant cross-border banking relationships.

Our recommendation in this section is that:

- In economic areas which are meant to be very integrated, like the European Union, one should move towards a centralised supervisor and a centralised deposit insurer.

3|2 International coordination in general

The European Union is in a sense an 'extreme' case of economic integration. Note however that many emerging economies face very significant foreign bank presences. There too the need for coordination in times of crisis – and in particular 'who takes care of depositors' – is crucial, especially since these emerging countries have more limited means of effectively guaranteeing deposits. A crisis in one such country where depositors would fail to be protected could have devastating effects, by triggering bank runs on other, 'similar' countries!

The problem is less severe for intercontinental relations involving large rich or emerging economies, because:

- (i) they have more ammunition to tackle crises; and
- (ii) they have more limited cross-banking relations. However, these have been growing over time, especially with the opening up of banking markets and the spread of risks through securitisation. And unfortunately, the regulatory and supervisory safeguards have not been raised to match these evolutions: harmonisation still has not taken place concerning the treatment of banks in distress.

Clearly, this can lead to a host of problems, especially since we have to keep in mind that crisis management has to take place with under great time pressure. Let us simply stress the two most important ones:

- First, there is the issue of when public intervention can take place and what are the public intervention powers. We have stressed earlier that the US system established by FDICIA, with PCA, was a good idea; but this system is definitely not generalised, making such prompt action unavailable in other countries.

- Second, and most importantly, is the question of depositor protection. Note that banks, when setting up operations in a foreign country, can go for subsidiaries – which then have legal personality in that country and become national firms – or simply branches, which remain an integral part of the bank.

There are clear potential incentive problems facing the home supervisor in terms of consolidated supervision, with the risk of being pressured to 'limit damages' and leaving part of the mess to foreign countries. This can be really dangerous in terms of contagion.

While it is beyond this short paper to analyse in detail the way forward in terms of cooperation in crisis management, we can highlight a couple of general principles:

- While a global supervisor and deposit insurer may be beyond reach, it has to be considered seriously if one really wants to integrate further the banking market. What applies to the EU Single Market applies, *mutatis mutandis*, to a Single World Market. Concretely, one could give real powers to a supranational authority like the Basel Committee on Banking Supervision.
- If one thinks that centralisation is either impossible or undesirable, one should at least get serious about joint crisis management. The two goals of avoiding contagion and avoiding regulatory arbitrage by banks should be kept in mind. We have already stressed the need to harmonise intervention thresholds, following an idea like PCA. Moreover, if one keeps the idea of domestic deposit insurance, whatever the legal form of cross-border banking relationships, it is crucial to think of a more even-handed approach between home-country and host-country supervision. Indeed, the decision of whether to 'save' the bank, and therefore fully protect all its depositors, and at which conditions, should in fact be taken jointly by the various authorities. More generally, in the absence of a supranational supervisor, what is required is an *ex ante* credible agreement, or MoU, between the various countries about how to share supervisory and deposit-insurance responsibilities. Such a MoU should be as explicit as possible in order to have a chance of functioning in times of crisis. Once again, there should be standardisation of such MoU's to spread best practices.

Our recommendations in this section are that:

- If one wants to keep integrating the world banking market, one should seriously consider partial centralisation of supervision and deposit insurance at the world level.

- Barring such centralisation, it is important to foster best practices in establishing credible Memoranda of Understanding for cross-border banking crisis management between authorities that detail in particular the respective rights and obligations with respect to intervention thresholds and deposit insurance.

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Credit default swaps and financial stability: risks and regulatory issues

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The credit default swap (CDS) market has grown much faster than other derivatives markets since its inception. Even though it is dwarfed by the interest rate derivatives market, which is eight times larger, its growth has affected the stability of the financial system. CDS were originally designed as a risk transfer tool to allow investors to hedge their position in the debt of a reference entity, but much of the activity in this market is also speculative (Olléon-Assouan, 2004).

Risk management in the CDS market has certainly improved significantly, reflected in the fact that gross notional volumes have fallen remarkably as a result of trade compression. Nevertheless there is still no accurate indication of how much risk has actually been transferred with these instruments, and this is a major concern for financial stability. Even a rough estimate of market size ranges from USD 29 trillion to USD 38 trillion at end-2008.

Clarifying and harmonising information is vitally important, particularly since the uncertainty surrounding market participants' risk exposure contains the seeds of systemic contagion. There is now a pressing need for better market supervision based on the active participation of regulators. The task has already been made easier by a number of public and private initiatives aimed at improving the functioning of the market and monitoring risks more effectively. The most tangible evidence of these combined efforts can be found in various plans for a clearinghouse that emerged in 2008 and 2009. Aside from its practical limitations, however, this solution cannot be extended to all CDS classes. And regulators still face the sizeable challenge of assessing overall counterparty risk on the CDS market and preventing concentration and formation of systemic exposures.

1 | A NON-TRANSPARENT, COMPLEX MARKET

1|1 Estimating the size of the market

DATA SOURCES

There are three main data providers, each with its own collection process (see Table 1).

Comparing the data is not an easy process because its scope (products, number of reporting institutions, geographies, etc.) and used definitions vary from one institution to another. For comparison, the latest data from the International Swaps and Derivatives Association (ISDA), taken from the April 2009 market survey, estimated the CDS market at USD 38.6 trillion at end-2008, while the Depository Trust & Clearing Corporation (DTCC) gives a figure of USD 29 trillion (Table 1). Harmonising and clarifying this information are therefore key issues.

DEFINITIONS

One key issue for supervisors is to measure exposure. Several definitions are used when collecting data, each of which has its advantages and limitations. For example gross volume is an indicator of changes in market activity. But because the CDS market trades over-the-counter (OTC) and is therefore not standardised, contracts are not perfectly fungible and lack liquidity. Hence participants have to multiply their positions to increase or decrease their exposure. Accordingly, gross volume data result from a mass of trades and provide no information that can be used to assess position risk. However, the data concerning types of counterparties and reference entities are useful for analysing systemic risk.

The net amounts identified by DTCC are the sum of each counterparty's net long and short positions on a particular reference entity. They correspond to the maximum possible funds transfers between protection buyers and sellers if an issuer defaults, assuming a zero recovery rate and no collateral.

Table 1
Main sources of global data on the CDS market

	BIS	ISDA	DTCC – TIW *
Start date for CDS reporting	December 2004	June 2001	October 2008
Frequency	Half-yearly	Half-yearly	Weekly
Scope	56 dealers	78 reporters, ISDA members (primary members)	All trades confirmed in DTCC Deriv/SERV (24 major dealers + buy side firms) Estimated coverage as % of trades' number: 95% (DTCC) - 75% (IMF)
Geography	G10	21 countries	World
Type of data	– Gross notional amounts of CDS bought and sold, before bilateral netting – Gross market value	Gross notional amounts	– Gross notional amounts of CDS bought and sold – Net notional positions per reference entity
Estimated market size (USD trn)			
June 2008	57	54.6	N/A
December 2008	41	38.6	29

N/A: Non available.

* DTCC estimates that it covers 95% of all transactions on the CDS market (in number of contracts). The IMF has lowered that estimate to 75% because past transactions are not recorded; neither are bespoke trades, which are not confirmed electronically.

The only metric that allows a true assessment of counterparty risk in CDS is the market value of contracts. This is because risk exposure varies according to a contract's market value after bilateral netting (not just on CDS positions but across all OTC derivatives positions covered by the same Master Agreement with a counterparty), multilateral netting through trade compression cycle and collateralisation.

1|2 Recent developments

A MORE SMOOTHLY FUNCTIONING MARKET

The measurement of risk actually transferred through CDS must be put into perspective. Market participants now benefit from a range of mechanisms that have helped improve the management of operational risk and make transactions more secure. Owing to a number of private, regulator-backed initiatives the CDS market place has become one of the most highly automated OTC markets.

Since 2005 the industry has been seeking to solve the problem of operational risk arising from confirmation backlogs. With the implementation of DTCC's electronic platform, Deriv/SERV, trades are now automated and confirmed electronically. These initiatives have reduced the volume of outstanding confirmations by 75% since 2005 and cut confirmation times from several weeks to a few days.

Trade confirmation facilitated by novation

Another factor contributing to the market improvements was the introduction in 2005 of the ISDA Novation protocol, which sets precise deadlines for getting counterparty consent for novation. In economics, novation is a process whereby a CDS counterparty transfers its obligations under the contract to another entity. If the novation is not confirmed, validation of the transaction is delayed. In such situations, both operational risk and counterparty risk increase because the investor cannot be informed that its CDS obligations have

been transferred to the new entity. Under the ISDA protocol the counterparty must give its consent via an electronic confirmation process before the contract is transferred to the new entity.

A standardised auction procedure has improved the efficiency of credit event settlement

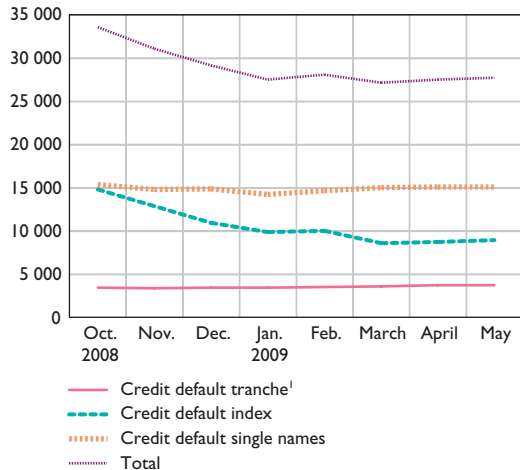
Following the collapse of several carmakers and airlines, market participants introduced in 2005 a standardised auction procedure under the umbrella of ISDA to deal with the default of reference entities with a volume of underlying debt smaller than the notional value of their CDS. The amount of protection on certain firms in these sectors was much larger than the deliverable assets needed in case of physical settlement. And because some of these CDS were index components, a single recovery rate was necessary to ensure that all investors with a position on an index would be treated equally. With the current auction process, all investors can take part and choose between physical and cash settlement. The process determines a single final price, which is then applied to all cash-settled investors. Since March 2009 the market has taken a step towards greater standardisation of settlement procedures by incorporating the auction method into the ISDA definitions. The method is retroactively applied to existing contracts ("Big Bang Protocol").

Eliminating redundant contracts through compression cycles

Used extensively by investors in 2008 the compression process consists in eliminating positions that can be multilaterally netted from the portfolios of several dealers, replacing them with a smaller number of contracts with the same net residual exposure. The current contraction in market size can be attributed to private initiatives to compress portfolios. TriOptima, the leading supplier of compression services, announced that it compressed USD 30.2 trillion of CDS contracts in 2008. Going forward, however, the potential effects of compression will be limited by the lack of standardisation in the CDS market.

Chart 1
Gross notional amounts

(USD billions)



Source: DTCC, 5 May 2009.

1 Credit default tranche: tranche of standardised CDO linked to a CDS index. A CDT replicates the behaviour of unfunded synthetic CDO tranches with a reference portfolio composed of the reference entities in the index basket (Cousseran and Rahmouni, 2005).

WITH HINDSIGHT, HOW HAS RISK MATERIALISED?

Market size must be reassessed and risk should be evaluated in light of net notional volumes

Recent trends suggest that the size of the market in gross volume terms should be assessed in broader perspective. Extensive use of portfolio compression by market participants, for instance, has sharply reduced total gross notional outstandings in CDS from USD 57 trillion in June 2008 (BIS) to USD 27.7 trillion in early May 2008 (DTCC).

Understandably, the reduction has been more significant for multi-name contracts (indices, baskets) than for single-name CDS. Since multi-name CDS include contracts linked to indices, which are standardised and therefore automatically permit more efficient netting, compression cycles are likely to have a greater effect in this segment.

In sum, the net overall exposure, i.e. the maximum amount payable by protection sellers, currently stands at USD 2.5 trillion, or 9% of the gross notional amount.

Credit event settlement has been smooth, and risk exposure in the CDS market should be reassessed in light of the amounts transferred

A number of lessons have been learned from a steady string of credit events since the onset of the crisis, with 10 credit events settled via auctions in 2008 and 21 in the first four months of 2009. These lessons apply both to the exposure of market participants and to the resilience and robustness – at least from a technical perspective – of the CDS market.

The Lehman Brothers default illustrated the problems caused by the lack of information available to individual participants before a credit event occurs. Initial media estimates suggested that total gross insurance claims would amount to USD 400 billion, much higher than Lehman's bond debt of USD 150 billion or less. But preliminary estimates from ISDA, based on the auction, give a net figure of USD 7 billion only. According to DTCC, USD 72 billion in CDS was settled normally through the automatic settlement procedure on 21 October 2008, without incident. This made it possible to calculate the funds transferred from net protection sellers to net protection buyers at just USD 5.2 billion, or 7% of the notional amount. As a result, fears of serial default among protection sellers unable to settle their claims proved baseless.

Broadly, looking at the auctions held since the crisis began, it can be seen that funds transfers arising from reference entity defaults have been fairly small. According to DTCC data, the ratio of gross notional CDS amounts to net funds transfers has rarely topped 10% (Table 2).

Table 2
Most recent CDS credit events

CDS/CDX/CDT Events

Reference Entity	Affected transactions	Settlement date	Gross Notional (USD Equiv)	Net funds Transfers (USD Equiv)
Fannie Mae Freddie Mac Tembec	Single Name and index	15 October 2008	99 billion	0.43 billion
Lehman Bros. Inc.	Single Name	21 October 2008	72 billion	5.2 billion
Washington Mutual	Single Name	7 November 2008	41 billion	1.4 billion
Landsbanki, Glitnir, Kaupthing	Single Name	20 November 2008	71 billion	4.65 billion
Tribune Company	Single Name, Index	16 January 2009	24.9 billion	2.65 billion
Republic of Ecuador	Single Name, Index	23 January 2009	2.6 billion	0.3 billion
Lyndell Chemical Millennium America Equistar Chemicals	Single Name, Index	10 February 2009	7.8 billion	0.45 billion
Nortel Networks	Single Name, Index	18 February 2009	5.6 billion	0.52 billion
Smurfit	Single Name, Index	26 February 2009	4.3 billion	0.44 billion

Furthermore the credit events that occurred in 2008 and 2009 were handled smoothly, thus demonstrating the efficiency of the auction protocols, with a participation rate in excess of 95%.

The volatility of CDS premia during the crisis has affected risk assessment on other markets

The reason for the market's rapid expansion is that CDS, like all derivatives, are not used solely for hedging purposes; investors also use them as trading instruments and hold them in the trading book. Transactions aimed at generating a direct profit from trading strategies are partly responsible for the liquidity of this market and also its volatility. This is significant because movements in the CDS market are not without consequence: when CDS premia fluctuate, market participants revisit their default

probability expectations for reference entities. The recent sharp rise in sovereign CDS premia in Europe, the United States and Japan is likely to produce default probabilities that bear little relation to these countries' economic fundamentals (Box 1). Likewise, changes in CDS premia will probably impact a broader range of financial asset prices because of the relationship between the CDS market and other markets. Transfers of information between the CDS market and its underlying market can affect corporate financing conditions and, more broadly, the entire economy. And since CDS are seen as yardsticks for measuring companies' financial strength, they are used in some asset pricing models. For instance, market participants concur that CDS may have been purchased to get around the restrictions on short selling introduced by supervisors in some countries.

Box 1

Challenges for financial stability: the European sovereign CDS market

Emergence of the market in the aftermath of Lehman Brothers

Between early 2008 and end-September 2008 the CDS of the highest-rated and reputedly safest countries, including Germany and France, traded at a premium of several basis points. Premia for lower rated countries such as Greece, Spain and Italy amounted to some tens of basis points.

Following the collapse of Lehman Brothers most developed countries introduced plans to shore up their financial systems. As a result of these programmes, which consisted in taking stakes in the largest ailing banks or guaranteeing some of their liabilities, risk was transferred from the banking industry to governments. This prompted market participants to review their expectations for sovereign default probability. The premia on these countries' CDS soared, creating fresh opportunities in a market that had not been actively traded so far.

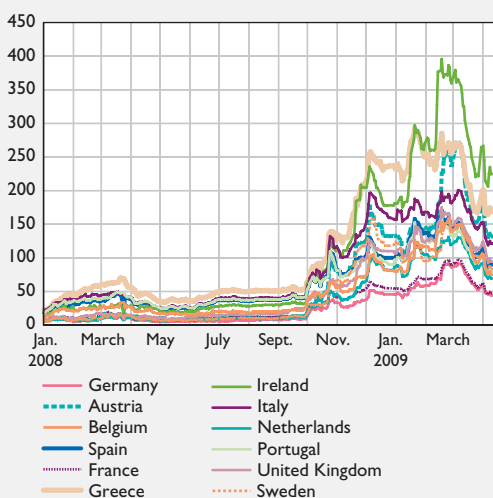
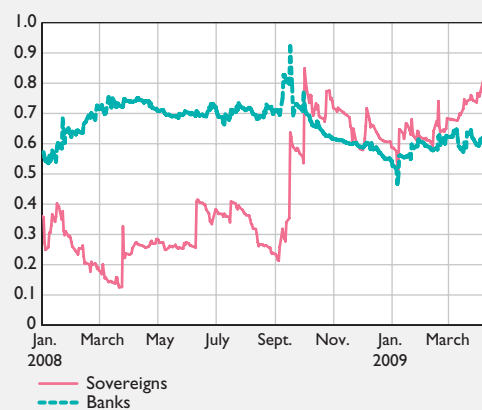
How will sovereign CDS trading affect the credit market?

To take advantage of the rise in sovereign CDS premia, the major banks that normally trade credit derivatives have devised directional or relative value strategies. Some have set up trading desks to deal specifically with this market segment. Although this activity has been responsible for most of the trading flows observed to date, sovereign CDS are also being used either to hedge some of the economic risk on debt portfolios on a specific country (i.e. macrohedging) or to build bespoke structured products incorporating developed country sovereign debt.

The emergence of the developed sovereign CDS market has implications for the economy as a whole. CDS are seen as a bellwether for risk pricing, and the correlation between sovereign CDS premia rose sharply post-Lehman to reach a level comparable to that between the premia on bank CDS. This reflects a disconnect between the market and the economic fundamentals of each developed country, which differ structurally. So although notional CDS volumes are small in relation to sovereign debt, the increase in sovereign risk – and hence systemic risk – evidenced in CDS premia affects the financing of the economy and sends out a negative signal for the future ratings of developed countries.

Sovereign CDS premia for developed countries

(in bps)

**Average correlation between CDS premia**

1|3 Special challenges for financial stability: potential systemic risk

Due to advances in the management of operational risk, the credit derivatives market is now better able to withstand a crisis-hit environment marked by frequent and regular credit events. But there are still several types of risk, closely linked to the occurrence and management of counterparty risk, that are a source of weakness with potential systemic repercussions.

COUNTERPARTY RISK AND THE LIMITS OF COLLATERALISATION

Counterparty risk – the risk that one of the two parties to a transaction will default – is the focal point of attention on the CDS market, as it is on all OTC markets. With a CDS, a protection seller is exposed to the risk that the protection buyer will not fulfil its commitment to pay the pre-agreed premium regularly until the contract matures. A protection buyer risks losing the protection it has purchased and being forced to replace it at a certain cost. Counterparty risk is therefore assessed on the replacement cost of a contract with a positive market value. It varies according to the market value of the premium and the maturity of the contract, and it declines with the number of outstanding payments.

Market participants actively manage counterparty risk by exchanging collateral. The purpose of these collateralisation practices is to cover one party's net residual exposure to the other party, thereby reducing the loss sustained in the event of default. More than 80% of the collateral received and delivered in the OTC derivatives market is cash¹. The non-defaulting counterparty can use the collateral to replace its position. In practice, market participants manage the counterparty risk on their entire OTC derivatives portfolio according to their aggregate position on a specific counterparty. Collateralisation practices seem to function satisfactorily on the whole, as reflected in the reduction in funds transfers arising from the credit events occurring in 2008 and 2009 (Table 2). That said, efficient management of counterparty risk is undermined by three sources of risk.

¹ See ISDA Margin Survey 2009.

² *ibid.*

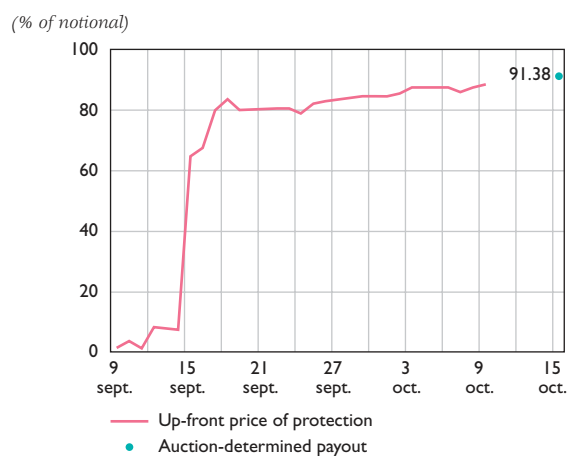
Collateralisation practices are still incomplete and uneven

While almost all inter-dealer trades are collateralised, this is not the case for transactions between dealers and non-dealers. According to ISDA², 66% of credit derivatives exposures are covered by collateral. Although the percentage of collateralised exposures has risen significantly since 2004, when it stood at 39%, it did not increase in 2008 despite the crisis. Unsecured thresholds (the amount above which collateral has to be posted) cannot be the only reason why one-third of exposures are not covered. Some highly-rated entities still do not post collateral. This has been the case for monoline insurers, and is still the case for some of them despite a decline in their solvency and hence their ratings.

Margin calls cannot cover jumps to default

The process of managing and calibrating margin calls for CDS can be hindered by specific risks. It is extremely difficult to capture and mitigate counterparty risk effectively through CDS collateral calls in the run-up to default. A credit event is preceded by a so-called jump to default, that is to say a sudden spike in the CDS premium and thus the market value of the contract. Chart 2 illustrates this phenomenon, which is specific to the CDS market. In such cases, it is highly likely that the level of

Chart 2
Jump to default
Lehman Brothers 5-Year CDS



Source: Moody's CreditQuotes.

collateral will be too low to cushion the rise, and the protection buyer will not have time to adjust its margin call. Despite collateralisation, therefore, a protection buyer can still incur substantial losses if its selling counterparty defaults.

Counterparty risk can turn into liquidity risk

The procyclical nature of margin calls based on rating triggers has highlighted the limitations of some of the practices used to manage counterparty risk. Increasing a collateral call on a downgraded counterparty can spark a liquidity crisis and weaken the struggling entity, possibly driving it to default. For example even though AIG, as a triple-A rated counterparty, was originally not required to collateralise its positions, it was called on significant margin calls after being downgraded. Between September and December 2008 AIG FP paid a total of USD 22.4 billion in margin to its 20 biggest counterparties. That said, rating triggers are not confined to CDS and are fairly infrequent in this market. They are generally used when arranging structured products, chiefly in the United States and only infrequently in Europe.

FROM COUNTERPARTY RISK TO SYSTEMIC RISK: CONCENTRATION AND CORRELATION

The very high level of concentration that is characteristic of the CDS market, combined with a higher risk of correlation between the protection seller and the underlying entity, transform the shortcomings of counterparty risk management into a potential systemic risk.

Concentration calls into question whether risk is actually transferred

Market concentration has increased following the default of financial entities active in CDS trading, such as Lehman Brothers, along with the near-bankruptcy of AIG, the disappearance of key players like

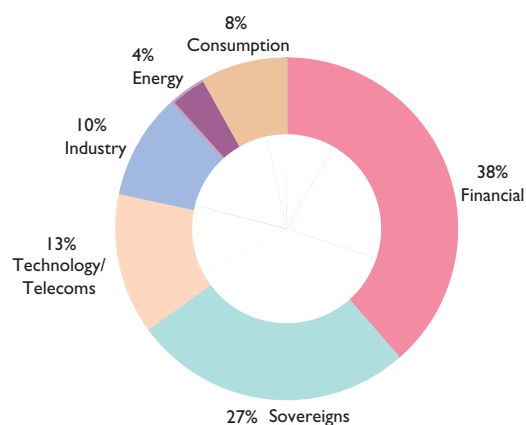
Bear Stearns and the exit of numerous hedge funds. In terms of systemic risk, two issues arise: the increase in counterparty risk and the extent to which credit risk has actually been transferred. The credit risk still haunts the financial system and therefore the banking system.

The 10 largest dealers now account for 90% of trading volume by gross notional amounts, compared with less than 75% in 2004. Concentration is even higher in the US market, where the five biggest commercial banks account for more than 97% of gross notionals (30% of global activity is generated by JPMorgan).³

Wrong way risk – i.e. risk arising from a dealer selling protection to a reference entity with which it is closely correlated – also increases the risk of serial default

Although risk remains within the financial sector, the protection sold by market participants relates to that very sector. At 1st May 2009 nearly 40% of gross outstandings in single-name CDS concerned reference entities in the financial sector (Chart 3).

Chart 3
Gross notional amounts
Sector analysis of the top 100 reference entities



Source: DTCC, 1st May 2009.

³ Data at Q4 2008, Office of the Comptroller of the Currency – JPMorgan Chase, BoA, Citibank, Goldman Sachs, HSBC Bank USA.

Table 3
Top 10 reference entities by net protection amounts

Net	USD billions
General Electric Capital Corporation	11.07
Deutsche Bank Aktiengesellschaft	7.16
Bank of America Corporation	6.80
Morgan Stanley	6.32
The Goldman Sachs Group, inc.	5.21
Merrill Lynch & Co., inc.	5.15
Berkshire Hathaway inc.	4.63
Barclays Bank PLC	4.36
UBS AG	4.31
The Royal Bank of Scotland Public Limited Company	4.27

Source: DTCC, 1st May 2009.

There is a significant risk of double default, that is, the default of an entity that is both an active counterparty on the market and a CDS underlier. In terms of net notional amounts, i.e. the maximum amount at risk,⁴ seven dealers are among the top ten reference entities (Table 3).

Instead of redistributing credit risks, CDS have actually contributed to intensifying systemic risk by concentrating exposure on a handful of highly interconnected players that are simultaneously buyers, sellers and underliers. This has spawned a new type of risk, "too interconnected to fail", which has superseded "too big to fail" risk (Brunnermeier, 2008).

These observations underscore the need to upgrade the operational management of counterparty risk, which will be achieved partly by setting up clearinghouses for the credit derivatives market, and to increase market transparency. The aim is to improve the assessment of counterparty risk, in the interest not only of regulators but also of market participants.

2| MAKING CREDIT DERIVATIVES MARKETS MORE RESILIENT

2|1 Extending central counterparty clearing to credit derivatives

The debate over extending central counterparty clearing to OTC derivatives is not new.⁵ But the problems encountered in CDS markets during the financial crisis have prompted US and European regulators, notably within the G20, to speed up the extension process. Clearing infrastructures have responded positively to these requests. In the course of 2008 the managers of five clearing infrastructures (two in the United States and three in Europe, including two in the euro area) unveiled plans to provide services for these products.⁶

EXPECTED BENEFITS

Central counterparty clearing is a mechanism for absorbing the credit risk and market risk generated by trades in capital markets.⁷ The clearinghouse, acting as a central counterparty (CCP), guarantees the fulfilment of its members' transactions. Its action can be critical if a member defaults, because it will stand in for the defaulter and ensure that the firm's obligations to other counterparties are honoured. In this case the CCP continues to pay premiums to the protection seller and to protect the protection buyer against the underlying credit risk of the contract until it can liquidate the position. The surviving counterparties are not therefore required to bear the cost of replacing their position – which would expose them to market risk – since that risk is absorbed by the CCP.

The CCP reduces the aggregate level of risk associated with all the positions in the market by systematically

⁴ Maximum possible funds transfers if the reference entity defaults, assuming a zero recovery rate and no collateral.

⁵ See Committee on Payment and Settlement Systems (2007).

⁶ See Appendix: summary of CDS clearing projects.

⁷ It should be noted that setting up central counterparty clearing for credit derivatives does not involve bringing these products onto organised markets (or "exchanges"). Clearing through central counterparties has traditionally been associated with organised markets, and in particular with derivatives markets, this being one of the criteria distinguishing them from OTC markets. Since the 1990s, however, central counterparty services have been developed for OTC trades, including derivatives such as interest rate swaps and products traded in the cash market, such as government bond repos. In contrast with organised markets, trading in such products remains decentralised and is carried out on a bilateral basis between market intermediaries. But once a trade is complete, the counterparties elect to go through a central counterparty, enabling them to manage their mutual default risks more effectively.

netting positions⁸ in fungible contracts. Compared with maintaining the bilateral relationships between the initial counterparties, the CCP facilitates novation by providing a single, predictable legal framework that is accepted in advance by all users.

Setting up a CCP involves extending collateralisation practices to all the positions it covers. A core condition for the efficiency of a CCP is to receive adequate guarantees, whose amount is adjusted frequently to reflect changes in its exposure to members. In practice, CCPs accomplish this by performing margin calls at least once a day, possibly supplemented by intraday variation margin calls if their exposure to a member deteriorates.⁹ Moreover, CCPs benefit from additional sources of collateral provided by a risks mutualisation mechanism set up among the members. This takes the form of a clearing fund, which is activated if the individual collateral posted by the defaulting member proves insufficient.¹⁰

CENTRAL COUNTERPARTY CLEARING FOR CREDIT DERIVATIVES: CONDITIONS AND LIMITATIONS

The capacity of a CCP to absorb the shock generated by a member's failure hinges on the quality of its risk management systems. The current lack of standardisation among credit derivatives is hampering the extension of central counterparty clearing to all categories of CDS. Moreover CCPs will have to adapt their risk management frameworks in order to accommodate the particular risk profile of these contracts.

Extending central counterparty clearing to CDS is hampered by a lack of contract standardisation

The varying level of standardisation in credit derivatives limits the range of CCP-eligible products. The only credit derivatives covered by ongoing CCP projects are those that are sufficiently standardised. They include CDS index products, and potentially the most liquid single-name CDS, basically contracts on the reference entities making up the index. Standardisation is key to coping effectively with legal risk. The CCP must be able to measure the nature and scope of the obligations it guarantees. The degree to which products are standardised will

determine their fungibility and hence the CCP's capacity to reduce its exposure to members by netting their positions. Standardisation also increases the liquidity of the products cleared, making it simpler for a CCP to manage a default because positions can be hedged or unwound more easily.

Accommodating the special risk profile of CDS

The special risk profile of CDS calls for significant adaptations in the usual methods used by CCPs to manage risk. The methods for calculating margin calls, as well as the stress tests used to calculate the size of the clearing funds set up by clearinghouse members, need to factor in jump to default risk (see above), which is not present in the other types of derivatives usually cleared by CCPs.

Another difficult challenge is to incorporate wrong way risk. For this the clearinghouse has to determine the amount of collateral needed to cover not only its own counterparty risk on members but also the underlying credit risk in the contracts on which a failed member has sold protection. If a member's credit risk is closely correlated with that of the reference entities on which it has sold protection, the CCP may have to deal simultaneously with the failure of the member and a credit event triggered by contracts on the same member as well as on a reference entity with risk correlated to that of the defaulting member. Given the special nature of the risks involved in clearing credit derivatives, it would seem that the risk management systems used for these products should be kept separate from the systems that handle other market segments cleared by the same CCP. In this respect, a separate clearing fund for credit derivatives is essential for limiting the risk of contagion between the failure of a member active in credit derivatives markets and other members of the CCP that do not necessarily deal in these markets.

The access of CCPs to liquidity: a crucial issue

A CCP's access to liquidity is an essential part of its default management system. The clearinghouse must have sufficient resources to cope with a sudden increase in its needs so that it can carry the defaulting member's positions until they can be liquidated.

⁸ See Duffie (2008).

⁹ See Wendt (2006).

¹⁰ Note that when Lehman Brothers failed, none of the G10 CCPs involved in its positions needed to draw on their clearing funds.

Access to central bank money and intraday and overnight credit with the central bank greatly reduces the CCP's dependence on bank refinancing lines, which are likely to dry up when money markets are under strain. Indeed the constant policy of the Eurosystem, which requires clearinghouses dealing in the euro to be located in the euro area, is based on the need to ensure that CCPs have direct access to central bank credit operations and that central banks can effectively supervise CCPs.

2|2 Challenges for regulators

HARMONISING CCP SUPERVISION

The specific risks posed by clearing credit derivatives are not entirely addressed by existing international standards for managing clearinghouse risk. The G10 recommendations on CCPs, published jointly in 2004 by the Committee on Payment and Settlement Systems and the International Organisation of Securities Commissions make no distinctions based on the type of product cleared. Consequently the risks specific to OTC derivatives – in particular the special risks associated with credit derivatives, as described above – are not taken into account.

The standards applicable to CCPs that clear CDS need to be adapted and harmonised to ensure that the solutions now being developed are robust and that competing CCPs benefit from a level-playing field. Work in this area is currently under way at European level¹¹ and in the G10, and is due to be completed by end of 2009.

CCPs that clear CDS are likely to become highly interdependent, not only because they all use common infrastructures such as the DTCC's Trade Information Warehouse but also because a given participant can potentially participate in several clearinghouses. In view of this interdependency, a cooperation framework needs to be put in place for the authorities responsible for overseeing CCPs, as well as for those that supervise clearinghouse members. Such cooperation is also necessary so that these authorities can access DTCC data.

SUPPORTING INITIATIVES FOR MORE EFFECTIVE REGULATION OF CREDIT DERIVATIVES MARKETS

Since the CDS market is not regulated it is important for regulators to foster private initiatives aimed at improving transparency. It is also necessary to support such initiatives and make sure they contribute to the ultimate objective of financial stability.

European regulators currently face three major challenges:

Establishing adequate incentives to promote the use of CCPs

Competent authorities should adopt policies that encourage market participants to clear CDS via a CCP. The alternative – imposing prudential penalties on CDS that do not pass through a CCP – does not seem feasible given that a large number of contracts are not currently eligible for central clearing due to a lack of standardisation and liquidity. The only products eligible for clearing in the projects launched so far are indices, because they trade on the basis of fixed coupons. Discussions under way at the European Commission should generate proposals for incentives by the end of 2009.

Assessing counterparty risk in the CDS market: the need for greater transparency

The AIG and Lehman Brothers affairs have highlighted the need for greater transparency to help market participants assess counterparty risk in the CDS market. The type of information needed depends on the end user. The needs of regulators are dictated by the imperative of preventing systemic risk, while the needs of market participants reflect a tradeoff between gaining a finer-grained assessment of counterparty risk and protecting the confidentiality of their strategies and thus their transactions.

Since counterparty risk cannot be assessed at aggregate level, regulators need to know the individual bilateral commitments of the various dealers so that they can detect and prevent systemic exposures. It is less easy to determine the extent to which this type of information should be disclosed to market participants.

¹¹ The ESCB and the Committee of European Securities Regulators are working together to adapt CPSS-IOSCO recommendations on CCPs and settlement systems at EU level. They have amended their draft report to incorporate the specific aspects of clearing OTC credit derivatives.

Box 2

Standardisation of North American contracts: consequences for the market and issues for European regulators

The new contract for CDS on North American reference entities, developed by ISDA at the behest of the major US dealers, entered into force in April 2009. It involves two major changes in market practices:

- *Like CDS indices, single name CDS under the new contract trade at fixed coupons of 100 bps (for investment grade) and 500 bps (for speculative grade) instead of running spread equal to the market value of the spread on the contract origination date. An up-front fee is paid to compensate for the present value of the difference between the fixed coupon and the market spread.*
- *Debt restructuring is no longer recognised as a credit event.*

Consequences for the market

- *The new contract is better suited to trading needs. Standard coupons make the contracts more fungible and facilitate the netting of positions between contracts signed on different dates. As a result, market liquidity should improve.*
- *These are basically the standardised contracts that will be cleared by CCPs.*

Issues for European regulators

- *In Europe, the new contract is less well suited to the use of CDS as hedging instruments, because of the prudential treatment of CDS that do not include a restructuring clause. Without that clause, only 60% of the amount of a purchased CDS is recognised as a risk mitigant under Basel II, compared with 100% with the restructuring clause.*
- *European banks have to choose between the capital relief associated with the old contract and the advantages of CCP clearing if they adopt the new contract. The key issue for European regulators, therefore, is to decide on the prudential treatment of CDS.*

Aside from knowledge of the actual amounts exposed, better information about collateralisation practices can provide a more accurate framework for assessing the magnitude of counterparty risk. Other useful information includes the identity of uncollateralised counterparties, unsecured threshold amounts, and the number of transactions covered by collateral agreements.

Supporting standardisation efforts undertaken by private parties under the purview of ISDA

Until now the impetus for formalising and harmonising the procedures and definitions used by market participants has come from ISDA, whose legal documentation has become the industry standard.

Recent efforts to standardise contracts should be encouraged, since standardisation is necessary for

netting purposes. However, in its new standard contract for North American reference entities, ISDA has chosen not to include restructuring as a credit event. This raises a prudential issue (Box 2). Furthermore, the restructuring clause makes protection more comprehensive in countries where bankruptcy law does not offer the same possibilities as the Chapter 11 procedure in the United States. While the clause is complicated to trigger and has rarely been activated in the past, its usefulness in a credit cycle characterised by an unprecedented rise in bankruptcies should not be underestimated. As market standards evolve, one issue that arises is the tradeoff between standardising a contract and ensuring that it is exhaustive – an issue that should not be neglected by the regulator. Regulators should certainly ensure that the interests of dealers are represented, a task amply discharged by ISDA, but they should also consider the interests of participants on the buy side.

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APPENDIX

Current projects for CCPs clearing of credit derivatives

Reference Entity	ICE/TCC	CME – Citadel	LCH.Clearnet Ltd/ NYSE Euronext (Liffe)	EUREX	LCH.Clearnet SA
	United States	United States	United Kingdom	Germany	France
					
	ICE TRUST went live on 9 March	CMDX went live on 16 March	went live on 22 December 2008	Due to launch in H2 2009	Due to launch at end H2 2009
Promoters	– Intercontinental Exchange (ICE): Atlanta-based derivatives exchange – The Clearing Corporation (TCC): Chicago-based clearinghouse	– Chicago Mercantile Exchange (CME): derivatives exchange and clearinghouse – Citadel (US hedge fund)	NYSE Euronext in partnership with LCH. Clearnet Ltd (London) based on the BClear derivatives trading platform operated by Liffe (London).	– EUREX Clearing: joint subsidiary of Deutsche Börse and SWX Swiss Exchange	LCH.Clearnet SA
Products	– US indices (CDX) at inception	– US indices (CDX) at inception	– European indices (iTraxx) at inception	– European indices (iTraxx) at inception	– European indices (iTraxx) at inception
New developments	Cleared 613 trades with a face value of USD 71 billion in the first month Plans to launch ICE Clear Europe	Plans to launch FX clearing	No transactions		

The future of financial regulation

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The current crisis stems from a long period of macroeconomic imbalances, characterised by excess liquidity and major current account imbalances in certain areas of the world. This environment encouraged the issuance of low-yielding debt instruments, but also spurred investors to seek higher yields through more risky products. In this context, the transfer of credit risk by financial institutions to protect their balance sheets resulted, due to the fragmentation and opacity of the markets, in a situation where the location of risks and the size of exposures were unclear.

This crisis calls for a thorough review of financial regulation and in particular of the relations between markets, players and products. In the light of this situation, the primary objective of all regulators is to restore confidence in the financial system. The first step in achieving this is to re-establish the soundness of its players. The second step then consists in addressing the disruptions in financial markets: enhancing the transparency of the credit market, improving the security of settlement systems and, lastly, extending the scope of regulation to cover other market players such as hedge funds and credit rating agencies.

A combination of four factors led to the deep-seated financial and ensuing economic crisis of 2008:

- cheap excess liquidity;
- current account imbalances, i.e. a particularly marked deficit in the United States and excess savings in Asia;
- the search for ever-higher yields associated with the increasing segmentation of increasingly complex products;
- and lastly, and most importantly, the externalisation of risks taken by major financial institutions in order to protect their balance sheets.

This externalisation or spreading of risk in the context of greater market opaqueness and fragmentation resulted in a situation in which the location of risks and the size of exposures were unclear.

This crisis, whose epicentre is in the United States, brought to light the fact that there is a general lack of information about the amount of risk transferred, the prices at which credit risk transfers were carried out, the net exposure of each player in this market as well as the ultimate risk holders.

Transactions involving credit risk transfer instruments are usually conducted outside the regulated markets. Transactions on over-the-counter (OTC) markets are, however, not traditionally reported; price and volume data are therefore not necessarily disclosed to the all market players, with the exception of certain market segments or indices. Furthermore, investors are often lightly regulated or unregulated entities. As a result, it is difficult to assess the real breadth, depth and liquidity of this market and consequently the true level of liabilities and exposure of its players.

This crisis calls for a thorough review of financial regulation and in particular of the relations between markets, players and products. In light of this situation, the primary objective of all regulators is to restore confidence in the financial system. However, in such an environment, regulators have to deal with the difficulties arising from the current fragmentation of responsibilities at the institutional, operational, geographical and legal levels.

- At the institutional level, the powers of regulators remain limited with regard to many aspects of the chain that are currently managed by the players themselves through bilateral or multilateral arrangements. For instance, all the legal aspects of international derivatives transactions are established by a professional association, ISDA – International Swap and Derivatives Association, and certain key market benchmarks such as the LIBOR rate or credit spread indices such as ABX or iTRAXX, which have been strongly contested, are set respectively by the British Bankers' Association and a private financial information provider, Markit, which is owned by a number of large banks.

- At the operational level, as regards regulated sectors, the players in the chain are regulated or supervised by a wide range of bodies: ranging from the large US banks that are regulated by the Federal Reserve, local banks and insurers that have no federal supervision but are subject to regulation by their State of incorporation, to European financial institutions that are subject to sectoral directives and each supervised by specialised supervisors from their home Member State.

- At the geographical level, the credit market has become difficult to define in terms of territoriality: where does the regulatory competence lie for a credit swap contract on US underlying assets (partly guaranteed by a monoline insurer regulated in Bermuda), traded OTC by brokers in London but recorded, on the one hand, on the books of a hedge fund domiciled in Jersey or Grand Cayman and, on the other hand, on those of a French bank in Paris?

- At the legal level, credit markets now intermingle transactions based on securities, contracts and guarantees: for instance, banks can issue loan contracts (e.g. mortgage loans or consumer credit card loans), refinanced by the issuance of securities (e.g. asset-backed securities/mortgage-backed securities – ABSs/MBSSs), which are enhanced by guarantees (e.g. monoline insurers), but whose risks are then transferred by derivatives contracts (e.g. credit default swaps – CDSs), which are themselves repackaged as securities (e.g. collateralised debt obligations/collateralised loan obligations – CDOs/CLOs), but in their turn resecuritized through asset-backed commercial paper conduits (e.g. asset-backed commercial paper – ABCPs) or covered again by contracts (e.g. CDSs), and so on.

1| EXTEND THE SCOPE OF REGULATION

In this context, market regulators are reflecting on ways to strengthen the traditional tools for prudential and macrofinancial regulation through another approach that takes specific financial market developments into account.

This principle was clearly set out by the G20 in its summits of November 2008 and April 2009 where it committed to ensuring appropriate regulation and oversight of all systemically important financial institutions, markets and instruments.

A review of the scope of regulation is therefore necessary in order to supervise more closely certain areas in which market players have been left to regulate themselves. This review will require an adaptation of regulation in particular concerning the way in which it is applied to non-regulated markets or entities. However, this task will be complicated by the major discrepancies that exist between the latter. In this context, a review of the tools available to regulators is essential in order to enhance their effectiveness.

The crisis has shown the need for closer coordination between financial market regulators and prudential regulators in particular in terms of risk assessment. Indeed, prudential regulation chiefly focuses on the solvency of the intermediaries, without intervening in the functioning of unregulated market segments in which entities other than intermediaries participate. Financial market regulation, for its part, has focused on the functioning of regulated markets, codes of conduct for players on these markets and financial disclosure requirements for issuers on these markets. Analyses of the crisis have evidenced the impact of the activity of non-regulated entities and the trading of unregulated products on the world financial system and thus call for a review of the scope of supervisors' remits.

2| FOUNDATION OF A NEW ARCHITECTURE

The need to enhance the international regulatory framework was a key objective of the G20, which transformed the Financial Stability Forum (FSF) into the Financial Stability Council (FSC), broadening its mandate, strengthening, alongside the International Monetary Fund (IMF), its authority in the global governance of regulation and setting out its powers and objectives with regard to financial stability. At the end of the 1990s, during the Asian and Russian financial crises (1997 and 1998 respectively), it became clear that increased coordination between prudential and market regulation was necessary. This new approach gave rise, at the institutional level, to the creation of the FSF. In order to improve the consistency of regulatory standards at the global level, the FSF, together with the main standard-setting bodies like the International Organisation of Securities Commissions and the Basel Committee, was charged with promoting the convergence of international financial regulations in accordance with high-level principles. The members of the FSC will set out to foster financial stability, increase the openness and transparency of the financial sector, and implement international financial standards. They undertake to carry out periodic peer reviews based in particular on the reports of the Financial Sector Assessment Program (FSAP), established by the IMF and the World Bank. The FSC will have to regularly report to the IMF's International Monetary and Financial Committee (IMFC) on the progress made in regulatory reform aimed at implementing solutions to the crisis. The IMFC is expected to be transformed into a Council authorised to take decisions in accordance with the IMF Articles of Agreement.

At the European level, the Larosière Report makes recommendations on how to strengthen supervision and crisis management in Europe. It proposes that the system should continue to be based on

national supervisory authorities and recommends consolidation of European regulation through "enhanced" Level 3 Committees (L3L). The report advocates the setting up of a European System of Financial Supervisors, (ESFS), consisting of a decentralised network formed by these "enhanced" Level 3 Committees that will be termed "Authorities". The role of these Authorities would be to coordinate the application of supervisory standards and guarantee strong cooperation between the national supervisors.

3| PRIORITIES FOR RESTORING CONFIDENCE IN THE FINANCIAL MARKETS

The first prerequisite for restoring confidence is for players to be sound. It is therefore important for the balance sheets of large institutions to be purged of their toxic assets. Second, the major disruptions in financial markets, in particular the credit market, need to be addressed. Four issues appear to be particularly important:

- the transparency of the credit market;
- the organisation of the post-trade infrastructure;
- hedge funds;
- the role of credit rating agencies.

3|1 The transparency of the credit market

Although often criticised for its role in the initial phases of the crisis, thanks to its unquestionable merits securitisation has been widely used for over 25 years. This technique has made it possible to optimise corporate financing conditions by legally isolating specific assets of better intrinsic quality than that of their balance sheet as a whole. Moreover, by structuring products it is possible to tailor the risk/return characteristics of each credit tranche to fit the demand of different investor types. Even CDOs, at which much criticism is being levelled, originally merely replicated corporate loan portfolios that were relatively homogeneous and fairly transparent in terms of their overall risk profile.

Nevertheless, the securitisation model itself led market players to be less stringent in their monitoring of the quality of investments. Reports on the crisis published by the FSF and International Organisation of Securities Commissions (IOSCO), among others, already invited the originators of securitised products to step up their due diligence and risk management for underlying assets in order to ensure that the quality of the assets securitised and sold was equivalent to that of the assets they keep on their balance sheets.

This objective was echoed by the European Commission in the framework of amendments to the Capital Requirements Directive (CRD), requiring the originators or distributors of the credit risk products themselves to retain at least 5% of the exposure. This text is expected to be adopted in the second quarter of 2009.

In the securitisation process, it is important for investors to have sufficient information on the initial nature of and changes over time in the assets underlying securitisation transactions. This crisis showed that there is a lack of transparency in this area. In the primary market, the documentation on the investment vehicles most open to money market fund managers, involving short-term instruments such as ABCPs, did not have sufficient details or explanations for investors to be able to analyse the quality of the underlying assets or understand how they might behave in the event of a turnaround in the market.

Furthermore, secondary transactions in credit risk transfer instruments are largely carried out OTC, making it difficult to assess the real depth and liquidity of the market. Prices and volumes of transactions are only disclosed to the market on certain very limited segments or via indices. These trading systems also pose problems at the operational level owing to the lack of shared clearing and settlement infrastructures for these instruments. Moreover, the crisis has brought to light the general lack of information on actual risk transfers, the identity of the ultimate holders of risk and the net exposure of the different players.

Therefore, in order to enable investors to take better investment and risk management decisions in the future, it is necessary to increase transparency on primary and secondary credit markets, improve the quality of information provided to investors on

complex financial products, and improve the security of securities settlement systems and contracts at the legal and technical level.

At the international level, IOSCO published in May 2009¹ a consultation paper in response to concerns expressed by the G20 in November 2008 regarding the crisis and the pivotal role that certain unregulated market segments and products had played in the evolution of capital markets. Taking securitisation and CDSs as examples, IOSCO identified the areas in which regulation could be a major factor in restoring confidence in financial markets. The proposed recommendations aim in particular to bolster investor confidence in these markets and improve the functioning and supervision of non-regulated products and markets. These recommendations focus, *inter alia*, on transparency, disclosure of information and the due diligence of the players in the securitisation chain.

At the European level, in December 2008 the Committee of European Securities Regulators (CESR) published a consultation paper entitled *Non-Equity Market Transparency*, focusing largely on the corporate debt market, structured financial products and credit derivatives. In the latter two areas, the CESR set out to examine the role of post-trading transparency in price formation as well as in information about the scale of credit risk transfers. Its final report is set to be published in the second quarter of 2009.

For a long time the *Autorité des marchés financiers* (AMF – Financial Markets Authority) has been calling for greater post-trading transparency in order to improve the efficiency of the market. It supports the measures advocated by the European Commission and the European Parliament to minimise potential conflicts of interest between the holders of the different tranches of securitised products and thus contribute to restoring confidence in this market. The importance of this issue is undeniable and is at the core of the tasks of regulators, which consist in ensuring the quality of investor information and protecting savings invested in financial products. Nevertheless, it is evident that progress in this domain is difficult due to the fact that there is no real consensus among regulators about the effectiveness of exploring an area that has to date escaped market regulation.

¹ <http://www.iosco.org/news/pdf/IOSCONEWS143.pdf>

3|2 The organisation of the post-trade infrastructure

The July 2005 report of the Counterparty Risk Management Policy Group II stressed the significant increase in the use of credit derivatives and insisted on the potential risks associated with the post-trading infrastructure of these instruments. It set out proposals for minimising these risks such as the automation of trading flows. The financial crisis has underscored the importance of implementing solutions to manage these risks. The FSF report of April 2008 was among the first to call for clearing services for OTC derivatives transactions, in order to ensure a better control of counterparty risk and the conditions in which cash and securities transfers are carried out between the players concerned. A number of initiatives in this area have already been announced in the United States and Europe.

At the European level, following the publication of the press release on 17 October 2008 by Charlie McCreevy, European Commissioner for Internal Market and Services, the Commission set up a working group of market participants and supervisors that resulted, in February 2009, in a roadmap to ensure that credit default swaps (CDS) are cleared via at least one European central clearing counterparty before 31 July 2009.

On 18 December 2008, the Eurosystem announced its wish that such central counterparty clearing facilities for OTC credit derivatives derivatives be established in the euro area, constituting the other key element for operational solutions in this area.

The *Haut Comité de Place* (High-Level Market Committee), chaired by the Minister of the Economy, Industry and Employment, decided to set up a task force to make proposals on clearing activities in France and European clearing initiatives regarding derivatives currently traded on OTC markets. The AMF supports this important decision.

It now appears essential to make rapid progress on a euro area infrastructure that provides the necessary guarantees in terms of both the quality of members of clearing systems and efficiency in the treatment

of financial flows. The AMF has already stressed the need to ensure healthy competition between the different players in order that this process results in greater economic efficiency.

3|3 Hedge funds

Hedge fund activity has grown to such an extent that its consequences for financial stability and market efficiency cannot be ignored. While hedge funds are not responsible for the current financial crisis, some of them, in the same way as other major investors, may have contributed to fuelling the speculative bubble and the sharp decline in asset prices that started in summer 2007. Moreover, hedge funds are traditionally opaque in order to protect their "trade secret", i.e. the strategies they use. Yet, this opacity makes it more difficult for prudential regulators to assess where systemic risks lie and their magnitude, both for the banking system (counterparty risk) and financial markets (risk of inefficiency). On a number of occasions the AMF has stressed the need to put an end to the opacity of offshore hedge funds that still prevails. Hedge funds should therefore be subject to reporting requirements *vis-à-vis* the prudential supervisors as well as «indirect» regulations imposing transparency obligations on their counterparties, in particular their prime brokers.

Given the organisation of hedge funds, only through international coordination can appropriate rules be defined that guarantee risk control, in particular systemic risk, at the global level. IOSCO and the FSC are apposite bodies for developing such an approach.

At the European level, the European Commission's Draft Directive on Alternative Investment Fund Managers (AIFMs) published on 29 April 2009 underscores the stakes attached to hedge funds. The terms of this Draft Directive are in line with the G20 guidelines set out in London on 2 April, in particular with respect to the reduction of systemic risk. That said, on closer analysis, a number of points deserve particular attention.

Indeed, the draft directive requires investment managers of funds marketed to investors in the European Union and not currently subject to

European level regulation (including, among other, hedge funds) to be authorised and regulated in a Member State and to be subject to organisational requirements (management of risk, liquidity, conflicts of interest, etc.) as well as to prudential requirements (minimum capital). These AIFMs will be required to report to European prudential regulators on all the funds they manage, assets and markets in which they invest, their leverage and the risk management procedures they use. However, the requirements will only apply to AIFMs managing portfolios with total assets exceeding EUR 100 million (including any assets acquired through the use of leverage) or EUR 500 million when the portfolio consists of assets that are not leveraged and with no redemption rights exercisable during a period of 5 years following the date of constitution of each.

These provisions could mean that that hedge funds based in offshore centres or managed by AIFMs that are not subject to the directive because their assets under management are below the above-mentioned threshold might escape all transparency obligations *vis-à-vis* the prudential regulators even though they may pose systemic risks. For example, an AIFM with less than EUR 100 million in assets under management could obtain substantial leverage, implying potential system consequences.

Moreover, under the draft directive, AIFMs will be entitled to market alternative investment funds to professional investors in any Member State as soon as this text comes into force for hedge funds based in Europe and three years following this for hedge funds based in offshore centres. The AMF is in favour of a European «label» for hedge funds based in Europe in the case of those complying with strict governance and transparency rules. However, the AMF shares the views of the French authorities and is not in favour of the idea of a passport for offshore hedge funds. Such a mechanism could result in unfair competition from offshore hedge funds, thus penalising French AIFs that are subject to a regulatory framework governing both the funds and their managers. Indeed, the crisis has showed the importance of a secure framework. Furthermore, this passport would lead to massive regulatory arbitrage to the detriment of undertakings for collective investments in transferable securities (UCITS) and, consequently, a reduction in the level of protection of investors, including individual investors.

3|4 The role of credit rating agencies

Given their central role in the structured finance market, credit rating agencies are considered to be partly responsible for the excesses and disruptions leading to the subprime crisis. With ratings covering debt to the tune of USD around 45 trillion, the amount of assets analysed by credit rating agencies is equivalent to the total of bank balance sheets. They have acquired this position through both economies of scale that enable them to perform their core function of data collection, modelling and analysis covering all issuers, and through the official recognition afforded by over three decades of US regulation. Credit rating agencies have thus largely fuelled the debates thrown up by the crisis. Their role in assessing the credit risk of securitisation vehicles has been called into question, and doubts have been raised as to the reliability of the rating of structured finance products (problems in the management of conflicts of interest, excessive volatility due to the poor quality of the models used or the lack of hindsight, etc.).

At the international level, market regulators have rapidly addressed these issues. In particular, after an in-depth examination of the role of credit rating agencies on the structured product market, IOSCO amended certain aspects of its code of conduct so that it takes into account specific features related to the rating of structured financial products. It then analysed the implementation of this new code by credit rating agencies. It is now considering stepping up coordination at the international level of the

regulation and oversight of credit rating agencies. This initiative is backed by the G20.

At the regional level, wide-reaching changes in the way credit rating agencies are regulated have been set into motion, in particular in Europe; a draft regulation on credit rating agencies was published by the Commission in November 2008 and adopted in late April 2009. This regulation calls for a shift from a system of self-regulation of credit rating agencies to their effective and coordinated supervision at the Community level.

At the national level, the AMF has been contributing to debates over the past five years through the publication of its annual report on credit rating agencies. Before the start of the crisis, the AMF had requested that the supervision model for credit rating agencies be adapted and made a number of proposals accordingly. It is crucial to ensure that the implementation of the new European regulation guarantees the quality, transparency and integrity of the ratings process. Some key elements of this regulation will be set out in the next few months in the framework of the CESR's forthcoming guidelines. One of the main aspects is the organisation of the supervision of credit rating agencies by the competent authorities. The college of supervisors set up for each credit rating agency will play a key role in this framework as will the supervision resources and tools to be put in place. The AMF wishes to stress that using the services of a credit rating agency should not prevent fund managers investing in structured products on behalf of UCITS, especially those marketed to individual investors, from carrying out their own due diligence and checks.

The current financial crisis has brought to the fore some of the fundamental issues of regulation. The securitisation and subprime crisis has shed considerable doubt on the originate-to-distribute model, which had largely contributed to the financing of the economy. The crisis has revealed weaknesses with regard to the transparency of the structured product market, the management of conflicts of interest and the assessment of credit risk by the various players and, in particular, the credit rating agencies. Financial regulators, within the FSF, have contributed to the work of the G20 by publishing a series of recommendations aiming to restore confidence in this market.

.../...

However, it is important to avoid focusing in the short-term only on the resolution of the current crisis or overreacting by implementing a new wave of regulations that may not prove useful. In order to find a solution to these market dysfunctions both a close cooperation at the global level and a greater integration of markets in Europe are required; this would be beneficial to investors and industry. Both the pursuit of such a solution and the prospects of that which still remains to be done in Europe should encourage Member States to think about and more generally, to commit to developing a more effective financial regulation in order to foster competitiveness and protect savings.

The major economic areas compete internationally to attract capital. Regulation is an important factor in this competition, even though it is naturally not the only one. Jurisdictions with lax regulation may attract activity in the short-term, but run the risk of losing it forever if a crisis of confidence occurs.

For Europe, where, on the one hand, the savings pool, which is already one of the largest in the world, is likely to expand further as populations realise how difficult it will be to maintain their standard of living during retirement, and where, on the other hand, the financial industry is one of the major sectors of the economy, what is important is not the absolute level of regulation but its effectiveness. Effective regulation does not bring into conflict the interests of savers and professionals. Rather, it creates and maintains a level of confidence in the market that lets savers entrust their assets to professionals, with the assurance that their investment will be managed in their interest, in accordance with rules of the game. Effective regulation should not give rise to costs generated by the uniform application of bureaucratic procedures but should be a source of value added: the gains that it procures from guaranteeing confidence should outweigh the costs of complying with it.

The future of financial regulation: an exchange of views ¹

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BANQUE DE FRANCE

A conference took place on 3 March 2009, on the issue of the future of financial regulation, between Anil Kashyap and several Banque de France staff members.

Six issues were discussed:

- *the future of capital regulation;*
- *liquidity regulation;*
- *macroprudential regulation;*
- *moral hazard;*
- *the relationship between monetary policy and financial stability; and*
- *bank restructuring.*

Here is the transcript of their discussion. Three main conclusions emerged from the discussion:

- *regulators should design mechanisms aimed at avoiding asset fire sales in stress times, possibly through a mandatory mechanism for recapitalisation;*
- *strengthening central banks' responsibilities for financial stability should not blur their main task of maintaining price stability;*
- *the current situation is fundamentally different from the Japanese experience during the "lost decade" insofar as in Japan, banking losses came from lending to bad firms whereas today, problems come from bad collateral.*

¹ *Transcript of a discussion between Anil Kashyap, Professor of Economics and Finance at Booth School of Business, University of Chicago, Jean-Pierre Landau, Deputy Governor of the Banque de France, Sylvie Matherat, Financial Stability Director, Pierre-Francois Weber, Financial Stability Directorate, and Benoit Mojon, Monetary and Financial Analysis Directorate.*

1 | THE FUTURE OF BANKING CAPITAL REGULATION

Jean-Pierre Landau: *Has the crisis revealed a regulatory failure? Does Basel II need to be amended?*

Anil Kashyap: The current capital regime is characterised by its strong asymmetry over the credit cycle: in good times, the market does not require banks to hold much capital and exerts little monitoring. Banks using their own internal models of risk that mimic the market's assessment can easily expand credit and at best the regulatory rules slow this down a bit. When the slowdown comes, the market (and the banks' models) suggest the required capital buffer is far above the regulatory requirement. Put differently, everyone understands that if we cut regulatory capital requirements right now it would have no effect on bank behaviour because banks need very high levels of capital just to attract funding. This asymmetry means that financial system amplifies cycles, something that has also been evident since the middle of 2007.

Therefore, capital regulation needs to be amended to avoid excessive deleveraging during the slowdown. This requires constraining banks' ability to expand their balance sheets and leverage during good times. If this can be done then the banks might enter the slowdown with enough capital to not have to cut back their lending. This would reduce the extent of asset fire sales in times of stress that result from the bank system collectively selling assets to comply with capital ratios.

But achieving this will not be that easy. The pitfall in this solution lies in the need to avoid regulatory arbitrage. Constraining banks' leverage in good times will incite them to transfer their assets to a shadow banking system in order to escape regulation.

Jean-Pierre Landau: *In good times, no capital regulation is likely to bite. Hence there is a need to prevent risk taking per se. Do you think that requiring more capital is enough to achieve this? Would it be sufficient in order to avoid deleveraging in bad times?*

Anil Kashyap: An analogy can be made with monetary policy. In conducting monetary policy, central banks can fix quantities (through the level of reserve requirements) or prices (through the

level of the interest rate). Along the same lines, in my 2004 paper with Jeremy Stein, we put forward the idea of creating a market for regulatory capital relief. This market would be supplied by the regulator (central banks or supervisor) with a small amount of tradable capital certificates provided through periodical auctions. The market price of these certificates would be a direct and transparent measure of the shadow value of bank capital. In this way, a high price would indicate a relative shortage of bank capital to regulators. The regulator may then be allowed to increase the supply of certificates in response to rising prices, so as to tie the effective capital requirement to the shadow value.

Jean-Pierre Landau: *I interpret your proposal as a way to create an artificial scarcity of capital, as monetary authorities do with central bank liquidity through reserve requirements.*

Anil Kashyap: Exactly. Your remark leads me to ask you whether Banque de France has considered implementing such a mechanism of pricing capital.

Jean-Pierre Landau: *We are carrying out reflections at the Banque de France on the way of ensuring an appropriate pricing of risks in good times aimed at changing incentives and reducing the procyclicality of financial systems. To that end, financial reporting and accounting systems should force banks to retain and put aside profits in good times and allow them to use these buffers in bad times.*

Anil Kashyap: Changing the accounting framework to recognise that financial stability is something that merits consideration. The accountants tend to focus only on realised losses and worry that allowing provisioning against potential losses is a license to manipulate earnings. This may be true, but there are benefits to having banks build up a buffer when times are good.

In addition, banks should have to draw up business continuity plans for crisis management. Large banks and other systemically relevant institutions should have to tell their supervisors how they could be quickly wound down. These plans would force financial institutions to internalise extreme risks in their risk management system. Figuring out where to draw the line on which organisations are subject to this rule is going to be a challenge.

Sylvie Matherat: *Your proposal is converging with the works in progress within the Financial Stability Forum: a working group chaired by John Gieve, Deputy Governor of the Bank of England, recently issued a report on cross-border crisis management. This report advocates the elaboration by groups of authorities of firm-specific contingency planning exercises covering practicalities and strategic policy considerations.*

Jean-Pierre Landau: *Your point on tail risks is essential. It seems obvious that this kind of risks has not been internalised by the financial systems. It is likely that financial innovation has reduced average risks, but magnified tail risks. A crucial question related to this is whether it would be economically and socially efficient for financial intermediaries to insure against tail risks. In other words, should insurance be private or socialised?*

Anil Kashyap: The key point may not be whether insurance should be private or public, although if it is public we need to bear in mind that it may lead to some underpricing of risk. Rather, what we should keep in mind that the purpose of this to avoid rapid asset disposal and a credit crunch when tail risks materialise. Banks should continue to carry out their function of intermediation in any case. At the same time, the private sector should be forced to do the pricing of tail risks and to bear the costs. This might turn out to come at a very high price for banks but would allow avoiding the recurrence of situations such as the rescue of AIG in which taxpayers bear the costs in an unfair way.

Pierre-François Weber: *The question of the overcomplexity of capital regulation within the framework of Basel II is often raised. In your opinion, what kind of incentives does this alleged overcomplexity create?*

Anil Kashyap: Understanding the models that the banks have created under Basel II is a challenge. But the more important point is to amend Basel II to make sure that there is a mandatory mechanism for recapitalisation.

Pierre-François Weber: *As you know there is a debate about the scope of regulation. Do you think that the regulatory framework should be expanded*

beyond banks, notably to hedge funds and the shadow banking system?

Anil Kashyap: From a general point of view, public authorities should refrain from expanding regulation excessively. Hedge funds are not a root cause of the crisis. That being said, hedge funds may have contributed to fire sales and created externalities in the markets. Their role as stress amplifiers might justify an expansion of regulation to cover these actors. Perhaps this can be accomplished simply by having them disclose more to supervisors.

2 | LIQUIDITY REGULATION

Jean-Pierre Landau: *A major dimension of tail risk has to do with liquidity risk. Could you think of a device which could induce financial institutions to internalise systemic risk of liquidity and of their transformation activities?*

Anil Kashyap: This can be tied back to capital requirements. Clearly, larger institutions can cause more problems on that liquidity front and should be held to a higher standard, since they impose a bigger externality. They pose a bigger risk as a result of short-term debt refinancing. Hence, they should be charged differently.

The problem is that higher "tax" may lead big financial institutions to search for ways to overcome the regulation. Therefore, this should be accompanied by a new reporting regime, to follow more closely what large banks are doing.

Sylvie Matherat: *Do you have a tax in mind?*

Anil Kashyap: Any type of such measure is, effectively a "tax"; we should refer to it as such. We need to recognise that larger institutions create more risk. The capital ratio should depend both on the composition of assets, and the composition of liabilities.

Recall that we have an incentive problem: how to constrain large institutions in expansion times, without "strangling" them and driving them to try to shift their activities to avoid regulation.

Jean-Pierre Landau: Are there any other regulations to be considered, such as looking at the compensation structure?

Anil Kashyap: Surely, we could also look at the compensation structure. What we need to realise is that all of these proposals may reduce efficiency and the mobility of resources. Hence, all of these measures should be considered as a form of "tax".

3| THE MACROPRUDENTIAL APPROACH

Jean-Pierre Landau: The economic costs of financial crises and the limited scope of microprudential supervision strengthen the case for implementing a macroprudential surveillance. How should macroprudential regulation and supervision proceed? Do you consider that it should be underpinned by automatic stabilisers into the capital regime or leave some room for discretion?

Anil Kashyap: These are critical questions that have received too little attention so far. Ultimately, central banks need to be involved in supervision for several reasons. First, they are the liquidity providers and need to have an informed judgement in order to take responsible decisions on whether to rescue or not banking institutions. Second, experience shows that supervisory agencies tend to be captured by the institutions they supervise. This risk questions the relevance of Basel II internal ratings-based approach.

As regards over-the-counter derivatives markets, central banks need to be involved in the process of creating central counterparties, with regard to the systemic risks embedded in such markets. The difficulty lies in the effective implementation and the need to find a way of keeping central banks informed without overburdening them. Another pitfall results from the lack of data, which has meant much of the existing work has been purely theoretical.

4| MORAL HAZARD

Jean-Pierre Landau: Historically, we built our regulation system around the idea that moral hazard

should be dealt with so as to ensure that market discipline functions. Would you agree on the finding that the way in which public authorities collectively managed the financial crisis has undermined this framework? If so, what would you suggest for the design of future financial regulation?

Anil Kashyap: To answer your question, we should look at history. During the Great Depression, the US Supreme Court modified private debt contracts and public authorities decided to close markets temporarily, in a move which was described as outrageous and heralding the end of capitalism. I agree that the argument of moral hazard will be significantly weakened for a while. It played a key role in Lehman Brothers' failure but its implementation has proved to be very difficult with the handling of Bear Stearns.

Jean-Pierre Landau: I agree with you on the lessons we can draw from these two examples. Market participants followed strategic behaviours on the occasions of these two institutions' distress, some actors were searching for opportunities.

Anil Kashyap: These events point to the urgent need for an internally and time-consistent resolution regime that allows to let financial institutions fail without crippling the entire financial system.

5| THE RELATIONSHIP BETWEEN FINANCIAL STABILITY AND MONETARY POLICY

Jean-Pierre Landau: Should Central Banks be given a mandate for financial stability, which is at the same level as the objective of price stability?

Anil Kashyap: The conduct of monetary policy and the supervision of the financial sector are not necessarily part of the same skill set. To give you an example, the US regulatory agency has been criticised by the Consumer protection agency as a result of the subprime mortgage lending situation. More generally the issues related to most elements of consumer protection have little to do with macro or monetary economics.

Even though financial stability has macroeconomic implications, I am not sure Central Banks have those skills. If at all, there should be a section of the Central Bank exclusively dedicated to this function, to avoid any conflict of interest. We also may run into the risk of making the Federal Reserve Bank Chairman the target of criticisms. It is always difficult for the Central Bank to lean against the wind.

That said, there should indeed be a separate voice that is tasked with monitoring changes in conditions of financial markets.

6 | BANK RESTRUCTURING

Benoît Mojon: *How do we avoid the problem of "zombie lending"? How can we organise a restructuring without deleveraging: Can we clean-up the balance sheets without causing a major recession?*

Anil Kashyap: The situation in the United States is different from the problem in Japan. In Japan, lending was made to "bad firms", while in the United States, lending was made to "bad collateral". If Congress were to (say) force Citibank to lend to GM, that would be a disaster for both Citibank and for taxpayers, if as I expect the loans wind up not being repaid.

If we can afford to move all the bad assets to a different part of the bank, the private sector would again recapitalise the "good" part of the bank. Running a stress test on the banks to figure out the size of the bad assets problem is the right first step.

Jean-Pierre Landau: *Would you advocate punishing investors holding bonds of distressed banks?*

Anil Kashyap: There has to be some imposition of losses to bond-holders. If this were not a financial firm, bankruptcy laws would make clear what bond-holders would share some of the losses as a result of the liquidation.

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Emerging contours of financial regulation: challenges and dynamics

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The current ongoing financial crisis is attributed to a variety of factors such as the developments in the subprime mortgage sector, excessive leverage, lax financial regulation and supervision, and global macroeconomic imbalances. At a fundamental level, however, the crisis also reflects the effects of long periods of excessively loose monetary policy in the major advanced economies during the early part of this decade.

The theory and belief of efficient and rational markets have been severely discredited by the current crisis. There is, therefore, a growing agreement for much strengthened, and perhaps, intrusive regulation and supervision in the financial sector. Hitherto unregulated institutions, markets and instruments will now have to be brought under the regulatory framework. A more developed macroprudential approach will be important. Once the current financial crisis is beyond us, minimum regulatory capital requirements would need to be significantly above existing Basel rules, with emphasis on Tier I capital, and supported by a maximum gross leverage ratio. Liquidity regulation and supervision must be recognised as of equal importance to capital regulation, reinforced by an effective global liquidity framework for managing liquidity in large, cross-border financial institutions. The issue of remuneration in the financial sector would require reforms on an industry-wide basis so that improved risk management and compensation practices by some systemically important firms are not undermined by the unsound practices of others. Whereas the suggested reform principles are being increasingly well accepted, many challenges will arise on their modes of implementation, and their practicality. For instance, once normalcy returns, the financial industry will do its utmost to resist the requirements for higher capital at that time.

From the point of view of emerging market economies (EMEs), the volatility in capital flows – mainly the outcome of extant monetary policy regimes in developed countries – has led to severe problems in both macro management and financial regulation. This will remain a challenge since there is little international discussion on this issue. Finally, as the global economy starts recovery, a calibrated exit from the prevalent unprecedented accommodative monetary policy will have to be ensured to avoid the recurrence of the financial crisis being experienced now.

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The world is currently in the midst of the most severe financial and economic crisis since the Great Depression. Although the crisis originated in the subprime mortgage market in the United States, it then spread to Europe and later to the rest of the world. The speed of the contagion that spread across the world is perhaps unprecedented. What started off as a relatively limited crisis in the US housing mortgage sector turned successively into a widespread banking crisis in the United States and Europe, the breakdown of both domestic and international financial markets, and then later into a full blown global economic crisis. Almost all governments and central banks of the world have been busy over the last 9-18 months in an effort to contain the effects of the crisis through both fiscal and monetary policy measures, respectively. Just as the global nature of the crisis is unprecedented, so is the global nature of the response, as exemplified by the coordinated action being committed to by the G20.

Along with the coordinated fiscal and monetary policy actions, a comprehensive re-examination of the financial regulatory and supervisory framework is also underway around the world.

Against this backdrop, this paper attempts to analyse the emerging contours of regulation of financial institutions with an emphasis on the emerging challenges and dynamics. The paper is organised as follows:

- Section I provides a broad overview of the global developments which contributed to the current global financial crisis.
- Section II presents the ongoing discussion and debate at the international level in the light of the shortcomings of the extant regulatory framework.
- Section III analyses proposals for reforming the regulatory framework, while
- Section IV discusses the difficulties in implementing the regulatory proposals.

1 | EVOLUTION OF CRISIS: WHAT WENT WRONG?

What are some of the identifiable sources of market failures that led to the current financial turbulence?

The current ongoing financial crisis is attributed to a variety of factors such as the developments in the subprime mortgage sector, excessive leverage, lax financial regulation and supervision, and global macroeconomic imbalances. At a fundamental level, however, the crisis also reflects the effects of long periods of excessively loose monetary policy in the major advanced economies during the early part of this decade.

After the dotcom bubble burst in the United States around the turn of the decade, monetary policy in the United States and then in other advanced economies was eased relatively aggressively. Policy rates in the United States reached 1.0 per cent in 2002, and were held around these levels for an extended period, longer than was probably necessary (Taylor, 2009; Yellen, 2009). Excessively loose monetary policy led to excess liquidity and consequent low interest rates worldwide; and the burst of financial innovation during this period amplified and accelerated the consequences of excess liquidity and rapid credit expansion (Larosière Report, 2009).

What is interesting about this episode is that, despite the persistent accommodative monetary policy, the accompanying strong worldwide macroeconomic growth did not result in measured inflationary pressures in goods and most services. Consequently, central banks in advanced economies, particularly in the United States, did not withdraw monetary accommodation for an extended period. The excess liquidity worldwide did show up in rising asset prices, and later in commodity prices, particularly oil. It was only then that measured inflation did start rising and central banks began to tighten monetary policy, though belatedly.

With significant increases in both investment and consumption, along with declining savings,¹ aggregate demand exceeded domestic output in the United States for an extended period, leading to persistent and increasing current account deficits, as the domestic savings investment imbalance grew. This large excess demand of the United States was supplied by the rest of the world, especially China, which provided goods and services at relatively low cost, leading to corresponding current account surpluses in China and elsewhere. The surpluses generated by the oil exporting countries added to the emerging global imbalances.

¹ The US personal saving rate hovered only slightly above zero from mid-2005 to mid-2007 (Yellen, 2009).

Large current account surpluses in China and other emerging market economies (EMEs) and equivalent deficits in the United States and elsewhere are often attributed to the exchange rate policies in China, other EMEs and oil exporters. Given the fact that the US demand exceeded output, it is apparent that the US current deficit would have continued at its elevated levels. In the event of a more flexible exchange rate policy in China, the sources of imports for the United States would have been some countries other than China. Although the lack of exchange rate flexibility in the Asian EMEs and oil exporters did contribute to the emergence of global imbalances, it can not fully explain the large and growing current account deficits in the United States, particularly since Europe as a whole did not exhibit current account deficits at the same time.

Accommodative monetary policy and the corresponding existence of low interest rates for an extended period encouraged the active search for higher yields by a host of market participants. Thus capital flows to EMEs surged in search of higher yields, but could not be absorbed by these economies in the presence of either large current account surpluses or only small deficits, largely ending up as official reserves. These reserves were recycled into US government securities and those of the government sponsored mortgage entities such as Fannie Mae and Freddie Mac. Thus, while accommodative monetary policy kept short-term interest rates low, the recycled reserves contributed to the lowering of long-term interest rates in the advanced economies, particularly the United States. Such low long-term interest rates contributed to the growth of mortgage finance and consequent rising housing prices.

Furthermore, the stable macroeconomic environment – relatively stable growth and low inflation – in the major advanced economies in the run up to the crisis led to sustained under-pricing of risks and hence excessive risk taking and financial innovation. It may be ironic that the perceived success of central banks and increased credibility of monetary policy, giving rise to enhanced expectations with regard to stability in both inflation and interest rates, could have led to the mispricing of risk and hence enhanced risk taking. Easy monetary policy itself may have generated a search for yields that resulted in a dilution of standards in assessing credit risk

leading to erosion of sound practices (Mohan, 2007). Lower yields encouraged excessive leverage as banks and financial institutions attempted to maintain their profitability. Lacunae in financial regulation and supervision allowed this excessive leverage in the financial system. Assets were either taken off banks' balance sheets to off-balance sheet vehicles that were effectively unregulated; or financial innovation synthetically reduced the perceived risks on balance sheets.

The sustained rise in asset prices, particularly house prices, on the back of excessively accommodative monetary policy, and lax lending standards coupled with financial innovations, resulted in the high growth in mortgage credit to households, particularly to low credit quality households. Due to the 'originate-to-distribute' model, most of these mortgages were securitised. In combination with strong growth in complex credit derivatives and with the use of credit ratings, the mortgages, inherently subprime, were bundled into a variety of tranches, including AAA tranches, and sold to a range of financial investors looking for higher yields.

As inflation started creeping up beginning in 2004, the US Federal Reserve did start to withdraw monetary accommodation. Consequently, mortgage payments started rising, while housing prices started to ease. Low/negligible margin financing incentivised default by the subprime borrowers. Although the loans were supposedly securitised and sold to the off-balance sheet special investment vehicles (SIVs), the losses were ultimately borne by the banks and financial institutions wiping off a significant fraction of their capital. The uncertainty about the extent of the likely bank losses led to a breakdown of trust among banks. Given the growing financial globalisation, banks and financial institutions in other major advanced economies, especially Europe, have also been adversely affected by losses and capital write-offs. Inter-bank money markets nearly froze and this was reflected in very high spreads in money markets and debt markets. There was aggressive search for safety, which has been mirrored in very low yields on Treasury bills and bonds. These developments were significantly accentuated following the failure of Lehman Brothers in September 2008 and there was a complete loss of confidence.

The deep and lingering crisis in global financial markets, the extreme level of risk aversion, the mounting losses of banks and financial institutions, the elevated level of commodity and oil prices (until the third quarter of 2008), and the sharp correction in a range of asset prices, all combined, have suddenly led to the sharp slowdown in growth momentum in the major advanced economies, especially since the Lehman failure. Global growth for 2009, which was seen at a healthy 3.8 per cent in April 2008 is now expected by the International Monetary Fund (IMF) to contract by – 1.3 per cent.

Thus, the causes for the current crisis reflect the interaction of monetary policy, the choice of exchange rate regime in a number of countries and important changes within the financial system itself (Larosière Report, 2009; Bank for International Settlements, 2008), along with lax regulation arising from the belief in efficient markets and light touch regulation. To recap, low interest rates, together with increasing and excessive optimism about the future pushed up asset prices, from stock prices to housing prices. Low interest rates and limited volatility prompted the search for yield down the credit quality curve, and underestimation of risks led to creation and purchase of riskier assets. Central banks, focused on measured consumer price inflation and aggregate activity, while neglecting asset price movements, did not perceive the full implications of the growing risks until it was too late (IMF, 2009).

2 | SHORTCOMINGS IN FINANCIAL REGULATION AND SUPERVISION

There have been calls for fundamental rethinking on macroeconomic, monetary and financial sector policies to meet the new challenges and realities, which perhaps represent a structural shift in the international financial architecture demanding potentially enhanced degree of coordination among monetary authorities and regulators. A review of the policies relating to financial regulation, in a way, needs to address both the acute policy dilemmas in the short run and a fundamental rethink on broader frameworks of financial and economic policies over the medium-term (Reddy, 2008).

A great deal of very active discussion is now going on internationally on the existing regulatory practices and the future of financial regulation and supervision. It is also perhaps correct to say that there is an emerging consensus on the directions that need to be taken on financial regulation and supervision. Among the most influential reports on this issue are:

- Report of the High Level Group on Financial Supervision in the European Union (Chairman: Jacques de Larosière).
- The structure of financial supervision: Approaches and challenges in a global market place (Group of Thirty; Chairman: Paul A. Volcker).
- The fundamental principles of financial regulation (The Geneva Report).
- The Turner Review: A regulatory response to the global banking crisis (Financial Services Authority of the United Kingdom); and finally,
- the Report of Working Group I on "Enhancing sound regulation and strengthening transparency" (G20).

What is common among all these reports is the acknowledgement that regulation and supervision in the advanced economies was clearly too lax in recent times and that there needs to be considerable rethinking leading to much strengthened, and perhaps, intrusive regulation and supervision in the financial sector. There is clear recognition of serious regulatory and supervisory failures.

The root of such rethinking is really the questioning of the existing intellectual assumptions with respect to the functioning of markets, and the nature of financial risk. To quote the *Turner Review*:

"At the core of these assumptions has been the theory of efficient and rational markets. Five propositions with implications for regulatory approach have followed:

(i) Market prices are good indicators of rationally evaluated economic value.

(ii) The development of securitised credit, since based on the creation of new and more liquid markets, has improved both allocative efficiency and financial stability.

(iii) *The risk characteristics of financial markets can be inferred from mathematical analysis, delivering robust quantitative measures of trading risk.*

(iv) *Market discipline can be used as an effective tool in constraining harmful risk taking.*

(v) *Financial innovation can be assumed to be beneficial since market competition would winnow out any innovations which did not deliver value added.*

Each of these assumptions is now subject to extensive challenge on both theoretical and empirical grounds, with potential implications for the appropriate design of regulation and for the role of regulatory authorities". (Turner Review, 2009, page 30)

What were the specific developments in the financial system that arose from these broadly accepted intellectual assumptions that led to the ongoing global financial crisis?

Financial and banking crises have a long history, which is as old as the existence of the financial sector itself. What is common among almost all crises is the build up of excessive leverage in the system and the inevitable bursting of the financial bubble that results from such leverage. What is interesting about the current crisis is that this excess leverage occurred over a period when greater consensus had developed through the Basel process on the need for and level of adequate capital required in banking institutions across all major jurisdictions. Furthermore, sophisticated financial risk management capabilities were also believed to have been developed within large financial institutions during this period of unusually high rapid growth in both the magnitude and sophistication of the financial system. With financial deregulation in key jurisdiction like the United States and the United Kingdom, along with most other countries, financial institutions also grew in complexity. Financial conglomerates began to include all financial functions under one roof: banking, insurance, asset management, proprietary trading, investment banking, broking, and the like. The consequence has been inadequate appreciation and assessment of the emerging risks, both within institutions and system wide. What were the factors that led to this emergence of excessive system wide and institutional risk?

Among the notable developments of the last decade has been the unprecedented explosive growth of securitised credit intermediation and associated derivatives (Yellen, 2009). The assumption underlying this development was that this constituted a mechanism that took risk off the balance sheets of banks, placing it with a diversified set of investors, and thereby serving to reduce banking system risks. As late as April 2006, the IMF's global financial stability Report noted that this dispersion would help "mitigate and absorb shocks to the financial system" with the result that "improved resilience may be seen in fewer bank failures and more consistent credit provision" (as quoted in the *Turner Report*, page 42).

This assumption has already proved to be erroneous, although simple forms of securitisation have existed for a long time. Among the key functions of banks is maturity transformation: they intermediate shorter term liabilities to fund longer term assets in the non financial sector. Banks are typically highly leveraged and hence trust and confidence is crucial to their functioning and stability. Traditionally, therefore, banks exercised sharp vigilance on the risk elements of their assets, which were typically illiquid, in order to ensure constant rollover of their shorter-term funding liabilities. What securitisation does is to turn illiquid assets into liquid ones, which in theory then disperse risks from the banks' balance sheets and also reduce their requirements of banking capital. With assets themselves seen as liquid short-term instruments, they began to be funded by ultra short-term liabilities, including even overnight repos whose volume increased manifold in recent years. Systemic risk increased because traded instruments are inherently more susceptible to price swings depending on changes in market sentiment. Furthermore, liquidity risks in such markets were also not understood adequately. It was assumed that these liquid markets would always exist, and hence securitised assets were assumed to be inherently less risky than illiquid long-term credit assets.

Financial innovation arising from the search for yields compounded this problem as second order derivatives proliferated and their valuation became increasingly dependent on model valuation and credit ratings, rather than

observable and transparent market valuation, and hence inherently more opaque. Thus, when problems arose in these markets and prices were not visible, valuation of the assets of banks and the shadow banking system became unobservable. Consequently, trust and confidence evaporated and markets froze.

Compounding these problems was the emergence of the shadow banking system that took off assets from the banks' balance sheets, thereby reducing the latter's capital requirements. The complexity and magnitude of intra-financial sector transactions exploded over this past decade, particularly over the past five years. Thus the financial sector increasingly served itself, exhibiting high profits and growth, while doing relatively little for the non financial sectors of the economy, which the financial sector exists to serve in principle. The debt of financial companies increased to levels exceeding the GDP of leading economies. Thus, in the process of taking risks off balance sheets through securitisation, these risks returned to the extended banking system itself and the original rationale for securitisation got belied. Rather than reducing systemic risk the system of complex securitisation and associated derivatives only served to increase systemic risk. Moreover, it became increasingly difficult to trace where the risk ultimately lay.

The regulatory system was clearly behind the curve in taking account of these developments. The procedures for calculating risk-based capital requirements under-estimated the risks inherent in traded securitised instruments, thereby adding to the incentive for banks to securitise assets into traded instruments, which bore lower risks weights. The trading of these instruments has largely been in over-the-counter (OTC) markets that exhibit little transparency. As a result of this overall process, banks became effectively under capitalised, and the leverage ratios of the unregulated shadow banking system and investment banks reached unsustainable levels.

With the existence of low interest rates, mispriced low risk perceptions, and inherent incentives to originate lending and distribute securitised instruments, household indebtedness increased to unprecedented levels, particularly for housing. Demand for housing assets rose and hence housing prices. Thus micro behaviour led to increased systemic risk that was not

adequately appreciated or understood, and hence not monitored by the authorities.

Thus there are immense emerging challenges that confront financial sector regulators as a consequence of the ongoing global financial crisis.

We can look forward to extensive debate at both the academic level and among practitioners. How will we change our view on the efficiency and rationality of markets, particularly financial markets? What will be the effect of such re-examination on financial innovation in the future? What will regulatory authorities do in the meantime while these debates are settled at the intellectual level? Will they overreact and restrict financial growth in the months and years to come? Will this affect global GDP growth as well?

I now turn to the key proposals that are now being made for overhaul of the strong financial regulatory architecture.

3 | REFORMING THE REGULATORY FRAMEWORK: THE FUTURE PERSPECTIVE

A great deal of discussion is going on at both the national and international levels on reform of the financial regulatory system to address the various weaknesses that have emerged. There is no question that financial regulation has to be strengthened all round. Hitherto unregulated institutions, markets and instruments will now have to be brought under the regulatory framework, and the framework itself will need to be redesigned to address the emerging needs at both national and international levels. As this new enthusiasm for financial regulation unfolds, it is important that we keep in mind the basic functions of the financial system, and how they can be strengthened so that the needs of the real economy are better served.

We need to ensure that the financial system continues to play a vital role in intermediating savings for providing adequate levels of funding to the real sector, thereby supporting economic growth.

It needs to be recognised that financial markets will remain global and interconnected, while financial innovation would continue to be important to foster economic efficiency. Hence, while strengthening financial regulation and supervision, an endeavour has to be made in this process to be careful not to stifle entrepreneurship and financial innovation. But the following question needs to be constantly asked: "Financial innovation towards what objective?" As long as financial innovation is seen to promote price discovery, greater intermediation efficiency, and hence, overall efficiency and growth, it must be encouraged, but with appropriate safeguards to maintain financial stability. Unproductive financial innovation, however, will need to be discouraged. Moreover, the debate on financial innovation and regulation has to be considered in terms of potential and systematic relevance of such innovations besides the capabilities for bringing them effectively under the regulatory umbrella (Mohan, 2007). Therefore, there is a need for reform of the regulatory framework to shield the financial system from potential crises, while identifying measures to mitigate the consequences of any future episodes of financial stress.

The regulatory framework will need to keep pace with the associated risks in a more rapid and effective manner. Large complex financial institutions will continue to operate in multiple jurisdictions in order to meet the needs of their large global clients, and supervision will need to be better coordinated internationally with a robust global resolution framework. In order to avoid regulatory arbitrage, there is a need for greater consistency in the regulation of similar instruments and of institutions performing similar activities, both within and across borders.

In addition, capital markets will require greater emphasis on reducing counterparty risk and on ensuring that their infrastructure allows them to remain a source of funding during periods of stress. The post-crisis period is likely to be characterised by a financial system which functions with lower levels of leverage, reduced funding mismatches (both in terms of maturity and currency), less exposure to counterparty risk, and greater transparency regarding financial instruments. After credit markets recover from the crisis, it will be important to mitigate the inevitable pressure to expand profits

through increased risk-taking. A more developed macroprudential approach will be important in this context.

The type, size, and cross-border exposures of institutions and markets that will emerge from this crisis are likely to be considerably different from before. As banks and financial institutions consolidate, policy makers will have to adapt prudential regulation to varying degrees of size and concentration. Similarly, competition policy will be important in ensuring healthy competition. Financial institutions, markets and instruments will therefore continue to evolve in ways that pose challenges for regulation, notwithstanding the retrenchment that is currently underway. Financial institutions, policymakers, supervisors and regulators will all need to become better equipped to manage the interconnectedness of markets, both domestically and globally, the effects of innovation, and the potential for incentives to become misaligned.

It will be necessary to consider the appropriate timing for changes in the regulatory framework going forward. Recommendations should promote proportionate regulatory reaction when needed, acknowledging the possible limits of the self-regulation approach in some contexts. For example, while ultimately capital buffers for the system should be enhanced during the economic expansion in order to be drawn down as needed in downturns, changes in the current environment may have negative consequences on the real economy. A considered and comprehensive review of the consequences of reforms and harmonisation, coordinated across jurisdictions, is necessary to increase the effective transition to a more stable financial system (G20, 2009).

In short, the overarching mandate of reforms is to make regulatory regimes more effective over the cycle. This is related to many other issues including certain aspects of compensation schemes at financial institutions, of margin requirements and risk management practices focused on value-at-risk calculations based on short historical samples, of the capital adequacy framework, and of valuation and loan-loss provisioning practices. In addition, there is a need to redefine the scope of the regulatory framework in order to establish appropriate oversight

for the institutions and markets that may be the source of systemic risk. Risk management also needs to be enhanced to better evaluate vulnerabilities arising from low-frequency, system-wide risks, and to better mitigate these risks.

Against this broad background, this section endeavours to focus on defining the priorities for action in so far as financial regulation and supervision are concerned.

3|1 Macroprudential orientation

As observed, the build up of micro institutional risks has resulted in the unfolding of massive macrorisk, partly through the rise in unsustainable asset prices. As a supplement to sound microprudential and market integrity regulation, national financial regulatory frameworks therefore should be reinforced with a macroprudential oversight that promotes a system-wide approach to financial regulation and supervision and mitigates the build-up of observable excess risks across the system. Prudential regimes should encourage behaviour that supports systemic stability; discourages regulatory arbitrage; and adopts the concept of 'systemic' risk, factoring in the effects of leverage and funding. In most jurisdictions, this will require improved coordination mechanisms between various financial authorities, mandates for all financial authorities to take account of financial system stability, and effective tools to address systemic risks. It will also require an effective global table, which is now proposed to be the Financial Stability Board, to bring together national financial authorities to jointly assess systemic risks across the global financial system and coordinate policy responses.

A number of policy institutions, particularly central banks, have enhanced their analysis of systemic risks in recent years – many of the systemic vulnerabilities that caused or enhanced the current turmoil had in fact been identified – but policy mechanisms to effectively translate these analyses into policy action have been lacking. The basic idea here is to multiply the capital adequacy ratios with a systemic risk factor. Better measures of macroprudential risk are to be found. It is argued that leverage ratios, maturity mismatch and estimates of bank credit expansion should be taken into account. Highly levered and

fast growing 'systemic' institutions would be subject to higher capital requirements than the rest. The idea is that when there is increasing systemic risk, with increasing leverage, maturity mismatch, credit expansion and asset price increases during boom times, banking capital required should increase, and reduce during a downturn when deleveraging takes place (Geneva Report, 2009).

Potential macroprudential tools that could be explored further could include:

- complementing risk-based capital measures with simpler indicators aimed to measure the build-up of leverage, with enhanced sensitivity to off-balance sheet exposures;
- capital requirements that adjust over the financial cycle;
- loan-loss provisioning standards that incorporate all available credit information;
- the use of longer historical samples to assess risk and margin requirements; and
- greater focus on loan-to-value ratios for mortgages.

Further, the challenge is to continually endeavour to strike a balance between macro and microprudential regulation.

3|2 Regulatory regime

With the emergence of the shadow banking system and other leveraged financial institutions, the scope of regulation and oversight needs to be expanded to include all systemically important institutions, markets and instruments. Accordingly, the perimeter of the financial sector surveillance would have to be extended possibly with differentiated layers to allow institutions to graduate from simple disclosures to higher levels of prudential oversight as their contribution to systemic risks increases. Financial authorities will need enhanced information on all material financial institutions and markets, including private pools of capital. Large complex financial institutions require particularly robust oversight given their size and global reach. Consideration would also need to be given to put in

regulatory disincentives for such institutions to not become too big to fail. The regulatory and oversight framework should strive to treat similar institutions and activities consistently, with greater emphasis on functions and activities and less emphasis on legal status.

The main bone of contention here, *inter alia*, is whether and how to regulate private pools of capital, including hedge funds. There have been differences with regard to the role of these funds in the current global financial crisis. Nevertheless, there is a broad agreement that private pools of capital, including hedge funds, can be a source of risk owing to their combined size in the market, their use of leverage and maturity mismatches, and their connectedness with other parts of the financial system.

The widespread reliance of market participants on credit ratings of market instruments led to inadequate risk analysis by themselves. Thus, credit rating agencies (CRAs) will have to be subject to a regulatory oversight regime. Further, there is a need for modifications to a rating agency's practices and procedures for managing conflicts of interest and for assuring the transparency and quality of the rating process, particularly on the process underlying ratings of complex securitised instruments and derivatives. Given the global scope of some CRAs, the oversight framework should be consistent across jurisdictions with appropriate sharing of information between national authorities responsible for the oversight of CRAs.

3|3 Procyclicality

Once conditions in the financial system have recovered, international standards for capital and liquidity buffers will have to be enhanced, and the build-up of capital buffers and provisions in good times should be encouraged so that capital can absorb losses and be drawn down in difficult times such as the current period. It will be necessary to develop a methodology to link the stage in the business cycle to capital requirements in a non discretionary way and to accounting and prudential standards.

Many questions have also arisen on accounting conventions and procedures that are perceived to have added to procyclicality in the financial system.

It should be recognised that the clock should not be turned back on fair value accounting just to address the issue of temporary market illiquidity. What is needed is to make clear the nature of price uncertainty, and to do so in a manner that speaks symmetrically to the potential for mispricing in illiquid markets as much as in booming markets. Enhancements could include better guidance and principles for mark-to-market valuation, information on the variance around the fair value calculations and data on history price.

3|4 Prudential oversight

There are three broad areas with regard to prudential oversight that require strengthening: capital adequacy framework, liquidity risk management and infrastructure for OTC derivatives.

CAPITAL ADEQUACY FRAMEWORK

There is a clear need for higher quantity and quality capital resulting in minimum regulatory requirements significantly above existing Basel rules. The emphasis should be on Tier I capital. The transition to future rules should be carefully phased given the importance of maintaining bank lending in the current macroeconomic climate. Capital required against trading book activities should be increased significantly. Published accounts could also include buffers which anticipate potential future losses, through, for instance, the creation of an 'Economic Cycle Reserve'. A maximum gross leverage ratio could be introduced as a backstop discipline against excessive growth in absolute balance sheet size. Further, in the context of rapid financial innovation and risk-based regulatory capital requirements, a well constructed non-risk-based capital measure can at least partially address the problem of modelling deficiencies for the advanced approaches and ensure a minimum level of capital is retained in the banking system.

LIQUIDITY RISK MANAGEMENT

A new element in the future regulatory approach is explicit recognition that liquidity regulation and supervision must be recognised as of equal importance to capital regulation. Individual institutions have demonstrated that their own

internal incentive structure is such that liquidity risk may be procyclical due to its links with market and credit risk, and to accelerator factors, such as the mark-to-market effects of asset values and net worth. Structural reliance on short-term wholesale market funding, including via securitisation, has increased the sensitivity of banks balance sheets and cost of funds to procyclical elements. Therefore, regulatory policies need to reflect appropriately the true price of funding liquidity on financial institutions' balance sheets – ensuring that the market does not rely excessively on the central bank emergency liquidity support facility. Areas that could be considered include:

- Improved funding risk management by strengthening risk management and governance and control.
- Introduction of minimum quantitative funding liquidity buffers of high-quality liquidity assets.
- Introduction of regulatory charge for institutions that present a higher than average liquidity risk and pricing of access to central bank liquidity in order to encourage institutions holding better-quality collateral.

An effective global liquidity framework for managing liquidity in large, cross-border financial institutions should include internationally agreed levels of liquidity buffers, and should encourage an increase in the quality of their composition. Such a framework needs to be comprehensive and take into account liquidity needs for the overall institution.

INFRASTRUCTURE FOR OTC DERIVATIVES

The explosion of credit derivatives and their offshoots (Collateralised debt obligations – CDOs, CDO², etc.) has demonstrated the clear need for oversight and transparency in this market. As noted earlier, the market for credit default swaps (CDS) operates on a bilateral, OTC basis and has grown to many times the size of the market for the underlying credit instruments. In light of problems involving some large players in this market, attention has focused on the systemic risks posed by CDS. There is a global consensus on the need for a central counter party (CCP) for all the OTC derivative products and accordingly efforts are

on, both in the United States, European Union and elsewhere to implement CCP for CDS.

The development of a CCP facilitates greater market transparency, including the reporting of prices for CDS, trading volumes, and aggregate open interest. The availability of pricing information can improve the fairness, efficiency, and competitiveness of markets – all of which enhance investor protection and facilitate capital formation. The degree of transparency, of course, depends on the extent of participation in the CCP. If needed, some incentives may be provided by national authorities, for example, by taking a higher capital charge for transactions not cleared through central counterparties. In order to foster transparency and to promote the use of CCP and of exchange trading for credit derivatives, public authorities should also encourage the financial industry to standardise contracts and to use a data repository for the remaining non-standardised contracts and promote fair and open access to central counterparty services. In order to mitigate systemic risk resulting from counterparty credit risk, in the short run, it would also be beneficial for there to be a competitive environment for central counterparties without imposing regulatory requirements that unduly fragment the market.

3|5 Compensation and risk management

COMPENSATION

Among the issues that have gained prominence as contributory factors to the emergence of the global financial crisis is the explosion of remuneration in the financial sector, particularly in comparison with trends in the rest of the economy. Much more attention is now being given to the development of sound practice principles by the international standard setters. It is important that reforms in this regard be done on an industry-wide basis, so that improved risk management and compensation practices by some systemically important firms are not undermined by the unsound practices of others. Along with the enunciation of such principles and practices, we need to look more carefully at the inherent market incentive structure that has led to the observed compensation practices in the financial

sector. Acting on this flawed incentive structure is more likely to be effective than regulatory prescriptions.

RISK MANAGEMENT

The fundamental weaknesses in risk management practices revealed in the current crisis were the inability of financial institutions to adequately monitor risk concentrations across products and geographical areas, shortcomings in stress testing and inappropriate practices for managing risks arising from structured products. First and foremost, it remains the responsibility of the private sector to take the lead in strengthening firm-wide risk management frameworks. Both management and the Board of Directors are responsible for putting in place adequate risk management and control systems. Generally, banks are expected to have in place effective internal policies, systems and controls to identify, measure, monitor, manage, control and mitigate their risk concentrations in a timely manner, and under various conditions, including stressed market situations. The supervisory authorities would have to oversee compliance of such best practices for capturing firm-wide risk concentrations arising from both on- and off-balance sheet exposures and securitisation activities.

TRANSPARENCY

In recognition of the serious problems that have arisen, there is a clear need for greater emphasis on greater market transparency about the techniques, data characteristics, and the caveats involved in the valuation of complex financial instruments, improved information regarding OTC derivatives markets and clearing arrangements and reporting of exposures in a format that permits regulators to aggregate and assess risks to the system as a whole. This would help investors to perform some of the due diligence currently outsourced to CRAs, while also helping the latter to do a better job measuring the tail risks.

The fundamental issue here is two fold: standard setters should work with supervisors and regulators to reduce complexity in accounting standards to facilitate better assessment of uncertainty surround valuation and achieve consistency of valuation methods and a single set of accounting standards.

ENFORCEMENT

Through the expanded Financial Stability Forum, now renamed as Financial Stability Board, the International Monetary Fund and the international standard setters, international standards, including those for macroprudential regulation, the scope of regulation, capital adequacy and liquidity buffers, should be coordinated to ensure a common and coherent international framework, which national financial authorities should apply in their countries consistent with national circumstances. The financial regulatory and oversight frameworks and their implementation in all G20 countries should be reviewed periodically, validated internationally and made public.

4| THE CHALLENGES AHEAD

The agenda that is being developed for strengthening of financial sector regulation and supervision is ambitious. Contentious issues will arise both at domestic/national regulatory levels and at the international levels on regulatory cooperation. Whereas the principles that have been outlined for this regulatory overhaul are being increasingly well accepted, many challenges will arise on their modes of implementation, and their practicality.

The first issue is that the various proposals that will lead to increased levels of regulatory capital over the economic cycle, and extension of such capital requirements on bank like institutions that are currently unregulated or lightly regulated, will inevitably lead to lower profitability for equity investors. The bargaining power of banking institutions has become weak in the current circumstances and hence there is little observable protest regarding these proposals at present. As the financial crisis is resolved, and normalcy returns, we can expect the financial industry will do its utmost to resist the requirements for higher capital at that time. It will be a challenge for regulators and governments to resist demands for relaxation of the new capital requirements, both the enhanced minimum levels and the capital buffers proposed in good times. The lobbying power of

the financial industry will be restored by that time and hence authorities will need to be prepared for such challenges. Lower systemic profitability levels will also be effective endogenously in limiting compensation levels in the financial sector.

Second, the proposal for provision of contra-cyclical capital will face significant implementation issues. Regulators will need to do significant technical work in the understanding of business cycles so that turning points can be recognised. What would be the triggers for changes in these capital buffers in either direction? Would these changes kick-in in anticipation of business cycle turns or *post facto*? How formation or rule-based would these changes be so that regulated institutions know in advance themselves what they need to do? An additional issue in this sphere arises from the possibility of economic cycles occurring at different times in different jurisdictions. This would necessitate greater cross border cooperation between home and host regulators in terms of applicable capital requirements for different segments of the same international financial conglomerate. An additional problem for EMEs would be the lack of adequate data for business cycle identification.

Third, there is general agreement on macroprudential regulations and the identification of systemic risks like the build up of asset bubbles. However, considerable technical work will need to be done at both national and international levels on identifying what such risks are, what is systemic and what is not, and what kind of regulatory actions would be effective. In the recent experience, for example, there was ample awareness of the build up of both global financial imbalances, and of the asset price bubble, but there was little agreement on what needed to be done. Even if adequate work is done on the identification of systemic risk, and on the regulatory measures necessary, what will be the enforcement methodology internationally. Within national regulatory systems, issues relating to inter-regulatory cooperation will also arise, who will be in-charge of issuing early warning systems and who will listen to them?

Fourth, there is general agreement on the extension of regulation on all systemically important institutions, markets and instruments. Here again there is an issue of implementation. How do we decide what is systemically important? Considerable

debate has ranged around the regulation of hedge funds, which come in all sizes, shapes and forms. Some are large, but not leveraged, others can be both large and leveraged, and yet others can be small and leveraged or otherwise. Whereas it may be that individual hedge funds or other equity pools are not systemically important, they may be so collectively. Furthermore, they could be collectively not important systemically in good times, but become so in times of extensive leveraging. Similar is the story for markets and instruments. Thus the work of national and international regulatory system is cut out in this regard. Excessive regulation could indeed snuff out entrepreneurship if not done carefully.

Fifth, a great deal of debate has emerged around the issue of securitised credit and its offshoots. Very clearly, financial innovations in this area have been unproductive and dysfunctional and will need to be discouraged. Once again, however, securitisation is a time honoured methodology that has done much to lubricate the financial system and helped funding real economy needs at competitive costs. How these instruments are regulated and how "good" financial innovations will be winnowed from the "bad" will be a challenge.

Sixth, as the current global crisis has shown, whereas many of the large complex financial institutions are global in nature, their regulation is national. Considerable discussion is now ongoing on how international regulatory cooperation can be enhanced. Apart from the regulatory problems associated with ongoing institutions, even more difficult are the problems associated with cross border resolution of failing institutions. The discussion on these issues has just began.

Seventh, from the point of view of EMEs, at the macro level, the volatility in capital flows has led to severe problems in both macromanagement and financial regulation (Committee on Global Financial System – CGFS –, 2009). These capital flows have been influenced significantly by the extant monetary policy regimes in developed countries and hence their volatility is not necessarily related to economic conditions in the receiving economies. Excess flows, sudden stops and reversals have significant effects on EME financial sectors, the working of their capital markets, and asset prices, and hence their economies as a whole. Management of this volatility involves action in monetary policy, fiscal management,

capital account management, and also financial market regulation. This will remain a challenge since there is little international discussion on this issue.

Finally, in response to the crisis, monetary policy has been loosened substantially in major advanced economies since the second half of 2007. Policy rates have been cut to near zero levels, even lower than that in 2003-04, and the financial systems have been flooded with large liquidity. Abundant liquidity, if not withdrawn quickly, runs the risk of inducing the same excesses and imbalances that were witnessed during 2003-07. Excess liquidity could also take the form of large capital flows to the EMEs and their

likely recycling back to the advanced economies. As the global economy starts recovery, a calibrated exit from this unprecedented accommodative monetary policy will have to be ensured to avoid the recurrence of the financial crisis being experienced now.

To summarise, the emergence of the global financial crisis has led to a new wave of thinking on all issues related to both monetary policy and financial regulation. Whereas considerable progress has been achieved on the principles governing this regulatory overhaul, very significant challenges remain on the implementation issues that will arise as we move into a new regime globally.

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Regulation-supervision: the post-crisis outlook

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Following the G20 summit in April 2009, the principles defined by the Heads of State and Government must be turned into operational rules. Over the coming period, the weaknesses of the regulation-supervision system need to be considered and the associated risks integrated into any new measures that are defined in the current environment.

The current system has four major weaknesses:

- *limited coverage;*
- *fragmentation;*
- *heterogeneity;*
- *pro-cyclicality.*

There are five risks that need to be managed:

- *coordination between numerous bodies at multiple levels can render the system opaque and unresponsive;*
- *the potential accumulation of regulatory capital requirements;*
- *difficulty in establishing the relevant liquidity management tools;*
- *the increasing complexity of prudential supervision rules may hamper financial innovation;*
- *macroeconomic and microeconomic approaches are too frequently considered separately, preventing a proper assessment of the efficiency of monetary policy and its impact on the real economy.*

NB: The opinions expressed in this article represent the opinions of the author and not necessarily those of the institutions to which he belongs.

The conclusions of the G20 summit reflect the participants' intention to provide the financial system with a reference and action framework to help combine economic growth and financial equilibrium. The work accomplished at this international summit must be commended. Although the focus was admittedly more on stimulus measures, it is clear that a stimulus package without regulation has even less chance of working than before.

In the wake of this political discussion the time will come for applying the principles to operational rules. The resulting framework will evidently be the fruit of negotiations and will certainly be complex. In this context, it is useful and appropriate to clarify and rank in order of importance the principles that must govern the new system. Regulation and supervision will indeed play a key role in the new system, clarifying and implementing a reference framework at both the macrofinancial and the financial institution level.

According to the definition given in the report drawn up by the High Level Expert Group chaired by Jacques de Larosière, "regulation is the set of rules that govern financial institutions; their main objective is to foster financial stability and to protect the customers of financial services. Regulation can take different forms, ranging from information requirements to strict measures such as capital requirements. On the other hand, supervision is the process designed to oversee financial institutions in order to ensure that rules and standards are properly applied."

Although the roles and responsibilities of regulation and supervision are clearly distinct, it is necessary to consider them together as a single system in relation to other financial players, such as governments or financial institutions.

The relationship between regulation and supervision pertains to another rationale, which links the player who defines the rules to the player who monitors their application. This essential link explains why regulators are to a large extent responsible for developing regulation.

Therefore, there are two levels of general analysis that have proven useful both in determining the flaws and weaknesses of the current system governing financial activities (Section 1]) and in identifying the risks to be managed beyond the redefinition of this system (Section 2]).

1 | A CRITICAL LOOK AT THE FUNCTIONING OF REGULATION AND SUPERVISION

The prevailing opinion regarding finance has often been that markets are efficient and naturally return to equilibrium.

The financial crisis that we are experiencing has revealed the limits of this theory and of the regulation-supervision system that in certain respects is based on it. We have identified four major weaknesses, which must be corrected if we wish to meet the common objective of financial stability.

First, the regulation-supervision system has limited coverage. This may be due to the choice of governments, which have a particular view of the way financial markets function and their role in the economy. It may also stem from the lack of coordination between States, which allows large unregulated areas to develop. Market players take advantage of this situation, creating an industry that generates jobs and other positive economic effects. The calling into question of this state of affairs is especially problematic given its scope. As a result, what started out as an anomaly becomes an integral part of the system. The underlying idea of the system's limited coverage is that the absence of rules would encourage the taking of initiatives and would therefore create value more rapidly than overly regulated systems. From this viewpoint it can be argued that minimum capital requirements or strict rules concerning fit and proper management constitute barriers to entry. It implies that a model based on initiative taking without constraints is more likely to create value.

These approaches nonetheless conflict with several realities: the absence or lack of sufficient capital can remove responsibility from the originator of the project, thus transferring the risk to the consumer or to the rest of society, depending on the size of the project. The absence of professional standards makes it more difficult to identify and therefore to sanction improper practices.

A reference framework is therefore absolutely essential. However there is cause for adapting the framework so that it is constantly operational,

i.e. making it proportional to the degree of risk depending on the activity. Distortions can indeed appear between the different frameworks and activities, generating competition problems because of the many supervisors and regulators. These distortions are obviously the cause of numerous difficulties, hampering development, but also of opportunities for regulatory arbitrages or even of insecurity, although they are not likely to destabilise the whole system.

The lack of coordination between countries allows the development of unregulated areas that can destabilise systems. These areas include both countries with more 'relaxed laws' and actual tax havens. The two categories obviously do not have the same systemic impact. The reduction of this unregulated area is therefore a crucial issue for the stability of the financial system over the long term. This is not necessarily the case to the same degree during a crisis period.

The regulation-supervision system's second weakness is its fragmented nature, in view of globalised economies and financial markets. The resulting differences in standards have systemic impacts. The lack of coordination between players could also potentially aggravate the situation during crisis periods.

The fragmentation of regulators is manifest. Let us take the extreme example of the United States, where there is one insurance commissioner per State, none of which identified the monoline risk, where the large firms on Wall Street were poorly regulated by the Securities and Exchange Commission and the Federal Reserve which, faced with the complexity and fantastic speed at which the crisis developed, only fumbled. Not to mention that certain US regulators, such as those overseeing mortgage financing, had a vested interest in not imposing overly strict rules. Once the conditions for a crisis were there, i.e. risk of regulatory capture, the fragmented nature and lack of coordination of the system, the flaws and gaps in the system were responsible for aggravating the financial crisis. At the European level, although the situation does not appear quite so bleak, limits have also emerged. Regulators have not had the time to adapt, as they are not organised to do so. Supervisors are undoubtedly coordinated, but the results of their intervention are not apparent, due to the lack of a clear decision-making process. The European Central Bank (ECB) intervened in a timely fashion to provide the system with the necessary liquidity.

The only possible response to this situation is to rebuild the regulatory system's architecture and reconsider the regulation-supervision relationship.

At the top of the pyramid is the monitoring of systemic risks and the link that should be established with monetary and exchange rate policies conducted in the major economic areas, i.e. the United States, Europe and China, and their potential interaction combined with supervision rules. The impact of monetary policy on systemic risk, and particularly on the structure of systems and banking models, should henceforth be taken into account systematically.

The strengthening of the IMF's role, the increase in the responsibilities and the membership of the Financial Stability Board are evidently working towards this, as is the setting up of a European Systemic Risk Council under the auspices of the ECB.

However, this should not hide the fact that the United States does not apply the Basel II capital adequacy framework, or the fact that virtues have been ascribed to a leverage ratio that is ineffective in prudential terms and conducive to considerable distortions of competition.

The regulation-supervision relationship also needs to be re-examined. This point has been insufficiently analysed to date, despite the fact that it is one of the system's core elements. Supervisors will evidently continue to offer their experience, thus helping to fine-tune the rules and the ratios. The role played by the leading supervisor is naturally likely to strengthen the coherence of the system, as are the exchanges within supervisory colleges. This collective effort is tangible and indispensable. However, it may not be sufficient. There will certainly be grounds for making this dialogue more explicit and also for involving the industry in a clearer and more formal fashion. This approach should not be limited to consultation alone but taken as a shared responsibility, in order to assess both the risks and the opportunities.

The regulation-supervision system's third weakness is its heterogeneity. We should not forget that Basel II is now essentially a European system, which means that the banks of this region bear the brunt of the adjustment and pro-cyclicality of the measures related to this new regulation. US banks and regulators do not give the impression that this issue concerns them. European banks have invested a great amount to meet

these standards and are hoping to reap the benefits of their financial and human endeavours. They are drawing attention to the fact that the Basel II tools are, nevertheless, very useful during periods when counterparty risk deteriorates in terms of detecting risk and of forward-looking risk management thanks to the results of stress tests.

However, at the European level, heterogeneous practices in the definition of capital leads, in practice, to abnormal market pressure from cursory calculations which, in a climate of great uncertainty, are set up as management principles. The concept of solvency ratios thus differs from one country to another, which leads to a certain degree of incomprehension (at the least) between experts and markets.

In some respects, the market has thus taken the place of the regulators, as there is currently no established instrument that enables the comparison of the main European financial institutions' capital ratios. Clarification and harmonisation in this area are therefore urgent.

The regulation-supervision system's fourth weakness is its pro-cyclical nature. This is a well-known issue. In this context, the point that should be highlighted is what has turned out to be a devastating combination of prudential and accounting rules, which will deliver its full effect over the coming months.

The instability of markets leads to significant variations (via VaR models) in capital requirements. The deterioration in counterparties' ratings in the loan portfolio has the same impact. Overall, this additional capital requirement cannot be met by the market, and the system seizes up. In the absence of public intervention, the credit supply can only contract, thus increasing the pressure on the economy. The risk of a credit crunch thus becomes the direct consequence of the very prudential standard and accounting system that was trying to avoid it.

The practice of counter-cyclical provisions such as those introduced in Spain is one response to the loan portfolio issue.

The conditions governing the use of VaR in the event of extreme volatility should be re-examined. The limits of this tool are well known. The economic significance of prices in the markets is uncertain when the markets are unhinged and arbitrages are

no longer possible owing to the scarcity of liquidity. At this stage, the accounting and prudential fields are totally interlinked. A separate approach is no longer acceptable either, which raises the question of regulators' powers in terms of accounting. Financial markets cannot be compared to other markets, since their specific nature and their role in the economy justify a specific regime, coordinated with the IASB, but with sufficient independence from the latter and the crucial presence of regulators at the decision-making stage.

Analysis of these weaknesses has led to a number of recommendations that should be taken into account when developing the new system.

In so doing, other risks related to the new architecture are worth identifying and taking into account.

This is the focus of the second section of this article.

2 | RISKS ASSOCIATED WITH THE DEVELOPMENT OF A NEW REGULATION-SUPERVISION SYSTEM

Five main risks may be isolated. This is obviously not an exhaustive analysis; what follows merely reflects the concerns of a market participant.

The first risk stems from coordination between numerous bodies at multiple levels, without an explicit approach — so far at least — or a sufficiently clear decision-making process. No one is contesting countries' sovereignty, but it is important that the IMF and the Financial Stability Board formulate opinions and, better still, recommendations, and that these should be published in a given form and at a given frequency, in order to focus the attention of market participants, the media, and more generally any players who could influence government decisions.

The complexity of negotiations between policy makers is evident. Europe is an excellent illustration of this, and a number of the recommendations in the Larosière report show the very recent difficulties

encountered in the attempt to move forward, even slightly, in this field. However, clarifying the roles and the coordination process, defining the form of opinions or recommendations and their publication are factors that exert pressure and therefore help to make progress. Sharing and disseminating tools is also a powerful means of harmonising, as it is based on a more fine-tuned and explicit analysis of financial mechanisms. Establishing clearer procedures and the sharing of tools between public and private sector players should help to facilitate and strengthen links and therefore remove certain barriers and spread information more effectively. These are all factors that could improve the efficiency of monetary policy transmission and the assessment of its potential impact on the economy.

It would be desirable for Europe to play a pioneering role in this area. This is necessary in order to strengthen the area's monetary union at a time when its economies are diverging. Europe is less coordinated and less responsive than the United States and therefore cannot take the additional risk of importing rules and standards without drawing appropriate conclusions. Since this importing has already taken place, it is forcing a more complex coordination in a European alliance that remains divided, but which is all the more necessary for precisely this reason.

The second risk is that capital requirements could accumulate, at a time when markets will not respond satisfactorily to demand from the financial sector.

This accumulation is foreseeable since we are concomitantly witnessing the strengthening of capital requirements related to market activities, another related to the loan portfolio deterioration and a third subsequent to the detection of a flawed remuneration system for market operators, which is considered responsible for encouraging excessive risk-taking. Not to mention an additional requirement related to liquidity risk management or the possibility of the leverage ratio being taken into account. In addition to this are the consequences in terms of regulatory capital under Pillar 2 in the Capital Requirements Directive (CRD). Of course, it is not certain that all of these mechanisms will be set up and implemented concomitantly, but their number alone indicates that an impact study of their combined effects is necessary. The safety desired by all market players should not end up stifling the system.

The accumulation of capital requirements is an easy option for regulators and governments. It is reassuring at a time when confidence in banks has broken down, but it does not guarantee optimal financing of the economy. Fighting against this tendency amounts to taking a gamble on long-term growth rather than Malthusian approach.

The third risk is linked to the new tools that need to be implemented in order to improve liquidity management and avoid – both at the level of institutions and of the entire system – hitting the wall of liquidity and suffering the disastrous consequences. The Basel Committee and the various national regulators are trying to assess the liquidity phenomenon and the corresponding risks through the use of models, stress tests and additional capital requirements. Obviously, the transformation performed by credit institutions must be limited and their refinancing capacity, including during periods of market instability, must be correctly assessed. However, it must also be acknowledged that liquidity is an insufficiently understood mechanism that may be permanently linked to information asymmetry between players, as well as sudden changes in behaviour when uncertainty increases abruptly (a succession of rating downgrades by rating agencies, for example, has this kind of impact). We should thus accept the idea that the prudential mechanisms currently being set up are amendable. Investing in a better understanding of liquidity phenomena and integrating this knowledge into steering systems is indispensable. Liquidity has a large behavioural component. This is closely related to players' perception of the state of the system at a given moment. This image can change. The factors that explain the sometimes sudden changes of perception are worth closer analysis and clarification. Progress in behavioural analysis applied to economics should help to do this.

So, it does not all come down to ratios, and safety cushions are necessary. However, we should avoid making credit institutions bear the brunt of what is partly a flaw in the oversight of the system by certain regulators.

Lastly, in the euro area at least, a cross-border approach is indispensable, and logically should even constitute a prerequisite for the implementation of new requirements.

The fourth risk is that the increasing complexity of prudential regulation may hamper financial innovation, when the latter is indispensable in improving the financing of the economy.

This risk is difficult to assess. In the current context, we must rely on the quality of the dialogue between supervisors and market players. The crisis has reminded us that inadequate control and monitoring of some innovations can have destructive consequences. Therefore, we cannot leave it up to the market's spontaneous functioning alone. A framework is essential. This would not necessarily block innovation automatically. Innovation does not preclude regulation. One of the possible solutions is experimentation, analysed and controlled stage by stage. The smooth functioning of *Comités NAP* (*Nouvelle Activité, Nouveau Produit* – bank committees for new activities and new products) can help to control creativity without unduly restricting it. After all, this is the method used in scientific research laboratories.

The fifth risk stems from the fact that it is extremely difficult to combine micro and macro approaches in both the real economy and the monetary policy sphere. They are often considered as separate worlds, even in academic studies. This is not a satisfactory situation.

Therefore, systematic and in-depth assessments of the impact of monetary policy on financial markets are necessary. The same applies to planned changes

in the area of regulation, even though this type of practice is already frequent.

Moreover, the observed limits of models that are inevitably based on historic precedents must be taken into account, and the use of scenario approaches should be increased to help identify risk frontiers, although they do not always necessarily need to be quantified. This type of analysis prepares the ground for crisis management and constitutes an appropriate way of strengthening the operational coordination between public and private sector players.

The regulation-supervision system will undergo new developments, or even a transformation over the coming months. This is crucial in order to ensure the stability of the financial system more effectively. In taking this approach, which aims to protect the public interest, we must make sure that the financial system's performance, particularly that of the various market players, is properly taken into account.

It would be paradoxical if European construction, which is founded on such sound and well-established principles as financial stability, were to become handicapped by rules imported from elsewhere (where they are not even followed) without sufficient examination of how they are likely to function or interact. Regulators and banks share the same objective of reaching the best possible balance between stability, security and performance in order to continue ensuring the financing of the economy as effectively as possible.

Beyond the crisis: the Basel Committee's strategic response

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A variety of factors led or contributed to the current financial crisis, including loose monetary policy; excessive financial market liquidity, leverage and maturity mismatch; weak risk management and underwriting standards; and poor incentives and regulatory gaps in some important segments of the financial system. These weaknesses were amplified by certain procyclical dynamics in regulatory, accounting and risk management frameworks. The banking sector was at the centre of the crisis as the market stress led to an acute re-concentration of on- and off-balance sheet risks in banks, putting pressure on capital buffers, liquidity and credit availability. The weaknesses in the banking sector amplified the transmission of shocks from the financial sector to the real economy.

Strengthening the banking sector and how it is managed and regulated is critical to a return to both near- and long-term financial stability. The Basel Committee's programme to promote a more robust supervisory and regulatory framework for the banking sector has five key components: strengthening the regulatory capital framework; increasing banks' liquidity buffers; enhancing bank governance, risk management and supervision; improving market transparency; and deepening cross-border supervisory cooperation for internationally active banks. Taken together, and reinforced through a macroprudential approach to regulation and supervision, these efforts will promote a banking sector that is more resilient to future periods of economic and financial stress and help reduce systemic risk.

Supervisors and central banks have taken swift and unprecedented actions to mitigate the effects of the financial crisis that began in mid 2007. The scale and significance of the measures taken demonstrate the special place banks and other systemically important financial institutions have in the modern economy and reemphasise the need for effective regulation and supervision of this crucially important sector in the global economy. The financial crisis has exposed many examples where bankers have strayed from the basic principles of sound risk management and underwriting practices and where supervisors did not sufficiently probe and follow-up on these weaknesses. While other factors contributed to the crisis beyond weaknesses in risk management, regulation, and supervision, to one degree or another, bankers, policy makers and supervisors must confront the fact that they did not prevent the eruption of this crisis or constrain its virulence.

As a result of the crisis, banks and other financial market participants have sharply (and perhaps rationally when viewed on an individual basis) deleveraged their balance sheets. The result of this deleveraging process has been a contraction in lending and hence, a large decline in the real economy, with second round effects impacting other credit portfolios, such as retail and commercial real estate loans. The speed and scale of these developments have been nothing short of astonishing and the response by the official sector also has been unprecedented and covered a wide range of measures. The official sector, including supervisory authorities, continues to work nationally as well as across borders to keep the crisis from worsening and to encourage the resumption of lending activities to support the real economy. In addition, supervisors are working to develop a coordinated strategy to put the banking system on a sound footing over the longer term. Such efforts will further reinforce near term confidence-building measures and provide a long term target around which national and global policy making efforts can converge.

1 | THE FINANCIAL CRISIS: WHAT WENT WRONG?

As has been the case with past financial downturns, the violation of fundamental risk management principles

is a key cause of today's problems. While there were a number of causes that contributed to the crisis, it was the combination of several factors that helped form the perfect storm which culminated in the severity of the crisis we are now facing. For example, excessively loose monetary policy led to the availability of easy credit, and a large amount of pre-crisis, system-wide liquidity. This, together with a booming global economy and exuberant capital markets, contributed to excessive risk taking and an aggressive "search for yield". Moreover, poor incentives arising from the originate-to-distribute (OTD) model helped fuel unsustainable leverage within and outside the banking sector, compounding the effect of already high levels of consumer debt. Some of this mortgage debt was poorly underwritten and, in some cases, originated by firms that were un- or under-regulated, thus revealing regulatory gaps in some important segments of the financial system. At the same time, there were fundamental shortcomings in financial institutions' governance, of which the current risk management shortcomings are just a symptom.

The rapid growth of fair value accounting further compounded an already fragile situation. In the run-up to the crisis, many banks did not employ robust fair valuation techniques. This included, for example, failing to capture the uncertainty around liquidity estimates, model assumptions and counterparty credit risks. Many valuation techniques also relied too heavily on rating agency estimates. As liquidity in financial markets evaporated, credit spreads on structured products increased due to the higher liquidity risk premia. The wider credit spreads led to lower mark-to-market valuations, which in turn resulted in lower earnings and accumulated unrealised losses, and ultimately, an erosion in banks' capital. In response, banks sold assets to offset their growing leverage and liquidity needs but such "fire sales" of these instruments led to further mark-to-market losses.

Loan loss provisioning practices were less than adequate and also exacerbated the crisis. In particular, accounting standards that are based on the "incurred loss model" do not provide adequate scope for banks to exercise necessary judgement and to take a sufficiently longer term view of the inherent loss in a loan over its lifetime.

Finally, supervisory measures to identify and contain some of these damaging developments

were inadequate. While supervisors historically tend to focus on bank-specific issues, the crisis has illustrated that greater attention must also be paid to the broader aspects of financial stability. For example, excessive leverage, risk concentrations and maturity mismatches – whether on- or off-balance sheet – can in combination have severe consequences for entire sectors, the broader financial system and the global economy. One of the main lessons from this turmoil is that both bankers and supervisors need to remain focused on the financial system as a whole, as well as the longer term horizon.

1|1 Liquidity

Available liquidity, due to its abundance prior to the crisis, was often treated as a free good by banks. This was particularly damaging for banks as they developed and invested in complex structured products, with little or no consideration of the potential for these products to become illiquid. Off-balance sheet exposures were often not considered as potential liquidity draws on the firm, especially products with a recent or limited history of *not* requiring liquidity. For instance, since there had been extensive liquidity in the system for several years, many contingent commitments had been issued, but not drawn upon. This illustrates the hazards of risk management relying on a data series that does not incorporate a period of stress. As both asset and funding markets had been liquid for an extended period, banks did not consider stress scenarios that involved key asset and funding markets drying up. Banks also usually did not consider the interaction of credit, market and liquidity risks and rarely considered a sustained period of liquidity stress. In combination, these factors left the banking sector with inadequate liquidity cushions to absorb the current period of stress and ultimately required massive injections of liquidity by central banks.

During the initial phase of the current crisis, the lack of asset and funding liquidity was particularly acute. Liquidity in certain asset and funding markets completely disappeared, even for normally "reliable" markets such as the interbank market, for a much longer period than the vast majority of market participants had envisioned. The lesson drawn from this experience is that banks' resilience to system wide liquidity shocks – affecting both market and funding liquidity – should be significantly increased and their management of this risk strengthened.

This is also an area which requires much greater supervisory attention going forward.

The recent market turbulence has shown that banks must strengthen their liquidity buffers. One way for banks to accomplish this is to increase their holdings of high quality liquid securities, in particular, liquid government securities. The size of these cushions should be dimensioned according to banks' stress tests and contingency planning exercises. In addition, while liquidity risk cannot be entirely mitigated with capital, capital can help improve the liquidity profile of a firm since, unlike other liabilities, much of regulatory capital does not have to be repaid. Furthermore, a strong capital buffer enhances a bank's creditworthiness and, from the market's perspective, reduces its counterparty risk and helps to ensure continued access to funding.

1|2 Capital adequacy

It is now clear that the level of risk was grossly underestimated by many financial institutions during several years of high, often record, profits. The crisis also has emphasised the importance of not only the *level* of banks' capital but the *quality* as well. Over the last year and a half, high losses have put pressure on banks' capital cushions and impaired their ability to lend. Many banks have been forced to replenish their capital base. A strong, capital buffer is necessary to absorb unexpected losses and Basel II was designed so that more risk-intensive activities required higher capital cushions. In addition to strengthening the risk coverage of the Basel II framework, the Committee is working to increase the quality and global consistency of the capital base backing banks' risk exposures.

1|3 The originate-to-distribute model

An important driver behind the build up of leverage in the financial system was the shift by many global banks to an OTD business model, which these banks increasingly employed to transfer various risks, including subprime, to the market. To this end, banks repackaged loans that they had originated into securitisations – often legally set apart in the form of special purpose vehicles – and distributed or sold them to investors instead of keeping them on their balance sheet.

A significant problem associated with the OTD model was one of incentives. Instead of the traditional focus on a borrower's ability to repay a loan, many banks focused instead on generating a high volume of loans, and booking as income the fees received for originating the mortgage loans. Many firms chose not to invest the necessary time and resources to perform thorough credit analysis and underwriting since another party would be purchasing the mortgage. Unfortunately, many banks that also retained significant interests in a securitisation (e.g., in the most senior tranches) also failed to manage their exposures appropriately.

Investors also did not perform adequate due diligence, particularly when a structured security was highly rated. Instead, investors relied on the due diligence of originators and packagers, who lacked the incentives to perform this function adequately. In addition, investors placed undue reliance on the judgments of the credit rating agencies, the capacity of modern financial modelling, and diversification to manage financial risks. The ratings attached to structured products further catalysed the OTD process as too many investors blindly trusted them without assessing the underlying assets.

Some tranches that were labelled AAA by the rating agencies carried spreads of 200 basis points above the risk-free rate, indicating that some investors were aware that not all AAA-ratings were equal, but many investors did not consider the risks beyond those captured by the ratings. On one hand, ratings did not serve as reliable measures to convey the riskiness of mortgage-backed portfolios, whereas on the other, many investors were insufficiently aware of the exact nature of the ratings, which do not cover other risks such as volatility, liquidity, market and correlation risk.

Although securitisation has its merits and can contribute to the financial system's liquidity and efficiency, the crisis has clearly shown that the OTD model needs to be implemented much more carefully. A fundamental premise of the OTD model is easy, accessible liquidity. The extreme difficulties and ruinous results stemming from the absence of well-functioning and liquid capital markets were laid bare by the crisis.

1|4 Unsustainable leverage

Many parties in the financial system, particularly banks and securities firms, took on excessive levels of risk. Leverage was both on- and off-balance sheet, explicit and embedded in complex products. Essentially, by applying a myriad of leverage strategies that were aimed at meeting the market's profitability demands, the banks made themselves highly vulnerable to economic and financial shocks. Eventually, deterioration in the US subprime mortgage sector, which constitutes a relatively small part of the global financial market, was the catalyst for the financial crisis. Uncertainty about losses on mortgage-backed securities and other related assets and, hence, about their valuation, coupled with a generalised heightened risk aversion, resulted in large write-offs. This, in turn, resulted in a rapid erosion of banks' existing capital buffers.

Further leverage and term-structure mismatch risk arose where mortgage-backed securities were financed with short term commercial paper that was sold with credit enhancements and liquidity support. As a consequence of this disregard of the risks inherent in structured products and funding vehicles, the systemic scale of the subprime bubble was severely underestimated, as was the degree of risk concentration throughout the system. While exposing themselves to subprime tranches, banks effectively took on greater leverage via off-balance sheet vehicles in ways that generally were not reflected in the Basel I and ordinary leverage ratios. When losses emerged that quickly wiped out the junior and often the mezzanine tranches as well, some banks realised that they needed to provide support to investors for reputational reasons. Risks which banks had considered as transferred to other market participants actually came back to the banks and the capital and liquidity buffers of some banks were significantly impaired as a result. These banks' capital buffers were further impaired by losses in the value of tranches that the banks themselves held.

The affected banks and securities firms had to quickly reduce their leverage. The market demanded much higher simple tangible equity-to-asset leverage ratios, and many had taken their eye off the ball of this type of basic metric. As a result, banks had to reduce their

lending, which has had negative consequences for the real economy. As asset values declined due to lack of demand and uncertainty about their true value, complex financial products and financial institutions not involved in subprime lending were also adversely affected due to the overall uncertainty and lack of confidence in the market. This expanded the impact of the crisis by damaging funding possibilities and asset sale prices on a system wide scale.

1|5 Risk management and governance

As I noted earlier, many banks failed to practice some of the fundamental aspects of risk management and governance. While risk-taking and leverage are essential elements in banking, the manner in which these elements were managed and controlled was inadequate. In addition, complacency on the part of bankers and supervisors certainly played a role. The banking industry was exceedingly optimistic during times of benign economic conditions. In such instances, it can be difficult to maintain a proper perspective and to exercise prudent judgment when your competitors are generating high volumes of business. An obsessive drive to generate high short-term profits also contributed to the crisis. This myopic outlook led to generous bonus payments to employees without proper regard to the longer-term risks they imposed on their firms. These perverse incentives amplified the excessive risk-taking that severely threatened the global financial system and left firms with fewer resources to absorb losses as risks materialised.

Financial crises are repeatedly characterised by the failure to adhere to basic risk management principles, especially during times of benign economic conditions and rapid financial innovation. In hindsight, supervisors did not always take the difficult decisions to correct these failures by, for example, dampening lending to non-creditworthy borrowers or constraining leverage.

At the core of it all is poor underwriting standards. This point can not be emphasised enough. Everything else down the securitisation chain is affected by this

initial shortcoming. This crisis is no different from others in that weakness in many banks' fundamental underwriting principles was, among other factors, a key contributor to the asset quality problems that have arisen. In addition, poor risk management at a number of firms resulted in a massive build-up of risk concentrations within and across institutions that further compounded already weak asset quality. These banks were caught unaware by concentrations to subprime loans that they had in their traditional loan portfolios, in trading books, in off-balance sheet vehicles, and with counterparties. Many did not understand their full exposure to subprime mortgages, particularly when they purchased structured credit products, eg collateralised debt obligations backed by residential subprime mortgage-backed securities (i.e. so-called "resecuritisations"). Poor asset quality and excessive risk concentrations are the core of the subprime mortgage problems. Banks and supervisors must intensify efforts to ensure that sound underwriting standards are in place and adhered to, and that there are adequate, systematic procedures for identifying firm- and system-wide risk concentrations.

2| THE BASEL COMMITTEE'S STRATEGIC RESPONSE

The financial crisis is without precedent in this generation and likewise so has been the official sector response. In formulating responses to the financial crisis, it is necessary to address both the near term challenges related to the weakening economic and financial situation and the long term regulatory structure issues. The two are linked and it is important to manage carefully the transition from current measures to a more sustainable long term framework.

It is critical that supervisors have a comprehensive strategy to deal with both phases of the crisis and their associated impact on banks. That is essential if we are to restore stability to our financial systems and economies. When it comes to the long term, there is a need to establish a clear target for the future regulatory system which substantially reduces both

the probability and severity of a crisis like the one we currently are working through. Providing clarity about the future regulatory framework will help to re-establish near term confidence, reduce the risk of competitive distortions and limit the degrees of uncertainty for the public and private sector. Also, by emphasising that these reforms will be phased in over an appropriate horizon, we reduce the risk that our own actions contribute to procyclicality in the system.

The Basel Committee has and will be undertaking a number of steps to produce a more robust supervisory and regulatory framework for the banking sector. Such a framework needs to have five key components:

- strong regulatory capital,
- robust standards for bank liquidity management and supervision,
- enhanced risk management and supervision,
- better transparency,
- cross-border supervisory cooperation.

2|1 Regulatory capital

The Basel Committee has underscored the importance of a strong capital base as a necessary condition for a strong banking sector. The level of capital in the banking system needs to be strengthened to raise its resilience to future episodes of economic and financial stress. The Committee will do this through a combination of initiatives. The objective will be to arrive at a total level and quality of capital that is higher than the current Basel I and Basel II frameworks and appropriate to promote the stability of the banking sector over the long run. This effort will be phased in over a time frame that will not aggravate the current stress.

The three pillars of the Basel II framework were developed to provide a more resilient capital framework than Basel I with multiple safeguards built into it. In response to the crisis, in January 2009 the Committee issued for public consultation a series of proposals to enhance each Pillar of Basel II

and it is considering additional areas for potential future development.

RISK COVERAGE

First, the Committee strives to ensure that key risks are identified, managed and captured in the capital framework. Financial innovation is a necessary and desirable element of any vibrant and growing financial system but only if it is accompanied by commensurate advancement in risk management techniques and supervision.

One of the most procyclical dynamics has been the failure of risk management and capital frameworks to capture key exposures in advance of the crisis. For example, the risks arising from securitisation activities –especially resecuritisations– as well as certain trading book exposures were not sufficiently recognised, with inadequate capital held against these exposures. As I noted earlier, I could also point to exposures to complex financial instruments that experienced severe declines in value because of impaired liquidity. The Basel Committee's response therefore is to enhance the Basel II framework so that risks are more comprehensively and more accurately covered as they are taken on. The recently proposed enhancements to the Basel II framework include measures to increase capital for certain complex products, including resecuritisations. The crisis has shown that resecuritisations are more highly correlated with systematic risk than are traditional securitisations. Resecuritisations, therefore, warrant a higher capital charge.

The Committee also proposes to require that banks obtain comprehensive information about the underlying exposure characteristics of their externally-rated securitisation positions, both within and across structures. Failure to conduct such due diligence would also result in higher capital requirements.

In *Revisions to the Basel II market risk framework and Guidelines for computing capital for incremental risk in the trading book*, which the Committee also published for public consultation in January 2009, the Committee set out guidance to increase the capital backing exposures held in the trading book, where many banks have experienced the majority of losses to date. Our goal is to help ensure that the amount of capital held at banks will reflect (and prudently constrain) risks which the banks are taking.

QUALITY OF CAPITAL

In addition, the composition of this capital buffer is important both for the utilisation of the buffer in times of stress, as well as in maintaining market confidence. One way to help achieve this is by strengthening the quality, consistency and transparency of the highest forms of Tier 1 capital. A clear definition of capital needs to be transparent and must be global to ensure competitive equality. The Basel Committee already has a strong foundation for such a definition, namely common equity and reserves. We are now taking steps to address the many differences related to definitional issues, such as deductions from capital and the treatment of prudential filters. This will help to harmonise a definition of capital across jurisdictions so that there is more comparability and market trust regarding the quality of capital buffers from bank to bank.

PROCYCLICALITY

Third, we need to address procyclicality. Procyclicality is a complex issue and it is the product of many factors. At the most basic level, it is the result of animal spirits, which produce exuberant behaviour in the upswing of the cycle, and fear during the downturn. We cannot change this behaviour, but we can seek to dampen the channels through which it manifests itself. These include accounting and capital frameworks, liquidity regimes, risk management and compensation, margining, basic infrastructure, transparency, and the way supervision is carried out. In the case of the regulatory capital regime, we need to address any excess cyclicality in minimum requirements over the credit cycle while maintaining appropriate risk coverage and sensitivity. The Committee is also working to promote strong provisioning practices over the credit cycle. In addition, the Committee has put in place a process to systematically assess the quantitative impact of Basel II on the level and cyclicality of capital, and will take appropriate steps if the results of the capital monitoring suggest the capital framework is unduly procyclical.

But even more importantly, we need to build countercyclical buffers into capital frameworks and provisioning practices. This will help ensure that reserves and capital are built up during periods of earnings growth, so that they can be drawn down during periods of stress. The Committee is working to translate this important principle into a concrete

proposal. The approach needs to have robust standards that can be applied at the global level and translated into national contexts.

SUPPLEMENTAL MEASURES

Finally, the capital framework needs to be underpinned by a non-risk based supplementary measure. Just like we expect banks to manage to a variety of measures when they assess risk (such as net and gross exposures, VaR and stress tests), supervisors also must not be constrained by evaluating risk through the lens of a single, risk based measure. We need the risk based measure (i.e. Basel II capital requirements) to interact with a simple metric that can act as a floor and help contain the build up of excessive leverage in the banking system, one of the key sources of the current crisis. The Basel Committee is working to develop by the end of 2009 a specific proposal in this area. Key principles guiding this work are that the measure must be simple and transparent, and it must address issues related to accounting differences and off-balance sheet exposures, among others. Finally, it needs to interact with the risk based measure in a prudent but sensible manner.

Once these different streams of work are further advanced, taken together they will form the basis for the Committee's assessment of the appropriate level of minimum capital that should be put in place over the long term. But whatever we do – and this gets back to my link between the near and long term – we must not raise global capital requirements in the middle of this crisis. Capital buffers are there to be used and we must provide a clear road map where we are headed.

2|2 Liquidity management and supervision

Capital is a necessary condition for banking system soundness but by itself is not sufficient. Of equal importance is a strong liquidity base. Many banks that had adequate capital levels have still experienced difficulties during the crisis because they did not manage their liquidity in a prudent manner. As market and public confidence in a bank is dependent on a bank's ability to meet payment obligations in a timely manner without taking actions that would adversely affect the bank, a liquidity shortfall, real or perceived, at a bank can seriously undermine

market confidence. This could potentially lead to a suspension of further transactions with the bank and its very rapid demise as it no longer has access to funding sources.

In response to these shortcomings, the Basel Committee last September issued its *Principles of sound liquidity risk management and supervision*. These principles were designed to strengthen banks' liquidity risk management. They focus on the governance, measurement, management and monitoring of liquidity risk. The guidance requires banks to incorporate the cost of liquidity in internal transfer pricing, capture liquidity risks posed by intraday transactions, appropriately manage collateral and measure potential increases in haircuts. It also sets standards for stress tests and mandates that banks develop stress tests which capture a broad range of both asset and funding liquidity risks and the interactions with other types of risks. Both a bank's contingency funding plans and the size of its liquidity buffer must take account of the stress test results. Finally, the guidance requires that banks maintain strong liquidity buffers comprised of high quality liquid assets.

The issuance of the principles was a significant step toward setting a new global soundness standard for what constitutes robust liquidity risk measurement, management and supervision. But this was only the first step. The next step is to monitor implementation of the principles and we have put in place a process to do just that. We also are developing benchmarks, tools and metrics that supervisors can use to promote more consistent liquidity standards for cross-border banks.

2|3 Better risk management and supervision

Having stronger global standards for capital and liquidity is important, but this is not enough. If firms have poor governance and risk management cultures or if supervision lacks independence or is weak, then we could again find ourselves with the types of problems we are now facing.

The Committee has expanded Basel II's supervisory review process —Pillar 2— to raise the bar for

risk management and supervision practices. The Committee's Basel II enhancements published in January 2009 included supplemental Pillar 2 guidance. The purpose of this guidance is to address the flaws in risk management practices revealed by the crisis, which in many cases were symptoms of more fundamental shortcomings in governance structures at financial institutions. The guidance focuses on firm-wide governance and risk management; capturing the risk of off-balance sheet exposures and securitisation activities; more effectively managing risk concentrations; and providing incentives to better manage risk and returns over the long term, including compensation practices.

The supplemental Pillar 2 guidance also addresses valuation practices, which is more fully covered in a set of principles recently issued by the Committee, *Supervisory guidance for assessing banks' financial instrument fair value practices*. This guidance assists banks and banking supervisors in strengthening valuation processes for financial instruments. Among other things, the principles promote strong governance processes around valuations and strong supervisory oversight around bank valuation practices. The Committee has also initiated work to promote enhanced provisioning approaches. Such approaches to recognise and measure loan losses would incorporate a broader range of available credit information. The financial crisis has highlighted the importance of prudent, well-informed standards and supervisory guidance. Critically, however, it has also underscored the need to effectively and consistently implement such standards. While Basel II implementation issues, supervisory colleges and home-host issues remain a high priority, the Committee will redouble its efforts to promote implementation of all Basel Committee standards in an internationally coordinated and consistent manner.

There is also a need to move towards a macroprudential approach to supervision. What does this mean? In our discussions in the Basel Committee, we have emphasised the need to focus supervision not just on the soundness of individual banks but on broader financial stability objectives, to consider the systemic impact and implications of financial sector developments, growth, and risks. This should inform where we focus our supervisory resources and how we design our supervisory and regulatory tools.

2|4 Transparency

Confidence among counterparties, investors, analysts and other market participants is a crucial element for the well-functioning of any financial system. One of the main amplifiers of the crisis was the lack of transparency regarding the risk profile of institutions and structured products, which led to a massive reduction in investment in the financial sector by investors and counterparties. This further exacerbated the deleveraging process. Moreover, the process by which structured products are valued often lacks rigour, leading to further market uncertainty surrounding the actual value of assets during a time of stress and less confidence regarding the strength of banks' balance sheets.

To help mitigate this behaviour, the third pillar of the Basel II framework –market discipline– sets out a series of required disclosures that are intended to complement the other two pillars of the Basel II framework. This should allow market participants to assess capital adequacy of a bank through key pieces of information on the scope of application, capital, risk exposure and the risk assessment process. The Committee's January 2009 proposals for enhancing Pillar 3 are focused on disclosures related to securitisation, off-balance sheet exposures and trading activities. We believe that these proposed enhanced disclosure requirements will help to avoid a recurrence of market uncertainties about the strength of banks' balance sheets related to their capital market activities.

2|5 Cross-border supervisory cooperation

The financial crisis has provided an abundance of examples highlighting the importance of supervisory cooperation. Indeed, a key initiative of the Basel Committee is to further enhance cooperation of supervisors globally and to facilitate an efficient exchange of information. Such coordination and communication is the basis for promoting robust

risk management practices and developing sound supervisory standards. Cross-border cooperation is also a prerequisite for establishing effective resolution techniques for systemically important banks having cross-border operations. The Committee is well along the way in evaluating the range of issues associated with the resolution of complex global banking organisations, factoring in the lessons of the current crisis. Before the end of this year we will be putting forth recommendations to strengthen the resolution process of cross-border banking groups. However these are difficult issues that will require a sustained effort by regulators, legislators, central banks and the private sector.

The need for effective systems of deposit insurance to help maintain public confidence is another lesson of the financial crisis. In response, the Basel Committee and the International Association of Deposit Insurers (IADI) collaborated to develop *Core principles for effective deposit insurance systems*. These core principles set an important benchmark for countries to use in establishing or reforming deposit insurance systems and address a range of issues including deposit insurance coverage, funding and prompt reimbursement. They also address issues related to public awareness, resolution of failed institutions and cooperation with other safety net participants including central banks and supervisors.

One of the clear lessons of the crisis is that risk management and supervision need to maintain pace with financial innovation. The Committee's efforts to improve risk management and supervision will help raise the bar in these areas. In addition, the Basel Committee and its governing body, central bank governors and heads of supervision, recently agreed to expand the Committee's membership and invite representatives from the following countries to join the Committee: Australia, Brazil, China, India, Korea, Mexico and Russia. The Basel Committee's governance body will also be enlarged. The Committee believes that this expansion in membership will enhance the Committee's ability to carry out its core mission, which is to strengthen regulatory practices and standards worldwide.

Taken together, the recent and planned initiatives of the Basel Committee will promote a more robust banking sector and limit the risk that weaknesses in banks amplify shocks between the financial and real sectors. Because the measures are far reaching and ambitious, they will need to be phased in over a reasonable timeframe.

The efforts of the Basel Committee need to occur in a broader context of achieving the right balance between the scope and depth of regulation. Failure to produce adequate regulation for other "bank like" activities means that tighter regulation in the banking sector will just lead to the activity migrating elsewhere. This highlights the importance of activities of other bodies like the G20, the Financial Stability Board and the Joint Forum to ensure that all sectors are subject to an appropriate degree of regulation, oversight or transparency commensurate with their systemic significance. The Committee will continue to actively contribute to these other efforts.

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Below are listed all of the articles published in the *Financial Stability Review* since its inception. These studies are available on the Banque de France's website (www.banque-france.fr).

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