Policy lessons from the recent financial market turmoil

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It is a great pleasure and honour to join you on the occasion of the 2008 CEMLA Governors' Meeting in Ottawa. For this privilege, I would like to thank Governor Mark Carney, CEMLA and all those who have contributed to the excellent organisation of this conference at the Bank of Canada.

Since mid-March, global risk appetite has recovered somewhat in financial markets, perhaps reflecting a perceived decline in systemic risk. But it is premature to declare the end of the financial turmoil which we have seen since August 2007.

Therefore the policy lessons from this turmoil can only be preliminary. No one knows how long the present deleveraging process will take, what its precise dynamics will be, and what feedback effects this will have on the real economy. We do know, however, that this deleveraging will have to run its course, and that it has to be accompanied by deflation in asset prices until a new equilibrium is found. As history has shown, this process can be costly and painful.

This may be even more relevant in the present turmoil because current disturbances in credit markets are interacting with the uncertainty created by two major (twin) disequilibria in the real economy:

– one real sector disequilibrium is in housing markets in the United States and a number of other countries;

– a second major real disequilibrium is the persistence of large external current account imbalances.

1. Main features of the global credit crisis

Before turning to future prospects and policy lessons, it is important to step back and look at what in the financial turmoil was not a surprise and what was a sheer surprise.

Surprises and non-surprises

What was not a surprise was the repricing of credit risk. The turn in the credit cycle had been envisaged by the central banking community and was indeed discussed in the BIS June 2007 Annual Report. The need for a correction after years of excessive compression of credit spreads and evident mispricing of risks was widely recognised, and the unsustainable build-up of housing credit excesses had also been well documented.

What came as a surprise was the securitisation crisis and its spillover to the money markets. From this perspective, the emergence of a so-called "shadow banking system" (off-balance sheet special purpose vehicles) had been unnoticed. Moreover, the turmoil surprisingly hit the heart of the financial system, in particular the large global banks and the interbank money markets with an unprecedented widening of Libor-OIS spreads. Furthermore, there was an underestimation of the leverage and hence an overestimation of the capital buffers in the financial system. The initial presumption that large banks were very well capitalised turned out to be wrong, and this also came as a surprise.

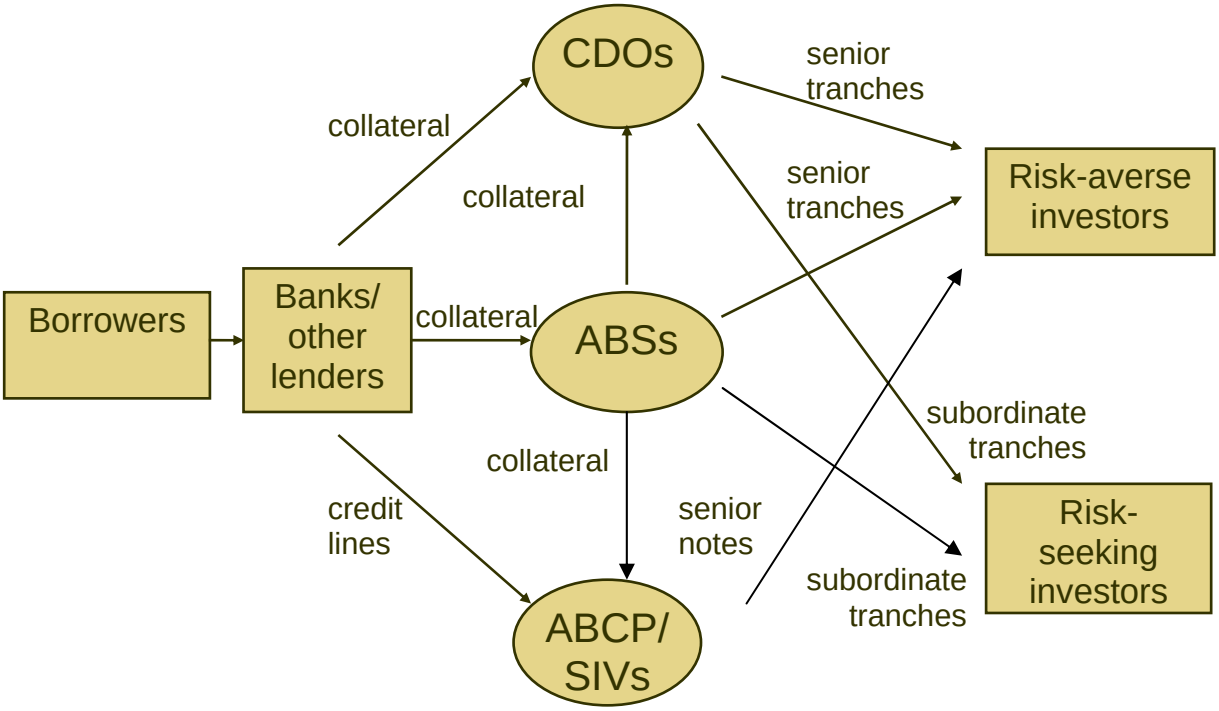
Three key features

These surprises and non-surprises underscore three key features of the ongoing financial turbulence: excessive and hidden leverage; excessive complexity; and imprudent financial alchemy.

The first key feature was excessive and hidden leverage. The 2007 global credit crisis was preceded by a sizeable credit boom. What was new was that the boom was amplified and so to speak leveraged by financial innovation. Indeed, the leverage in the global financial system was much greater than one would think when looking only at the balance sheets of regulated financial institutions, mainly because of the new leverage possibilities provided by the "shadow banking system" (Figure 1).

Figure 1

The shadow banking system

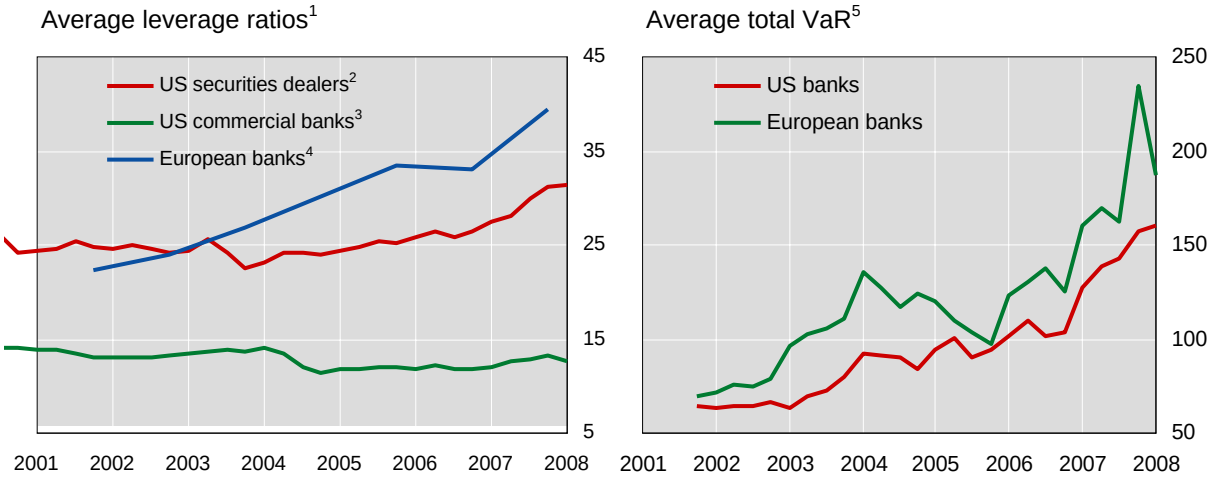


Some evidence of rapid asset growth and increased risk-taking leading to higher leverage in the past few years can be clearly found in the balance sheet indicators of large banks. The left-hand panel of Graph 1 shows that the average leverage ratio of the major US investment banks and European banks has increased markedly in the past few years. And a significant part of this leverage has been hidden. One common measure of risk in financial institutions is value-at-risk (VaR). As shown in the right-hand panel of Graph 1, this measure has risen

over the last five years. Moreover, these years were marked by a fall in volatility to very low levels, which masked the increasing leverage and risk-taking. This meant that underlying position-taking increased much more than indicated by the VaRs concerned. And indeed, when volatility bounced back in 2007, VaRs rose sharply as a result. The global credit crisis is thus in part a VaR crisis, ie a serious weakness of the VaR risk management technique.

Graph 1

Failure of the VaR technique: underlying position-taking increased as volatility was historically low



[1] Defined as the ratio of total assets/total shareholders' equity; unweighted average. [2] Including Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley. [3] Including Bank of America, Citigroup, JPMorgan Chase, Wachovia and Wells Fargo. [4] Including Barclays, BNP Paribas, Credit Suisse, Deutsche Bank, HSBC, Royal Bank of Scotland and UBS. [5] Market capitalisation-weighted average of value-at-risk data of Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, JPMorgan Chase, Morgan Stanley, Société Générale and UBS; index Q4 2002 = 100.

Sources: US Securities and Exchange Commission; financial reports of individual companies.

The second key feature was the excessive complexity of new structured finance products, which exceeded the comprehension of bankers, investors and regulators. As a result, disclosure about the risk exposure of financial institutions turned out to be inadequate and difficult to interpret, especially regarding their off-balance sheet holdings and credit risk transfer activities.

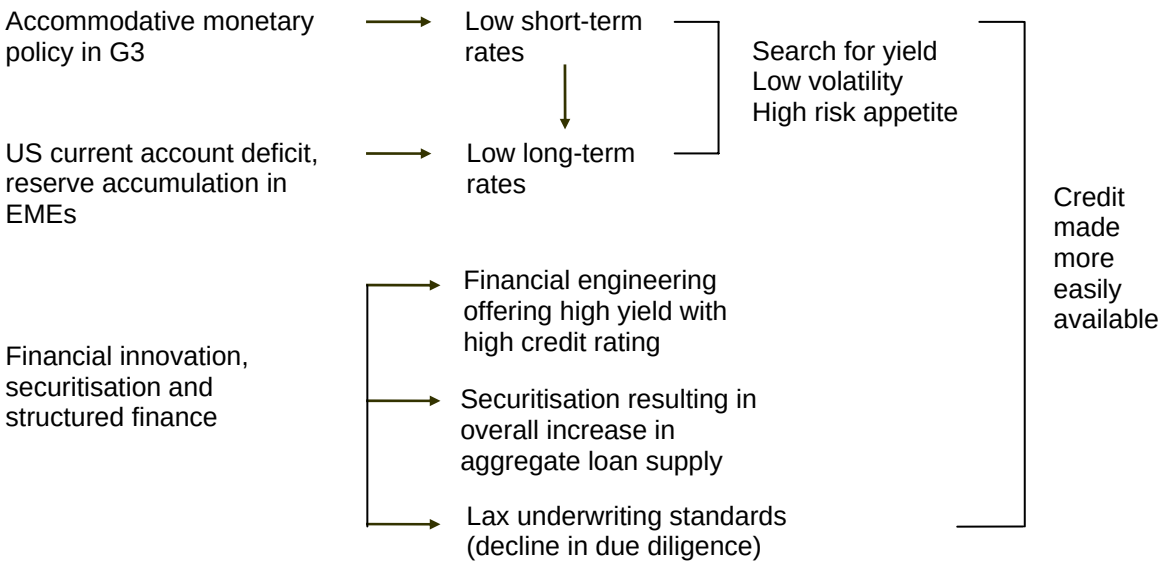
The third feature was imprudent financial alchemy. With the benefit of hindsight, it was a fundamental illusion to believe that financial engineering can create complex instruments that are both tailored to the needs of individual investors and, at the same time, tradable in liquid markets. It also proved an illusion to believe that structured finance would be able to offer, in a sustainable way, high yields without the corresponding risks – in other words, to break the traditional relationship between risk and return, like alchemists thinking they could magically transform lead into gold. These developments produced strong incentives to increase leverage in the system, as investors were attracted by these new higher-yielding but apparently still low-risk instruments.

The ingredients of the crisis

What are the factors that can explain the key features of the crisis detailed above? Figure 2 illustrates the main ingredients that in the years 2000–07 led to global credit excesses: first, accommodative monetary policies; second, large global imbalances and forex reserve accumulation; and third, very rapid financial innovation.

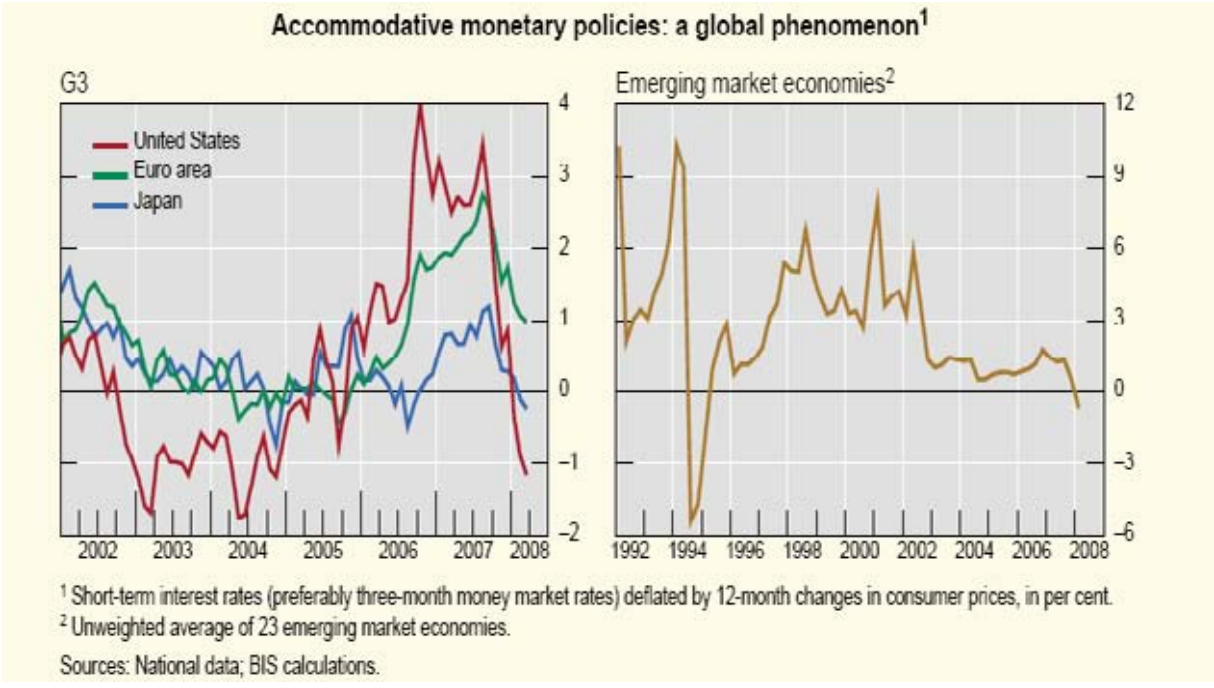
Figure 2

The three ingredients of the 2007 global credit crisis



The first ingredient is the accommodative monetary policy in the G3 countries, as manifested in low policy rates and low long-term rates. These low interest rates precipitated a search for yield and a high risk appetite, in a context of low volatility and low risk premia. What was new and unprecedented was that accommodative monetary policy had become a global (worldwide) phenomenon (Graph 2). Moreover, a large number of EMEs implemented a strategy aiming at resisting exchange rate appreciation by keeping interest rates at a level sufficiently low to avoid excessive short-term capital inflows. In addition, excess global saving relative to investment may also have contributed to exceptionally low real long-term interest rates.

Graph 2



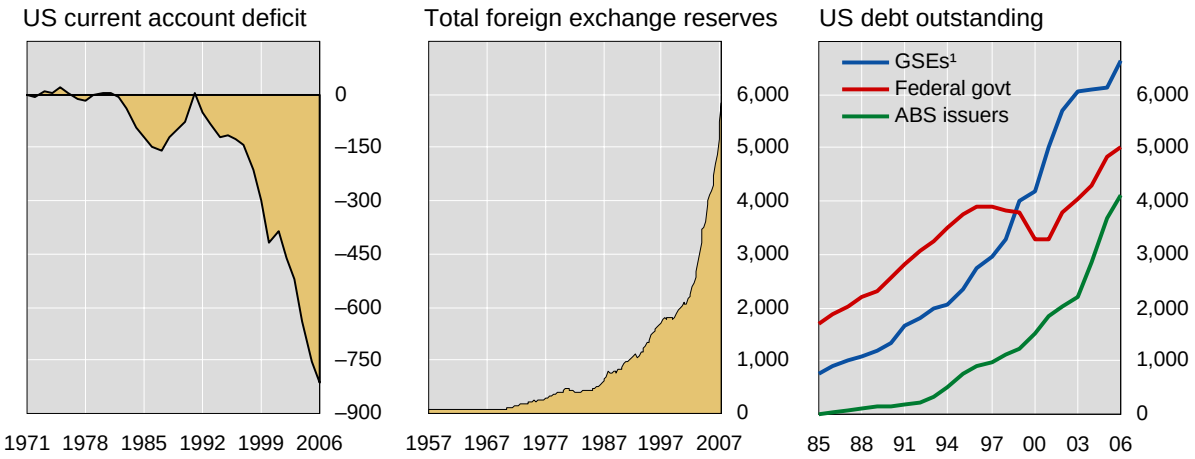
The second ingredient which led to the global credit crisis was the sharp increase in global imbalances. The massive rise in the US current account deficit has been largely financed by reserve accumulation by emerging market economies, possibly related to a global savings glut. A key element was that the strong increase in US net external liabilities in recent years reflected a large decline in US households' saving rate, which in turn was associated with rising US household leverage and buoyant US housing markets. Hence, the US current account deficit and the US housing credit bubble have been two faces of the same reality ("twin imbalances"). On the financing side of this deficit, those emerging market central banks willing to resist exchange rate appreciation through foreign reserve accumulation as well as commodity-exporting countries had a rapidly growing pool of dollar reserves to invest each year (Graph 3). At the global level, these foreign exchange reserves were mainly invested in sovereign securities, reinforcing downward pressures on long-term interest rates. At the domestic level, to the extent that reserve accumulation was not fully sterilised, it led to an expansion of money supply and therefore easy credit at home; and we know that sterilisation cannot always be perfect. In a nutshell, the resistance to exchange rate appreciation in emerging countries and the associated reserve accumulation contributed to the persistence of global imbalances and provided financing for US financial liabilities.

The third ingredient of the credit excesses was financial innovation in the form of securitisation, credit derivatives and structured finance. As mentioned earlier, financial engineering offering relatively high yields with high credit ratings proved to be a kind of imprudent alchemy whose exponents believed that they could transform lead into gold. This third ingredient was a key element of surprise in the 2007 financial turmoil. No one had anticipated the securitisation crisis and the structured finance crisis, or their spillover to the money markets and interbank markets.

Graph 3

Global imbalances and the US housing bubble are two faces of the same reality

In billions of US dollars



[1] GSEs plus agency- and GSE-backed mortgage pools.

Sources: IMF; Bloomberg; FinanceAsia.com.

Two paradoxes

In sum, two paradoxes relating to capital and liquidity have been revealed by the turmoil.

The first is that, after several years of high profits, the global banking sector was thought to be well capitalised. In fact, banks' actual capital buffers and provisioning proved to be thinner than desirable. Widely used VaR indicators of risk underestimated the rise in underlying position-taking during the period of low volatility.

The second paradox is that bouts of massive illiquidity occurred in certain financial market segments (such as those for complex structured products) within a context of overall excess liquidity worldwide.

2. Explanation for the crisis: macro versus micro approaches

In general, observers are divided into two groups when assessing the underlying causes of the current financial turmoil and understanding the two aforementioned paradoxes.

The first type of explanation observers come up with is the general macrofinancial explanation. The turmoil is seen as the long-run consequence of the easy global money and credit conditions that prevailed particularly from early 2002: accommodative monetary policies, accumulation of global reserves amplifying excess liquidity, and advances in financial technology. These elements led to a persistent rise in risk-taking and financial leverage.

The second type of explanation is the idiosyncratic or microfinancial explanation. The turmoil is the result of shortcomings in specific types of financial products and entities that have come into being in recent years: subprime mortgages, associated structured products, and bank-related structured investment vehicles (SIVs) and asset-backed commercial paper (ABCP) conduits. It is a securitisation crisis, risk management techniques having lagged behind overly rapid financial innovation.

The choice of the type of explanation of the causes of the current turmoil is central to determining how to address what is ***primarily*** a market failure (eg inadequate risk management practices, market abuses, perverse remuneration incentives), or a monetary policy failure, or both. An additional issue is whether the 2007 turmoil was also, subsidiarily, a supervisory policy failure.

I believe that the ingredients that played a major role in the current turmoil – monetary accommodation, global imbalances and financial innovation – suggest that the idiosyncratic type of explanation is not sufficient to capture the main features of the crisis. Admittedly, the crisis was triggered by very specific weaknesses in risk management, in the functioning of the originate-to-distribute business model of large internationally active banks, and in the financial regulation across financial institutions, markets and national borders. All these "micro" elements have to be addressed, and this is precisely the scope of the important report by the Financial Stability Forum's Working Group on Enhancing Market Functioning and Resilience, which presented its conclusions to the G7 Finance Ministers and central bank Governors in Washington on 11 April. But a more global, macrofinancial explanation is indispensable for understanding how the three ingredients I described earlier have been central in shaping the current financial turmoil.

3. Policy options to prevent financial excesses

What should policymakers have done to avoid the recent global financial turbulence? And what should be done, looking forward, to avoid the repetition of the serious financial excesses that we have seen?

There are ***three schools of thought*** on the crucial question of "what is preventable":

– The first school of thought considers that it is illusory to "lean against the wind". Asset price and credit booms are not preventable, and the real policy issue is to be ready to "clean up the mess" when the bubble bursts.

– The second school of thought considers that it is desirable to lean against the build-up of serious financial excesses. But monetary policy cannot deal with financial bubbles and asset price exuberance. Prudential and supervisory policy is instead the right tool for that.

– The third school considers that both monetary policy and macroprudential policy can and should be used to lean against the wind. A macrofinancial stability framework should be implemented to pre-empt financial excesses and "serial bubbles".

First school of thought

According to the first school of thought, financial booms are not preventable, and there is no reliable early warning system for financial shocks. There are indeed well known obstacles to the use of monetary policy as an instrument to pre-empt financial excesses. First, it is unclear whether a central bank can identify a bubble in progress. Second, the mandate of central banks is focused on price stability, and it is widely recognised that one cannot achieve two objectives with one instrument and that central banks should not try to control too many facets of the economy.

Hence, in this school of thought, central banks should confine themselves to being ready to "clean up the mess" after a sharp decline in asset prices. As a good illustration of this, G10 central banks have acted in a decisive way in the past 10 months to address the dislocation in money markets. They provided term funding on a large scale, added illiquid assets to their list of eligible collateral, widened the range of their counterparties in open market operations, established facilities for borrowing liquid securities (treasuries) in exchange for illiquid securities, provided exceptional emergency liquidity assistance, and occasionally complemented these liquidity-providing operations with policy rates cuts.

But measures for providing liquidity cannot address underlying credit problems: for instance, the temporary asset swaps offered by central banks were aimed mainly at liquefying currently ill-functioning asset markets, not at resolving credit risk weaknesses.

Second school of thought

The second school of thought recommends pre-empting financial excesses through regulatory and supervisory channels only. In this conception, it should not be the ambition of monetary policy to pre-empt financial excesses. Supervisory policy is instead the appropriate instrument for that. Central banks with supervisory authority can make bubbles less likely through strong supervision of the financial system, and macroprudential policies have to become more active in preventing boom-bust dynamics.

Third school of thought

The third school of thought recommends leaning against the wind by making use of ***both*** monetary and supervisory instruments to pre-empt serious financial excesses. In this

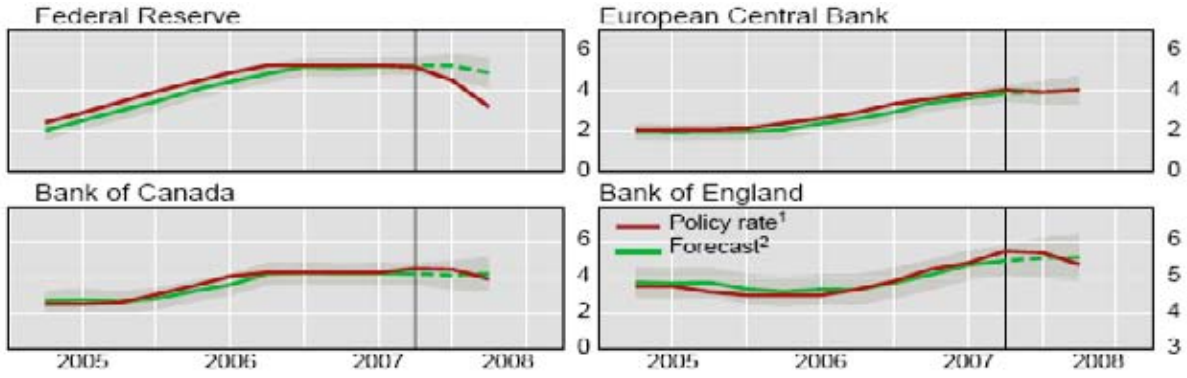
conception, macroprudential policy (the supervisory tool) has a crucial role to play in reducing the procyclicality in the financial system. But monetary policy ***also*** has a role to play in that respect. The recent financial turmoil suggests that monetary policy may have to counteract excessive credit expansion and asset price booms even if price stability were achieved. The key argument[1] is that central banks should not rule out leaning against the wind by raising interest rates to stop asset price bubbles and credit booms from getting out of hand: in other words, prevention is better than cure.

4. Policy lessons from the financial market turmoil

What are the lessons from the current turmoil that can help us analyse the respective merits of the three different schools of thought highlighted above?

Graph 4

Central bank reaction functions



[1] For Canada, overnight rate; for the euro area, interest rate on the main refinancing operations; for the United Kingdom, repo rate; for the United States, federal funds target rate. [2] Predicted values from the regression: $i_t = a + b(i_{t-1}) + c(p_t) + d(gap_t)$, where: i_t = policy rate, period average; p_t = inflation; gap_t = output gap. Quarterly data, sample period 1990-2007; dashed line represents dynamic forecast; shaded area represents +/- one standard error. The tight fit of the equation during the period up to mid-2007 is due in large part to the inclusion of lagged interest rates as explanatory variables. The influence of lagged rates diminishes steadily after Q3 2007 when values predicted by the model are used.

Sources: IMF; OECD; Bloomberg; national data; BIS estimates.

Monetary policy

As regards monetary policy, the first lesson is that there seems to be an emerging consensus that ***monetary policy can react to financial shocks***. However, views diverge on how central banks should react. Graph 4 shows estimates of central bank reaction functions during the second half of 2007 and early 2008. Simple equations linking policy rates to output gaps and inflation as well as lagged policy rates (to account for interest rate smoothing) are able to explain the path of policy rates relatively well in Canada, the euro area, Japan, Switzerland and the United Kingdom. The estimates thus suggest that the behaviour of the respective central banks was roughly in line with that observed in the past. By contrast,

[1] See William White, "Is price stability enough?", *BIS Working Papers*, no 205, 2006.

policy rates in the United States decreased by more than predicted on the basis of past responses to changes in the output gap and inflation.

The second lesson is that some central banks have clearly signalled the need for having a so-called ***risk management approach*** on the downside. Among the central banks of the major industrialised countries, the Federal Reserve falls perhaps most clearly into the category of central banks putting particular emphasis on such a risk management approach, implying that monetary policy must be pre-emptive in responding to financial market disruptions representing a tail risk to the economy.

The third lesson has to do with ***the asymmetry problem***. One can derive from Graph 5 that monetary policies have been arguably asymmetric in the past 10 years, with an accommodative bias, acting in a pre-emptive way against any sign of downturn (including downturns resulting from financial disruption) while being more reluctant to lean against the build-up of financial imbalances in good times. The question is whether reactivity to financial shocks should apply to financial booms and financial disruptions symmetrically. This asymmetry issue is reinforced by the recent concerns about the return of inflation: after a number of years when global excess liquidity and easy credit did not translate into higher inflation, we may now be experiencing (with a lag) the inflationary impact of past monetary easing.

Graph 5

[1] In per cent; weighted averages based on 2005 GDP and PPP exchange rates. [2] Uncentred 12-month moving average of annualised monthly changes in consumer prices. [3] Changes over 12 months. [4] Three-month money market rates deflated by 12-month changes in consumer prices.

Sources: National data; BIS calculations.

One could argue that the monetary pillar of the ECB's two-pillar strategy allows developments in money and credit aggregates to be taken into account in the conduct of monetary policy, thus providing room to lean against the wind in the event of an excessive credit boom. Another example in the same vein was provided by the Bank of Japan's decision in 2006 to introduce a new two-perspective framework. The first, monetary policy-related perspective focuses on developments affecting output and inflation over the one- to two-year horizon. The second perspective emphasises risks, and their associated costs, over a longer horizon. This approach implies that policy might be tightened even in situations where the risk of rising inflation over the short run is judged to be negligible.

In any case, it should be clear that asset prices are not an objective of monetary policy (central banks should obviously not target asset prices), but asset prices and credit aggregates can be an important indicator for monetary policy.

Macroprudential policy

Moving now from monetary to macroprudential policy, the 2007 credit crisis has highlighted, first, the need to address risk management weaknesses. VaR-type methodologies have proven procyclical and unable to prevent excessive leverage in a context of very low volatility. Economic capital calculation based on such methodologies is a useful tool, but it should be complemented by stress testing and by basic judgment and simple indicators.

There are a few examples of this need for judgment. Economic capital and VaR techniques amount to transforming large nominal amounts into very small values-at-risk. This reduces the perceived order of magnitude of risk exposures and gives a false sense of comfort. The 2007 financial turmoil is a reminder that nominal and notional amounts do matter when looking at risk exposures. The same applies to the calculation of risk-weighted assets under the advanced approaches of the Basel II Framework, which in my view can be usefully supplemented with the monitoring of other simple and crude indicators. Similarly, low-correlation assumptions in economic capital calculation and valuation techniques may not hold in times of extreme stress, undermining the strategy of diversification.

A second lesson is that the need to "go back to basics" should be a key message instilled by supervisors going forward. The balance between complexity and simplicity will remain an important issue in the future. As stated by Alan Greenspan in a recent article: "The essential problem is that our risk models, as complex as they have become, are still too simple to capture the full array of variables that drive economic reality."[2] Supervisors have to keep pace with complex financial innovation and models, but at the same time they have to restore simplicity.

A third lesson is that supervisors may have overestimated the magnitude of existing capital buffers. Large global banks were not as well capitalised as was previously thought. The recent turmoil has also highlighted the weaknesses of Basel I and the need to implement Basel II. The Basel II Framework could have alleviated some of the weaknesses revealed by the financial turmoil if it had already been in place in key jurisdictions. This framework should thus be promptly implemented.

At the same time, all three pillars in the new Basel II Framework are currently being refined by the Basel Committee and further strengthened to reflect the lessons from the recent market turbulence and to tackle issues relating to off-balance sheet commitments and structured finance securitisation, including the capital charge on highly rated ABS-CDOs (ie resecuritisation). More generally, it is key to make sure that banks hold strong capital buffers over the cycle. Since the beginning of the turmoil in early August 2007, large banks worldwide are reported to have raised more than $250 billion of new capital,[3] which is in line with the FSF action plan to restore confidence.

Reducing the procyclicality in the financial system: is Basel II enough?

In this context, it is essential to be clear on the fact that while the Basel Committee sets minimum standards, national regulators and supervisors can impose additional measures that go beyond the minimum requirements. This is at the heart of the Pillar 2 concept of the Basel II Framework, which, if properly implemented, will allow adequate capital cushions to be built up over the cycle. I would highlight four examples of additional macroprudential

[2] *Financial Times*, 17 March 2008.

[3] Bloomberg's estimate for around 60 of the largest banks and securities firms that have sold shares or subordinated debt that is considered capital.

measures taken by national supervisors to complement the Basel Committee's minimum standards:

(1) Maximum loan-to-value ratios for mortgage loans in several countries.

(2) A capital charge on SIVs in Spain.

(3) A leverage ratio in US regulation.

(4) Dynamic provisioning in Spain.

- *Loan-to-value ratios for mortgage loans in several countries*. While Basel II may lead to a reduction in capital requirements for retail residential mortgage exposures compared to the less risk-sensitive Basel I Framework, the imposition of prudential limits such as maximum loan-to-value ratios would certainly help build a buffer against ex post deterioration in credit qualities and collateral values.
- *Capital charge on SIVs in Spain*. The Bank of Spain undertook an interesting move to complement Basel I in the area of securitisation. Several years ago, when Spanish banks asked for permission to set up SIVs, the central bank imposed an 8% capital charge against SIV assets. This effectively made SIVs unattractive to Spanish banks.
- *Leverage ratio in US regulation*. It is also important for supervisors to complement their use of the Basel II Framework with a wide range of indicators. Under current US bank capital regulation, capital ratios based on risk-weighted assets under Basel rules are important, but the leverage ratio also plays a role. The leverage ratio is a simple and robust indicator designed to constrain the maximum degree to which a bank can leverage its equity capital base.
- *Dynamic provisioning in Spain*. As a final example, in 2000 the Bank of Spain introduced a system of prudential provisioning to complement existing specific provisioning arrangements. The main idea was to set a floor under the fall in provisions during the upswing in the credit cycle. This creates a prudential cushion that can be drawn upon as the cycle turns. By contrast, the IFRS provisioning rules, based on incurred losses and not on expected losses, are procyclical.

This finally brings us to the suggestion of developing a macroprudential framework, as advocated since the early 2000s by the BIS. This approach starts from the observation that systemic risk and the time dimension of risk are not properly addressed by traditional microprudential supervision. Under microprudential regulation, each individual institution is the unit of analysis and supervision. In contrast, macroprudential approaches focus on the system as a whole, and the linkages with the macroeconomy ("looking at the wood and not just at the trees"). Moreover, macroprudential approaches make it possible to capture the time dimension of risk and to address the concern of excessive procyclicality in the financial system. The basic principle is to encourage the build-up of cushions in good times, when imbalances typically emerge, so that they can be run down in bad times, as the imbalances unwind.

To conclude, in the light of the recent financial market turmoil, it might be useful for the central banking community to consider developing a macrofinancial stability framework in supervisory and monetary policymaking,[4] as an alternative to the "serial bubbles" that we

[4] Such a framework would, in particular, encompass the actions of prudential regulatory and supervisory authorities and macroeconomic policymakers – notably monetary authorities (anticyclical fiscal policy may also play a useful role in this connection, through fiscal restraint to moderate booms and reduce outstanding public debt in good times).

have experienced over the past 10 years: the dotcom equity bubble, the housing bubble, the credit bubble and perhaps the latest one, the commodity price bubble.