# Jarle Bergo: The Norwegian economy and financial stability

Speech by Mr Jarle Bergo, Deputy Governor of Norges Bank (Central Bank of Norway), at the Norwegian Savings Banks Conference, hosted by Fox-Pitt, Kelton, London, 7 November 2006.

*The* Charts in pdf-format *can be found on the Norges Bank's website.*

*The text below may differ slightly from the actual presentation. The speech is based on the assessments presented at Norges Bank's press conference following the Executive Board's monetary policy meeting on 1 November and Inflation Report 3/06.*

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First of all, let me tell you how pleased I am to be here with you at the Norwegian Savings Banks conference in the great city of London, and to share with you some views on the Norwegian economy and financial stability.

I shall structure my presentation as follows: First some stylised facts on our two economies, then set out the special challenges to a small, open, oil-rich economy. Next, I shall comment on the current economic situation and the prospects before I turn to financial stability issues.

Now, about our countries: The UK and Norway enjoy strong and close relations, not least trade relations and we have done so for centuries. Our first bilateral free trade agreement was signed between King Henry the third and King Håkon Håkonsson in 1223. Today the UK is our single largest export market and the fourth largest supplier of Norwegian imports.

We are also bound together by a common sea. We have developed our petroleum resources largely in parallel. The opening of a new gas pipeline from mid-Norway to Easington – Langeled – in October this year is yet another example of the tight bonds between us.

Comparing our two countries we find strong similarities - both are affluent, growing briskly, and experiencing low unemployment. Both are open economies with a significant public sector. The UK economy is, however, nearly eight times larger than the Norwegian economy and with a very large and well-developed financial sector, while Norway on the other hand has a much larger oil sector.

## Challenges in an oil economy

Norway ranks as the world's third largest oil exporter after Saudi Arabia and Russia and the eight largest oil producer.

Petroleum activities have contributed substantially to Norway's GDP, exports and government revenues since the late 1970s. Petroleum activities give Norway an economic base that is not available to many other countries.

But oil and gas also present Norway with considerable economic policy challenges. The experience of other countries that have received large, unexpected income from natural resources is not encouraging. Societies that suddenly gain access to huge wealth stemming from natural resources have a tendency to spend the money and then fall into decline.

Spain in the 17th century provides a good example of this, as the historian David Landes observed.[1] The colonisation of South and Central America gave access to a wealth of natural resources, not least gold. Spain chose to spend a large portion of the windfalls on luxury and war. More recently the expression "Dutch disease" reminds us that this issue is still relevant.

It can certainly be argued that easy money is bad for a country. It is tempting to live comfortably on this income – which actually is not income but drawing on wealth – while it lasts, and forget about and be less concerned about safeguarding other revenue sources. The challenges with large income from natural resources and its negative impact on economic growth have also been pointed out by Jeffrey Sachs and Andrew Warren.[2]

[1] David Landes (1998): The Wealth and Poverty of Nations, W.W. Norton & Company, Inc., N.Y.

[2] See e.g. J.D. Sachs and A.M. Warner (2001): "The curse of natural resources", *European Economic Review* 45, pp. 827 – 838.

Success in managing our petroleum wealth may be particularly dependent on four key factors.

First, from a long-term perspective, oil and gas production will take place during a limited time period. When oil is extracted and sold, petroleum wealth is transformed into financial wealth. This wealth belongs not only to our generation, but also to future generations. We must therefore manage the wealth as an asset.

Second, the size of the cash flow from petroleum activities varies considerably from year to year. If it were to be spent as it accrues, this would lead to strong cyclical fluctuations in the Norwegian economy.

Third, in terms of economic policy, an explanation for “the resource curse” has been that such “unearned” wealth leads to an extreme focus from various groups on acquiring as much of this extra wealth as possible. It is therefore important that the decision-making processes in the political sphere guard against this kind of “rent-seeking” behaviour.

Finally, petroleum revenue spending will have a serious impact on the competitiveness of Norwegian industry if spending is too rapid and variable. It is therefore important that we succeed in maintaining an industry structure that promotes learning, innovation and development, which can give us other sources of revenue than oil.

What we are trying to achieve is to transform petroleum wealth into financial wealth, to the benefit of future generations as well.

Nonetheless, the discounted value of our own labour force is our main asset. Our livelihood essentially depends, and will continue to depend, on our ability to efficiently produce goods and services and to use our creativity and innovation to become ever more efficient.

## Economic policy guidelines

During the first thirty years of the oil age, economic fluctuations, often linked to oil revenue spending, were strong. Against this backdrop and increasing demands for spending more, new economic policy guidelines were adopted in 2001.

A fiscal rule was drawn up for petroleum revenue spending over the central government budget. Government petroleum revenues are transferred to the Petroleum Fund, now renamed the Government Pension Fund - Global. The Fund serves as a buffer between current petroleum revenues and the use of these revenues in the Norwegian economy. According to the fiscal rule, future petroleum revenue will be added to the Fund while spending shall be limited to the expected real annual return on the Fund, estimated at four per cent. When all the petroleum revenues have been extracted, the Fund would grow no further, but its value in real terms would be maintained – in principle for eternity. This ensures an equitable distribution of the petroleum wealth across generations.

The fiscal spending rule partly insulates the economy from fluctuations in the petroleum sector – and when followed it ensures that revenue spending is at a level that can be sustained over time. The difference between the net cash flow and spending is reinvested in foreign financial markets. Norges Bank manages the Fund, and our London office plays a pivotal role in the investment activities.

The Pension Fund also functions as a buffer and dampens the wide fluctuations in the krone exchange rate that petroleum revenue inflows might otherwise have generated. The Fund is invested solely abroad, thus acting as a kind of “revolving door” for currency inflows from petroleum activities.

With the fiscal rule, it was recognised that the most important contribution fiscal policy can make to stabilising the Norwegian economy is to provide a sound, long-term strategy for petroleum revenue spending.

As a consequence, monetary policy had to take responsibility for smoothing the business cycle to a greater extent than earlier. A specific target for monetary policy was thus a necessary supplement to the fiscal rule to ensure reasonable macroeconomic stability. The operational target states that monetary policy in Norway is oriented towards low and stable inflation, with annual consumer price inflation of approximately 2.5 per cent over time. In its conduct of monetary policy, Norges Bank operates a flexible inflation targeting regime, so that weight is given to both variability in inflation and variability in output and employment.

## Current economic situation

Since the summer of 2003, there has been a clear upturn in the Norwegian economy. Low domestic interest rates, increased petroleum investment, favourable prices in important export markets, and a strong upturn in the world economy have contributed to solid growth in the Norwegian economy. So far in the upturn, the mainland economy has grown by an average of close to 4 per cent annually.

Current information on economic developments indicates that the upswing is continuing. Corporate sector profitability is good. There is strong growth in employment, unemployment has fallen markedly, and household demand continues to rise.

Unemployment is now at a historically low level. Seasonally adjusted, registered unemployment stood at 2.3 per cent of the labour force in October.

Nevertheless, wage moderation has generally prevailed so far. The opportunities provided by an international labour market may have prompted participants in local and centralised wage negotiations to place greater emphasis on the considerably higher wage level in Norway relative to our trading partners, and potential job vulnerability. At the same time, labour migration has reduced bottlenecks in some industries allowing the economy to expand more briskly than would seem warranted judging by previous experience.

Inflation has remained low. According to our indicators underlying inflation appears to be in the range of ¾ - 1½ per cent. Low underlying inflation is not a result of weak economic growth but rather reflects favourable developments on the supply side of the economy. Strong competition, high productivity growth, and a shift in imports towards low-cost countries have dampened domestic price increases.

Presently, there is little spare capacity in the Norwegian economy. Demand is still strong and real income growth high. At the same time, the krone exchange rate has depreciated. This should over time result in a pick-up in inflation.

The global economy has shown strong growth, and continued solid growth among our trading partners is in prospect. However, there is uncertainty regarding the slow- down in the US economy. Consumer price inflation among a number of our trading partners has risen as a result of rising energy prices, but the increase in prices for other goods and services generally remains moderate.

## Monetary policy

The challenge to monetary policy in the present conjuncture is how the interest rate should be set to steer inflation towards the target while at the same time avoiding overheating in the real economy.

Central banks influence over-night market rates directly via the policy rate. However, economic agents' consumption and investment decisions depend more on their interest rate expectations. Hence, monetary policy works primarily by influencing expectations regarding future interest rates. Monetary policy may thus be more efficient if economic agents understand the central bank's intentions in its interest-rate setting.

In the November 2005 *Inflation Report*, Norges Bank first published its own forecast for the interest rate for the next three years. The aim is to enhance the predictability of monetary policy. With a predictable monetary policy, market participants can react to new information in a way that contributes to stabilising developments in output and inflation.

We try to establish an interest rate path that provides a reasonable balance between the objective of stabilising inflation at target and the objective of stabilising developments in output and employment within a reasonable time horizon, normally 1 - 3 years. Interest-rate setting is also assessed in the light of developments in property prices and credit.

The results of this trade-off are published in the *Inflation Report* in the form of a chart that presents central projections for the interest rate, the exchange rate, inflation and capacity utilisation in the economy.

Underlying inflation has been lower than projected in recent months. Nevertheless, several factors point to higher inflation ahead. Capacity utilisation is high and there is little spare capacity in the Norwegian economy. Employment is rising rapidly and unemployment has exhibited a marked decline. There are signs of higher wage growth and expectations of rising inflation. At the same time, the krone exchange rate has depreciated from strong values.

Monetary policy influences the economy with a lag. Over several years, interest rates have been considerably lower than what we consider to be a neutral level. Against the background of high growth in output and employment, rising wage growth and a weaker krone, there are prospects of higher consumer price inflation ahead. The interest rate may gradually be raised to a more normal level at a somewhat faster pace than envisaged earlier, although it is unlikely that rates will be raised at every monetary policy meeting. Based on our current assessment, the interest rate will thus continue to be raised in small, not too frequent steps.

The forecasts are uncertain. They are based among other things on an assessment of the current situation and a perception of how the economy functions. Disturbances to the economy may result in changes in the forecasts. Frequent data revisions imply that the current economic situation is not fully known. The chart illustrates the uncertainty surrounding the forecasts. The wider the fan chart is, the more uncertain the forecast. The uncertainty implies that the interest rate should normally be changed gradually, so that we can assess the effects of interest rate changes and take into account new information about economic developments.

Changes in forecasts are nothing new to financial market participants. There is no reason to believe that Norges Bank will not also have to reassess its interest rate and other forecasts as new information emerges about economic developments. Our ambition must be to reduce uncertainty with regard to our own response pattern.

## Financial stability and monetary policy

Financial stability means that the financial system is robust to disturbances in the economy and is able to channel funding, execute payments and redistribute risk in a satisfactory manner. Experience shows that the foundation for financial instability is laid during periods of strong growth in debt and asset prices. Banks play a central part in providing credit and executing payments and are therefore important to financial stability.

Monetary and financial stability are both important for economic developments. In my view, they are often mutually reinforcing.

Financial stability can be seen almost as a prerequisite for price stability. First, it promotes stable developments in financial markets, which is crucial to balanced economic growth. Second, financial stability supports the transmission mechanisms of monetary policy.

Conversely, price stability has a positive influence on financial stability. A successful monetary policy will support financial stability by removing distorted price signals associated with high and volatile inflation. Low and stable inflation provides households and enterprises with a clear indication of changes in relative prices, enabling them to make better informed decisions. Allocation of resources will then be more efficient.

## The Norwegian financial system and its soundness

In Norway, responsibility for financial stability is divided between Norges Bank, Kredittilsynet (the Financial Supervisory Authority of Norway) and the Ministry of Finance. To promote efficient cooperation, the regular exchange of information between these authorities is crucial and a framework for cooperation has been established.

Kredittilsynet is responsible for supervising individual financial institutions, while Norges Bank analyses the stability of the financial system from a macro perspective, aiming at identifying developments that may lead to the build-up of excessive risk in the financial sector and the build-up of financial imbalances that may pose a threat to financial stability. Norges Bank also has special responsibility for the clearing and settlement systems and inter-bank payment systems.

Should a situation arise where financial stability is threatened, Norges Bank and other authorities will, if necessary, implement measures to strengthen the financial system. Norges Bank may supply extraordinary liquidity to individual banks or to the banking system as a whole but only against proper collateral. The Ministry of Finance will be responsible for decisions where use of tax-payers' money would be an issue.

Norges Bank publishes an overall assessment of the outlook for financial stability in the biannual *Financial Stability report*. The conclusions in the report are summarised in a submission from the

Bank's Executive Board to the Ministry of Finance. The report is also intended to foster dialogue with the financial industry and to increase awareness of and foster debate on the importance of financial stability.

Norges Bank has also developed a macroeconomic model to assess developments in financial stability based on the forecasts published in the Bank's *Inflation Report*. Based partly on the results from this model, financial stability assessments are taken into account in the monetary decision-making process.

Before I turn to our most recent assessment of the stability of the Norwegian financial system, let me give a brief outline of the structure of the financial system.

The Norwegian financial system is dominated by banks, with a market share of more than 56 per cent, calculated as the banks' share of total assets in financial institutions and mutual funds. The banking system is relatively concentrated. The largest bank had a market share of 37 per cent in terms of total assets in the banking sector at the end of 2005, while the largest five had a market share of 61 per cent.

Savings banks account for a substantial part of the banking sector. However, most of the savings banks are quite small. To partly compensate for that, some cooperate on a range of products which provides economies of scale while maintaining their independence.

During the past decade, activities of foreign-owned banks in Norway have expanded considerably both through take-overs and organic growth. At the end of 2005, they had a market share of over 30 per cent, in terms of total assets. Their lending growth has been higher than for Norwegian-owned banks for several years. The development towards larger cross-border banks makes supervision and crisis management more complicated. In the event of a crisis, central banks, supervisory authorities, political authorities as well as deposit guarantee funds in several countries will have to be involved.

In contrast to the balance sheets of the banking sectors in many other countries, Norwegian banks' total assets are heavily dominated by loans to households and non-financial enterprises. One reason for that might be the lack of securitisation of loans. The work on regulations that will enable securitisation of loans is in progress. Loans to households alone constitute around 50 per cent of banks' total assets. Loans to households have increased as a percentage of banks' total assets, reflecting strong credit growth to households.

Norwegian banks' main source of financing is deposits from households and non-financial enterprises. Securities are the second largest source of financing.

### Assessment of financial stability in Norway

In 2005, the International Monetary Fund (IMF) prepared a thorough assessment of the financial system in Norway under the Financial Sector Assessment Program (FSAP) for Norway. The main conclusions were that the system appeared sound, well managed and competitive, and shorter-term vulnerabilities appeared low overall. Beyond the shorter term, rising household debt levels and associated house price inflation were the most important potential risk factors that needed to be watched.

Let me add some observations on this last topic. Unlike many other countries, house purchases in Norway are mostly financed by loans from private banks at variable interest rates. Growth in credit to households has been high for a relatively long period, largely driven by rising house prices. According to our model, a rise in house prices has a strong and prolonged effect on household debt, as it takes time before all dwellings have been traded at the new higher price level. Growth in credit to households can therefore remain high for quite some time, even if the increase in house prices should start to subside.

What then is driving house prices? In our empirical model, house prices are determined by household income, banks' lending rates after tax, the housing stock, unemployment, and an indicator of household expectations of their future financial situation and of the Norwegian economy as a whole.[3] Household income has contributed most to the rise in house prices in the last two years. Interest rates

[3] D. H Jacobsen and B.E. Naug (2005): "What drives house prices?", *Norges Bank Economic Bulletin*, no. 1/05, pp. 29-42.

have increased since the summer of 2005. Given the lags involved, the cumulative contribution from interest rates to house prices is still positive. Nevertheless, in the period ahead, the normalisation of interest rates in Norway may moderate the rise in house prices.

Observations from other countries, such as the UK and Australia, indicate that a rise in the key interest rate by the central bank has been followed by slowdown in house prices.

Growth in household debt has been higher than growth in disposable income for several years now. The household debt burden (household debt as a percentage of disposable income) has increased to a historically high level and is expected to rise further. However, the household interest burden (interest expenses after tax as a percentage of disposable income plus interest expenses) is still low as a result of the low interest rate level. The interest burden is expected to increase to fairly high levels in pace with a normalisation of the interest rate. Still, on the whole, households' financial position is strong.

The rise in the policy rate so far has not been fully reflected in banks' lending rates. Intensified competition, especially for mortgages, has dampened increases. Banks' interest margin has declined during the last decade.

Falling interest margins have, however, partly been compensated by high lending growth, and banks have so far succeeded in maintaining good results. Pre-tax profits as a percentage of total assets have been solid.

Norwegian banks are solid. Due to high growth in lending, capital adequacy ratios for banks as a whole declined slightly in 2005. Nevertheless, capital adequacy ratios are still high.

Under Basel II, capital requirements for credit risk are to be calculated using either the standardised approach or more risk-sensitive internal ratings based (IRB) approaches. The five largest Norwegian banks have applied to Kredittilsynet to use the Foundation Internal Ratings Based (FIBR) approach for credit risk. Under Basel II, the required level of capital for banks in Norway will be reduced. The main reason is that mortgages constitute a substantial part of banks' total assets. These loans are considered low risk under Basel II. The reduction in the required level of capital may be substantial for the banks using IRB approaches for credit risk, though transitional arrangements provide for a gradual reduction.

With solid results in banks, a good financial situation for borrowers and a well functioning financial infrastructure, there appears to be little risk of a crisis in Norway's financial system in the next few years. However, the long period of strong debt growth and asset price inflation may be a source of subsequent instability in the economy and in banks' losses and results. During an upturn such as the current one, it is therefore important to show vigilance and provide a cushion for weaker cyclical conditions and higher interest rates. Within the framework of Basel II, banks that shift to internal risk models based on historical losses for measuring capital requirements should take into account that loan losses have been unusually low in recent years.

Banks are vying for market shares. Competition is fostering more cost-effective banks, better and more flexible borrowing terms and a broader product range. This is to the benefit of customers. At the same time, it is important that banks price risk correctly. This enhances capital efficiency and promotes financial stability.

Thank you for your attention.

## William A Ryback: Macro prudential policy – a new name for some old ways of thinking?

Speech by Mr William A Ryback, Deputy Chief Executive of the Hong Kong Monetary Authority, at the Macro Prudential Supervision Conference: Challenges for Financial Supervisors, organised by the Korea Financial Supervisory Commission / Financial Supervisory Service and the International Monetary Fund, Seoul, 7 November 2006.

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Ladies and Gentlemen,

I am pleased to be here today to add my thoughts to this important discussion on emerging insights into the macro prudential end of the supervision business. I also am pleased to be back in Seoul one of the most dynamic cities in Asia and to be hosted by my friends in the Korean Bank supervisory community - many of whom I have known for a number of years.

It is almost ten years from the financial crises that affected many parts of Asia. This conference then is being held at an opportune time to allow us to reflect on the lessons learned. There has been considerable change over the last decade. Risk management in the regions banking systems' have become more robust. There has also been a step-change in the standards of supervision. Risk-based supervision has replaced compliance checking. There are also now moves under way to improve regional cooperation on issues like Basel II implementation, in which EMEAP will continue to play a leading role.

Clearly, no financial system can be considered stable unless the individual institutions that comprise its whole are themselves healthy. Thus risk-based supervision and proper risk assessment by banks are essential measures to bring about financial stability. In this regard Basel II will no doubt help strengthen our collective financial systems by encouraging banks to adopt stronger risk management mechanisms. Pillar 2 of Basel II will add to the stability of the financial system by providing a deeper and richer mechanism to evaluate a broader range of risks - including risks that will impact on the system more broadly - such as credit concentration risk. Encouraging greater transparency by banks under Pillar 3 also contributes to making financial systems more resilient by providing a consistent framework across national boundaries for analysts to do their job in identifying weak or risky banks.

Ensuring the soundness of individual banks – what some people now call the "micro prudential" perspective – is, however, only part of ensuring a sound financial system. Bank supervisors these days now talk about "pillars" and in addition to the three pillars of Basel II I believe that there are also two pillars of financial stability. One of these is the micro prudential perspective. The other one is the macro prudential perspective. They are mutually reinforcing and both are essential for ensuring financial stability. An important movement in the last decade has been a much more explicit emphasis being given to the macro prudential aspects of banking supervision by central banks as well as academics and other market observers.

What do we mean by macro prudential aspects? I think it has the following four features:

- First, its aims to limit the distress to entire financial systems rather than distress to individual institutions.
- Second, its chief aim is to avoid large and burdensome costs to the economy – such as expensive bank bailouts – rather than aiming to protect more narrowly the depositors of an individual bank.
- Third, it is based largely on the assumption that at least some of the risks faced by the banking system collectively differ from those faced by individual banks. In other words, the risk to the system is not simply the sum of risks to individual banks.
- And, fourth, it aims to examine risks that arise from the interaction of banks as part of a financial system rather than on a bank-by-bank basis.

While having sound and sturdy building blocks of the system is essential, it is also essential to understand how they all fit together in a framework and this is where the macro prudential perspective becomes critical. In short, the difference between the two pillars of micro and macro prudential surveillance is between a system-wide health check and ensuring that individual banks are inoculated properly from disease. The macro prudential pillar takes account of those risks that may affect all, part, or most banks in the system - and not just individual banks.

Like most other bank supervisors I've spent most of my career looking at banking system soundness mainly from an individual bank perspective. However, as a career central banker, I also have had to spend a good deal of time looking at financial stability from the macro prudential perspective as well. For much of my career we didn't call it macro surveillance but it was very much in our minds when, for example, in the late 1980's the U.S. banking system suffered from the collapse of a number of sectors of the economy episodically resulting in a very unhealthy and unstable banking system as a whole. Over 1,500 banks failed and public confidence in the industry was understandably threatened. In fact, on two occasions during that period the system was so close to collapse that major banks were unwilling to settle transactions unless the physical documents were in hand. At that time public policy was being directed toward eliminating weak and unstable banks so that trust and confidence could return – a necessary precursor to turning around a weak economy. That's why – to use the title of my speech – I wonder whether the trend toward macro prudential surveillance isn't just a new name for something we, as supervisors, have been doing all along.

An interest in macro prudential policy is part of what Tomasso Padoa-Schioppa has called the "genetic code" of central banks. Throughout their history central banks have aimed to ensure the overall soundness of the financial system and this followed naturally from their basic functions. Three historical developments were the key to this. In the beginning central banks were first and foremost banks – and like any bank they needed to consider the soundness and creditworthiness of their clients as well as factors in the general trading environment that might cause them losses. Second, over time, central banks developed a monopoly over ultimate liquidity, the means of final settlement, and they facilitated the settlement of inter bank payments through the rediscounting of commercial bank assets and the collection of reserves in the form of bank deposits. Third, as commercial bank money progressively developed into a larger share of the money stock, the value of money became dependent on the soundness of commercial banks. In this environment the concern of the central bank for the orderly functioning and stability of the banking system arose from the need to maintain the public goods of a stable means of payment, a unit of account and a store of value. This included last resort lending when commercial banks suffered from liquidity strains.

This historical development meant that by the end of the nineteenth century, or by the early years of the twentieth at the latest, central banks' concern for financial stability was an already well-established part of their function. However, the second half of the twentieth century saw many central banks also taking on the responsibility for statute-based micro prudential supervision. In many parts of the world banking laws were passed for the first time and the central bank often became the bank supervisor. In this process the distinction between the micro- and macro- perspectives became blurred.

What has changed in the past ten to fifteen years is that central banks have started to give much more explicit emphasis than in the past on their macro prudential responsibilities and have distinguished it more clearly from the micro-supervision perspective. This renewed emphasis has several different sources.

One of them was undoubtedly the financial crises that hit Asia in 1997. This experience showed that even if the individual banks in a financial system appear to be sound, the system itself can still be overwhelmed by financial shocks. For example, the system can be exposed to a common risk that isn't obvious from looking at each bank individually. In the Asian crisis countries the exposures of banks to foreign exchange risks didn't show up on bank balance sheets. The risks were instead in the balance sheets of their major borrowers, who had borrowed heavily in foreign currencies even though they had domestic currency cash-flows. And this also points to another feature of macro prudential concern – it cannot stop at the traditional boundary of the banking system, but must look at the risks in the non-bank financial sector and at the structure of household and corporate balance sheets.

There are also two other factors worth mentioning.

The first is that central banks have become increasingly aware that monetary stability and financial stability are closely linked. It used to be said that the reason why central banks were concerned about banking system soundness was that the banks were the main transmission mechanism for monetary policy. This still remains largely true, but central bankers have come to recognise that other aspects of financial stability also matter from the point of view of being able to meet monetary policy goals. For example, as the bond market has become an increasingly important as a transmission mechanism for monetary policy, market conditions, the soundness of intermediaries, and the transparency and integrity of pricing have all become relevant issues for the central bank to consider. The debate that took place a few years back on whether central banks should also target asset price inflation as well as consumer price inflation is another example.

A third factor has been the changing responsibilities of central banks. The recent emphasis given to macro prudential policy has coincided with the move, in some countries, to establish regulatory agencies separate from the central bank. The statutory responsibility for ensuring bank soundness has moved to these agencies, but the central bank has kept its traditional concern for the overall soundness of the financial system. This has led to a clearer distinction between the micro- and macro-perspectives that had become blurred in the second half of the last century. In Britain the creation of the Financial Services Authority led the Bank of England to build up its resources in financial stability analysis. This was a result of the Bank's efforts to ensure that oversight of the financial system did not fall between the gaps in the new institutional structure of supervision. Since then other central banks have followed the Bank of England's lead. Financial stability units – small teams with backgrounds in economics and banking supervision whose job it is to monitor wider trends in the financial system – are now increasingly a feature of the organisational charts of many central banks.

These factors have led to a redefinition in the way in which central banks have begun to approach their traditional macro prudential remit. I would like to mention four of these in particular:

- The formalisation of payments and settlement system oversight;
- The publication of financial stability reports;
- Stress testing and scenario analysis; and
- Concern with financial condition of non-bank financial intermediaries and health of corporate and household balance sheets.

Let me now briefly talk about each of these in turn.

Payment system oversight has been part of the core functions of central banks almost from the very beginning. However, once the formal responsibility for banking supervision was split away from central banks like the Bank of England and the Reserve Bank of Australia, these central banks began to formalise their role in payment system oversight. In Australia, for example, the 1998 Payment Systems (Regulation) Act gives the RBA powers to regulate the payments system and purchased payment facilities (such as travellers' cheques and stored value cards). It also allows the RBA to obtain information from payment system participants and to set access regimes and determine risk control and efficiency standards for designated payment systems. The RBA's responsibilities in this regard are discharged by a Payments System Board.

The adoption of Real Time Gross Settlement (RTGS) has been another key risk reduction initiative on the part of many central banks in the past decade and a half. These systems eliminate the build up of settlement exposure and Herstatt risk between financial institutions as a result of the exchange of high-value payments and debt securities settlements. Instead, individual transactions are settled in real time across accounts at the central bank. The availability of RTGS is also an important step in dealing effectively with foreign exchange settlement risk.

Finally, no discussion of payments system oversight would be complete without some mention of Anti-Money Laundering initiatives. AML is important for the integrity of payments systems, and thus also has important macroprudential implications.

The publication of a Financial Stability Report is the second way in which central banks have given more prominence to their macro prudential responsibilities. The Bank of England was among the first movers and its Financial Stability Report is now a decade old. The report recently underwent a revamp reflecting how rapidly this type of analysis has evolved in that time. Many other central banks have since followed the Bank of England's lead, and in the HKMA we have published our own Monetary and Financial Stability Report for several years now. More recently we began an internal Banking Stability Report which aims to provide a macro prudential perspective on trends in the banking system that we can then use to target our on-site bank examinations more effectively. The eventual goal is to try to draw these two reports more closely together and to bring a more forward-looking perspective to our banking supervision work.

When central banks make their financial stability analysis public it provides financial system participants with an insight into the central bank's perception of the vulnerabilities of the system. It enables policymakers to be transparent in their views of where they perceive the risks and vulnerabilities to be. Hopefully, by raising warning flags at a sufficiently early stage – for example if we perceive risks in a build up of credit to a particular sector – we can encourage banks to review the risks that they are running and, if necessary, to take action to mitigate those risks. But it is important to be careful how the risks and vulnerabilities are presented. The last thing we want to happen is for the predicted problems to surface because everyone has rushed for the exit at the same time. So the message has to be not one like "we think it's too risky to extend more credit to this sector" but instead more like "have you thought about the entire range of relevant risks in extending more credit and are your underwriting criteria in line with the riskier environment?" It's important in publishing a financial stability report to present its findings as a range of possible outcomes which the private sector can then be encouraged to factor into its own risk management practices.

Stress tests and scenario analysis provide the intellectual backbone for financial stability reports. Stress testing, in particular, has come a long way in recent years. The HKMA's requirements on stress testing by banks have been in place for some time. Our Supervisory Policy Manual Module on Stress Testing, issued in early 2003, requires banks to have in place a stress-testing programme and to integrate stress testing into their risk management processes. For our own internal purposes we also conduct stress tests by applying a range of shocks to the supervisory data that is reported to us. These shocks take into account various adverse movements in banks' liquidity, interest rate and market risk positions.

However, the techniques of stress testing are rapidly evolving and are becoming increasingly more sophisticated. The first generation of stress tests simply took a variable and subjected it to a shock. It was basically just a matter of saying "let's see what happens to capital if NPL's go to 20 percent." This type of crude stress test is quite helpful for a sense of how solid the system's capital buffer might be, but it doesn't allow you to take into account second and third round effects. If NPLs have risen to 20 percent of total assets, then there are likely to be a lot of other things happening in the economy at the same time, all of which could have additional implications for banks' financial soundness. As a result, stress testing is moving increasingly in the direction of scenario analysis. This involves economists constructing scenarios for the outlook on GDP, interest rates etc. and tracing through these changes in terms of their impact on the key measures of banking system soundness including profitability and capital adequacy. This approach involves some quite advanced economic modelling techniques and is still in its early days. However, the recent revamp of the Bank of England's financial stability report that I mentioned earlier was designed to give a larger role to this type of analysis.

A final issue that I'd like to discuss is that macro prudential analysis cannot stop with the banking system or at the borders of a particular jurisdiction.

In the past it might have been reasonable to think that systemic risk was something that began and ended with the banking system. As long as the banking system was – or at least appeared to be – sound, as central bankers we did not need to worry too much about what happened elsewhere in the financial system or the condition of the corporate sector or the structure of household balance sheets. But this is no longer true, if it ever was.

I have already mentioned the role of the corporate sector in the Asian financial crises of a decade ago. The fact that it was the corporate sector rather than the banking sector that had assumed foreign exchange risk ultimately didn't matter from the point of financial system stability. The effects were the same – or possibly were greater as the corporate sector was less well able to handle the risks than the banking sector might have been. From a macro prudential policy perspective this means that we must pay attention to conditions in the corporate sector and the soundness of corporate balance sheets. And given that so many banks in Asia have followed those in the rest of the world in looking to develop their consumer credit business, the condition of household finances is also important to understand from a financial system stability perspective.

In addition, the experience of the last decade has also taught us that non-bank financial intermediaries matter for the soundness of financial systems. For example, there is plenty of evidence that insurance companies have been major sellers of credit derivatives. This passes credit risk from the banking system to the insurance sector. How well can the insurance sector manage such risk? And if bank-insurance linkages are strong (e.g. through financial conglomerate groups) can we be sure that the risk has really passed out of the banking system? Similarly, the role of hedge funds in financial systems has recently begun to receive a good deal of attention from central banks and regulators. The extent to which they increase the volatility of financial markets has long been the subject of debate. But increasingly this largely unregulated sector has become a major provider of credit – thus transferring risks out of the regulated banking sector and into a part of the financial system that is far from transparent. Macro prudential policy cannot afford to ignore these innovations.

Finally, as the debate on hedge funds has also shown, financial stability analysis cannot stop at national borders or in particular jurisdictions. A hedge fund based in the Caribbean is capable of moving markets half way round the globe. In these circumstances, macro prudential policy must take into account the possibility of shocks originating outside our domestic financial systems in today's global, integrated financial marketplace. It also requires central banks and regulatory agencies to cooperate to develop policies to mitigate these risks.

In conclusion I come back to the question with which I started: is macro prudential policy simply a new name for some old ways of thinking? By now it should be clear that my answer is that it both is and it isn't. There is nothing new in central banks' concern with the stability of the financial system. It is part of their genetic code. What is new, however, is the explicitness with which the financial stability goal has been articulated, the broader range of intermediaries and institutions that form the focus of macro prudential policy, and the range and sophistication of the tools of macro prudential analysis. All of these are of a completely different order to those of twenty – or even ten – years ago. Thank you.