Svein Gjedrem: Experiences with the financial crisis

Lecture by Mr Svein Gjedrem, Governor of Norges Bank (Central Bank of Norway), at the Centre for Monetary Economics (CME)/BI Norwegian School of Management, Oslo, 30 September 2009.

The text below may differ slightly from the actual presentation.

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1. Introduction

The last time I addressed this assembly was on 12 September 2008, only a few days before the US investment bank Lehman Brothers filed for bankruptcy. The Norwegian economy had entered a new phase. Low inflation and high growth were late in the upturn being followed by somewhat higher inflation and slower growth. Early summer the key policy rate had been raised to 5.75 per cent – a fairly normal level. It seemed that the elevated level of capacity utilisation in the Norwegian economy would gradually drift down.

The economic conjuncture took a different turn. The Lehman Brothers' bankruptcy on 15 September triggered a crisis with failing confidence in banks, counterparties and contractual partners and confidence in the future plummeted. The world economy entered into a sharp downturn. It became increasingly evident that the Norwegian economy would slow at a faster pace and to a further extent than we had envisaged. In August last year, manufacturing enterprises in our regional network reported that growth would hold up. In November, they described the turnaround as a "cardiac arrest". Developments abroad fed through to the Norwegian economy, translating into a shortfall in funding for banks, weaker demand for our export goods and heightened uncertainty surrounding economic developments. The Norwegian authorities responded to the slowdown in activity with active measures, and the key policy rate was reduced in steps to 1.25 per cent to mitigate the fallout on the Norwegian economy.

Fiscal and monetary policy have been effective and the situation in some sectors of the Norwegian economy is improving. The financial industry has been exposed to a liquidity crisis, but the Norwegian banking system did not experience a solvency crisis and Norway escaped a real economic crisis. House prices and equity prices are again on the rise, output moved up in the second quarter and unemployment has been markedly lower through summer than we had expected.

There are still risks ahead. Many of our trading partners are struggling with large and mounting public debt and underlying external imbalances. This may give rise to new disturbances that may also influence our economy.

2. Crisis management

The financial market turbulence started in August 2007 after banks started to suffer subprime losses in the US market. After the failure of Lehman Brothers in September 2008, risk premiums surged in funding markets and equity prices plunged – particularly financials. Today we can observe that the element of surprise at how closely financial markets are interwoven amplified the crisis.[1]

[1] See for example Caballero and Kurlat (2009), "The 'Surprising' Origin and Nature of Financial Crises: A macroeconomic policy proposal", paper presented at the Federal Reserve Bank of Kansas' Jackson Hole Symposium.

Central banks around the globe cut key rates swiftly and forcefully, in some cases to levels close to zero. In Sweden, the central bank set the interest rate on banks' deposits in the central bank at negative ¼ per cent. In Norway, it was not appropriate to use instruments as forcefully. But Norges Bank also reduced the key policy rate markedly and rapidly and more rapidly than the inflation and growth outlook alone suggested.

Central banks have a long history of dealing with financial crises. The economist and journalist Walter Bagehot formulated as early as in 1873 the principles for central banks' role in this area:

> "To avert panic, central banks should lend early and freely (without limit), to solvent firms, against good collateral, and at 'high rates'."[2]

Bagehot's principles describe central banks' liquidity provision in the first phase of the financial crisis – from autumn 2007. Central banks responded swiftly and supplied an extraordinary amount of liquidity through their conventional instruments, i.e. loans against good collateral at a price close to the key policy rate. In most countries, banks also have access to liquidity through automatic drawing rights against the provision of collateral. These facilities are priced at a premium on the key policy rate in line with Bagehot's advice.[3] In addition, agreements were entered into between central banks so that liquidity in different currencies could be provided across borders. Many banks were particularly in need of US dollar funding.

After the failure of Lehman Brothers, the financial system became fully dependent on central bank funding. The situation required new instruments.

Central banks supplied liquidity at longer maturities than normal and eased the collateral requirements for central bank loans.

Many countries introduced government-guaranteed credit lines and swap lines for lending liquid securities – primarily government securities – against less liquid securities. In a number of countries, central banks have purchased both public and private bonds with longer maturities directly in the market.

Private bonds have primarily been purchased with a view to improving liquidity and reducing bond premiums. The Government Bond Fund was also established for that purpose.

Government bond purchases can influence long-term government bond yields and indirectly the interest rate on mortgage and corporate bonds and asset prices. Moreover, the Bank of England notes that the purchases increase the money supply, which can contribute to underpinning inflation expectations. It has not been relevant for Norges Bank to buy government bonds in the market.

But we have also been highly active. As mentioned, we reduced the key policy rate from 15 September last year. We supplied substantial liquidity to the banks and eased the collateral requirements for loans. We entered into a credit agreement with the Federal Reserve and supplied US dollar liquidity to Norwegian banks. Krone liquidity was provided through currency swap agreements, both in euros and US dollars. We also proposed the covered bond swap arrangement and a capital injection of core capital from the government to banks.

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[2] Walter Bagehot (1873), "Lombard Street: A description of the Money Market".

[3] Norges Bank's automatic borrowing facility for banks is referred to as D-loans. The interest rate on overnight D-loans is one percentage point higher than the key policy rate and forms a ceiling for short-term money market rates.

The Norwegian monetary policy measures have been effective

Before the crisis the daily surplus liquidity in the Norwegian market of about NOK 20 billion was sufficient to keep short-term money market rates near the key policy rate. From autumn 2008, Norges Bank has supplied ample liquidity, bringing bank deposits in Norges Bank to well above NOK 100 billion in periods. The substantial supply was necessary to prevent short-term money market rates from rising too high above the key policy rate or from fluctuating widely. Risk premiums at shortest end of the money market fell.

Through the currency swap agreements, under which Norwegian kroner were offered in exchange for US dollars or euros, we reached participants who were active in Norwegian kroner but who did not have access to loans from Norges Bank. The currency swap agreements helped to limit the risk premiums in Norwegian interest rates.

Norwegian banks are dependent on US dollar liquidity, which was on occasion difficult to procure in the market. Norges Bank, like other central banks in Europe, provided dollar liquidity to banks in periods.

Banks' access to funding at all but the shortest horizons has been very limited during the crisis. A key problem was that banks were heavily reliant on international market funding. When that source of funding seized up the Norwegian authorities had to intervene.

Several instruments have been deployed. Loans have been offered at longer maturities than earlier, in some cases up to 2 and 3 years. The arrangement where banks and bank-owned mortgage companies can swap covered bonds (OMF) for government securities was introduced to facilitate banks' access to medium-term and long-term funding, but also to ease money market conditions so that money market premiums could be reduced.

In the mid-1980s Norwegian banks also relied heavily on foreign funding. In spring 1986 – following a sharp fall in oil prices – confidence in the Norwegian economy weakened and liquidity flowed out of the country, as was the case last autumn. Norges Bank had to purchase NOK and sell foreign exchange to maintain a fixed krone exchange rate. The krone liquidity that flowed into the foreign exchange market flowed back into Norges Bank as loans to the banks to avoid a liquidity crisis and a surge in money market rates. Bank lending continued to grow in 1986 and 1987, and in retrospect it might almost seem as though the central bank through its lending operations had played an active part in financing the credit boom. There was no time or basis for the banks to provide collateral for borrowing from the central bank, and when the banking crisis became full-blown a few years later the central bank was highly exposed. This gave the banks a strong negotiating position in the first crisis resolution rounds.

This time, funding support for banks came from the government's balance sheet, not as loans from Norges Bank. This provided transparency. Norges Bank could to large extent concentrate on restoring the functioning of the money market. Moreover, the government was provided with sound collateral, while the banks were provided with government securities that they could use as collateral for borrowing or sell in the market.

The Norwegian measures were designed in such a way that Norges Bank's balance sheet has not increased to the same extent as that of a number of other central banks.

The measures led to a gradual improvement in Norwegian banks' funding. So far, drawings on the covered bond swap line have amounted to NOK 225 billion. The swap line soothed the panic among banks and led to a moderation in the tightening of bank lending standards.

Since spring, risk premiums on fixed-income securities have declined and activity in money and bond markets has picked up. In recent months, many financial institutions have again procured funding in traditional commercial paper and bond markets.

The winding down of extraordinary measures has started

In Norway, it has been appropriate to start winding down the unconventional measures earlier than in other countries. In recent months, liquidity has not been supplied through the currency swap lines or liquidity in foreign currency. Loans at long maturities have not been provided since February – several of the loans have now matured.

As the markets are now returning to normal, the supply of liquidity will be adjusted so that the money market rate reflects the key policy rate. We want the banks to redistribute liquidity in the interbank market.

The underlying structural liquidity in the banking system, i.e. liquidity excluding Norges Bank's liquidity provision, has been negative in recent years.

Structural liquidity was influenced by ingoing and outgoing payments via the government's account in Norges Bank and is projected to increase ahead, primarily because the government can partly finance increased lending to state banks, payments from the Government Bond Fund and the State Finance Fund and share subscriptions by drawing on their large deposits in Norges Bank. The banking system's demand for central bank loans can then decrease considerably.

The swap arrangement involving covered bonds in exchange for government securities has made a considerable contribution to securing banks' long-term funding. This spring we saw that the covered bond market started to reopen. The minimum price in the swap arrangement is thus adjusted to the interest rate forming in the market. The arrangement will be phased out in the course of autumn.

Norges Bank eased its collateral requirements to facilitate banks' borrowing access in the central bank. That will be reversed. Moreover, we have earlier announced that Norges Bank will reduce the share of banks' access to loans from the central bank backed by bank bond collateral.

The interest rate is now extraordinarily low. The Executive Board considered raising the key policy rate at the monetary policy meeting on 23 September, but decided to leave it unchanged. Norges Bank has previously noted that if developments continue as expected, it may be appropriate to increase the key policy rate earlier than projected in the June *Monetary Policy Report*.

3. The financial crisis and economic policy – lessons

In Norway, there is a division of roles in economic policy. Wage formation, the tax system and economic regulation should contribute to well functioning markets and promote the efficient use of labour and other real economic resources.

The government budget – growth in public spending – influences the real exchange rate and the size of the internationally exposed business sector in the long term. The fiscal rule enhances the predictability of petroleum revenue spending in the Norwegian economy even when the budget is actively used from one year to the next to stabilise economic developments and even when the automatic stabilisers are allowed to operate. A smooth phasing in of petroleum revenues dampen krone fluctuations and reduce the risk of abrupt and major shifts between internationally exposed and sheltered industries.

Monetary policy steers inflation in the medium and long term and can in addition contribute to smoothing fluctuations in output and employment.

Inflation targeting has served us particularly well in the lead-up to the crisis, during the crisis and after the crisis. After some years of very low inflation earlier this decade, the interest rate was set at a low level with a view to holding up inflation expectations. That was an important contribution. Before the crisis, when it was appropriate to tighten the stance again, the interest rate hikes were effective. Inflation targeting made it possible for us to cut interest

rates markedly in autumn 2008. Thanks to well anchored inflation expectations, the real interest rate rapidly declined to a low very level. Under the former fixed exchange rate regime, the key policy rate would have been highest when the degree of uncertainty was highest and demand for small currencies such as the Norwegian krone was lowest. Inflation targeting has enabled monetary policy to curb substantially the downturn in the economy.

The crisis may show that the real economy of countries with solid state finances, such as Norway, is less severely affected. The OECD notes that financial markets in countries with high public debt may react sharply so that market interest rates rise when fiscal policy is used to stimulate the economy during a crisis.[4] This may reduce the effect of an expansionary fiscal and monetary policy. If an upward shift in public spending is perceived as permanent, forward-looking households and firms will increase saving to meet higher tax payments in the future. Consequently, the effects of increased public spending on demand for goods and services may be limited. If households know that the increase in public spending is temporary, and is subsequently matched by lower spending, state finances will not be a source of concern for households and firms further ahead. In that case, they do not have to increase saving and increased public spending today will have a stronger effect on total demand. It is therefore important to tighten the fiscal stance in favourable periods to secure the effectiveness of economic policy in difficult periods. Norway is in a favourable position in this respect. The fiscal rule provides a good framework for tightening the stance when the economic cycle turns.

Fiscal policy in Norway is conducted with the knowledge of how monetary policy will react. Today's flexible inflation targeting provides a monetary policy framework and guidelines as to how monetary policy is to be conducted in different situations. The fiscal authorities can internalise the monetary policy response pattern. It is also natural for them to do so as the government and the Storting (Norwegian parliament) have laid down the mandate for monetary policy.

When the monetary policy response pattern is known and is consistent over time, the social partners can factor in a monetary policy reaction when setting wages. This viewpoint is most relevant when wage formation is centralised. When wage formation is decentralised, monetary policy will instead influence wage growth via market mechanisms, by stabilising aggregate demand. The existing monetary policy guidelines will function effectively whether wage bargaining is at a centralised, local or individual level.

There is a fine balance in the division of roles between fiscal policy, wage formation and monetary policy. This balance will be disturbed if the objective of monetary policy is changed or broadened.

Should monetary policy give particular weight to asset prices?

House prices in Norway have risen sharply and probably excessively.

The level of house prices in Trondheim in central Norway was an eye-opener for the American Nobel Laureate Georg Akerlof, who happens to be of Swedish ancestry. At a family gathering, he was told that a distant relative had bought a house in Trondheim at a price equivalent to more than USD 1 million, providing a source of inspiration for his and Robert Schiller's book "Animal Spirits: How Human Psychology Drives the Economy, and Why it Matters for Global Capitalism".[5]

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[4] OECD Interim Economic Outlook, (March) 2009.

[5] Georg Akerlof and Robert Shiller (2009): *"Animal Spirits: How Human Psychology Drives the Economy, and Why it Matters for Global Capitalism"*, Princeton University Press.

Self-reinforcing mechanisms in financial markets, which lead to slower credit flows and falling asset prices in downturns and the inverse in upturns, pose a challenge to monetary policy.[6]

We must take account of developments in equity prices and property prices when projecting inflation and output. Norges Bank's interest rate setting does not rely solely on one simple rule, such as the Taylor rule.[7] Instead, we seek to take account of all factors that influence inflation and output in the medium term, and the key policy rate is set on the basis of an overall assessment. Asset prices such as house prices, the exchange rate and credit growth therefore have a bearing on Norges Bank's interest rate setting. A written formulation of Norges Bank's monetary policy reaction function would be fairly comprehensive and include all the variables that are considered.[8]

However, a reaction function must not be confused with the monetary policy target – our target function or loss function. The fact that we give weight to variables such as the exchange rate, house prices and credit growth in interest rate setting does not imply that there are specific targets for these variables. The operational target of monetary policy is annual consumer price inflation of close to 2.5 per cent over time.

Interest rate setting in a small, open economy can be particularly challenging in periods of strong credit growth and a wide interest rate differential vis-à-vis other countries. A tightening of monetary policy in Norway specifically aimed at curbing property prices and credit growth can result in a rising krone exchange rate, a weaker labour market and excessively low inflation.

Moreover, a higher interest rate aimed at influencing the housing market would not eliminate the source of repeated credit cycles. There is a risk of a bubble in both the housing and the foreign exchange market when credit growth is high, as observed in Iceland and Hungary and perhaps even New Zealand in the years prior to the financial crisis. Interest rates were high in national currencies, but households and enterprises chose to borrow in low-interest-rate currencies.[9]

There was probably a sentiment of euphoria in the Norwegian housing market in 2006 and 2007, but the boom was financed by loans in NOK and not foreign currency.

Should we seek to avert bubbles in the housing market even when medium-term inflation prospects are moderate? On this point, it is our judgement that a distinction must be made between giving greater weight to credit growth and house price inflation in the reaction function and defining house price inflation as an independent monetary policy objective. So-called "leaning against the wind" would not require adjustments to Norges Bank's approach, bearing in mind our reaction function which already gives weight to asset price movements and credit growth.[10]

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6 See for example Bernanke, Gertler and Gilchrist: *"The Financial Accelerator and the Flight to Quality", The Review of Economics and Statistics*, 78(1), 1996, pp. 1-15. See also Nina Langbraaten (2001): "Formuespriser – konsekvenser for pengepolitikken? (Asset prices – consequences for monetary policy?)", Penger og Kreditt No 4.

7 See for example IMF (2009), [October] *World Economic Outlook*, Chap. 3, and Lars Svensson (2009): "Flexible Inflation Targeting: Lessons from the Financial Crisis", speech at a conference arranged by De Nederlandsche Bank in Amsterdam, 21 September 2009.

8 We also cross-check using simple monetary policy rules, cf. Norges Bank's Monetary Policy Report.

9 Olivier Blanchard, chief economist at the IMF, refers to this phenomenon when he states that the most effective instrument in relation to credit growth that amplifies swings in the economy is better regulation. See IMF (2009): "Lessons of the Global Crisis for Macroeconomic Policy".

10 See for example White (2009): "Should Monetary Policy 'Lean or Clean?', Working Paper nr. 34, Federal Reserve Bank of Dallas.

Should central banks also set explicit targets for asset prices? In our judgement, the answer is no, but we should probably apply a fairly long horizon for achieving the target so that we seek to take account of any imbalances that might disturb activity and inflation further ahead. The interest rate should be set so that developments in inflation and output become acceptable also under alternative, albeit not unrealistic, assumptions concerning economic developments and the functioning of the economy.

Norges Bank's mandate states that monetary policy shall be aimed at stability in the Norwegian krone's internal and external value. The internal value of the krone is determined by inflation.

Our interpretation of the mandate is that the external value of the krone – the exchange rate – cannot be fine-tuned. However, low inflation also makes a contribution to exchange rate stability. The Ministry of Finance has not suggested, and Norges Bank has not requested, that house prices should be given particular weight.

Macroprudential supervision and systemic risk

Even though inflation targeting has served us well, it was not possible to shield Norway's small, open economy, in an environment of free capital markets, from the liquidity crisis in global financial markets last autumn.

As we have observed abroad, when many banks encounter liquidity problems at the same time, triggered by a deterioration in some banks' financial strength, solvency problems can easily spread to other banks and to other countries.[11] This can occur when banks facing liquidity problems are forced to sell assets in a weak market. The market value of other banks' assets may then also be reduced. Even otherwise solid banks can then lose their equity capital.

Distrust spread among banks in Norway despite our generous and sound deposit guarantee scheme. Deposits were not withdrawn, but funding in foreign money and bond markets dried up. It was not easy for foreign investors to assess the value of banks' assets. They also wanted to keep liquidity with themselves.

Just as a bank deposit insurance scheme dissuades households and firms from withdrawing their deposits when uncertainty increases, new and improved banking regulation can contribute to bolstering confidence among financial institutions.[12] It is important that banks' balance sheets are easy to understand. It is also important that banks improve their deposit-to-loan ratios and increase their access to long-term market funding with a view to reducing their vulnerability to sentiment shifts in money markets. We cannot have a situation in the future where our banks panic after only a few weeks of unrest in international financial markets.

Banking regulation should also be adjusted in order to dampen the impact of credit cycles on the economy. In an upturn, banks' loan losses are low and profits rise. The supply of capital

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[11] Charles Bean (2009) refers to the spread of liquidity problems as a result of solvency problems in individual banks as a "lemons" problem in money markets. The expression comes from an article by George Akerlof (1970): "The market for 'lemons': Quality uncertainty and the market mechanism", *Quarterly Journal of Economics* 84:488-500. The article shows how a market can collapse when the buyer of a product (a second-hand car, which can prove to be a defective car or "lemon") cannot verify the quality of the product beforehand. The analogy to the money market is when a lender in the money market does not always know the financial strength of the borrowing bank. The money market may then function poorly. See Charles Bean (2009): "The Great Moderation, the Great Panic and the Great Contraction", Schumpeter Lecture, Annual Congress of the European Economic Association.

[12] See Jean Tirole (2009): "Illiquidity and All Its Friends". Paper presented at the BIS annual conference on "Financial Systems and Macroeconomic Resilience: Revisited".

is ample and provides room for brisk growth in lending. In a downturn, earnings decline, losses increase and banks tighten lending. Banking sector behaviour is thus procyclical.

This first implies that a higher level of equity capital must be required for a given risk assessment. Second, capital requirements must reflect risk through the entire business cycle. Third, banks must build up solid buffers above the minimum requirement in normal periods.

Today the capital requirements for mortgage loans are very low. NOK 1 in equity capital can actually be behind as much as NOK 250 in mortgage loans. House price fluctuations are amplified as a result because access to mortgage finance becomes almost unlimited in favourable periods. The requirements imposing an upper limit on banks' capital-to-loan ratio can remedy this to some extent.

Tax rules

Improved tax rules can also counteract credit cycles and promote housing market stability.

The household debt-equity ratio and house prices are influenced by the tax system. A sound principle is that the net return on capital, after deduction of capital costs, should be taxed. Net return is indicative of the capacity to pay tax. But households are not taxed on the net return on their housing capital. Deductions are allowed for capital costs without taxation of a rise in the value of the property or the imputed value of owner-occupied housing.

Over the years, taxation of the value of owner-occupied housing in Norway has gradually been reduced. The tax benefit for owner-occupied dwellings, introduced in 1882, was abolished in 2005. The tax allowance for debt interest, however, was retained. This system subsidises household borrowing, it subsidises owning rather than renting a dwelling, it leads to higher house prices than would otherwise have been the case and to overinvestment in housing capital. Households inflate their balance sheets and housing capital in order to take advantage of the tax benefit.

Taxation of housing in line with other forms of capital implies taxation of the value of owning a dwelling, the rent saved and the rise in the value of the dwelling.

Housing taxation reform can contribute to curbing the house price fluctuations that successive generations seem to be exposed to.

4. Conclusion

Developments in recent months indicate that the financial crisis in Norway will not turn into a crisis in the real economy. There has been no recurrence of the solvency crisis in the banking sector twenty years ago.

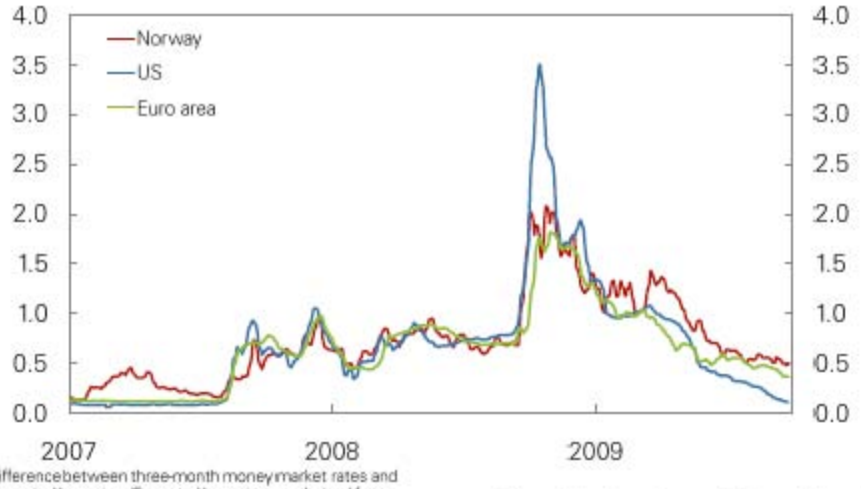
The Norwegian economy has nonetheless been exposed to major shocks. Oil prices and prices for other important export goods rose sharply through the upturn. The liquidity crisis hit the banking sector as growth started to slow. The impact on unemployment has not been pronounced and inflation has remained low and fairly stable throughout. We can safely say that fiscal and monetary policy have been fairly effective so far. But we must obviously not turn a blind eye to the possibility that new disturbances may expose other weaknesses.

Household behaviour in the housing market poses a considerable challenge to economic policy, particularly because demand for housing and residential mortgages is heavily subsidised via the tax system and because the very low level of equity capital required to extend a mortgage is reflected in the supply of loans. These challenges must be confronted at the source.

Thank you for your attention.

Money market premiums[1)]

5-day moving average. Percentage points
4 January 2007 – 25 September 2009



1) Difference between three-month money market rates and expected key rates. Expected key rates are derived from Overnight Index Swap (OIS) rates

Sources: Bloomberg, Thomson Reuters and Norges Bank

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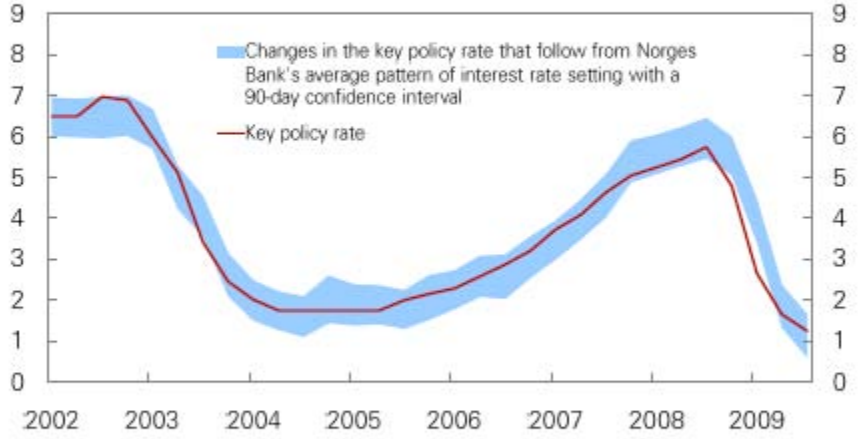
Key policy rate and Norges Bank's average pattern in interest rate setting[1)]

Per cent. 2002 Q1 – 2009 Q3



1) Changes in the key policy rate are explained by developments in inflation, mainland GDP growth , wage growth and key rates among trading partners. See Staff Memo 2008/3 for further elaboration

Source: Norges Bank

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"To avert panic, central banks should lend early and freely (without limit), to solvent firms, against good collateral, and at "high rates"."

"Lombard Street: A description of the Money Market".
Walter Bagehot (1873)

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Extraordinary measures

	US	UK	Europe	Norway
Easing of collateral requirements	✓	✓	✓	✓
Long-term liquidity provision	✓	✓	✓	✓ F-loans (2- and 3-year) NOK 35 bn
Lending/exchange of securities	✓	✓		✓ Swap arrangement NOK 225 bn
Purchase of private debt	✓	✓	✓	✓ Government Bond Fund NOK 6 bn
Purchase of government bonds	✓	✓		

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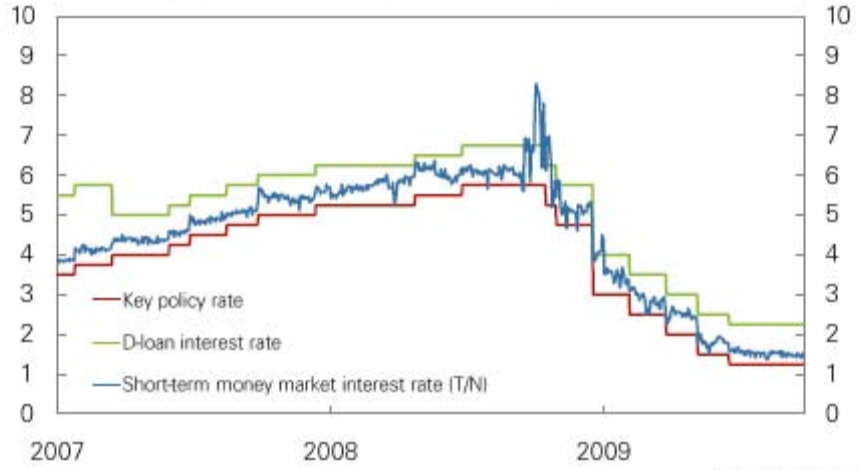
Financial events and measures in 2008

15 Sep	**Lehman Brothers** bankruptcy – money markets collapse
15 Sep	**More liquidity** – increased supply through F-loans
16 Sep	**Exchange rate swaps** supply USD for NOK – money markets reactivated
17 Sep	**AIG** emergency loan
24 Sep	**Monetary policy meeting** – widespread uncertainty
25 Sep	**Washington Mutual** into receivership – bond markets collapse
	Longer loans – 3-month F-loan
29 Sep	**Credit arrangement with Federal Reserve** – loan of up to USD 15bn
6 Oct	**Easing of collateral requirements** Submission proposing **swap arrangement** sent to Ministry of Finance
8 Oct	**Exchange rate swaps** supply NOK for EUR and USD
10 Oct	**Loans for smaller banks** – 6-month F-loan
15 Oct	**Key policy rate** reduced by 50bp
20 Oct	**Longer loans for all banks** - 6-month F-loan
24 Oct	**Swap arrangement** – Storting decision
29 Oct	**Key policy rate** reduced by 50bp
14 Nov	**Swap arrangement** – circular **Longer loans for small banks** – 2-year F-loan
24 Nov	**Swap arrangement** – first auction held
27 Nov	**Swap arrangement** – submission with adjustment proposal sent to Ministry of Finance
28 Nov	Ministry of Finance adjusts **swap arrangement**
17 Dec	**Key policy rate** reduced by 175bp
18 Dec	Submission to Ministry of Finance proposing government supply of Tier 1 capital
22 Dec	**Swap arrangement** – submission proposing extension of term from 3 to 5 years sent to Ministry of Finance

NB NORGES BANK 6

Key policy rate and short-term money market rate in Norway

Per cent. Daily figures. 2 January 2007 – 25 September 2009

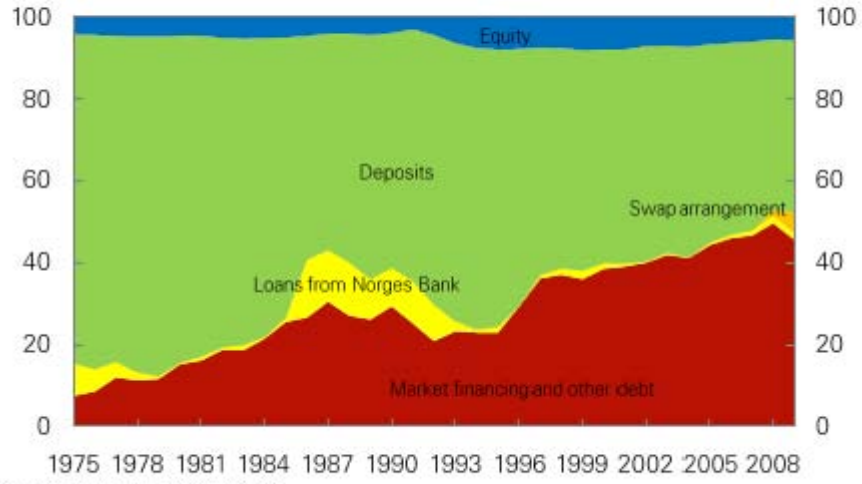


Source: Thomson Reuters

NB NORGES BANK 7

Funding sources, Norwegian banks[1)]

In per cent of total assets. 1975 – 2009[2)]



[1)] Including savings and commercial banks
[2)] Including Q1 and Q2

Sources: Kloviand (2007), Matre (1992), Statistics Norway and Norges Bank

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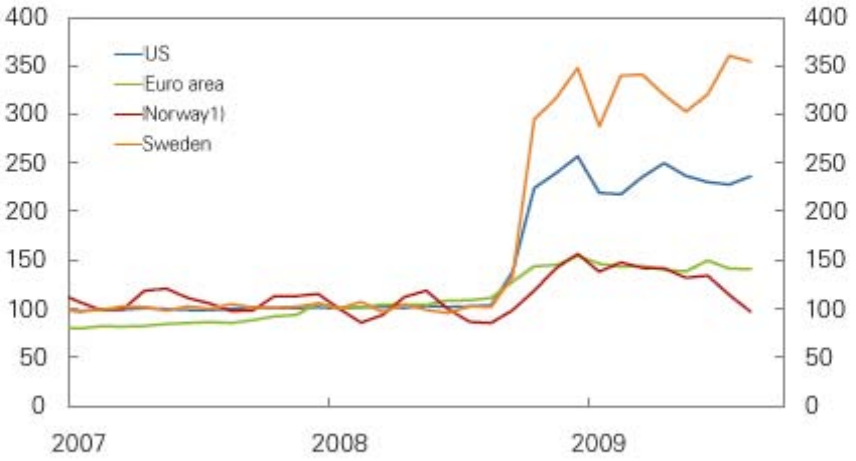
Central bank balance sheets

Index. January 2008 = 100. January 2007 – August 2009



[1)] Sum assets excluding investments in the Government Pension Fund - Global

Sources: Thomson Reuters and Norges Bank

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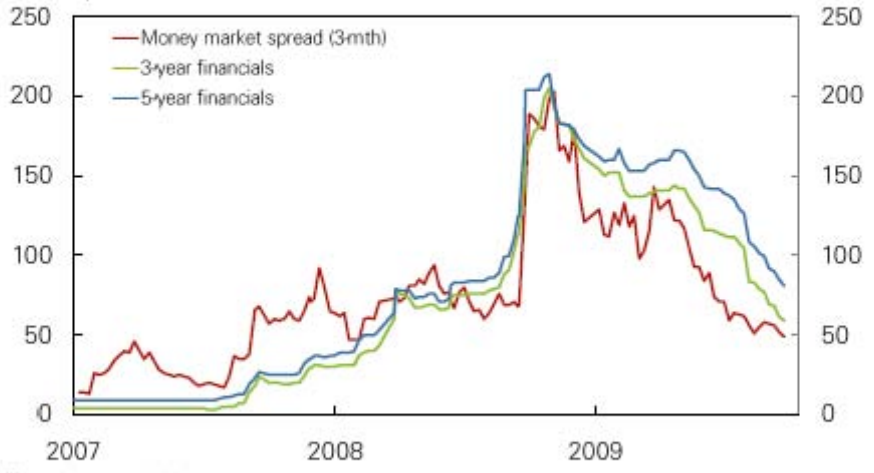
Bond spreads[1)] and three-month money market spread[2)]

Basis points. Week 1 2007 – Week 39 2009



[1)]Spreads compared with swap rates
[2)]Spreads compared with projectedkey policy rate

Sources: DnB NOR Markets, Thomson Reuters and Norges Bank

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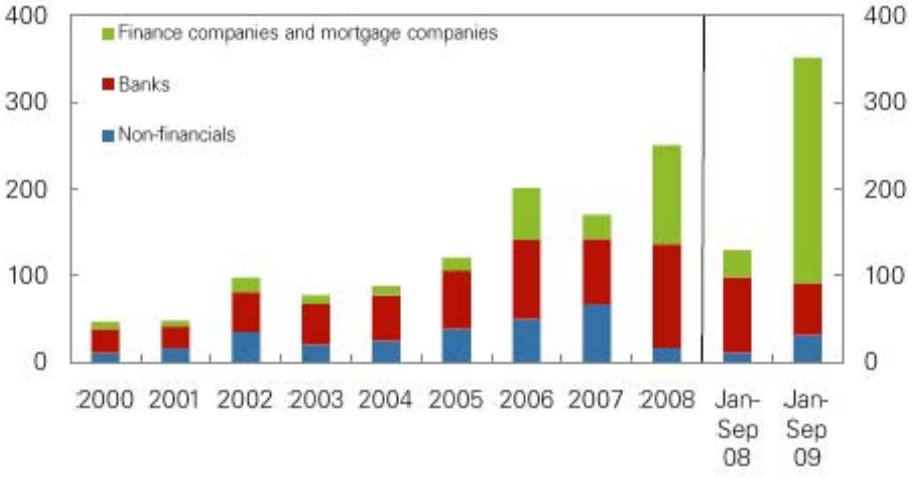
Bond issues in Norway

All VPS-registered issues. In billions of NOK
2000 – 2008. Period January – September 2008 and 2009[1)]



[1)]Up to and including 28 September in 2008 and 2009

Source: Statdata

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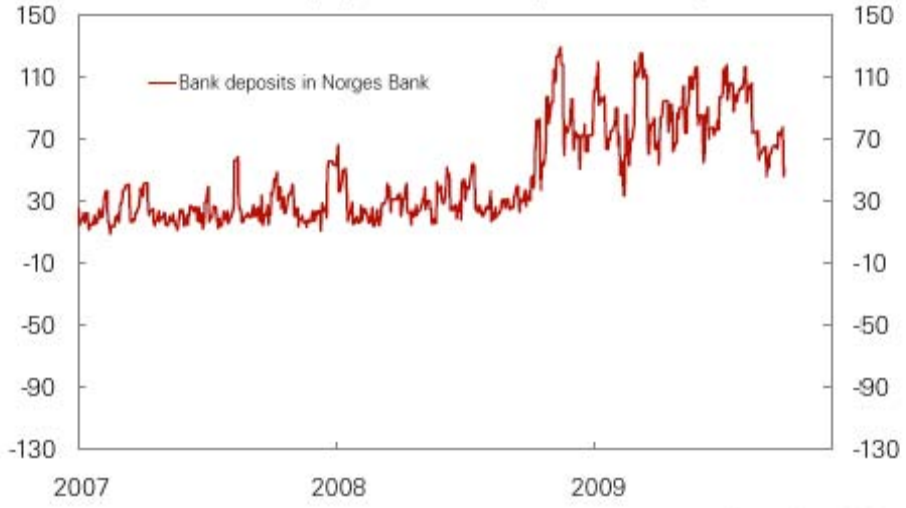
Bank liquidity

In billions of NOK. Daily figures. 1 January 2007 – 25 September 2009



Source: Norges Bank

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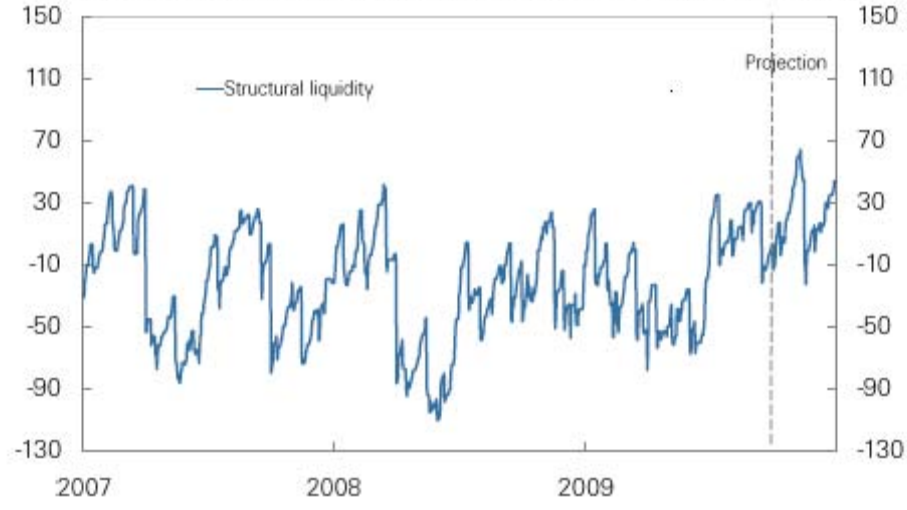
Bank liquidity

In billions of NOK. Daily figures. 1 January 2007 – 31 December 2009[1)]



[1)]Projection from 28 September 2009

Source: Norges Bank

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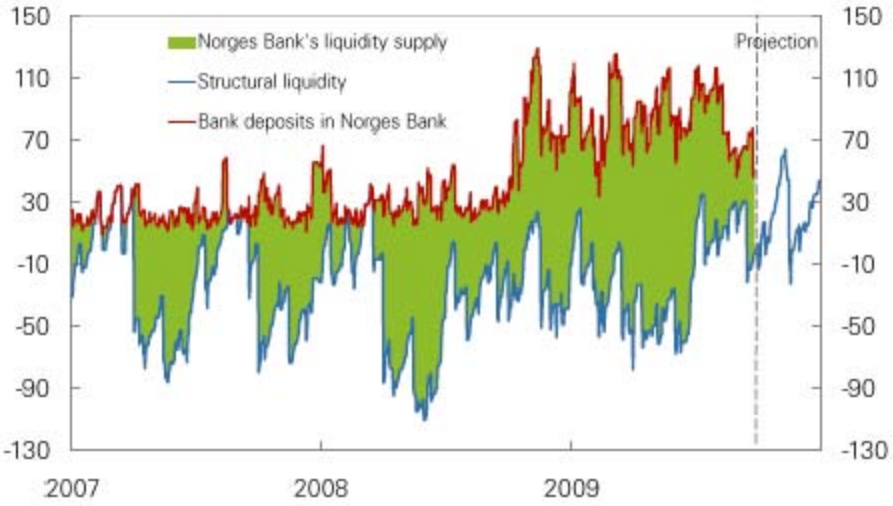
Bank liquidity

In billions of NOK. Daily figures. 1 January 2007 – 31 December 2009[1)]



[1)]Projection from 28 September 2009

Source: Norges Bank

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"One of us (Akerlof) remembers a dinner conversation a few years ago. During the housing boom a distant relative from Norway – by marriage by marriage by marriage, known only from a brief encounter at a family wedding – had reportedly bought a house in Trondheim, for more than $ 1 million. That seemed like a lot of money – perhaps not for New York, Tokyo, London, San Francisco, Berlin, or even for Oslo – but certainly for Trondheim, up the Norwegian coast, on the edge of settlement, and vying for the title of world's most northern city. Nor was it a mansion. This thought remained quietly parked in Akerlof's brain, classified along with other observations that property values were high in Scandinavia."

"Animal Spirits
How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism"
George A. Akerlof and Robert J. Shiller

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"Recently Akerlof told his co-author, Shiller, that he had been wondering if he should have given more thought to the Trondheim story. We discussed the matter. This seems to be a mental lapse, accepting this story of the high price as nothing more than an insignificant oddity. On the contrary, Akerlof should have seen it as an incongruity requiring active thought, to be resolved within the context of a larger view of the markets."

"Animal Spirits
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Flexible inflation targeting in theory

1. The central bank sets the interest rate with the aim of minimising a **loss function**
   - Loss = (deviation from inflation target)^2 + λ x (output gap)^2
2. The central bank follows a **reaction function** in interest rate setting
   - Key policy rate = function of all factors that influence inflation and the output gap in the model

The Taylor rule is a model-independent reaction function

- Key policy rate = 1.5 x inflation + 0.5 x output gap

From the Regulation on Monetary Policy

- Monetary policy shall be aimed at stability in the Norwegian krone's national and international value, contributing to stable expectations concerning exchange rate developments. At the same time, monetary policy shall underpin fiscal policy by contributing to stable developments in output and employment
- The operational target of monetary policy shall be annual consumer price inflation of approximately 2.5 per cent over time.

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Bank equity capital[1)]

In per cent of total assets. 1875 – 2009[2)]

[1)] Including savings and commercial banks
[2)] Including Q1 and Q2

Source: Klovland (2007), Statistics Norway and Norges Bank

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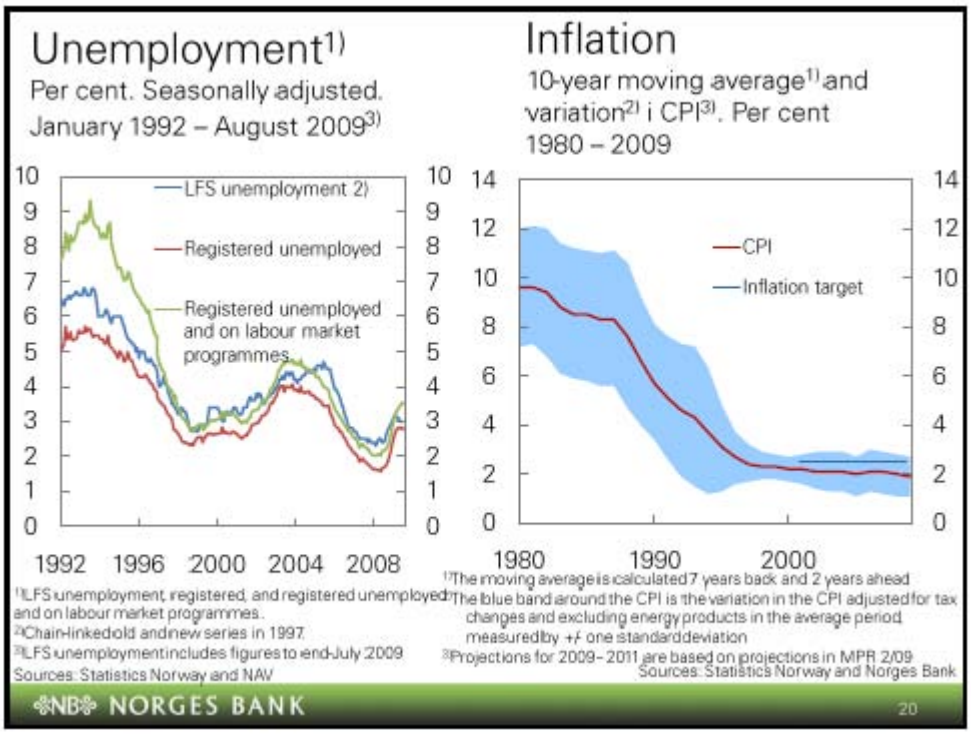
Unemployment[1)]
Per cent. Seasonally adjusted.
January 1992 – August 2009[3)]
LFS unemployment 2)
Registered unemployed
Registered unemployed and on labour market programmes
10
9
8
7
6
5
4
3
2
1
0
1992
1996
2000
2004
2008
[1]LFS unemployment, registered, and registered unemployed and on labour market programmes.
[2]Chain-linked old and new series in 1997.
[3]LFS unemployment includes figures to end-July 2009
Sources: Statistics Norway and NAV
Inflation
10-year moving average[1)] and variation[2)] i CPI[3)]. Per cent
1980 – 2009
CPI
Inflation target
14
12
10
8
6
4
2
0
1980
1990
2000
[1]The moving average is calculated 7 years back and 2 years ahead
[2]The blue band around the CPI is the variation in the CPI adjusted for tax changes and excluding energy products in the average period measured by +/- one standard deviation
[3]Projections for 2009 - 2011 are based on projections in MPR 2/09
Sources: Statistics Norway and Norges Bank
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