

# Norges Bank Watch 2010

An Independent Evaluation of Monetary Policy in Norway

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## Foreword

Each year the Centre for Monetary Economics (CME) at The Department of Economics, BI Norwegian School of Management appoints an independent group of experts to evaluate monetary policy in Norway.

This year the committee consists of Hilde Bjørnland, professor of Economics at BI, Richard Clarida, professor of Economics at Columbia University, Elisabeth Holvik, Chief Economist at Sparebank1 Group, and Erling Steigum, professor of Economics at BI. The committee is solely responsible for the report and the views therein. The report does not necessarily represent the views of the CME or of its members.

The Ministry of Finance partly funds the Norges Bank Watch reports, which contain useful information and analyses for the Ministry's evaluation of monetary policy that is presented each year in a White Paper to Parliament.

Oslo, 18 February 2010

Centre for Monetary Economics

Arne Jon Isachsen

## Executive summary

### The Great Recession

The international recession triggered by the financial crisis is often called “The Great Recession” because it is the deepest after World War II, and it did not turn into a full scale depression like in the 1930s. An evaluation of Norges Bank’s monetary policy in 2009 must therefore acknowledge the extraordinary uncertainty about the international economy facing Norges Bank, as well as the above-normal challenges of making forecast of the domestic business cycle and inflation when setting the key policy rate.

Fortunately, the recession in Norway turned out to be much milder than in most other OECD-countries. This is probably both a result of good macroeconomic policies, good financial regulation, and good luck. Monetary policy has been very expansionary since December 2008. Furthermore, the effects of monetary policy on aggregate demand are probably greater in Norway than in most other European countries due to the combination of large household indebtedness and floating mortgage rates. Fiscal policy also became much more expansionary in 2009 on top of the effects of automatic fiscal stabilisers. Good policies and conservative financial regulation are also – at least partly – factors that explain why there has been neither banking crisis, nor severe problems in any Norwegian bank in 2009. The international financial crisis did temporarily cut off many Norwegian banks from international funding, but this problem was manageable, and was fixed without any sizeable credit crunch. Finally it was good luck that the oil price (in USD) doubled in the course of 2009 and that the Norwegian manufacturing sector is relatively small, quite capital intensive, and not much involved in producing consumer durables.

A comparison of the forecasts by Norges Bank with those by Statistics Norway show that already in the beginning of 2009, both institutions quickly understood that the Norwegian recession would be much milder than the great international recession. However, there has been a clear (and to us surprising) tendency that Statistics Norway forecast a persistently lower inflation than Norges Bank for the period 2009 – 2011.

### Monetary policy in 2009

The committee has evaluated monetary policy in the first half of 2009 as being part of the Norwegian authorities’ management efforts to counter the negative effects of the financial crisis on the Norwegian economy. These were followed by an “exit strategy” phase in which Norges Bank began to signal a return to higher rates, as it scaled back the crisis measures and eventually started to hike rates in October. The central bank’s rhetoric and actions in the period since the August interest rate meeting have been part of this exit strategy, in our view.

From a peak of 5.75 per cent in the summer of 2008, Norges Bank’s policy rate was lowered in stages to 1.25 per cent by June 2009. In February, March and May, the policy rate was cut by 50 basis points each time, whereas the last rate cut in June was 0.25 percentage points. Between the release of the Monetary Policy Report (MPR2/09) and the final rate cut down to 1.25 per cent in June and the next Executive Board policy meeting in August, the rhetoric coming from Norges Bank saw a marked change. In fact, as early as 12 August, the date of

the meeting, Norges Bank hinted that it was getting ready to hike rates in the near future due to stronger-than-expected developments.

After evaluating Norges Banks monetary policy, the committee considers Norges Banks assessment of the Norwegian economy over all to be well balanced in the first half of 2009. The two rate cuts in February and March reflected well the deterioration of the outlook of the Norwegian economy.

The largest controversy regarding monetary policy in 2009 was probably the rate cut in June, and to a lesser extent in May. By then, the economy had begun showing signs of improvement, the government's expansionary fiscal policy was just starting to have an impact, and the financial markets had improved rapidly on the back of lower interest rates, government guarantees and ample liquidity. Along with the strong signs that the economy was improving, there were growing concerns that the extraordinarily low interest rates could initiate a housing market bubble. House prices started to increase already in January 2009, and have continued to climb gradually back to their pre-crisis levels.

Some leading indicators and the strong recovery of financial and asset markets suggested an earlier recovery than what Norges Bank emphasized at that time. The rate cut in May, and more notably in June, therefore raised some concern in the private sector. The upward revision of the projected output gaps and inflation in 2010 and 2011 should in normal times rather indicate higher interest rates. However, given the unusually high uncertainty about the economic outlook at the time, and the exceptionally low interest rate level abroad, the committee does not find the rate cuts inappropriate.

Up until its August meeting, Norges Bank had clearly pursued interest rate easing cycle. The August meeting represented a sharp change in rhetoric as Norges Bank indicated it would probably hike rates earlier than it had indicated in its June meeting. By August, the turning point had been moved to the third quarter of 2009, with an output gap of -1 per cent and a corresponding upwards adjustment of the forecasted interest rate path for 2010. This change in stance from June to August was to some extent anticipated by private sector as the rate cuts in June and to some extent in May were not fully priced in the market.

After the August meeting, Norges Bank communicated clearly its intention to start its exit strategy. Norges Bank wanted to withdraw the extraordinary measures first and then hike rates. On October 28, Norges Bank hiked rates by 25 basis points to 1.5 per cent and signalled that rates would be hiked by a further 25 basis points either in December 2009 or February 2010. Due to strong economic data, recovering financial markets, rising house prices and a lack of pass-through from the previous policy rate hikes to mortgage and corporate rates, Norges Bank hiked rates in December by 25 basis points to 1.75 per cent.

The committee would like to give Norges Bank credit for a quick and successful communication to the private sector when Norges Bank changed its view on the outlook for the Norwegian economy in August.

In the committee's view, the October rate hike reflected well the more optimistic outlook of the Norwegian economy signaled by Norges Bank since August. Although the rate hike in December was somewhat surprising to the private sector, the committee believes it was appropriate to increase rates due to the lack of pass-through of the previous rate hike to bank lending rates and a more favorable outlook of the economy.

During 2009 Norges Bank has given the housing market a great deal of attention in speeches, interviews and other communication. We have interpreted the various statements over the year as a gradual process in which Norges Bank at the end of the year put more weight on the role of house prices in increasing private demand than earlier. This does not mean that Norges Bank is targeting house prices in itself, but rather that sharp movements in house prices gives valuable information about the outlook for aggregate demand. The committee believes it to be appropriate for Norges Bank to put some more weight on rapid rising asset prices in monetary policy.

## Credibility and transparency

One important implication of having an inflation targeting Central Bank is that current economic behaviour will depend on expectations about monetary policy. The credibility and transparency of the central bank therefore becomes extremely important.

Norges Bank has the last few years approached the frontier in monetary policy transparency by publishing the projected interest rate path. Since the effect of a monetary policy decision depends on expected future decisions, the projected policy path is an integral part of the monetary policy stance.

The projected interest rate path, as well as the forecast of the other macroeconomic variables, are updated and published in the monetary policy reports three times a year. Norges Bank has argued against writing a report every quarter, as it leaves very little time for the staff to digest new information and conduct thorough analyses. Yet, Norges Bank Executive Board meets eight times a year. Only on the three occasions that they publish the Monetary Policy report do they update the forecasts. The exception was in December 2008, when the unexpected depth of the financial crisis required new forecast for the expected policy stance.

The NBW committee suggests that Norges Bank keeps the number of monetary policy reports to three per year, but consider publishing a press release and a monetary policy update at least on one of the other meetings of the Executive Board. The monetary policy update should contain a limited number of forecasts for central macroeconomic variables.

Norges Bank has decided not to publish minutes. Rather than voting they have a “collegial”, monetary policy committee, where the members of the Executive Boards make unanimous decisions. We suggest that non-attributed minutes should be published, in order to strengthen the accountability and further improve transparency. These minutes could note without attribution to individual members which issues were discussed and what arguments were presented, as well as how (if) individual members have voted.

Non-attributed minutes will reveal the scope and depth of the policy discussion, but do not identify the individual contributions of the members. Even to publish the voting patterns (without identifying individual votes) would be useful, as it provides an indication of the degree of disagreement and/or uncertainty among the members, which helps the private sector to more efficiently learn the monetary policy reaction function.

Currently, Norges Bank has decided to “speak with only one voice”. This has implied that only internal members (the Governor and Deputy Governor) have discussed the monetary

policy decisions or issues related to the operation of monetary policy in public. We suggest that also the external members should be able to discuss issues related to the operation of monetary policy in public. This would contribute positively to the current debates about monetary policymaking in Norway.

## Fiscal policy – challenges for monetary policy

Norway's situation as a small open economy makes it particularly important that there is a commitment to a credible rule for fiscal policy. Without such commitment, the Norwegian fiscal discipline may wear down, leading to rent seeking activities, excessive government spending and an increase in wages. This may put upward pressure on the interest rates and the exchange rate, leading to deterioration of industries exposed to international competition.

In general, good coordination of monetary and fiscal policy can be achieved by placing each within a decision framework focusing each on medium-term objectives and making those objectives and related actions transparent and predictable. In this way, fiscal actions can take full account of the likely monetary-policy response, and vice versa.

Norges Bank has been clear in arguing that a precondition for effective interaction between monetary and fiscal policy is that decision-making bodies recognize how their decisions will affect each other. In the absence of such recognition, discretionary fiscal policy can create tensions in the monetary policymaking in Norway. If fiscal policy stays on its current track, we are concerned it would represent a considerable challenge to Norges Bank.

## Asset prices and monetary policy – implications for Norway

As the world economy appears to be emerging from the worst financial crisis and deepest, most synchronized global slump in 75 years, policymakers, regulators, and academics are focusing intensely and appropriately on 'lesson to be learned', with particular attention paid to how movements in asset prices should influence the conduct of monetary policy. In the years leading up to the crisis, there had developed a broad consensus among monetary policy makers on the role that asset prices should play in an inflation targeting strategy. According to this consensus, asset prices will affect monetary policy to the extent that they are deemed to affect the forecasts of the central bank's target variables that is, inflation and the output gap. A central bank following this approach may well wish to lean against swings in asset prices, but only if these swings influence the forecast of inflation or possibly, the output gap.

Experts at the Bank for International Settlements had for some years have offered critiques of this consensus and since the crisis, have called for major changes in it. According to this critique, the focus on inflation and output stabilization resulted in a path for interest rates that might not sufficiently reflect the dangers that arise when an asset price boom is coupled with a credit boom. The focus on price stability meant that they ignored the very real, systemic threats arising from credit and asset price booms that had been building during the 'Great Moderation'.

Recent research by the IMF sheds light on the information role that asset prices and quantities have provided in previous housing and stock market busts since 1970. The study confirms the

valuable information content contained in data on credit flows, economic activity in the construction sector, and current account imbalances. However, at the same time IMF also pointed out that the ability to predict house price busts over a three year window can be difficult. At most only half the time in the IMF panel do the best indicator variables actually correctly signal an asset price bust within one to three years. Policymakers will in practice have to think carefully about an aggressive hike in interest rates solely to prevent an asset price bubble from forming given just 50-50 chance that the signal of a bubble is correct.

Each country, including Norway, will have to assess how best to design and implement systemic regulatory authority in the wake of the financial crisis. In Norway, the responsibility for financial stability is divided between the Ministry of Finance, Finanstilsynet and Norges Bank. Norges Bank publishes its assessment of the outlook for financial stability in semi-annual reports. In addition the Bank holds meetings with Finanstilsynet and the Ministry of Finance to discuss the status of the financial system and the need for government measures.

The committee believes that Norges Bank should continue and enhance its responsibility for analyzing, reporting, and communicating information about significant interactions between and risks among financial institutions, as part of its Financial Stability Report. By having regular meetings with Finanstilsynet and the Ministry of Finance, it will enhance and contribute to the macro prudential supervision in Norway.

## The forecasting process – models and judgement

Since November 2005, all macroeconomic forecasts from Norges Bank have been based on their own predictions regarding expected future interest rate setting. This forecasting analysis makes use of a structural model (NEMO), but this model is primarily suited for medium term analysis of the effects of monetary policy on the macroeconomy. Norges Bank's forecasts for the first few quarters are largely based on current statistics, information from Norges Bank's regional network and forecasts obtained from a number of short-term statistical and econometric models. The published projections in the monetary policy reports are the result of an overall assessment based on both models and judgment.

The analytical work conducted in Norges Bank is impressive, drawing on high level skills in diverse areas such as economic theory, statistics, econometrics, mathematics and programming techniques.

### **Indicators of underlying inflation**

Consumer price inflation varies from month to month, sometimes substantially due to extraordinary fluctuations in certain product markets or changes in taxes and subsidies. Norges Bank's mandate therefore opens up for ignoring extraordinary consumer price disturbances when setting the interest rate, by focusing on a measure of so-called underlying inflation.

In 2008, Norges Bank introduced a new indicator of underlying inflation called CPIXE. CPIXE measures CPI inflation adjusted for tax changes and excluding temporary fluctuations in energy prices. The motivation for constructing CPIXE is that the previous measure of underlying inflation (CPI-ATE) does not capture trends in energy prices, since CPI-ATE permanently excludes energy.



By focusing on CPIXE instead of CPI-ATE, Norges Bank has introduced a new main indicator of underlying inflation that they are targeting in their forecasting process. CPIXE is now the only measure of underlying inflation for which they provide conditioned, detailed forecast.

A major concern with CPIXE is that the historical index values will be revised as new observations of energy prices are added to the sample. In periods with rapid changes in oil prices, this revision can be substantial. In their monetary policy reports, Norges Bank does not update the data for CPIXE as it is revised. Hence, the effect of the revisions will be suppressed. If Norges Bank continues to publish CPIXE in their monetary policy reports, we recommend that the final numbers are published as they are revised, not the real time values. Given that the final revised values of CPIXE will always be uncertain by construction, Norges Bank should also extend the fan charts back in time to reflect this uncertainty.

Relying too much on CPIXE as the main indicator of underlying inflation could make monetary policy less robust, since historical data are revised as new observations becomes available. Furthermore, since the construction of CPIXE involves judgment and revision of history, it does not make it a transparent indicator that Norges Bank should use as its main indicator. Our view is that CPI-ATE should still be used as the focus measure, but that Norges Bank can use more judgment vis-à-vis CPI-ATE in times of rapid oil price increase/decreases.

### **Regional Network**

Norges Bank has established a regional network of enterprises, organizations and local authorities throughout Norway. The insight from the network is an important factor in decision-making by Norges Bank's Executive Board in its conduct of monetary policy. We find that there is clearly useful information in the regional networks in assessing current macroeconomic conditions. In that sense, it provides a signal about developments in the Norwegian economy before data is published and we recommend that Norges Bank continues to develop and refine the network. However, the ability of the network to forecast aggregate economic activity 3-6 months ahead is less clear, as it seems to be a coincident rather than leading indicator. Given the amount of resources that are put into constructing the indicator, we suggest that the forecasting power of the regional network is systematically assessed and compared to other leading indicators such as Statistic Norway business tendency survey.

### **Short term forecasting**

Norges Bank has the last few years developed and implemented forecasting methods of model combinations used in the monetary policy operations. These forecasts are unconditional forecasts. At the heart of the evaluation and combination of short-term forecasts is a set of programs collectively referred to as SAM – the System for Averaging Models. This work is encouraging and we recommend that Norges Bank continues to develop, test and evaluate these forecasting tools both for point forecast and densities. Furthermore, as last years Norges Bank Watch group, we recommend that Norges Bank publishes the short term forecast regularly, at least after each monetary policy meeting.

We also suggest that the forecast horizon be extended to 2-3 years. The forecasts can be published together with the regular forecast update from NEMO. In that way the

unconditional forecast from SAM can serve as useful cross checks for the forecast from NEMO, which are conditional on the interest rate path.

### **The structural model**

The last few years, Norges Bank has made impressive progress in developing a small structural model, called NEMO. The model has been in use for policy analysis and forecasting since the Monetary Policy Report 3/07.

We support Norges Bank's efforts to build a theoretically consistent structural model of the Norwegian economy, for evaluating monetary policy alternatives in the medium and long term. However, the recent financial crisis has highlighted some severe deficiencies in NEMO and many other DSGE models with respect to credit markets and asset prices, resulting in forecast failures.

To strengthen its forecast properties, we recommend that Norges Bank should use empirically validated econometric models systematically as cross checks when making forecast from NEMO. This will offer transparency about the models strengths and weaknesses.

We also suggest that leverage ratios and credit spreads are key variables in the monetary transmission mechanism that need to be modeled to assess the impact of different policy paths on the economy as well as how shocks to the financial sector generate fluctuations in inflation and the output gap.

Currently NEMO does not include oil prices. However, oil price changes may have large wealth effects that are likely to influence consumption and investment. Furthermore, since oil revenue now constitutes a large component of total government income, fiscal policy will be affected in the long run by changes in the oil price. We therefore suggest that Norges Bank considers whether oil prices could make an useful contribution to the current model.

## 1. Introduction

This report, Norges Bank Watch 2010, is an evaluation of the conduct of monetary policy in Norway in 2009. This report will not evaluate the institutional framework for monetary policy. Like previous Norges Bank Watch reports, we adopt the ex-ante rather than the ex-post perspective, i.e. our assessment of the conduct of monetary policy is solely based on the information available when decisions were made, not data and information that became known afterwards.

Professor Richard Clarida, University of Columbia has written Chapter 6 (Asset prices and monetary policy: Implications for Norway), and contributed to Chapter 7.5 (Financial frictions).

The committee for Norges Bank Watch 2009 met in Oslo on three occasions during the period from September 2009 to February 2010. On 5 November and 17 December 2009 we had meetings with the management of Norges Bank. The committee has also had meetings with the Ministry of Finance (6 November 2009), with representatives of Statistics Norway (December 8, 2009) and with The Financial Supervisory Authority of Norway (Finanstilsynet) 17 December. We wish to thank Norges Bank for supplying us with useful data.

The committee would also like to thank Petra Geraats, Arne Jon Isachsen, Steinar Juel, Kai Leitemo and Bjørn-Roger Wilhelmsen for constructive comments. The responsibility for errors and omissions rests solely with the committee, however.

## 2. The Great Recession

The year 2009 has been extremely challenging for central banks and governments around the world. The uncertainty facing Norges Bank and most other central banks during 2009 was clearly much higher than normal. During November and December 2008, news about the dramatic effects of the global financial crisis on industrial production and world trade triggered a substantial downward revision of the growth and employment forecasts of Mainland Norway for 2009 and 2010 as well. To evaluate Norges Bank's monetary policy decisions in 2009, therefore, it is both important to acknowledge the extraordinary uncertainties about developments in international financial markets and the international economy, as well as evaluating the business cycle forecasts on which Norges Bank's monetary policy decisions in 2009 were based.

### 2.1. Forecasting the Great Recession

The year 2009 turned out to be an exceptionally challenging year for the world economy, particularly for the OECD-countries. In the latest *OECD Economic Outlook* of 2009, the decline in aggregate output from 2008 to 2009 was forecasted to be 2.5 per cent in the US, 4 per cent in the Euro Area and 5.3 per cent in Japan. It could have been worse, however. In the first quarter of 2009, many forecasters feared that the recession would be deeper and more long lasting than what most forecasters think now. Last spring some would not even exclude the possibility of a full scale depression with deflation in the OECD area. Now, the consensus is that this is very unlikely to happen. During the summer and fall of 2009, new information suggested that the decline in aggregate output came to a halt and output was probably growing in the third and fourth quarter of 2009 in the US and Euro Area.

The recession in 2009, which started in the third or fourth quarter of 2008 in most industrialised countries (but earlier in the US), is going to be the deepest in the OECD area since 1945. Naming it "The Great Recession" therefore seems appropriate, see Termin (2010).

Table 2.1 looks at how Norges Bank, Statistics Norway, the IMF and OECD adjusted their Euro area output forecasts for 2009 and 2010 from the autumn of 2008 and during the year 2009. The table shows that both Norges Bank and Statistics Norway revised their forecasts downward considerably between the autumn of 2008 and February/March of 2009. The forecast were revised down even further in May/June, before they became slightly more optimistic in the autumn. They were also more pessimistic than OECD and IMF forecast, except at the end of the year. Although not displayed here, a very similar pattern applies to the US output growth forecast for 2009 by Norges Bank and Statistics Norway. This suggests a strong tendency for institutions to herd when making forecasts of international business cycles. In retrospect, both Statistics Norway and Norges Bank probably had a gloomier picture of the great recession in May/June than what will materialize, but the final answer to this question lies in the future.

Table 2.1. Forecasts of GDP growth rates in the Euro area in 2009 and 2010 by different institutions on four different occasions in 2008 and 2009.

Growth rate in <b>2009</b> (per cent)	OECD	IMF	Statistics Norway	Norges Bank
October/December 2008	-0,6	-0,5	-0,9	0
February/March 2009	-0.6	-2.0	-3.5	-3.25
May/June 2009	-4.1	-4.2	-4.9	-4.5
October/December 2009	-4.0	-4.2	-4.0	-4.0
Growth rate in <b>2010</b> (per cent)	OECD	IMF	Statistics Norway	Norges Bank
October/December 2008			0	1,75*
February/March 2009	1.2	0.2	-0.7	0
May/June 2009	-0.3	-0.4	-0.8	0
October/December 2009	0.9	0.3	0.8	0.5

Source: Statistics Norway: *Økonomiske analyser* 1/2009 (19 February), 3/2009 (27 May) and 6/2009 (1 December). Norges Bank: Monetary policy reports 1/09 (19 March), 2/09 (11 June) and 3/09 (22 October).

\*Average of growth rates in 2010 and 2011.

Table 2.1 also shows that both Norges Bank and Statistics Norway have revised their output growth forecast for the Euro area in 2010 upwards in October/November of 2009. Statistics Norway was more pessimistic than the other three institutions in the first quarter of the year and early summer, but raised its forecast considerably in October/December, and became slightly more optimistic than Norges Bank in the end. All four institutions now expect a positive growth rate in the Euro area in 2010. Again, the differences in the forecasts across these four institutions are small.

### **2.1. The mild Norwegian recession**

Recent data strongly suggests that the recession in Norway is significantly milder than in the Euro area and in the US. According to forecast by Statistics Norway in early December 2008, Mainland output growth rate was expected to decline from 2.2 per cent in 2008 to -1.1 per cent in 2009, followed by 2.2 per cent growth in 2010, see Table 2.2 below.

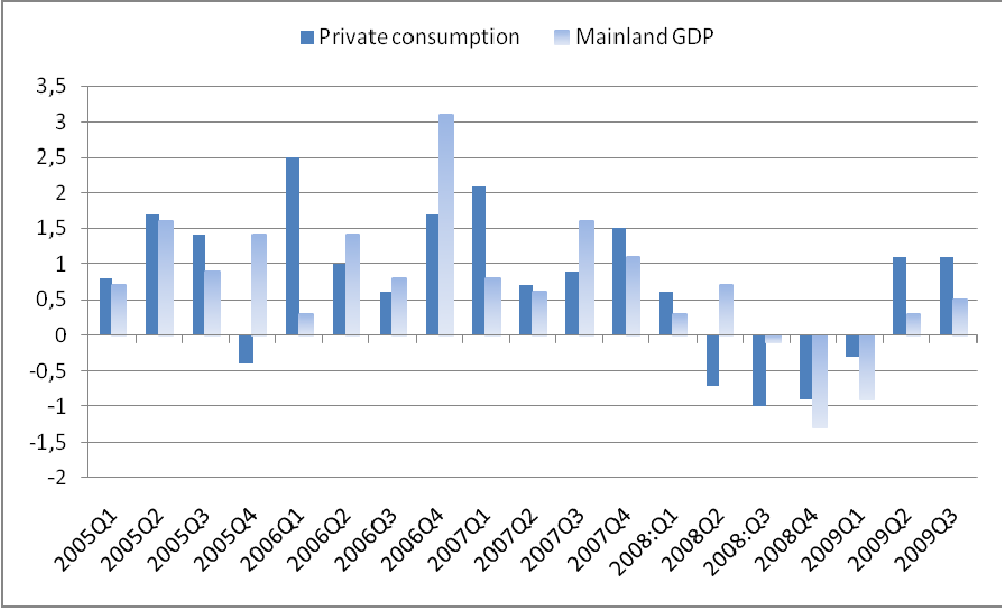
The relatively mild recession in Norway compared to the great international recession is probably a combined result of good macroeconomic policies, good financial regulation, and good luck. As emphasized in Chapter 3 of this report, monetary policy has been very expansionary since December 2008, and the effects of monetary policy on aggregate demand are probably greater in Norway than in most other European countries due to the combination of large household indebtedness and floating mortgage rates. In addition Norway has in the downturn benefited from having a large public sector and strong automatic fiscal policy stabilizers. On top of aggressive rate cuts, a considerable discretionary shift in fiscal policy was enacted in February. Good policies and strict financial regulations are also – at least partly – factors that explain why there has been neither a general banking crisis, nor severe problems in any Norwegian bank in 2009. The international financial crisis did temporarily

cut off many Norwegian banks from international funding, but this problem was manageable for the authorities, and was dealt with without incurring a credit crunch. Finally, it was good luck that the oil price doubled in the course of 2009 and that Norway’s manufacturing sector is relatively small, quite capital intensive, and not much involved in producing consumer durables. Also, a temporarily weakening of the external value of the Norwegian krone, made life easier for producers of tradeables. Thus, Norway enjoyed a substantial current account surplus, a fairly small decline in employment, and relatively low unemployment in 2009. In fact, the increase in unemployment in Norway has been much less dramatic than in small, European countries with a large industrial base, such as Sweden and Finland.

Still, the implications of the great, international recession and the domestic macroeconomic policy responses have opened up a very visible gap between a large booming sector producing non-tradeables, fuelled by booming house prices, private consumption and public spending, and a relatively small and declining, non-oil tradeable sector. Due to Norway’s large export revenues from petroleum, it has been possible for the government to undertake ambitious counter-cyclical fiscal and monetary policies measures, while at the same time enjoying considerable public sector surpluses as well as huge surpluses on the current account of the balance of payments in 2009.

Figure 2.1 indicates that private consumption has been leading mainland GDP during the recession and recent recovery. Real private consumption fell four quarters in a row, starting in the second quarter of 2008. It recovered strongly in the second and third quarter of 2009, growing by more than one per cent in each quarter on a q/q basis. Real mainland GDP started its decline in the third quarter of 2008. The decline in output was smaller in the first quarter of 2009 than in the last quarter of 2008, and in the second and third quarters of 2009, mainland output has been growing along with real private consumption.

Figure 2.1 Quarterly growth rates in mainland GDP and private consumption, 2005:1 – 2009:3 (seasonally adjusted data).

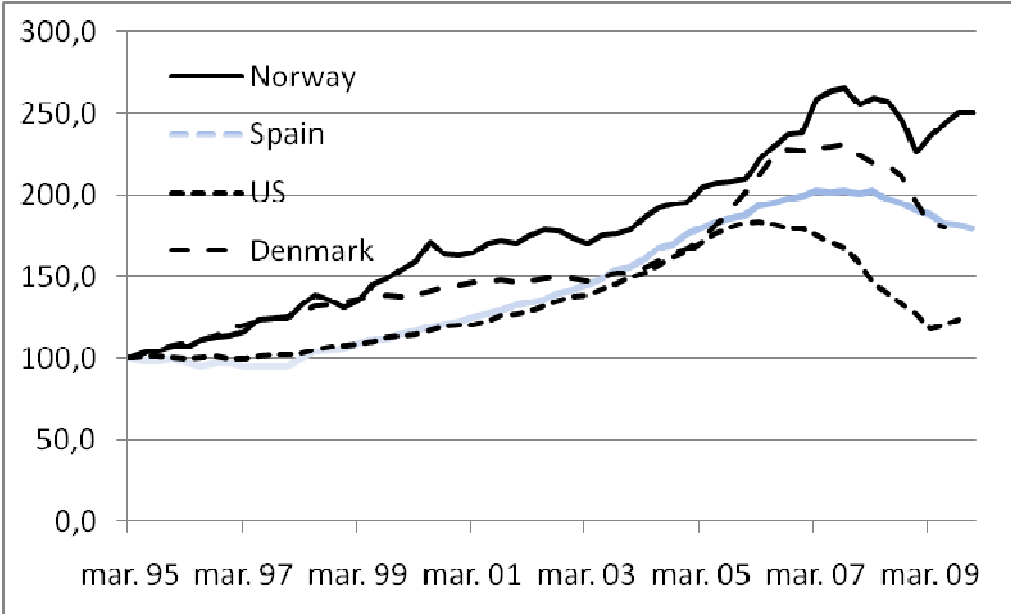


Source: Statistics Norway

There can be little doubt that the tight monetary policy in the year before the global financial crisis was an important factor behind the decline in private consumption starting in spring of

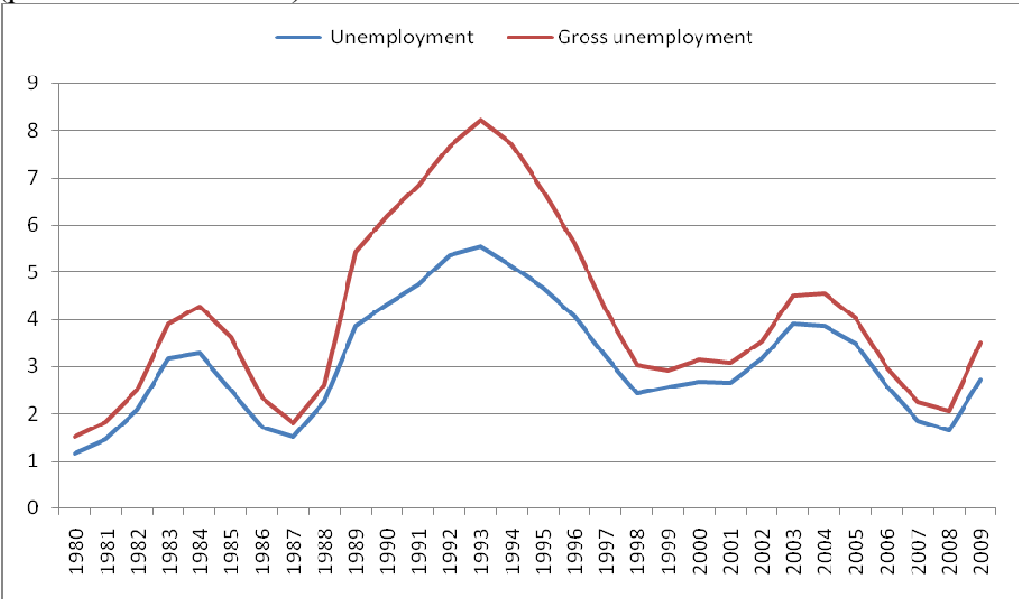
2008, half a year before the financial turmoil erupted in September and October. This policy had substantial effects on real interest rates and house prices. After monetary policy was vigorously eased in the fourth quarter of 2008, the house price decline stopped and was reversed in January 2009 (see Figure 2.2).

Figure 2.2 Real house prices, deflated by CPI. Index. 1995 Q1 =100



Source: Norges Bank

Figure 2.3 Unemployment and gross unemployment rates. Registered (totally) unemployed, excluding or including individuals and participants in labour market measures, 2001-2009 (per cent of labor force).



Source: The Norwegian Public Labour and Welfare Service (NAV) and Statistics Norway

Recent unemployment data suggest that the latest recession will have a much smaller negative impact on the labour market than the recession in 1988-1989, see Figure 2.2. The gross unemployment rate, including participants in labour market measures, increased to more than 5 per cent in 1989 and peaked at more than 8 per cent in 1993. The 2009 observation involves a rate of gross unemployment of only 3.7 per cent in 2009.

## 2.2. Norges Bank's forecasts of the real economy and inflation

Table 2.2 compares the 2009 and 2010 forecast of mainland GDP and private consumption by Norges Bank with those from Statistics Norway. It is interesting how little these forecasts have changed throughout 2009. In the first quarter of 2009, both institutions appear to have developed a realistic picture of a relatively mild recession in Norway in 2009 compared to the great international recession.

In February/March, Statistics Norway was slightly more pessimistic than Norges Bank, but in May/June the roles were reversed. Still, these differences between the forecasts of the two institutions are not large in relation to the normal adjustments of preliminary national accounts data.

Table 2.2. Forecasts of mainland GDP and real private consumption growth rates by Norges Bank and Statistics Norway for 2009 and 2010 on four different occasions in late 2008 and in 2009.

	Mainland GDP growth rate, (per cent), <b>2009</b>		Private consumption growth rate (per cent), <b>2009</b>	
	Norges Bank	Statistics Norway	Norges Bank	Statistics Norway
October/December 2008	0.25	-0.4	0,75	-1,0
February/March 2009	-1.0	-1.7	0	-0.4
May/June 2009	-1.5	-1.4	-0.25	0.4
October/December 2009	-1.25	-1.1	0	0.2
	Mainland GDP growth rate (per cent), <b>2010</b>		Private consumption growth rate (per cent), <b>2010</b>	
	Norges Bank	Statistics Norway	Norges Bank	Statistics Norway
October/December 2008	2,5	1,0	3,0	2,0
February/March 2009	2.5	0.9	5.25	3.1
May/June 2009	2.5	1.0	5.25	4.6
October/December 2009	2.75	2.2	5.5	5.5

Source: Statistics Norway: *Økonomiske analyser* 6/2008 (2 December 2008), 1/2009 (19 February), 3/2009 (27 May) and 6/2009 (1 December). Norges Bank: *Monetary policy reports* 3/08 (23 October 2008), 1/09 (19 March), 2/09 (11 June) and 3/09 (22 October). The dates refer to cut-off days for information, not publication dates.

Neither have Norges Bank and Statistics Norway changed their views on private consumption in 2009 (Table 2.2). Norges Bank forecasted zero growth both in February/March and



October/December, while Statistics Norway increased its forecast of the real private consumption growth rate from -0.4 per cent in February/March to +0.2 per cent in October/December.

The two institutions forecasts for 2010 of mainland output and private consumption growth rates were somewhat different in February/March 2009, but converged in the fourth quarter, as more data was available. Statistics Norway started out as more pessimistic than Norges Bank in the first half of 2009, but in their last forecast in 2009, both institutions expected private consumption to increase solidly in 2010.

Table 2.3. Forecasts of rates of unemployment and employment growth rates in Norway by Norges Bank and Statistics Norway in 2009 and 2010 on four different occasions in late 2008 and in 2009.

	Rate of unemployment in <b>2009</b> (per cent of labour force)		Employment growth rate <b>2008-2009</b> (per cent)	
	Norges Bank	Statistics Norway	Norges Bank	Statistics Norway
October/December 2008	3.25	2.7	-0.75	0.1
February/March 2009	4.25	3.7	-1.5	-0.4
May/June 2009	3.5	3.8	-0.5	-0.8
October/December 2009	3.25	3.1	-0.25	-0.4
	Rate of unemployment in <b>2010</b> (per cent)		Employment growth rate <b>2009-2010</b> (per cent)	
	Norges Bank	Statistics Norway	Norges Bank	Statistics Norway
October/December 2008	4.0	4.6	0	-0.1
February/March 2009	4.75	4.7	-0.25	-0.2
May/June 2009	4.5	4.6	-0.5	-0.5
October/December 2009	3.75	3.5	-0.25	-0.3

Source: Statistics Norway: *Økonomiske analyser* 6/2008 (2 December 2008), 1/2009 (19 February), 3/2009 (27 May) and 6/2009 (1 December). Norges Bank: *Monetary policy reports* 3/08 (23 October), 1/09 (19 March), 2/09 (11 June) and 3/09 (22 October). The dates refer to cut-off days for information, not publication dates.

Table 2.3 shows that both Norges Bank and Statistics Norway were more pessimistic about the labour market in February/March than in October/December, particularly Norges Bank. Norges Bank's first February/March forecasts of the rate of unemployment and employment growth in 2009 were 4.25 and -1.5 per cent, respectively. The revised forecasts in October/December were 3.25 and -0.25 per cent, respectively. This is much closer to the forecast by Statistics Norway. Interestingly, while Norges Bank was more pessimistic than Statistics Norway about the labour market in February/March, their positions changed in May/June. The differences were quite small in May/June, however.

In regard to the two institutions forecasts for unemployment and employment growth in 2010, there is a clear tendency for both Norges Bank and Statistics Norway to reduce their unemployment forecasts, while the employment growth forecasts change very little during 2009.

Recent unemployment survey data (January 2010) indicate that both employment and the labour force have declined in 2009. From the third quarter of 2008 to the fourth quarter of 2009, employment declined by 45,000 individuals (1.8 per cent of the labor force), whereas the labor force decreased by 36,000 (1.4 per cent), making for an increase in the rate of unemployment of only 0.4 percentage points.

It is the young age group up to 24 years that has been hit most severely by the recession. During the same period, employment declined by 43,000 individuals and the labour force by 42,000 individuals in this age group. Probably, many young Norwegians have preferred further education to unemployment.

Growth in public sector employment has also prevented higher unemployment in Norway. Recent survey data suggest that employment in public administration and health services has increased by 19,000 individuals (0.8 per cent of the labour force) from the third quarter of 2008 to the fourth quarter of 2009.

Table 2.4 looks at inflation forecasts. Norges Bank's forecast of CPI-inflation in 2009 was quite high in the fourth quarter of 2008; 3 percent compared to Statistics Norway's forecast of 2 per cent about five weeks later. The difference diminished throughout the year. Still, there is a clear tendency that Norges Bank forecasts a higher rate of inflation than Statistics Norway. This is also true when comparing their forecast for 2010 and 2011. For example, Norges Bank's forecast of inflation in 2010 in the fourth quarter of 2009 was 1.75 per cent, compared to a forecast of only 0.8 per cent by Statistics Norway. The persistent disagreement between Norges Bank and Statistics Norway in regard to future inflation is surprising.

Table 2.4 Forecasts of CPI-inflation rates in Norway by Norges Bank (NB) and Statistics Norway (SSB) in 2009, 2010 and 2011 on four different occasions in late 2008 and in 2009 (per cent).

	2009		2010		2011	
	NB	SSB	NB	SSB	NB	SSB
October/December 2008	3.0	2.0	2.75	1.7	2.5	2.1
February/March 2009	2.0	1.4	2.0	1.0	2.25	2.2
May/June 2009	2.25	1.7	1.75	1.1	2.25	1.7
October/December 2009	2.25	2.1	1.75	0.8	2.25	1.7

*Source: Statistics Norway: Økonomiske analyser 6/2008 (2 December 2008), 1/2009 (19 February), 3/2009 (27 May) and 6/2009 (1 December). Norges Bank: Monetary policy reports 3/08 (23 October), 1/09 (19 March), 2/09 (11 June) and 3/09 (22 October). The dates refer to cut-off days for information, not publication dates.*

When looking at previous inflation forecasts for the period 2002-2008, Norges Bank has tended to forecast somewhat higher inflation rates 2-3 years ahead than what materialized.

### **3. Monetary policy in 2009**

The Norwegian economy posted high growth rates and fairly low inflation numbers in the period from 2003 to 2007. Then, in early 2008 Mainland growth rate slowed while inflation increased. In June 2008 Norges Bank raised its policy rate to 5.75 per cent, which under normal circumstances in financial markets would be considered as a fairly normal level. However, as credit spreads in money markets were unusually large, the monetary policy stance in 2008 clearly had a restrictive impact on growth.

In October 2008, the Norwegian economy was impacted by the worldwide financial crisis as confidence in the interbank market collapsed (see Norges Bank Watch 2009), amplifying the slowdown in the Norwegian economy. Norwegian banks had been relying to an increasing extent on foreign sources for short-term funding. At the same time, the uncertainty sparked by the crisis contributed to a halt in new export orders from abroad. It became increasingly evident that the Norwegian economy would contract at a faster pace and to a further extent than most had imagined.

In August 2008, manufacturing enterprises in Norges Bank's regional network reported that growth would continue. But only a few months later, in November, the enterprises described the outlook for sales as having suffered a "heart attack"<sup>1</sup>. Developments abroad quickly fed through to the Norwegian economy, translating into a shortfall in funding for banks, weaker demand for export goods, and heightened uncertainty surrounding overall economic trends. The Norwegian authorities responded to the economic slowdown with strong, countercyclical measures. Among these, the key policy rate was reduced to 1.25 per cent in the period from October 2008 to June 2009 in an effort to mitigate the fallout on the Norwegian economy from the global crisis.

In what follows, we have evaluated monetary policy in the first half of 2009 as being part of the Norwegian authorities' immediate crisis management efforts. These were followed by an "exit strategy" phase in which Norges Bank began to signal a return to higher rates, as it scaled back the crisis measures and eventually started to hike rates in October. The central bank's rhetoric and actions in the period since the August interest rate meeting have been part of this exit strategy, in our view.

#### **3.1 Monetary policy in the period January – July 2009**

From a peak of 5.75 per cent in the summer of 2008, Norges Bank's policy rate was lowered in stages to 1.25 per cent by June 2009, see Figure 3.1. Most other central banks cut rates to even lower levels. In February, March and May, the policy rate was cut by 50 basis points each time, whereas the last rate cut in June was 0.25 per cent. Between the release of the Monetary Policy Report (MPR2/09) and the final rate cut down to 1.25 per cent in June and the next policy meeting in August, the rhetoric coming from Norges Bank saw a marked change. In fact, as early as 12 August, the date of the meeting, Norges Bank hinted that it was getting ready to hike rates in the near future due to stronger-than-expected developments.

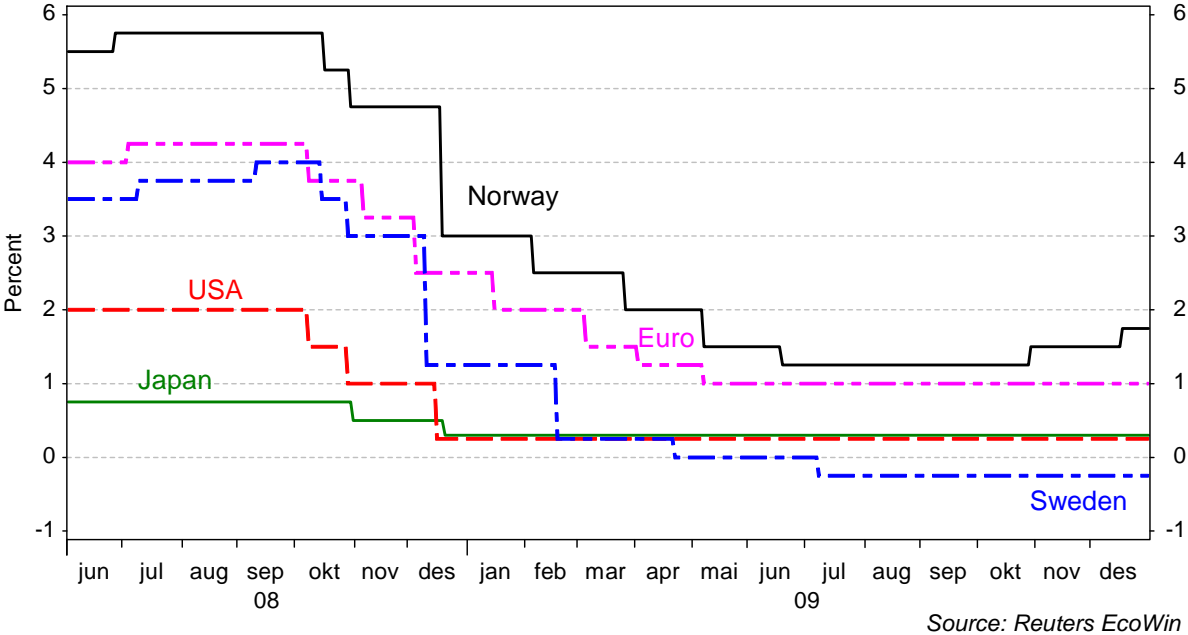
Comparing Norges Bank's Mainland output gap forecasts in different monetary policy reports (see Figure 3.2), the Bank made a considerable downward revision of the output gap path

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<sup>1</sup> Description from Norges Bank Governor Svein Gjedrem's annual speech, 12 February 2009

between its Monetary Policy Report MPR3/08 to MPR1/09 released on 25 March. Some of this revision probably came already in December, when forecast for inflation and the interest rate were updated, but no new forecast was published for the output gap then. In MPR1/09, Norges Bank forecasted the turning point of the Mainland business cycle to occur in the first quarter of 2010, corresponding to an output gap of -2 per cent. This forecast was only marginally adjusted upwards in MPR2/09 (17 June), but in MPR3/09 (28 October), the Bank's path for the output gap forecast was revised upwards considerably. We return to this issue in section 3.2 below.

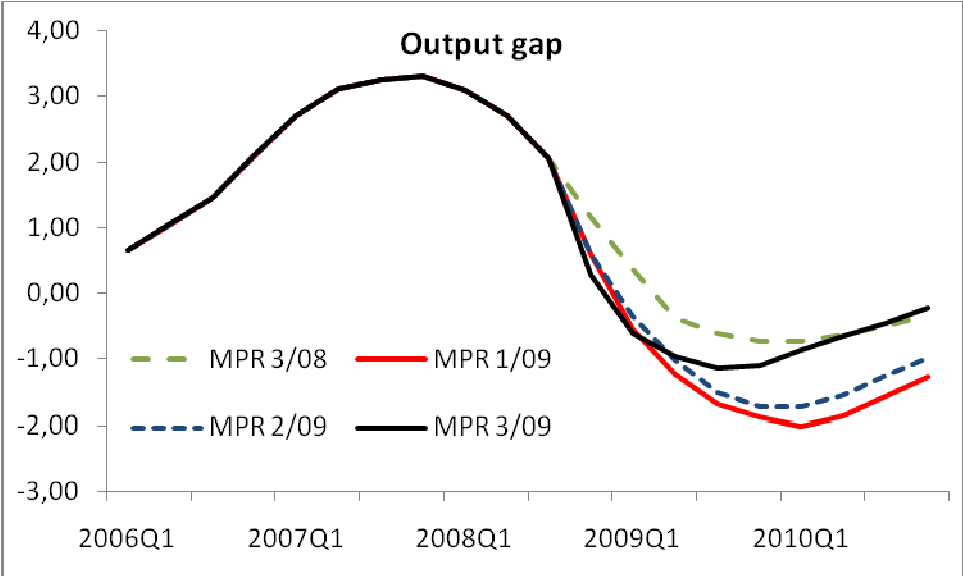
Figure 3.1. Key policy rates for Norway, US, UK, Euro and Sweden, June 2008-January 2010.



Norges Bank's inflation forecasts have not changed much in 2009 (see Figure 3.3), but a considerable downward revision occurred in the last quarter of 2008 and from December 2008 to March 2009 (MPR1/09). We will argue that a substantial share of the downward revision between MPR3/08 and the December forecast is due to methodological issues regarding how the CPIXE index is updated as new data is released. This is discussed further in Chapter 7.

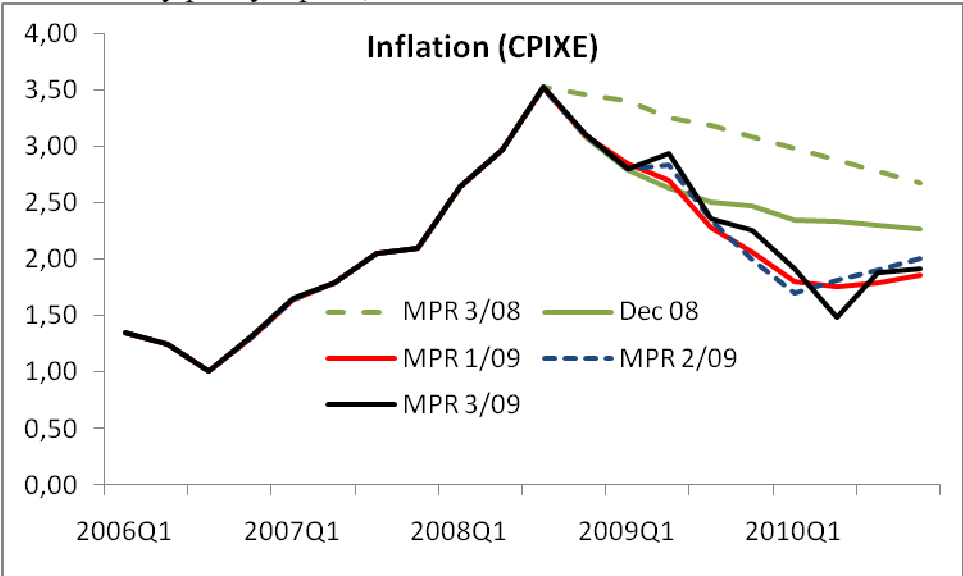
Figure 3.3 graphs Norges Bank's forecasts for the interest rates. Evaluating the Figures 3.2-3.4 together, it is striking how substantial the downward revisions in the policy rates are compared to the revisions in the output gap and inflation, in particular between MPR3/08 and MPR3/09. Although there are many different reasons for the recession to be so brief in Norway (see the discussion in Chapter 2), the figures may suggest that monetary policy was more powerful in this recession than expected. This will be discussed further below.

Figure 3.2 Norges Bank's forecasts of the mainland output gap in the four latest monetary policy reports.



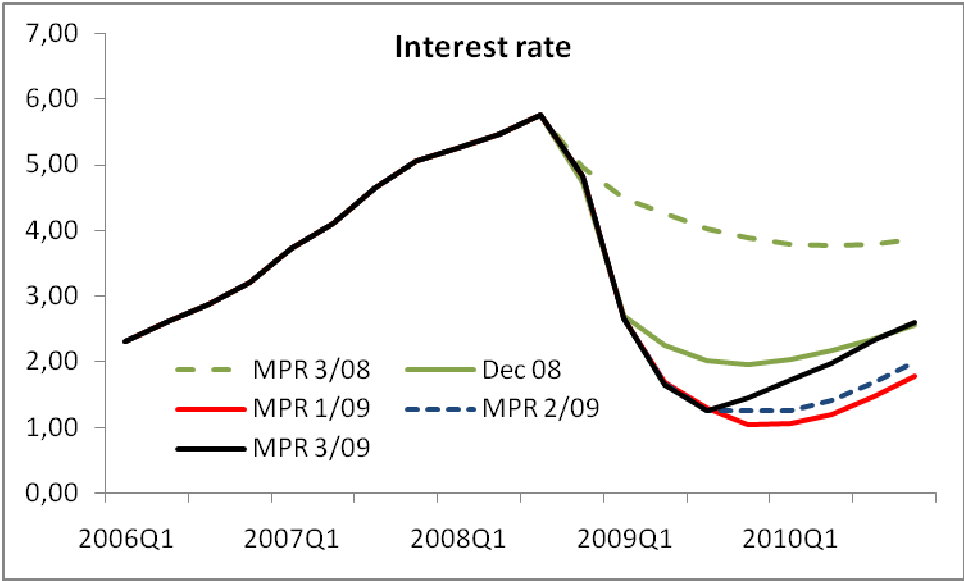
Source: Norges Bank

Figure 3.3 Norges Bank's forecasts of underlying inflation (in terms of CPIXE) in the last four monetary policy reports, and in December 2008.



Source: Norges Bank

Figure 3.4 Norges Bank’s forecasts of the key policy rate in the four latest monetary policy reports and December 2008.



Source: Norges Bank

At the **4 February** meeting of the Executive Board, the key policy rate was cut by 0.5 percentage points to 2.5 percent, with the press release stating: *“Global economic growth has weakened further since December. The international downturn seems to be having a broad impact and is likely to be deeper than previously expected ... There is still considerable uncertainty surrounding developments ahead. The downturn in the Norwegian economy may be deeper and more prolonged than Norges Bank has assumed. Inflation may in turn become too low.”*(our emphasize)

During the press conference, Norges Bank emphasized the need for proceeding gradually with further interest rate cuts, a point also being made in the press release. The level of uncertainty was indeed very great, particularly as far as the outlook for the global economy was concerned. The IMF, among others, lowered its global growth forecasts for 2009 and 2010 by 1.7 and 0.8 percentage points, respectively, compared to its November forecasts.

The rate cut was widely anticipated as it had been indicated in the central bank’s interest rate projection from its 17 December 2008 monetary policy update.

Following the aggressive rate cut in December 2008, in January the Norwegian government proposed changes to the 2009 budget in the form of a NOK 20 billion package of fiscal stimuli measures.

The household sector demonstrated a very rapid recovery from the widespread anxiety seen in late 2008, with such indicators as consumer confidence, retail sales and house prices all on the rise in January. The Norges Bank’s aggressive action in cutting rates in 2008 had already passed through to households by early 2009 as about 90 per cent of all households hold floating-rate mortgages. The decision to cut rates by 0.5 per cent on 4 February, and indicating that further rate cuts would be forthcoming, was widely anticipated and thus caused little discussion among economists and other central bank watchers.

On **12 February**, in his annual speech to the Supervisory Council of Norges Bank, Governor Gjedrem devoted some time to explaining why Norges Bank could not hike rates in order to cool down the housing market as higher rates would trigger capital inflows and a stronger currency:

*“Attempts to tighten monetary policy in the growth period from 2003 would, for example, have resulted in higher capital inflows, a noticeably stronger krone and a decline in manufacturing, even lower inflation, higher growth in real wages and more foreign currency loans to households and enterprises. The rise in credit and house prices would probably not have been affected to any extent and the current turnaround in the domestic economy would have been stronger and the fluctuations for our fragile krone even more pronounced.”*

Gjedrem also emphasised the role of the tax system in stimulating home ownership and pushing up house prices. He concluded that it was not the responsibility of Norges Bank to ensure a stable development in the housing market. It is widely acknowledged that in Norway housing and real estate are very advantageous investment classes compared to other asset classes due to the favourable tax regime and the ample supply of mortgage loans, which is supported by very low capital requirements on parts of the lending institutions.

It appears, however, that the government’s stimuli measures to help banks with longer-term funding have resulted in even lower funding costs for the mortgage market, and thus may have contributed to the increase in house prices through 2009. Norges Bank has commented on this in the Monetary Policy report in June in which they state that *“Norges Bank’s Survey of Bank Lending indicates that the swap arrangement has in turn primarily affected loan conditions for residential mortgages”* (MPR2/09 page 25).

On **25 March**, Norges Bank released its first Monetary Policy Report for 2009 (MPR1/09) and cut rates by an additional 0.5 percentage points to 2 per cent. The press release stated: *“It appears that the decline in activity in the Norwegian economy will be more pronounced than previously assumed. The enterprises in Norges Bank’s regional network are expecting output and employment to fall further over the next six months.”*(our emphasize)

The new report painted a much gloomier picture of the Mainland economy than the last report (MPR3/08), which was written before Norges Bank realized (in December 2008) how serious the mainland economy had been hit by international financial crisis. As noted above, the forecasts of the paths for the output gap and underlying inflation were lowered significantly, see Figure 3.2 and 3.3.

The path of the key policy rate forecast was also lowered from December 2008 to March 2009, see Figure 3.4 above. The trough of the interest rate cycle was reduced from 2 to 1 per cent, and expected to take place in the last quarter of 2009. The interest rate cut was widely anticipated, but the market had priced in further rate cuts of only about 0.5 percentage points, indicating policy rate would bottom out at 1.5 per cent.

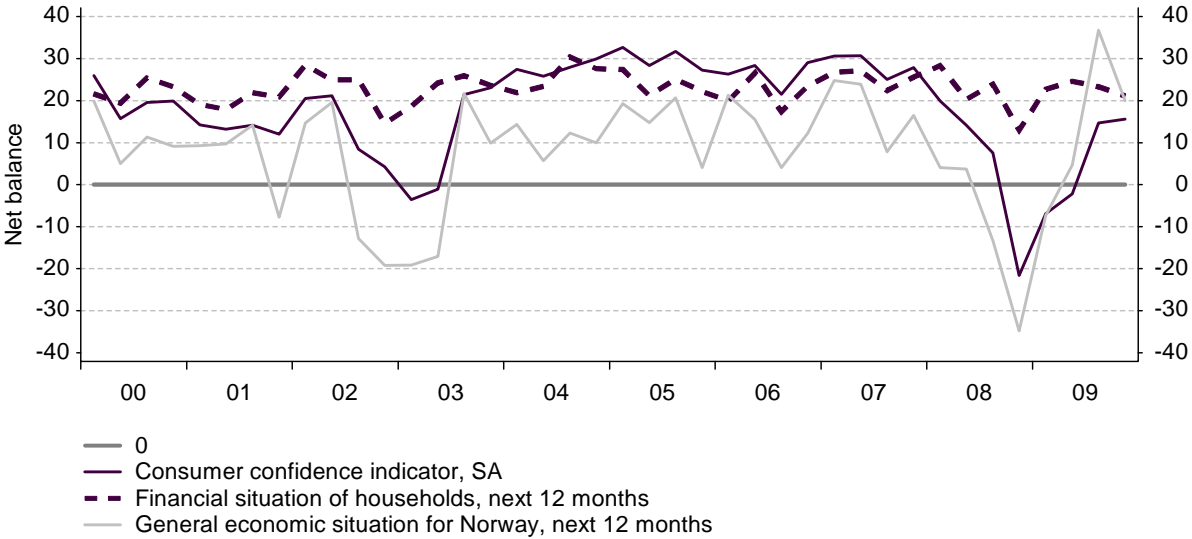
The fact that Norges Bank indicated further rate cuts of 1 percentage point and that policy rates were expected to bottom out at 1 per cent surprised the market and led to lower market rates and a weaker NOK. In fact, the EUR/NOK weakened from about 8.60 prior to the meeting on 25 March to between 8.80 and 8.90 in the days following the meeting.

Norges Bank made an explicit reference to its Regional Network in the assessment in the press release, as quoted above. It appears that Norges Bank regards information from the Regional Network as very useful in assessing the current state of the economy, as the information provided by the enterprises in the network is a more timely predictor of current situations than published statistics. However, the reference cited above also refers to the usefulness of the regional network as a leading indicator.<sup>2</sup> As we discuss in Chapter 7, we found more evidence that it is a coincident indicator rather than a leading indicator. Hence the statement that Norges Bank’s regional network is expecting output and employment to fall further over the next six months, could also reflect that output was falling fast when the survey was conducted in February/March.

On **6 May**, Norges Bank cut rates by 50 basis points down to 1.5 per cent. The press release stated: *“The global recession is having an adverse impact on the Norwegian economy and has resulted in a marked decline in exports. Developments since the March monetary policy meeting have been approximately as expected. [...] There are prospects that inflation will slow and fall below 2.5 per cent. It is therefore appropriate to set the interest rate at a low level to prevent inflation from falling too far below target.”*

The market consensus was indeed for a rate cut of 50 basis points to 1.5 per cent in line with the projection from the March Monetary Policy Report (MPR1/09). Interest rates had already been cut to nearly zero in most other countries, as illustrated in Figure 3.1, and all indications pointed to low interest rate levels continuing for an extended period.

Figure 3.5 Consumer confidence indicators, 2000 – 2009.



Source: Reuters EcoWin

Due to the rapid transmission of rate cuts on households’ mortgage rates, the confidence in the household sector improved rapidly over the spring months, as illustrated in Figure 3.5. In particular the household’s financial situation index (dotted line in the chart) only fell in the

<sup>2</sup> In Gjedrem’s speech on September 25<sup>th</sup> 2009, he states that: *“Regular interviews provide information about enterprises’ assessment of the economic outlook before other official statistics are available. This information is therefore an important part of the decision-making basis in the formulation of monetary policy.”*



last quarter in 2008 when mortgage interest rates were at its peak, and recovered rapidly in the first quarter of 2009 when interest rates fell sharply. In addition, as noted in chapter 2 above, the unemployment rate increased far less than feared thanks partly to increased hiring in the public sector.

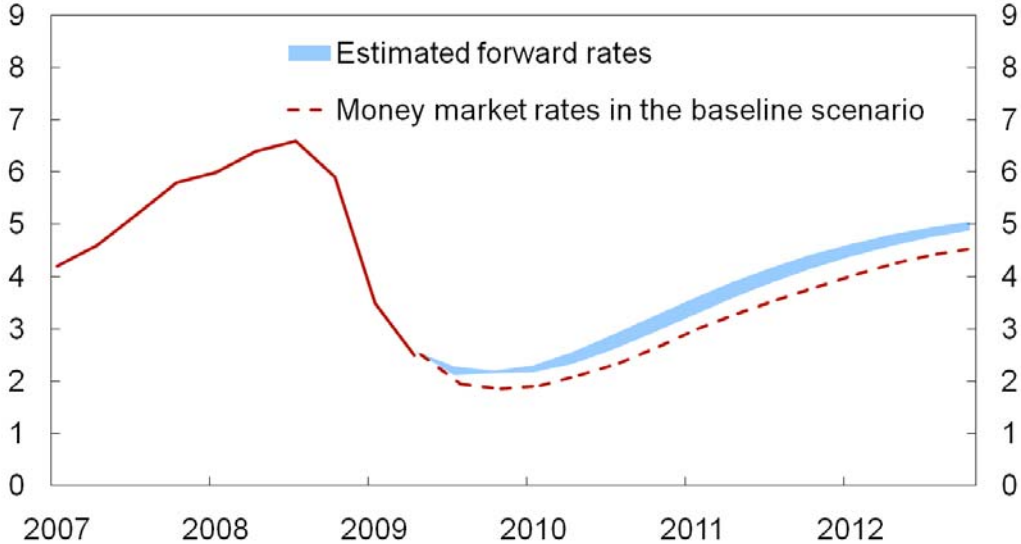
It seems that the high debt level in the household sector in combination with close to 90 per cent floating interest rate on mortgages have made households even more responsive to interest rates changes than earlier. This in turn may have increased the effectiveness of monetary policy.

On **17 June**, Norges Bank cut rates by 0.25 percentage points to 1.25 per cent. In the press conference, Deputy Governor Jan F. Qvigstad emphasized low expected inflation as one main concern for Norges Bank: *“It seems likely that domestic output will gradually pick up again, but inflation is expected to slow to around 1 ½ per cent in the coming year.”* “

The interest rate path was increased slightly compared to the March report as illustrated in Figure 3.4 above.

Although the interest rate path was lifted, it was still below market expectations, as illustrated in Figure 3.6. Market expectations concerning policy rates in the US, the UK and the eurozone had also risen measured by forward rates, reflecting increased optimism regarding the economic outlook abroad.

Figure 3.6 Money market rates in the baseline scenario and estimated forward rates<sup>1</sup>. Per cent. Quarterly figures, 2007 Q1 – 2012 Q4



1) Forward rates are based on money market rates and interest rate swaps. The blue band shows the highest and lowest forward rates in the period 5 - 11 June 2009.  
 Source: Norges Bank, MPR2/09.

Looking at the projected paths for output gap and inflation from the March report to the June report, Norges Bank made no changes in the projections for 2009, and revised upward its

estimate for output gaps in 2010 and 2011, see figure F.2. Hence, the revisions in the output gaps and inflation forecasts should perhaps in normal situations indicate higher interest rates in 2009 due to the lags in the effects of monetary policy.

Both the rate cuts in May and June were considered controversial by a number of private sector economists and academics, particularly the rate cut in June. Neither were these cuts fully priced in by the market. Indeed, by May, and certainly by June, the economy had begun showing signs of improvement, the government's expansionary fiscal policy was just starting to have an impact, and the financial markets had improved rapidly on the back of lower interest rates, government guarantees and ample liquidity. Along with the strong signs that the economy was improving, there were growing concerns that the extraordinarily low interest rates could trigger a bubble in the housing market. House prices started to increase already in January 2009, and have continued to climb gradually back to their pre-crisis levels.

The rate cut was surprising in part since according to the interest rate projection published in March, it was projected a reduction in the key policy rate by 0.25 percentage, with a probability of 50 percent for the cut being in either June or August.

Could the reason for Norges Bank's cut in June be that they was too pessimistic compared to other forecasters at the time? Comparing Norges Bank's forecasts in MPR2/09 (given in June) to Statistics Norway's forecasts from late May 2009, does not, however, suggest that this was the case. As noticed in Chapter 2 (Table 2.1), both Norges Bank, and especially Statistics Norway, were more pessimistic about OECD growth in May/June than later in 2009. Both institutions also agreed on the forecast for mainland Norway's output for 2009, but Norges Bank was more optimistic about mainland growth for 2010 (a growth rate of 2.25 per cent compared to a 1 per cent growth rate forecast by Statistics Norway, see Table 2.2).

The forecasts for private consumption are mixed. Norges Bank expected a lower growth rate than Statistics Norway for 2009, but a higher consumption growth rate for 2010. The forecasts for the labour market are similar, with Norges Bank slightly less pessimistic than Statistics Norway in regard to unemployment and employment growth in 2009, see Table 2.3. Hence, this comparison between Norges Bank and Statistics Norway does not provide arguments supporting a view that Norges Bank was too pessimistic in regard to output and employment and therefore cut the interest rate too much.

When comparing the inflation forecasts of Norges Bank and Statistics Norway for 2009 – 2011 in May/June 2009, we find that the latter forecasts have been significantly lower than Norges Bank's, see Table 2.4 in Chapter 2. For all three years 2009 – 2011, Statistics Norway's inflation forecasts were 0.55 or 0.65 percentage points lower than the inflation forecasts of Norges Bank. Therefore, if Norges Bank had adopted the inflation forecasts of Statistics Norway in June 2009, the Bank's arguments for cutting the key policy rate had been stronger.

In the press conference on June 17, Deputy Governor Qvigstad expressed concern about the outlook for the Norwegian krone, and the implication for export companies of a stronger currency. As the risk appetite had returned in financial markets, carry trades were back in fashion, and currencies of commodity exporting countries were beginning to become popular. The competitiveness of Norwegian companies was deteriorating on back of relatively high wage- and cost levels compared to other countries. In addition, private sector companies had to pay at the minimum 6-7% interest rates on loans. Should the NOK appreciate substantially,

this would add strain to companies in the tradable sector, as well as contributing to lower price growth for import in future.

In its press release in the assessment on monetary policy section, Norges Bank pointed to the currency as a risk factor and states that: *“inflation may be lower than projected if the krone appreciates markedly or the global downturn proves to be even deeper and more prolonged than expected. In this case, even stronger measures may be necessary.”*

**NBW's view:**

**The committee considers Norges Banks assessment of the Norwegian economy over all to be well balanced in the first half of 2009. The two rate cuts in February and March reflected well the deterioration of the outlook of the Norwegian economy.**

**However, in May and June some leading indicators and the strong recovery of financial and asset markets suggested an earlier recovery than what Norges Bank emphasised at that time. The rate cut in May, and more notably in June, raised some concern in the private sector. However, given the unusually high uncertainty about the economic outlook at the time, and the exceptionally low interest rate level abroad, the committee does not find the rate cuts inappropriate.**

### Box 1: Liquidity policy and extraordinary measures<sup>1</sup>

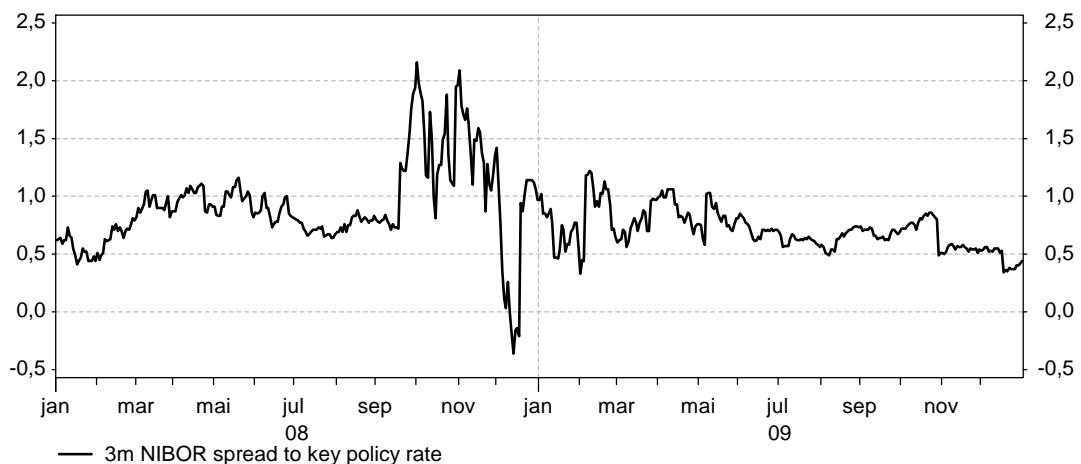
For monetary policy, the widening spread between money market rates and the key policy rate in the fall 2008 was one of the most challenging elements of the financial crisis. Higher and more volatile spreads added noise to the transmission mechanism of monetary policy. Liquidity policy aims at ensuring sufficient liquidity in the banking system for the short-term money market rates to remain close to the key policy rate.

As explained in Norges Bank Watch 2009, Norges Bank responded to the shortage of liquidity by supplying more and longer-term NOK-denominated funding to domestic banks through the F-loan facility, by easing the collateral requirements for acquiring F-loans and by lending USD to the banks. As the banks continued to face funding difficulties, the government together with Norges Bank set up a facility in which banks could exchange Norwegian covered bonds (OMFs) for government securities for a period of 3-5 years, with a ceiling of NOK 350 billion. In addition, Norges Bank offered F-loans with a 2-year maturity to smaller banks. As it was the government who took the risk in connection to the swap arrangement, Norges Bank did not have to expand its balance as much as many other central banks.

In February 2009 the Government established two new funds, the Finance Fund and the Bond Fund, each with a total capital of NOK 50 billion. The Finance Fund was directed to strengthening Norwegian banks tier 1 capital, improving their ability to uphold normal lending activity. The Bond Fund made it possible for industrial companies to get funding not only directly from banks, but also in a strengthened bond market

The liquidity policy and extraordinary measures were successful and have contributed to normalization of the spread between the policy rate and the money market rate, as illustrated in the figure below.

Figure 3.7 3m Nibor spread to key policy rate



Source: Reuters EcoWin

<sup>1</sup> See "The financial crisis in Norway: Effects on financial markets and measures taken" by Tom Bernhardsen, Arne Kloster, Elisabeth Smith and Olav Syrstad; Gjedrem speech "Experiences with the financial crisis" on September 30<sup>th</sup> and Norges Banks webpage for further information.

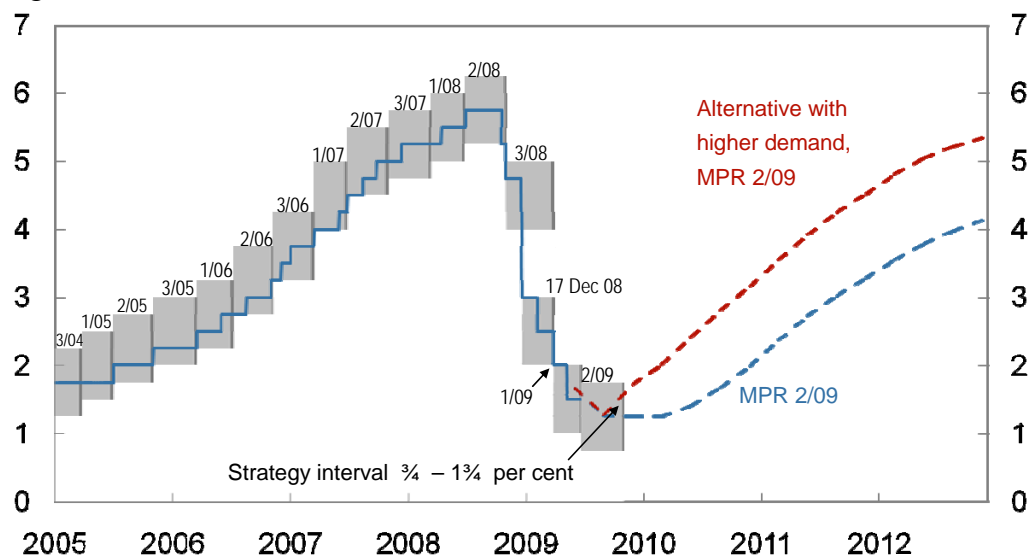
### 3.2 Monetary policy in the period August – December 2009

Up until its August meeting, Norges Bank had clearly pursued interest rate easing cycle. The August meeting represented a sharp change in rhetoric as Norges Bank indicated it would probably hike rates earlier than it had indicated in its June meeting. By August, the turning point had been moved to the third quarter of 2009, with an output gap of -1 per cent and a corresponding upwards adjustment of the forecasted interest rate path for 2010. This change in stance from June to August was to some extent anticipated by both market participants and economists as the rate cuts in June and to some extent in May were perceived as somewhat controversial and not fully priced in the market.

After the August meeting, Norges Bank communicated clearly its intention to start its exit strategy. Norges Bank wanted to withdraw the extraordinary measures first and then hike rates. On October 28, Norges Bank hiked rates by 25 basis points to 1.5 per cent and signalled that rates would be hiked by a further 25 basis points either in December 2009 or February 2010. Due to strong economic data, recovering financial markets, rising house prices and a lack of pass through from the previous policy rate hikes to mortgage and corporate rates, Norges Bank hiked rates in December by 25 basis points to 1.75 per cent.

On **12 August**, Norges Bank kept interest rates unchanged at 1.25 per cent. The press release stated: *“It appears that output and employment in Norway may slow somewhat less sharply than expected. New figures may change the picture, but should these developments continue, it may be appropriate to increase the interest rate earlier than projected”*

Figure 3.8 Key policy rate, actual development, projection and alternative scenario with higher demand



Source: Norges Bank.

Norges Bank pointed to the fact that the economy had developed more favourable than expected since the June 17<sup>th</sup> report, and indicated Norges Bank would hike rates earlier than what was projected in the June report. In accordance with the monetary policy meeting, Norges Bank only highlighted the one alternative scenario from the June report in which the economy recovered more rapidly than had been expected in June. The alternative scenario is

shown in Figure 3.8, taken from the background information in accordance with the interest rate meeting. The market took the information from Norges Bank as a clear signal that Norges Bank intended to hike rates far earlier than indicated in the June report (MPR2/09).

By pointing so clearly to only one alternative scenario, Norges Bank effectively communicated a change of view regarding the outlook of the Norwegian economy and a need for higher interest rates much earlier than what they indicated in the June report.

Norges Bank also made it clear that it intended to wind down the extraordinary liquidity measures put in place in response to the crisis before starting to hike rates. Hence, in its statement Norges Bank effectively pointed to all those measures that had already been terminated, or those that were slated for termination.

#### **NBW's view:**

**When Norges Bank changed its view on the outlook for the Norwegian economy in August, this was quickly and successfully communicated to the private sector.**

On **23 September**, Norges Bank again left interest rates unchanged at 1.25 per cent. The press release emphasised that aggregate demand was picking up more rapidly than expected, concluding that: *“Higher capacity utilisation and low productivity growth may increase upward pressure on costs, pointing towards somewhat higher inflation and suggesting that the key policy rate should be raised earlier than projected in the June Monetary Policy Report.”*

Norges Bank used the phrase *“The Executive Board considered the alternative of increasing the key policy rate at today's meeting”* as a signal that it intended to hike rates at its next scheduled policy meeting in October.

Speaking at the Centre for Monetary Economics on **30 September**, Governor Gjedrem made it clear that Norges Bank did in fact take house prices and credit growth into account when setting interest rates. In the speech, Gjedrem emphasised that house prices, the exchange rate, and credit growth are not target variables for Norges Bank. Still, changes in these and other variables would enter Norges Bank's “reaction function”:

*“Norges Bank's interest rate setting does not rely solely on one simple rule, such as the Taylor rule. 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. However, a reaction function must not be confused with the monetary policy target – our target function or loss function.”*(our emphasize)

*[...] 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.”*  
(our emphasize)

Although the Governor in his speech did not say that Norges Bank is going to put more emphasis on house prices and credit growth in its implicit reaction function than previously, the governor’s remarks was interpreted by many market participants as a first indication that going forward Norges Bank intended to give somewhat greater weight to credit growth and house price inflation when deciding on interest rate changes.

On **13 October**, the government presented its 2010 budget, which surprised the market by being far more expansionary than expected. The budget involved a non-petroleum budget deficit of NOK 150bn, which constitute 5.7 per cent of the capital value of the Government Pension Fund – Global at the end of 2009 (compared to the 4 per cent rule under normal business cycle conditions).

If the deficit remained at this level, this could potentially put a strain on monetary policy (see the discussion in Chapter 4). In Norges Banks Monetary Policy Report 3/2009, released on October 28, the central bank made a strict assumption that the nominal spending of the oil fund would remain at the current level in the following years in order to gradually return to the fiscal policy rule, as more money is expected to keep pouring into the fund.

The new forecasts in MPR3/09 involved a substantial upward shift in the output gap projection, see Figure 3.2 above. The Bank now expected the output gap to be only –1 per cent at the bottom of the cycle (in the first quarter of 2010). The inflation forecast was only marginally adjusted and the interest rate path were lifted, see Figure 3.3 and 3.4 above.

At the **28 October** meeting, the Executive Board increased rates by 0.25 percentage points to 1.5 per cent. In its press release, the Bank pointed to the fact that: *“Inflation has been slightly higher than expected. Unemployment is considerably lower than previously projected.”*

In addition, Norges Bank explicitly referred to rising house prices in the assessment: *“[I]nterest rates are low, resulting in renewed growth in household consumption. At the same time, house prices are rising. Over time, household borrowing may surge again and saving may fall. With low productivity, higher corporate costs, growth in household demand and higher capacity utilization, inflation may gradually become too high. This would indicate that the interest rate should be raised.”* (our emphasize).

We note that the decision in October (and later in December) to raise the policy rate specifically mentioned the recovery in house prices to their previous peak level being of relevance for the decision taken, i.e. for the increase in the interest rate hike. Going forward, we suspect that a number of other inflation targeting central banks will begin to highlight and clarify in their research, forecasts, and public statements the role that asset prices and quantities play in their decisions. We would strongly encourage Norges Bank to continue to work along these lines.

When commenting on the National Budget in the press conference, Governor Gjedrem stated that the budget was fairly neutral with an underlying growth in expenses close to 5 percent. However, he warned that the risk of developing the so called “Dutch disease” was rather high due to the high growth in the public sector. (See Chapter 5 for a further discussion of fiscal policy)

As the interest rate hike was well communicated by Norges Bank, and to some extent anticipated by the market, this decision was not considered controversial.

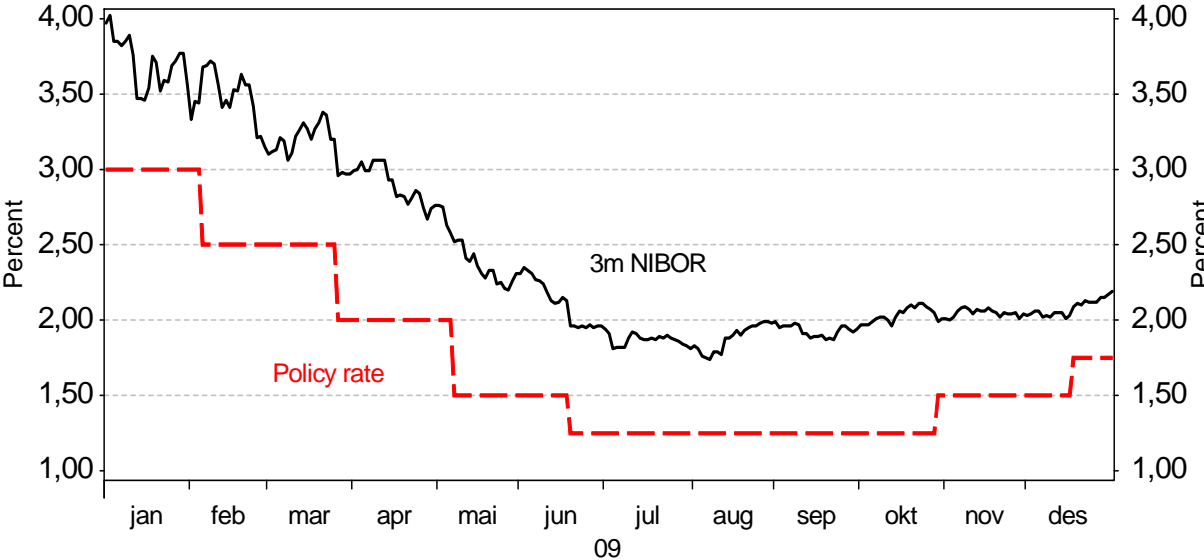
The Executive Board’s strategy indicated another hike by 25 basis points either in December 2009 or in February 2010.

On **December 16**, Norges Bank hiked interest rates by 0.25 percentage points to 1.75 per cent. In the press release the Bank again emphasised a sharp increase in house prices as one of the arguments for hiking rates.

The explicit mentioning of house prices in the introduction to the press release could be interpreted as a signal that Norges Bank at the moment was putting more weight on the role of house prices in increasing private demand than earlier. This does not mean that Norges Bank is targeting house prices in itself, but rather that sharp movements in house prices gives valuable information about the outlook for aggregate demand (see Chapter 6 and 7).

Norges Bank stated that *“The Executive Board considered the alternative of keeping the key policy rate unchanged, but interest rates are low and the October increase in the key policy rate has had a limited impact on bank lending rates”*

Figure 3.9 Norges Bank policy rate and 3m NIBOR



Source: Reuters EcoWin

Hence, the lack of pass through of the last rate hike to money market rates and lending rates to customers was one reason to hike rates in December rather than wait until February in order to ensure that the hike would be effective. Looking at the 3m NIBOR interest rate it has been very stable since the August interest rate meeting (see Figure 3.9). The effect of the two rate hikes hence have been to narrow the spread between the policy rates and the 3m NIBOR – and not to push up the 3m NIBOR rate. The reason is probably that the market expected and priced in rate hikes after the August meeting within a fairly short time horizon. Hence, the 3m NIBOR reflected market participants’ expectations of future interest rate hikes. As the spread



were more or less back to normal pre-crisis level at years' end, it seems the spread between 3m NIBOR and policy rates were back to a more normal level at that time, something that made it likely that future rate hikes will to a far larger extent be passed through to the 3m NIBOR and to lending rates to customers.

**NBW's view:**

**The October rate hike reflected well the more optimistic outlook of the Norwegian economy signaled by Norges Bank since August. Although the rate hike in December was somewhat surprising to the private sector, we believe it was appropriate to increase rates due to the lack of pass-through of the previous rate hike to bank lending rates and a more favorable outlook of the economy. We also believe it to be appropriate for Norges Bank to put some more weight on rapid rising asset prices.**

## **4. Credibility and transparency**

One important implication of having an inflation targeting Central Bank is that current economic behaviour to a great extent will depend on expectations about monetary policy. The credibility of the central bank therefore becomes extremely important. To enhance credibility, central banks must convince the private sector (general public, financial market and macroeconomic experts) that their decisions are well balanced and based on correct and relevant information. The disclosure of information by the central bank is therefore essential in reducing private sector uncertainty and increasing the predictability of future monetary policy actions, and final macroeconomic outcomes. However, transparency is also directly linked to accountability: the more transparent a central bank is, the less it can disclose its intentions from the private sector, to which it is accountable. Hence, transparency becomes important to ensure an effective monetary policy, but also that the central bank can be made accountable for its actions.

### **4.1 Measuring transparency**

There is by now a voluminous literature of academic research on central bank transparency and communication. One part of this literature compares transparency across central banks and over time, see for instance Eijffinger and Geraats (2006), Dincer and Eichengreen (2007), Geraats (2009) and Minegishi and Cournede (2009). These studies adopt various transparency indices (or a variant of a particular index) developed by Eijffinger and Geraats (2006), covering the political, economic, procedural, policy and operational aspects of monetary policymaking. In the most recent evaluation, Minegishi and Cournede (2009) compare the transparency of 12 OECD central banks from 1998 to 2009. This study found that in 2009 the three most transparent central banks were Sveriges Riksbank, the Reserve Bank of New Zealand and the Bank of England. Norges Bank was ranked as number 4, together with Bank of Canada.

The reasons why Norges Bank was not ranked among the world's most transparent central banks were a lack of transparency of the policy objective, incomplete transparency of the decision making process (involving also the executive board) and lack of transparency about economic analysis.

Regarding the issue of policy objective, many previous Norges Bank Watch groups have discussed the inconsistency of having the mandate refer to both inflation and exchange rate stabilization (see for instance NBW 2004 and NBW 2007). We will not discuss this issue here. As was also argued in Norges Bank Watch 2008, it is our understanding that the Regulation's reference to exchange rate stability is a way of bridging the new inflation targeting regime with the previous exchange rate targeting regime. Norges Bank has also been fairly transparent on this issue, arguing that the exchange rate is an important input when Norges Bank constructs its forecasts for output and inflation, develops an interest rate path and decides on a policy strategy. However, it is not a target. Also, since the formulation of the mandate is the responsibility of the Ministry of Finance, there are few active steps Norges Bank can take to improve its transparency with regard to this issue.

We will instead focus on how Norges Bank can improve its transparency with respect to the issue of economic analysis and the decision-making process. Before proceeding, we acknowledge that it is difficult to measure overall transparency by a single index in a precise way. Small changes in for instance the publication frequency of the forecasts can have a significant impact on a country's score in the index, as emphasized for Norway by Claussen

(2009). However, we still believe the index can be used as a broad measure of transparency. All the different studies also consistently rank the Riksbank, the Reserve Bank of New Zealand and the Bank of England as the three most transparent central banks.

#### **4.2 Transparency of economic analyses**

The last few years Norges Bank has approached the frontier in monetary policy transparency by publishing the projected interest rate path. Since the effects of a monetary policy decision depend on expected future decisions, the projected policy path is an integral part of the monetary policy stance. It provides an important tool for central banks to influence market expectations and thereby enhance the effectiveness of monetary policy. The projections will naturally be subject to a great deal of uncertainty. This is illustrated by having fan charts around the projections, ensuring that the projected path is not confused for a commitment.

The reason why Norges Bank is losing points in the transparency index with regard to economic analyses is because they do not provide forecasts on a quarterly basis. Norges Bank's forecasts are published in the monetary policy reports that are published only three times a year (March, June and October). Writing a report every quarter can leave too little time for the staff to digest new information and conduct thorough analyses before the next Report has to be written. This is why Norges Bank in 2001 started publishing three Reports a year instead of four, see the speech by Deputy Governor Jan F. Qvigstad in November 2008.<sup>3</sup> Recently, the Riksbank came to the same conclusion and reduced the number of reports from four to three per year. However, on the three other occasions that the executive board meets in the course of the year, the Riksbank publishes a press release and a monetary policy update; the latter containing a limited number of forecasts for central macroeconomic variables.

Norges Bank executive board meets eight times a year. Only on three of these occasions do they update the forecast, i.e. when they publish the Monetary Policy report. The exception was in December 2008, when the unexpected depth of the financial crisis required new forecast for the future policy stance. This is a good example where it is imperative to update macroeconomic forecasts, because they provide information about new developments (shocks) that affect monetary policy outcomes. Doing so will help the private sector to infer the central bank's intentions from its interest rate decisions.

We are sympathetic to the argument that publishing an additional monetary policy report a year can leave very little time for the staff to conduct thorough analyses. Good monetary policy decisions require in depth economic analysis. However, Norges Bank can provide updates of the forecasts, without having to write an additional report. Given the current publishing cycle of the monetary policy report (March, June and October), there is scope for an additional publication of forecast by the end of the year (December). The update should contain a limited number of forecasts for central macroeconomic variables.

#### **NBW's view:**

**We suggest that Norges Bank keep the number of Monetary Policy Reports to three per year, but consider publishing a press release and a monetary policy update at least on one of the other meetings; the latter containing a limited number of forecasts for central macroeconomic variables. As a start, Norges Bank could update the forecast for the last**

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<sup>3</sup>“Transparency and central bank communication”, Deputy Governor Jan F. Qvigstad, Speech at a seminar in Banca d'Italia, Rome, 4 November 2008.

**monetary policy meeting of the year (December), thereby providing minimum four updates a year.**

### ***4.3 Transparency of the decision making process***

The main reason why Norges Bank lost points on the Eijffinger-Geraats index is that the bank does not publish minutes and voting records. Norges Bank does, however, publish a detailed account explaining the Executive Board's reasoning behind the interest rate decision. The statement provides an account of the main aspects of economic developments that have influenced the interest rate decision and the Board's assessments. However, there is no indication as to how Norges Bank has weighted the different bits of information.

According to a speech held by Deputy Governor Jan F. Qvigstad in November 2009<sup>4</sup>, Norges Bank has decided not to publish minutes and to speak with only one voice. Rather than voting they have a "collegial", monetary policy committee, where the members of the Executive Boards make unanimous decision. The ECB's system is of the same type. The external members of the Governing Council of ECB are part-time members, and are employed in posts outside the Bank while serving as Board members.

Other central banks, however, publish minutes and/or voting records. In Sweden, the central bank publishes the voting records and provides an extensive report with the views of members by name. The Bank of England publishes a similar report of the minutes, but members remain anonymous. In the speech by Deputy Governor Qvigstad from 2009, he points out that both Sveriges Riksbank and the Bank of England have committees that are referred to as "individualistic committees". Each member is individually responsible for his/her vote, and the decision is normally decided by majority voting. Hence, the difference in practices between countries may partly reflect the different working of the monetary policy committees in the countries.

What does it mean that Norges Bank has a collegial committee? Although consensus need not mean that all agree, it suggests the absence of strong disagreements. However, evidence from other central banks shows that disagreements about monetary policy decisions are actually very common. In particular, Geraats et al. (2008) analyzed eight central banks that publish their voting records and found that the rate of unanimity about monetary policy actions ranges from 85% to only 42%, with a median of 60%. So, if a central bank only decides to adjust the interest rate if there is no (strong) disagreement, it is likely to be more inertial than a central bank acting by a simple majority.

One concern about publishing minutes is that members may come to meetings with pre-drafted statements, impairing a constructive exchange of views. This could prevent a frank discussion and make monetary policymakers more reluctant to express dissenting opinions. While detailed meeting minutes ensure accountability among committee members, which may give rise to good incentives, such transparency could therefore prevent a good discussion.

Minutes from Sveriges Riksbank and Bank of England, however, reveal that the analysis and discussion before the decisions are sophisticated and of very high quality, see Garaats (2008).

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<sup>4</sup> "On transparency", Deputy Governor Jan F. Qvigstad, Speech at Det Norske Videnskaps-Akademi (The Norwegian Academy of Science and Letters) in Oslo, 10 November 2009.

However, in contrast to the current board in Norges Bank, most or all members of their decision making bodies are experts in monetary policy, macroeconomics or financial markets. Since not all members of the executive board of Norway are experts, there may be a concern that minutes will reveal ill-informed arguments made during the policy discussions. However, if such a deficiency exist, we think it would actually be useful to expose the different views, as it is likely to induce members to improve the quality of their discussion and thereby decision-making.

Although Norges Bank does not release minutes, it holds a press conference after the monetary policy meeting. This could in principle be an adequate and even more timely substitute for minutes. However, the value of press conferences will depend on the ability of the journalist to ask appropriate questions about delicate monetary policy issues, which requires considerable communication skills (Geraats, 2009). Furthermore, press conferences will not reveal if there are different views among the members of the Executive board.

One could argue that if members of the Executive board were to publish voting records, they would have to be individually accountable for their votes and assessments. This will place a workload on the external members that may not be consistent with being part-timers. However, the most prominent example of a central bank with external, part-time members that publishes non-attributed minutes and individual voting records is the Bank of England. Non-attributed minutes will reveal the scope and depth of the policy discussion, but will not identify the individual contributions of the members.

Even to publish the voting patterns (without identifying individual votes) would be useful, as it provides an indication of the degree of disagreement and/or uncertainty among the members, which helps the private sector to more efficiently learn the monetary policy reaction function. Overall, we find the arguments supportive of having the Executive Board publish non-attributable minutes.

As emphasized above, Norges Bank has decided to speak with only one voice. This implies that only internal members (the Governor and the Deputy Governor) shall relate and discuss monetary policy decisions in public or issues related to the operation of monetary policy. We suggest that also the external members should be able to discuss issues related to the operation of monetary policy in public. That would contribute positively to the current debates about monetary policymaking in Norway. Furthermore, having the right to express opinions on monetary policy in public will make the external members of the board benefit from discussing monetary policy, with the likely effect strengthening good arguments and weakening bad arguments.

#### **NBW's view:**

**We suggest that non-attributed minutes could be published, in order to strengthen the accountability and further improve transparency. These minutes could note without attribution to individual members which issues were discussed and what arguments were presented, as well as how (if) individual members have voted. The members should also be able to discuss monetary policy issues in public.**

## 5. Fiscal policy: Challenges for monetary policy

In the last decade, Norway's economic growth and general macroeconomic performance have been strong. The current financial crisis caused only a small recession in Norway. Growth rates are again positive and unemployment remains below 4 percent, which is among the lowest level in the OECD area.

The petroleum activity puts Norway in an exceptional position in relation to other countries. Almost 30 percent of general government revenues were generated from the petroleum activity (net cash flow from the petroleum sector) in 2008, compared to 5 percent in 1999. The increase in revenues must be seen in relation to the rapid rise in (crude) oil prices that went from around \$10/barrel in 1998/1999 to more than \$140/barrel in 2008.

The government's fiscal guidelines, introduced in 2001, stipulate that the revenues shall be deposited in the Government Pension Fund - Global, while the expected real return (4 percent) on the fund can be used for public expenses. The Fund has represented a great opportunity for Norwegian policy makers to insure and increase general welfare in the last decade as well as future ones. Compared to other European governments, the Norwegian one has had a lot more room for fiscal maneuvering. This fiscal freedom, however, also brings along some pitfalls. Fiscal discipline may wear down, leading to rent seeking activities, excessive government spending and bureaucratization. An excessive government spending can in turn damage a nation's potential by causing an increase in wages and the real exchange rate.

Next year, the guidelines for fiscal policy have been in operation for ten years. It is outside the scope of this report to evaluate the guidelines and their effects on the Norwegian economy. However, in what follows we discuss the coordination of fiscal and monetary policies, focusing in particular on potential challenges for monetary policy of having considerable room in fiscal policy in the years ahead. We wish to emphasize, that in Norway's situation as a small open economy, it is particularly important that there is a commitment to credible rule for fiscal policy to ensure fiscal discipline. This is in line with the recommendation of previous Norges Bank Watch reports, see in particular NBW 2002. Below we will first briefly address the fiscal policy stance during the financial crisis and the consequences of having discretion in fiscal policy. Then we address the division of roles in economic policy, focusing in particular on the interaction between monetary policy and fiscal policy.

### 5.1 Rules versus discretion in fiscal policy

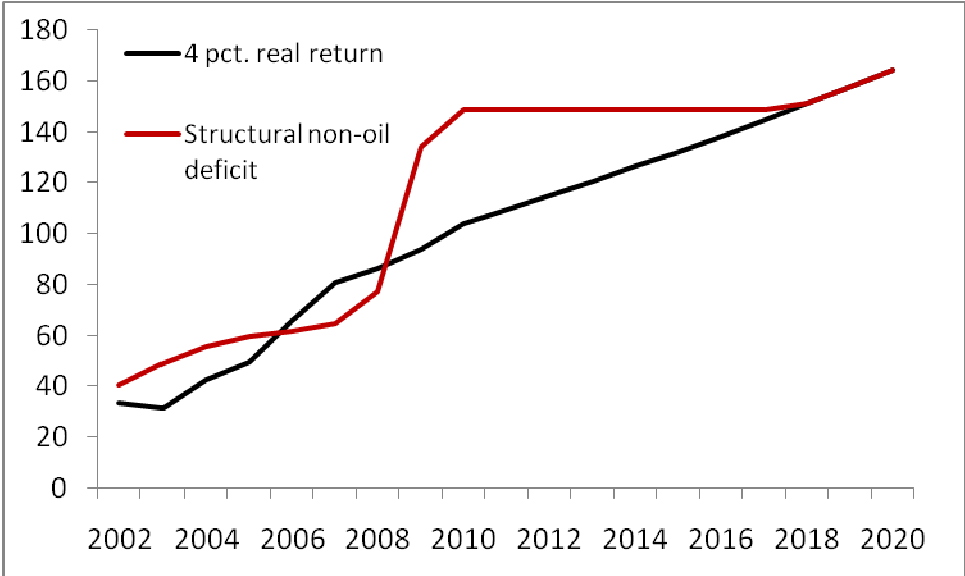
The general government's fiscal guidelines, introduced in 2001, should ensure a predictable and prudent phasing-in of petroleum income into the mainland economy. Report no. 29 to the Storting (2000-2001), introduced the following guidelines for fiscal policy:

- *Petroleum revenues shall be gradually phased into the economy, in line with expected real return on the Government Pension Fund – Global, estimated at 4 per cent a year.*
- *Fluctuations in economic activity shall be dampened in order to ensure high capacity utilization and low unemployment.*

The fiscal guidelines aim at a gradual increase in the spending of oil revenues up to a sustainable level. Spending only the expected real return (4 percent) of the fund reflects a cautious attitude towards the uncertainty of the size of the total petroleum wealth as well as towards the risks of providing too much stimulus to the economy. Credible guidelines on government spending will contribute to stability by shaping expectations in the foreign exchange market. As the fund only invests abroad, the mainland economy is sheltered from the effect of huge and volatile capital flows.

The last few years fiscal policy has become increasingly expansionary in Norway. At the outset, as wealth is gradually transformed from petroleum in the ground to financial assets, spending was expected to increase. However, wealth has increased by much more than the initial scenarios portrayed in 2001, as oil prices have more than doubled since then. Furthermore, in 2009 and 2010, fiscal policy also exceeded the 4 percent trajectory suggested by the guidelines, as seen in Figure 5.1.

Figure 5.1. Expected real return on the Government Pension Fund (global) and structural non-oil deficit. Actual and technical projections. Billion 2009 kroner.



Source: National budget 2010

As can be seen from the graph, the budget deficit will increase dramatically in 2009 and 2010. The non-oil deficit is estimated to be NOK 45 billion above the 4 pct. trajectory in 2010, which corresponds to 7.8 pct. of trend GDP for mainland Norway. The figure emphasizes that spending of petroleum revenues is almost in line with the expected return on the Fund for 2018, measured in constant prices. Hence, we are eight years ahead of schedule in phasing in the oil revenues. This can be seen by the horizontal line assuming unchanged budget deficit until 2018 (which is the technical assumption in the National Budget 2010). Given that the National Budget estimates that oil revenues peak around that time, the period with large annual increases in oil revenues, and hence large increase in the amount available to be spent over the fiscal budget may be behind us.

The fiscal policy guidelines allow for the temporary use of discretionary fiscal policy for the purpose of stabilizing the economy. In such a situation, fiscal policy should temporarily

accommodate monetary policy. This year Norges Bank Watch committee finds that with the high level of uncertainty facing the Norwegian economy in 2008/2009, the government wisely allowed for an expansionary fiscal policy in 2009. However, the stimulus in the 2009 budget was extraordinary. According to the national budget, the 2009 stimulus is the strongest fiscal stimulus recorded in any years the last three decades. Fiscal policy in Norway was also very expansionary compared to the policies of most of our trading partners. Hence, when the economy showed clear signs of improvements in the summer/autumn of 2009, the 2010 budget (released in October) should also quickly have been reversed to reflect the more optimistic forecasts. That would also have signaled a credible commitment to the fiscal ‘rule’.

The government argues that its intention is to return to the rule in due time, but it has not committed to curbing the deficit back within a certain time period. However, if spending follows the pattern suggested in Figure 5.1, the government will by 2018 have used NOK 250 billion more than the rule envisaged (since 2001). Hence, if the hypothetical scenario in Figure 5.1 becomes the present fiscal stance, monetary policy could come under severe strain.

Yet, even an assumption of unchanged budget deficit could prove itself to be too optimistic. In the years preceding the financial crisis (2001-2008), the structural non-oil budget deficit grew on average by 10 percent per year (in constant prices). The lowest growth rate was observed in 2006, when the deficit increased with 3 percent. Furthermore, much of the temporary stimuli suggested in the crisis has been put on a permanent basis. This will maintain spending at a high level also in the years ahead. Most importantly, though, in the coming years, fiscal policy maneuvering will be restricted as expenditures under the National Insurance Scheme are expected to increase by a total of NOK 25 billion for the three-year period 2011-2013, corresponding to NOK 8 billion per year (according to the National Budget 2010). This is higher than what has been recorded in the most recent years. Both a growing number of old-age pensioners, longer life and higher pension entitlements than former beneficiaries contribute to this sharp growth in expenditure.

The estimates of future petroleum reserves and energy prices are uncertain, making it difficult to project the recommended 4 percent spending trajectory. For instance, the government’s oil revenues, which are allocated to the Fund, have been lower than expected the last year owing to, among other things, lower oil prices than expected. If oil prices increase by more than anticipated in the years ahead, thereby increasing the Fund and the 4 pct. trajectory, spending can also increase. However, prices could well fall again, and natural gas prices have so far been much lower than the projection from the National Budget.

Hence, given how far spending is above the 4 percent trajectory and what we now know about future entitlements, it is important that the government now commits to returning to the 4 percent trajectory within a given time period. That is necessary to have a credible commitment to the fiscal rule.

There are many well-known problems associated with a discretionary use of fiscal policy for stabilizing the business cycle. **First**, there are implementation lags that make fiscal-policy stimuli arriving too late. These lags include time to collect data, time to identify the phase of the business cycle, time in formulating the appropriate fiscal-policy response, and time to implement expenditure alterations or tax changes. As a result, it is quite common that fiscal stimulus arrives too late, the impulse is inappropriate, and that policy may become destabilizing and even procyclical.



**Second**, focusing on short-term stabilization goals may reduce the effectiveness of fiscal policy in attaining long-term goals. On a general note, it is politically much easier to obtain consensus for cutting taxes and increasing spending in business cycle downturns than to agree on spending cuts and tax hikes in booms. There is therefore an expansionary bias in discretionary fiscal policy, leading to a higher real interest rate, a stronger currency and lower aggregate saving and investment.

**Finally**, excessive discretionary government spending can damage a nation's production levels by causing an increase in wages and the real exchange rate. This makes tradeable sectors less competitive in world markets, so that the sector declines. This phenomenon has been referred to as a Dutch Disease in the literature, describing the decline of the manufacturing sector in the Netherlands in the 1970s, a decade after they first discovered large natural gas fields.

A strong growth in public expenses has raised the concern that Norway will suffer from Dutch Disease. The first symptoms are indeed visible. Labor cost has increased steadily the last decade, leading to a decline in competitiveness for the manufacturing sector. Norges Bank's governor has also addressed this issue recently. On the press conference 28 October 2009 he argued that the risk of a Dutch Disease in Norway is large.

The remedy for defeating the disease in the Netherlands was to reduce government spending. When asked if this is a recommended cure also for Norway, the Governor relied "*I don't know about any other [remedies].*" The Governor also emphasized that less government spending than currently announced in the National Budget, would lead to a lower interest rate, a less appreciated currency and thereby a more competitive tradeable sector. This has also been emphasized in various Monetary Policy Reports.

**NBW view:**

**Norway's situation as a small open economy makes it particularly important that there is a commitment to a credible rule for fiscal policy. Without such commitment, the Norwegian economy may encounter periods of decline and instability. This may put upward pressure on the interest rates and on the exchange rate, leading to deterioration of industries exposed to international competition.**

## ***5.2 The division of roles in economic policy - Fiscal and monetary policy***

Policy-coordination failure is potentially serious problem with discretionary fiscal policy. In particular, the government and the central bank could have different opinions about the current state of the economy, calling for different policy responses. Suppose, for example, that the central bank believes that there is excess demand so that the current output gap is positive, while the government believes that the output gap is zero (or negative). If fiscal policy aims at short-run stabilization, a coordination problem could arise. If the central bank tightens monetary policy in order to prevent increasing inflation, the government could think that fiscal loosening is appropriate. But then the central bank could react to undo the effects of the fiscal policy, and so on. This process would lead to a very unfortunate policy mix: Too expansionary fiscal policy and a very tight monetary policy (see Leitemo, 2004).

In the present financial crisis, many countries that previously had scaled back discretionary fiscal policy, have again increased spending dramatically. However, in many countries,

automatic stabilizers (like unemployment benefits and income transfers) are built into today's welfare states. For Norway, the stabilizing effects of the automatic stabilizers are substantial (OECD ranks Sweden and Norway on top). Such automatic stabilizing effects present little problems for monetary policy as they are predictable and can be taken into account when monetary policy is formulated. In many cases strong automatic stabilizing effects also reduce the need for large interest rate changes that otherwise would have had to be applied.

In general, good coordination of monetary and fiscal policy can be achieved by placing each within a decision framework, having both focusing on medium-term objectives and making those objectives and related actions transparent and predictable see Norges Bank Watch 2002. In this way, fiscal actions can take full account of the likely monetary-policy response, and vice versa (Leitemo, 2004). Regular information exchange between fiscal and monetary authorities will improve matters.

Norges Bank has been very clear and transparent about the division of roles in economic policy, in particular regarding the interaction between fiscal and monetary policy stance. The following citation from a speech held by Svein Gjedrem in 2002 illustrates this point:<sup>5</sup>

*“A precondition for effective interaction is that decision-making bodies recognise how their decisions will affect decisions of the other body. In the absence of such recognition, a decision will not produce the intended result. The economy may move in a highly unfavourable direction, with high interest rates, sluggish economic growth and a deterioration in the state's financial position. A situation may, for example, arise in which Norges Bank tightens monetary policy to achieve the inflation target, while at the same time the central government authorities increase the use of petroleum revenues (more than implied in the fiscal policy guideline) in order to increase employment and reduce unemployment.”*

This statement is even more relevant today. At the interest rate meeting on 28 October 2009, Norges Bank announced its first of many interest rate hikes after the expansionary period 2008/2009 (see chapter 3). In so doing, they emphasized the following in the press release: *“Inflation has been slightly higher than expected. Unemployment is considerably lower than previously projected.”* Just two weeks prior to this meeting, the government presented its 2010 budget, which surprised the market by being far more expansionary than expected. Where Norges Bank had signaled a recovery for the Norwegian economy, the government emphasized instead low growth rates (the National Budget 2010: A summary, p 5): *“Given the decline in activity in 2009 and below-trend growth in 2010, unemployment is expected to rise somewhat in the near term. On this background, the Government has chosen to base the 2010 Budget on a slight additional increase in the spending of oil revenues.”*

In the annual address the Governor gave on 11 February 2010, he argued again for the importance of recognizing the interaction between fiscal and monetary policy stance in stabilizing the business cycles. In what was named a “handbook” of effective Keynesian use of instruments, Norges Bank suggested the following division based on historical experience:

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<sup>5</sup> Cited from “Lecture by Svein Gjedrem, Governor of Norges Bank at the Norwegian School of Economics and Business Administration”, Bergen, 17 October 2002. Available on the web: [http://www.norges-bank.no/templates/article\\_\\_\\_17882.aspx](http://www.norges-bank.no/templates/article___17882.aspx)

*“First, when demand for goods and services and inflation prospects fall, the interest rate is lowered. At the same time, the automatic stabilisers in the budgets will work when tax revenues fall and benefit payments increase.*

*When the fall in demand for goods and services is so steep that an interest rate close to zero is not sufficient, tax rates are reduced or government measures are applied. The measures should not influence long-term public sector priorities such as the size of the welfare state or the permanent tax level.*

*When the economy turns, as it now has in Norway, the rule is that fiscal policy should be tightened fairly rapidly. This provides room for growth in the business sector. When public expenditure has been reduced, the key rate can then be increased to a normal level.”*

Clearly, the Norges Bank’s “handbook” of effective Keynesian use of instruments stresses the use of rules/guidelines in fiscal policy. When growth prospects almost collapsed in the autumn of 2008, a discretionary expansionary fiscal policy was called for. That was consistent with the guidelines for fiscal policy in Norway. However, by not reversing the fiscal measures when growth prospects improved the year after, we find that fiscal policy has become too expansionary. If fiscal policy stay on its current track, we are concerned it may create tensions in the monetary policymaking in Norway, as Norges Bank will have to hike rates to counter the expansionary effect, hence contributing to a stronger currency and smaller tradeable than if the fiscal-policy rule had been adhered to.

#### **NBW view:**

**Norges Bank has been clear in arguing that a precondition for effective interaction between monetary and fiscal policy is that decision-making bodies recognize how their decisions will affect each other. In the absence of such recognition, discretionary fiscal policy can create tensions in the monetary policymaking in Norway. If fiscal policy stays on its current track, we are concerned it would represent a considerable challenge to Norges Bank.**

## 6. Asset prices and monetary policy: Implications for Norway

By Richard Clarida

### 6.1. Introduction and overview

As the world economy appears to be emerging from the worst financial crisis and deepest, most synchronized global slump in 75 years, policymakers, regulators, and academics are focusing intensely and appropriately on ‘lesson to be learned’, with particular attention paid to defining and calibrating the extent to and means by which movements in asset prices should influence the conduct of monetary policy. In the years leading up to the crisis, there had developed a broad consensus among monetary policy makers in inflation targeting countries on the role that asset prices should play in an inflation targeting strategy. An excellent summary of this consensus is provided by Lars Svensson, Deputy Governor of the Riksbank and, as a former Professor of Economics at Princeton, a leading academic expert on inflation targeting.

*“Asset prices will affect policy to the extent they are deemed to affect the forecasts of the central bank's target variables that is, inflation and resource utilization. Suppose, however, that a large asset-price increase is deemed to be fragile and a possible bubble, with a significant risk for a future collapse. Suppose further that a future collapse is deemed to have undesirable consequences for future inflation and resource utilization. Then the bank faces a delicate situation. It is possible that a policy-rate path with a higher policy-rate in the near future will be deemed to dampen asset-price increases in the near future and also reduce the risk or size of a collapse in the more distant future, thus undershooting the inflation target in the near term but providing a more stable development of inflation and resource utilization in the medium and longer term. These are examples of situations when the central bank may choose to respond to asset-price developments. However, the reason for these responses is that the central bank is concerned with the repercussions for inflation and resource utilization, not with the asset prices as such. **That is, asset prices are not target variables; they do not enter the loss function.** There is no scope for any mechanical adjustment of asset prices or bubbles. The central bank's reaction will not be stable but shift with its judgment... It is [not] productive to discuss these issues directly in terms of the central bank's reaction function, for instance as modifications of a Taylor rule (Svensson (2009), p. 10)*

It is important to understand the point that an inflation forecast targeting central bank following the approach outlined by Svensson may well find it optimal to lean against swings in asset prices, but only to the extent these swings influence the forecast of inflation or possibly, the output gap. A simple example that extends Clarida (2001) is provided in the appendix. There we show that to the extent that rising asset prices put upward pressure on the expected output gap and expected inflation a central bank following a forward looking Taylor rule will lean again such asset price moves by raising the policy rate *even if the asset price itself does not enter the objective function*

So given this consensus, which appears to have broadly guided Norges Bank policy since the adoption of inflation targeting in 2001, what lessons have some taken from the crisis that would argue to modify inflation targeting policy going forward? Experts at the BIS had for some years leading up to the crisis offered critiques of the inflation targeting consensus and since the crisis, have called for major changes in that consensus. According to this critique,

the inflation targeting monetary policy pursued by many central banks suffered from several defects. The focus on inflation and output stabilization resulted in a path for interest rates that did not sufficiently reflect the dangers that arise when an asset price boom is coupled with a credit boom. The focus on price stability, combined with the fact that many central banks had limited or no supervisory role meant, according to this view that they ignored or failed to incorporate into their rate setting decisions the very real, systemic threats arising from credit and asset price booms that had been building during the ‘Great Moderation’. Finally, confining monetary policy to setting a path for the short term interest rate in retrospect proved insufficient in many countries to cushion booms and busts in real economic activity and inflation resulting from excesses in financial markets. According to this emerging view, it is not clear that any feasible path for the policy rate would have sufficed and thus, a that set of regulatory macroprudential instruments will, going forward, be required to complement the traditional instrument of policy of setting a path for the short term interest rate. As the BIS points out in its most recent Annual Report

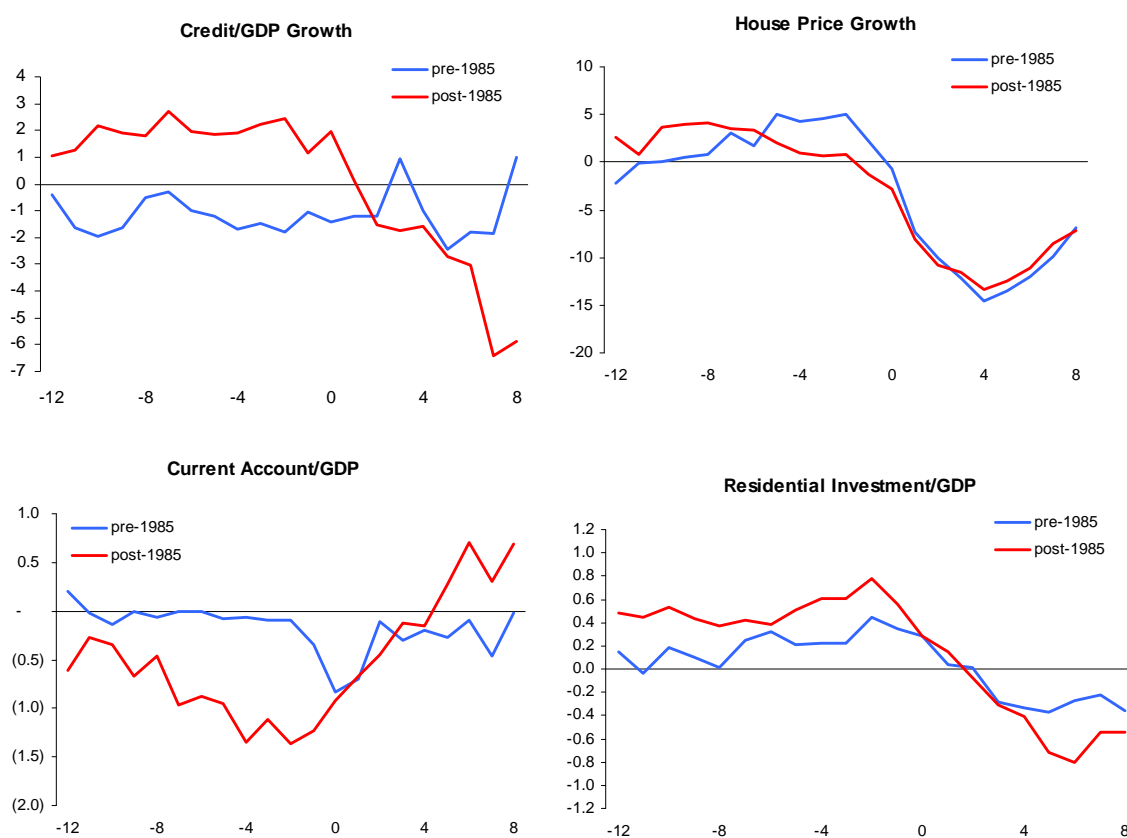
*“It is not surprising that government officials and market participants were largely deaf to the alarms. A common response was: “Even if you are right, and the financial system is in danger, what do you want me to do?” Monetary policymakers’ only available instrument was the short-term interest rate, and there was a broad consensus that this tool would be ineffective against the alleged threat. At the macroeconomic level, the expectation was that price stability would be enough and that asset and credit booms would self-correct. And at the microeconomic level, officials believed that investors’ self-interest would lead them to pay attention to the risks inherent in what they purchased and act as their own regulators. The narrow focus on regulated institutions, combined with a belief in the efficacy of self-regulation, meant that officials were insufficiently alert to system-wide threats. And across countries, markedly differing views about what could and should be done sharply limited progress on what turned out to be an international problem. Discussions of the need for someone to monitor and address the risk in the financial system as a whole mostly fell flat. Numerous central banks took their financial stability objectives seriously.... [but] in the industrial economies – especially the United States, where the problem was becoming the most severe – there was little discussion of what types of tools policymakers might try to use to combat the property and credit booms, and the consequent build-up of systemic risk. And it is easy to see why. Making what would have been wholesale changes to the monetary and regulatory policy frameworks in many countries would have presented nearly insurmountable political and intellectual difficulties. Why would anyone risk such a move when the existing apparatus appeared to be working so well? (BIS Annual Report 2009, pp. 11-12).”*

With this background, we review the path of asset prices and quantities in Norway in the years leading up to the crisis. We then examine the stance of monetary policy in Norway as these asset price and leverage developments occurred. We conclude that, even in retrospect knowing what we know now and knowing much more about subsequent developments than did Norges Bank at the time, that the stance of Norges Bank policy consistent with flexible inflation targeting was also broadly appropriate during the last rate hike cycle, and as emphasized in Section 3, the announced path of policy normalization commencing with the rates hikes in the fall of 2009, appear to be appropriate and well communicated.

## 6.2. Asset prices and quantities as indicator variables: Lessons for Norges Bank

The above discussion highlighted the role that asset prices and quantities could play in guiding an inflation targeting monetary policy even for a central bank, such as the Norges Bank, that did not target these prices and quantities by including them in the objective function. Recent research by the IMF sheds light on the information role that asset prices and quantities have provided in previous housing and stock market busts in major economies since 1970. The message is relevant for any central bank, including Norges Bank, that monitors asset prices and quantities as information variables. In this section we will focus on episodes of house price busts, but the IMF findings are similar for equity price declines.

Figure 6.1 Select Indicators Before Major House Price Busts



Quarterly observations on asset prices and macroeconomic variables for 21 advanced economies from 1970 to 2008. Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

This research by the IMF has some important implications for central banks such as Norway’s that monitor asset prices as indicator variables. The study confirms the valuable information content contained in data on credit flows, economic activity in the construction sector, and current account imbalances. However, at the same time IMF also pointed out that while this information has value, the ability to predict house price busts over a three year window – even with the benefit of hindsight afforded in the selection of variables and thresholds – can be difficult. Even when combining multiple signals and using thresholds to attempt to improve the ratio of signal to noise, at most only half the time in the IMF panel do the best indicator variables actually correctly signal an asset price bust within one to three years. If inflation is well anchored, policymakers will in practice have to think carefully about an aggressive hike in interest rates solely to prevent an asset price bubble from forming given just 50-50 chance that the signal of a bubble is correct. Advocates of including asset prices in the objective function of the central bank often appear to downplay this fact, implicitly assuming much higher likelihood of successfully identifying the bubble than appears to be possible at a horizon of one to three years.

For sake of comparison, we review the behavior of credit growth, resident construction, and the current account in Norway before and after the peak in housing prices that occurred in the fourth quarter of 2007.

Figure 6.2: House Prices in Norway versus US

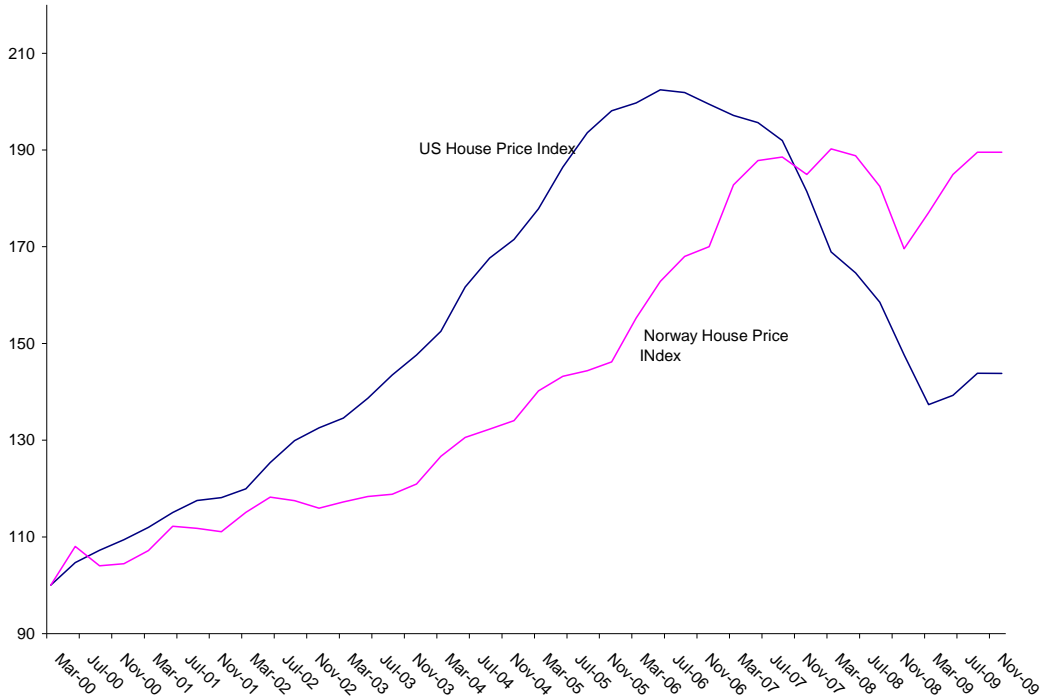


Figure 6.3 Norway Residential Construction versus Real GDP

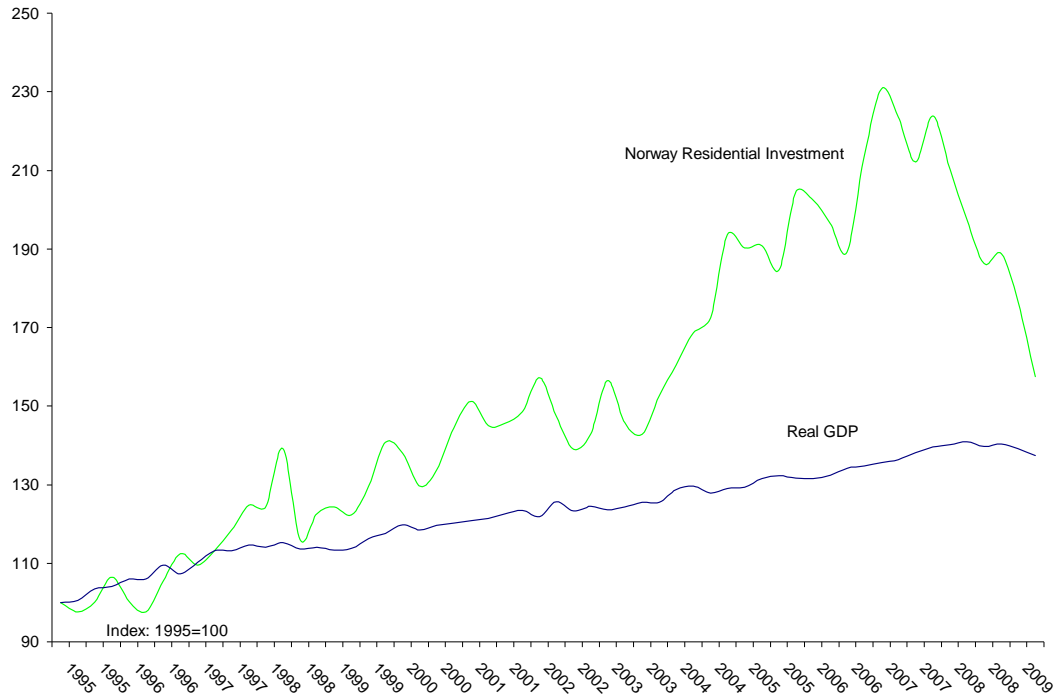


Figure 6.4 Norway Residential Construction/GDP Deviation from 8 Year Moving Average

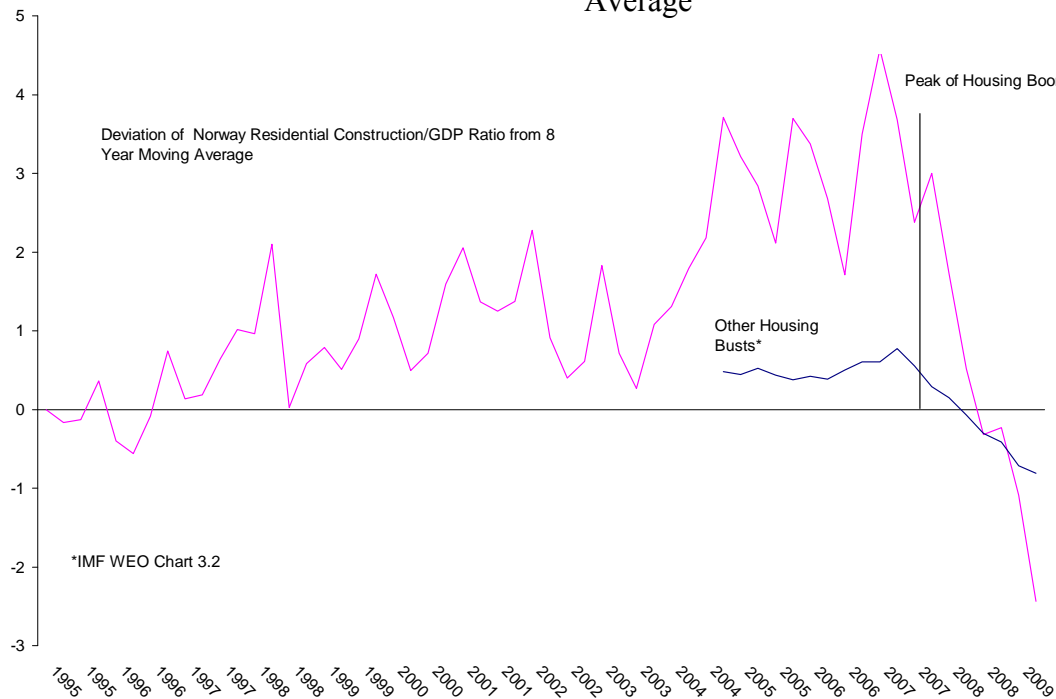




Figure 6.5 Norway Household Debt Outstanding versus Nominal GDP

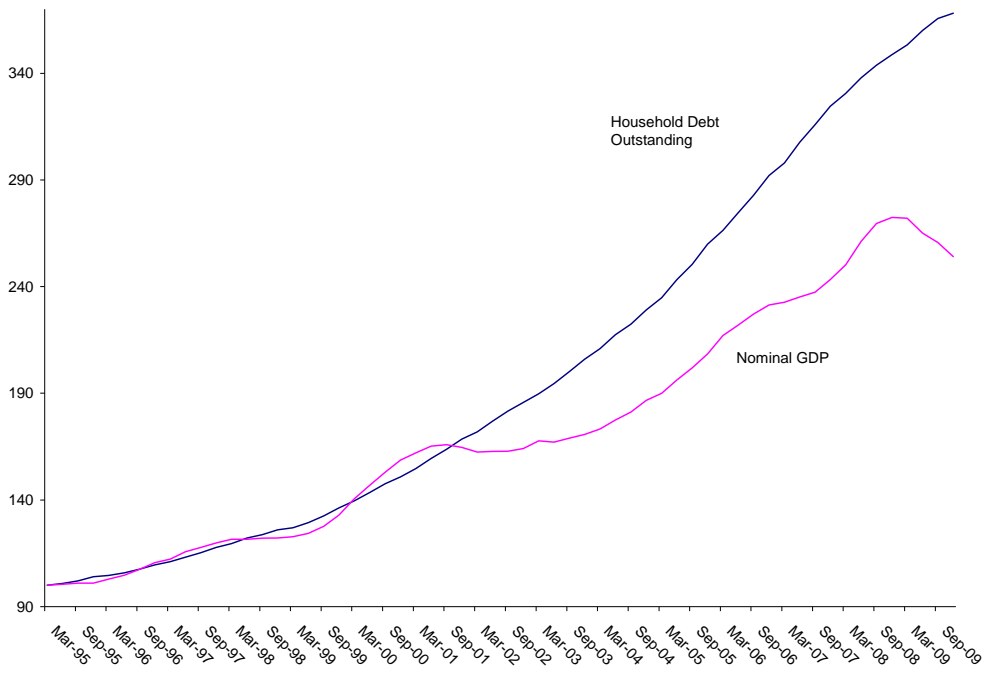


Figure 6.6: Norway Household Debt/GDP Growth: Deviation from 8 Year Moving Average

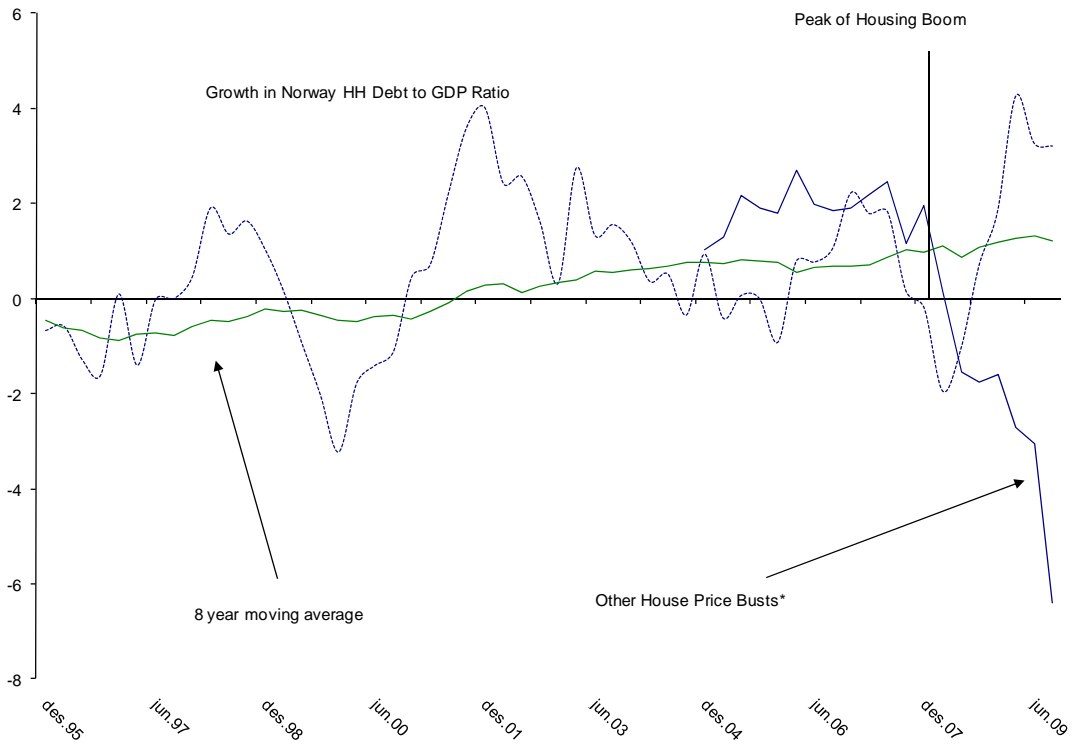
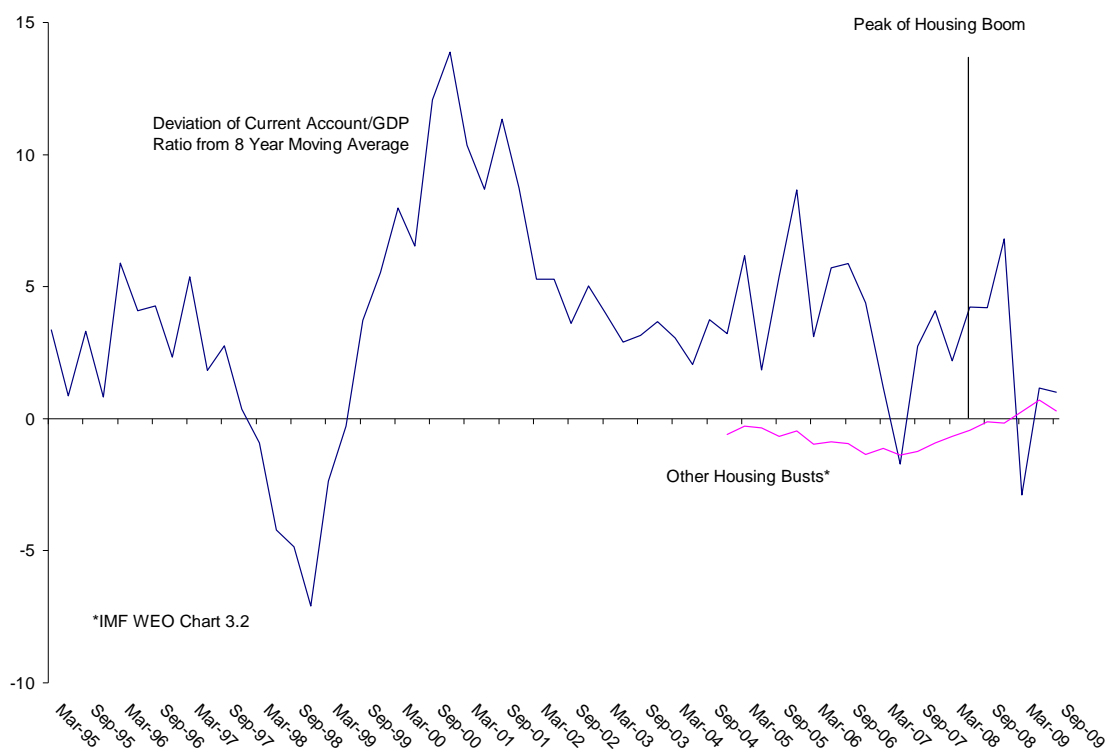


Figure 6.7. Norway Current Account Deviation from 8 Year Moving Average



As Figure 6.1 makes clear, there appears to be useful information in at least several of these indicators that could be help to predict house price busts (defined as a four quarter decline in house prices of at least 5 percent). Note that all of the variables displayed are *deviations* from rolling eight year moving averages in the *growth rate* or, where appropriate, GDP shares of these variables. Focusing on the crises since 1985, we see that rapid credit growth, residential investment, and a deteriorating current account balance (relative to the eight year rolling moving average) appear, on average to precede house price busts.

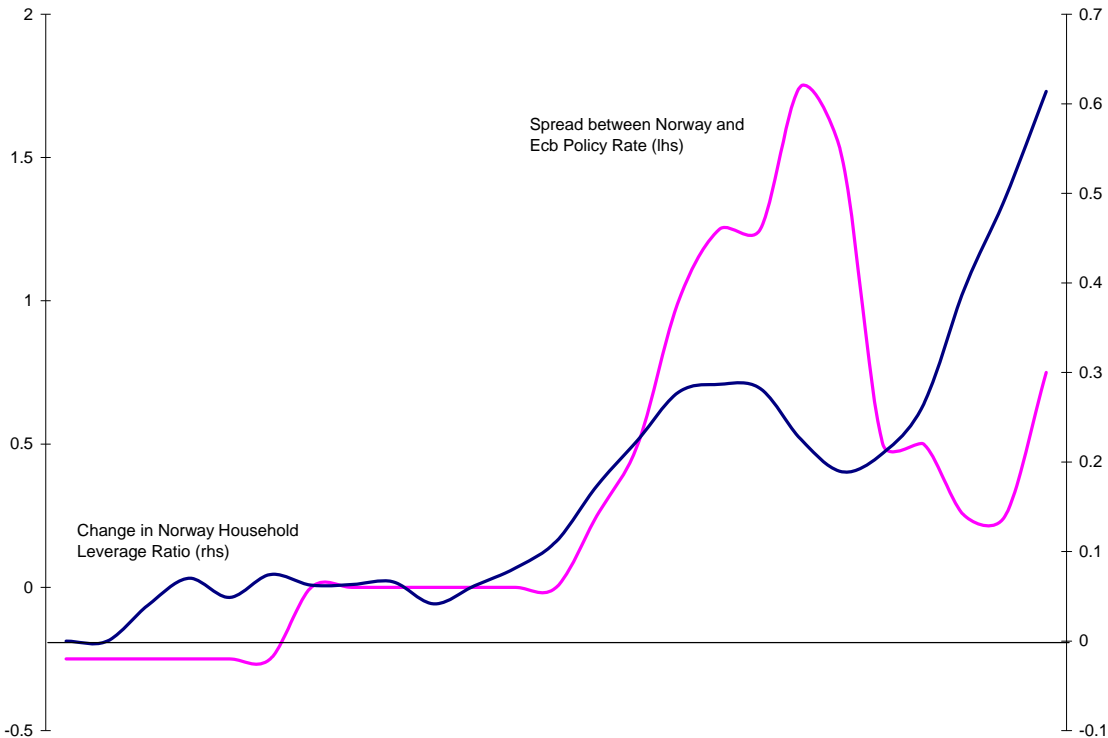
We note that these three best indicators of an unsustainable rise in house prices were providing conflicting signals for Norway in the quarters leading up to the peak in house prices. Residential construction relative to GDP was indeed rising very rapidly compared with its 8 years moving average and well above the level in the IMF panel which pre – dated housing busts in other countries. Turning to household debt accumulation, we see that while household leverage in Norway was increasing in the past decade, this followed a sustained period in the 1990s when the household sector was de leveraging after the Scandinavian financial crises of the early 1990s. Compared with the other episodes, increases in household leverage on a quarter to quarter basis in Norway were not far from the pace recorded in the IMF panel and , but on an 8 years average basis, mostly above. It should be noted, however, that Norway benefited from a significant terms of trade/wealth effect from the rise in oil prices during the past decade, and the measures of GDP used in the above charts include this effect. Relative to mainland GDP, leverage and residential investment were growing even more rapidly during the boom. Although it is difficult to quantify precisely, it would seem that some increase in household leverage would be expected and appropriate given the deleveraging and terms of trade decline experienced during the 1990s. Thus the challenge for Norges Bank was and will be going forward calibrating a signal of excessive household leverage in periods of improved or improving terms of trade. Turning to the third signal we

see that the deviation of the Norway’s current account balance from its 8 year average, while declining, were positive in the quarters leading up to the peak in house prices. This of course reflected the rise in oil prices/improved terms of trade that occurred during this period.

As for Norges Bank policy, during the years before the peak in house prices, Norges Bank was of course raising the policy rate, and rather aggressively so given the path for policy set by the ECB. This policy, along with the rise in oil prices, contributed to an appreciation of the exchange rate.

In summary, it would seem that Norges Bank has been well served by incorporating information on leverage, asset prices, and international capital flows as indicator variables as it has implemented flexible inflation targeting. We note that the decision in November 2009 to raise the policy rate specifically mentioned the recovery in house prices to their previous peak level as one factor that contributed to the decision. We did not take this message in suggest that house prices or other asset prices are now in the objective function of the Norges Bank, and did not find it confusing. In fact, we suspect that going forward, a number of other inflation targeting central banks will begin to highlight and clarify in their research, forecasts, and public statements the role that asset prices and quantities play in their decisions and we would strongly encourage Norges Bank to continue along these lines.

Figure 6.8 Change in Household Leverage versus Spread Between Norges and ECB Policy Rate



As can be seen from the chart, while a range of factors and information variables have informed Norges Bank policy in recent years, the net result was a substantial tightening of policy, both in absolute basis points as well as relative to the ECB, at the same time as

household leverage was returning and surpassing previous peaks, residential investment was booming, and house prices were rising. To this group, it would seem that policy in the last several years of the housing boom, in retrospect, has reflected some of the information available and uncertainties facing the Norges Bank at that time.

### **6.3. Macro Prudential Responsibility**

In the wake of the global financial crisis, there has developed something of a consensus that many if not most countries should in future empower existing or perhaps new institutions with an explicit “macro prudential” function which will seek to monitor, supervise, and regulate systemically important financial intuitions taking into account the macro risk to the financial system they and other such initiations impose. A clear statement of this view is provided by the Squam Lake Group of distinguished US academics and former policymakers .

*Financial regulations in almost all countries are designed to ensure the soundness of individual institutions, principally commercial banks, against the risk of loss on their assets. This focus on individual firms ignores critical interactions between institutions. Attempts by individual banks to remain solvent in a crisis, for example, can undermine the stability of the system as a whole. .... Similarly, the failure of one financial institution can inflict severe losses that threaten the viability of many others. The focus on individual institutions can also cause regulators to overlook important changes in the overall financial system. For example, although the markets for securitized assets ..... grew dramatically in the years before the current crisis, the existing regulatory structures [in many countries] did not evolve with them...*

*One regulatory organization in each country should be responsible for overseeing the health and stability of the overall financial system. The role of the systemic regulator should include i) gathering, analyzing, and reporting information about significant interactions between and risks among financial institutions; ii) designing and implementing systemically sensitive regulations, including capital requirements; and iii) coordinating with the fiscal authorities and other government agencies in managing systemic crises. We argue .... that the central bank should be charged with this important new responsibility. (Squam Lake Working Group, May 2009, p. 2)*

Each country, including Norway, will have to assess how best to design and implement systemic regulatory authority in the wake of the financial crisis. The Ministry of Finance is responsible for overall financial stability and the regulatory framework. Supervision on Financial stability is shared between the Ministry of Finance, Finanstilsynet and Norges Bank. The statutory basis for Norges Bank’s responsibility for financial stability is laid down in the Norges Bank Act. However, the Act does not directly specify or define the mandate. The primary basis for Norges Bank’s responsibility for financial stability is indirectly mentioned in Sections 1 and 3 of the Act. Section 1 states that *Norges Bank shall promote an efficient payment system domestically as well as vis-à-vis other countries, and that the Bank shall monitor developments in the money, credit and foreign exchange markets.* Section 3 states that *Norges Bank shall inform the Ministry of Finance when, in the opinion of the Bank, there is a need for measures to be taken by others than the Bank in the field of money, credit and foreign exchange policy.* Norges Bank publishes its assessment of the outlook for financial stability in semi-annual reports. Norges Bank, Finanstilsynet and the Ministry of Finance meet regularly in so-called "tripartite meetings" to exchange information and discuss the status

of the financial system. Norges Bank has no supervision or regulatory responsibilities for financial institutions in general. The supervision of individual financial institutions is Finanstilsynet's responsibility. Finanstilsynet is also administering the general legislation applying to such institutions and has a role as a macro prudential financial regulator. However, *Norges Bank is responsible for the monitoring and supervision of the interbank payment systems*. Norges Bank's responsibility for the overseeing of the interbank systems is laid down in Section 1 of the Norges Bank Act, which states that Norges Bank shall promote an efficient payment system domestically as well as vis-à-vis other countries. The Payment System Act assign Norges Bank responsibility for the authorization and supervision of Norwegian interbank systems.

The committee believes that Norges Bank should continue and enhance its responsibility for analyzing, reporting, and communicating macro prudential information about significant interactions between and risks among financial institutions, as part of its Financial Stability Report. By having regular meetings with Finanstilsynet and the Ministry of Finance, it will enhance and contribute to the macro prudential supervision. To the extent that monitoring and analyzing compliance with macro prudential requirements requires the gathering of information not currently collected by existing authorities, Norges would also need to be responsible for making sure it has the data it needs for the task. The committee does not believe it should be necessary for Norges Bank to assume responsibility for collecting financial data that is currently being collected by other agencies. Moreover, it should in many cases be possible to separate the responsibilities for ascertaining which new data needs to be collected by the responsibility for collecting and aggregating such data.

It is the third role envisioned for the systemic risk regulator – that of ‘coordinating’ the management of future financial crises – where Norges Bank and other central banks need to tread carefully. Resolution of financial crises often requires the commitment fiscal resources, sovereign borrowing authority, and loan guarantees of significant size and for extended periods of time. While it is difficult to imagine a serious financial crisis in which the expertise of the central bank would not be called upon and essential to their successful resolution, this does not, to the committee, imply that the central bank must necessarily direct or ‘coordinate’ such efforts, whatever that might mean. Indeed, there are sound reasons for independent central banks not to or *to be perceived as* directing or dictating fiscal policy intervention in financial crises that require the commitment of government revenue, sovereign borrowing authority, and loan guarantees of significant size and for extended periods of time. Bagehot's dictate for central banks in crisis to lend against ‘good collateral at a penalty’ rate may not always and everywhere apply in times of crisis, but obliterating the line between monetary and fiscal authority *as a matter of course and design* in any new macro prudential regime would seem to run the serious risk of materially compromising central bank independence and the ability achieve price stability as a matter of course.

## APPENDIX

It is important to understand the point that inflation forecast targeting central bank following the approach outlined by Svensson (may well find it optimal to lean against swings in asset prices, but only to the extent these swings influence the forecast of inflation or possible, the output gap. To illustrate some key points, it will be useful to consider a simple example that extends Clarida (2001). Let  $z_t = [\pi_t, y_t, r_t, h_t]$  with  $y_t$  the output gap,  $\pi_t$  inflation,  $r_t$  the policy rate, and  $h_t$  an asset price. Suppose the central bank uses a VAR to forecast the economy.

$$z_t = Dz_{t-1} + u$$

Now, a simple forward looking Taylor rule model can be written as

$$r_t = \beta E[\pi_{t+n} | z_{t-1}] + \gamma E[y_{t+n} | z_{t-1}] + v_t$$

where it will be noted that the asset price  $h_t$  does not directly enter the Taylor rule. For simplicity assume a simple Phillips curve relationship

$$\pi_{t+n} = b y_{t+n} + o_{t+n}$$

where  $o_{t+n}$  is a supply shock and  $E\pi_{t+n} = b E y_{t+n}$ .

Using the VAR

$$E[\pi_{t+n} | z_{t-1}] = \mathbf{1}D^n z_{t-1}$$

and using the structural Philips curve relationship

$$E[y_{t+n} | z_{t-1}] = b\mathbf{1}D^n z_{t-1}$$

where  $\mathbf{1}$  is the vector  $[1, 0, 0, 0]$ . Substituting back into the forward looking Taylor rule, we can write a reduced form Taylor rule which is the interest rate equation in the VAR model.

$$r_t = (\beta + b\gamma) D^n_{11} \pi_{t-1} + (\beta + b\gamma) D^n_{12} y_{t-1} + (\beta + b\gamma) D^n_{13} r_{t-1} + (\beta + b\gamma) D^n_{14} h_{t-1} + v_t$$

The scalar  $D^n_{14}$  is the regression coefficient of the lagged asset price in forecasting inflation  $n$  periods in the future while  $bD^n_{14}$  is the regression coefficient in forecasting the future output gap based on the lagged asset price. Thus to the extent that rising asset prices put upward pressure on the expected output gap and expected inflation a central bank following a forward looking Taylor rule will lean again such asset price moves by raising the policy rate *even if the asset price itself does not enter the objective function*

## 7. The forecasting process – models and judgements

Policymaking entails evaluating the future trajectory of the economy, and making policy decisions to influence that trajectory in favorable directions. Hence, policy decisions rests critically on the quality of the macroeconomic forecasting.

Since November 2005, all macroeconomic forecasts from Norges Bank have been based on their own predictions regarding expected future interest rate setting. This forecasting analysis makes use of a structural model called NEMO (see Brubakk et al. 2006), but the model is primarily suited for medium term analysis of the effects of monetary policy on the macroeconomy. Norges Bank's forecasts for the first few quarters are largely based on current statistics, information from Norges Bank's regional network and forecasts obtained from a number of short-term statistical and econometric models. The published projections in the monetary policy reports are the result of an overall assessment based on both models and judgment.

Norges Bank's forecasting process can briefly be described as follows:

- Short term forecast are given for 3-4 quarters. Conditional on these forecasts, NEMO is used to compute forecasts for up to a 2-3 year horizon.
- Through an iterative process, a time path for the key policy rate is derived so that the predicted underlying inflation rate approaches the target level of 2.5 per cent and the output gap approaches zero in the medium term.

In the last few years, Norges Bank has developed surveys, econometric models and structural macroeconomic model(s) that have been adopted in the Bank's forecasting process. This analytical work is impressive, drawing on high level skills in diverse areas such as economic theory, statistics, econometrics, mathematics and programming techniques. However, developing models to describe and forecast the behaviour of the Norwegian economy is also subject to many important judgmental decisions that can have a material impact on the forecasts of the models. These decisions include the choice of the data set, the transformations applied to the data, the dynamic specification of the model, the choice of estimation techniques and so on. Put simply, a theoretical model may be mathematically sophisticated, but if mis-specified, will fail to capture empirical regularities of economy activity which are important for monetary policy. In the following we will describe and evaluate the main ingredients in Norges Bank's forecasting process; models and judgment. Our discussion will deal with the following topics (1) The use of indicators in monetary policy - Measures of underlying inflation, (2) Analysis of the current situation (surveys), (3) Analysis of the short term (forecasting models), (4) Analysis of the medium and long term (NEMO), (5) Incorporating financial frictions into the models and finally, (6) Incorporating oil prices into the models.

### **7.1. Indicators in monetary policy - Measures of underlying inflation**

At the centre of inflation targeting lies two widely used concepts; underlying inflation and the output gap. Although these concepts are generally understood and widely used by the economic profession, there are no unique instrumental definitions of either of these concepts, and therefore no single, universally agreed method of measuring them. Nevertheless, as they remain the central targets in a monetary objective function, they should be critically evaluated by Norges Bank.

Many previous Norges Bank Watch reports have discussed and assessed these concepts in detail. In our discussion, we have chosen only to focus on underlying inflation. We refer to Norges Bank Watch 2004 and 2008 for evaluations of the usefulness of the output gap concept for monetary policy analysis. Although several measures of underlying inflation are regularly assessed by Norges Bank,<sup>6</sup> we would suggest further evaluation both regarding definition and methods and how to measure underlying inflation.

Consumer price inflation varies from month to month, sometimes substantially due to extraordinary fluctuations in certain product markets or changes in taxes and subsidies. Norges Bank's 2001 mandate (Royal Decree of 29 March) therefore opens up for ignoring extraordinary consumer price disturbances when setting the interest rate (also referred to as escape clauses):

*“In general, the direct effects on consumer prices resulting from changes in interest rates, taxes, excise duties and extraordinary temporary disturbances shall not be taken into account.”*

In interpreting its monetary policy mandate, Norges Bank has argued that it will focus on developments in a particular measure of underlying inflation (CPI-ATE inflation) when setting the interest rate. This index is calculated from CPI but adjusted for tax changes and excluding energy products. In their own wording, (Inflation Report 2/01, pp. 8-9):<sup>7</sup>

*“Norges Bank will focus on developments in the [CPI-ATE] when it assesses monetary policy performance in its annual report.”*<sup>8</sup>

Since October 2001, Statistics Norway has published CPI-ATE regularly as a supplement to the CPI.

A measure of underlying inflation can influence policymaking since Norges Bank pay close attention to CPI-ATE in its operation of monetary policy. In practice, this means that Norges Bank will construct forecast of CPI-ATE (with fan charts) conditioning on the interest rate path. In this way, Norges Bank will seek to stabilize CPI-ATE (around the inflation target).

CPI-ATE is not, however Norges Bank's only measure of underlying inflation. Following among other a suggestion by Norges Bank Watch 2004, Norges Bank has regularly assessed a series of alternative indicators.<sup>9</sup> These are displayed together with CPI-ATE in a separate

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<sup>6</sup> See for instance Simensen and Wulfsberg (2009) for an interesting indicator of underlying inflation that gives less weight to prices that change frequently than to those that change infrequently. Such an indicator was also suggested by Norges Bank Watch 2007.

<sup>7</sup> The same is also specified in Norges Bank's Occasional Papers nr. 34 from 2004 (page 91).

<sup>8</sup> In the Inflation report 2/01 Norges Bank denoted the measure CPIXE, but since Statistics Norway started publishing the series, it has been referred to as CPI-ATE.

<sup>9</sup> Norges Bank Watch 2004 pointed out that Norges Bank was not fully utilizing the flexibility provided by the escape clauses in the mandate. Given the limitations of measures of core inflation, Norges Bank should also pay attention to other measures than CPI-ATE when deciding on its monetary policy stance. By exploring alternative measures of underlying inflation the interest rate setting would also be more robust.



graph in the monetary policy reports (see for instance, Chart 1.9 in MPR3/09). It is a bit unclear how these other indicators influence monetary policy, however. They are not subject to forecast, but are still useful in assessing the current inflation pressure.

In MPR2/08, Norges Bank introduced a new indicator of underlying inflation called CPIXE. CPIXE measures CPI inflation adjusted for tax changes and excluding temporary fluctuations in energy prices. For an evaluation of this new measure, see Norges Bank Watch 2009. The motivation for constructing CPIXE is that CPI-ATE does not capture trends in energy prices, since CPI-ATE permanently excludes energy. Given the strong increase in energy prices in recent years, Norges Bank was concerned that CPI-ATE may have undervalued the underlying inflation pressure in the Norwegian economy. Technically, the CPIXE is calculated as the CPI-ATE plus an estimated trend in energy prices in the CPI. The trend in energy prices is computed using the so called Hodrick-Prescott (HP) filter, see Norges Bank Staff Memo 3/2009 and 7/2008 for details. Norges Bank calculates CPIXE, and publishes the data on its webpage a few hours after Statistics Norway publishes CPI-ATE.

When introducing this indicator in 2008, Norges Bank wrote:

*”Like the traditional indicators, the new indicator will not be a perfect measure of underlying inflation at all times [...] The assessment of underlying price pressures will therefore always have to be based on several different indicators and an analysis of the underlying reasons for the price changes.”* (MPR2/08 p. 55)

Although different indicators of underlying inflation may still be analysed, Norges Bank has in fact replaced CPI-ATE with CPIXE as their main indicator of underlying inflation. Therefore, detailed forecast with fan charts for CPI-ATE are no longer published by Norges Bank. Instead, forecasts of CPIXE (including fan charts) are constructed by conditioning on the Bank’s interest rate path. In that way, monetary policy now seeks to stabilize CPIXE instead of CPI-ATE (in their macro model NEMO).<sup>10</sup>

#### **NBW’s view:**

**By focusing on CPIXE instead of CPI-ATE, Norges Bank has introduced a new main indicator of underlying inflation that they are targeting in their forecasting process. Although Norges Bank considers many indicators of underlying inflation to evaluate the current inflationary pressure, CPIXE is the only measure of underlying inflation for which they provide conditioned, detailed forecast (with fan charts).**

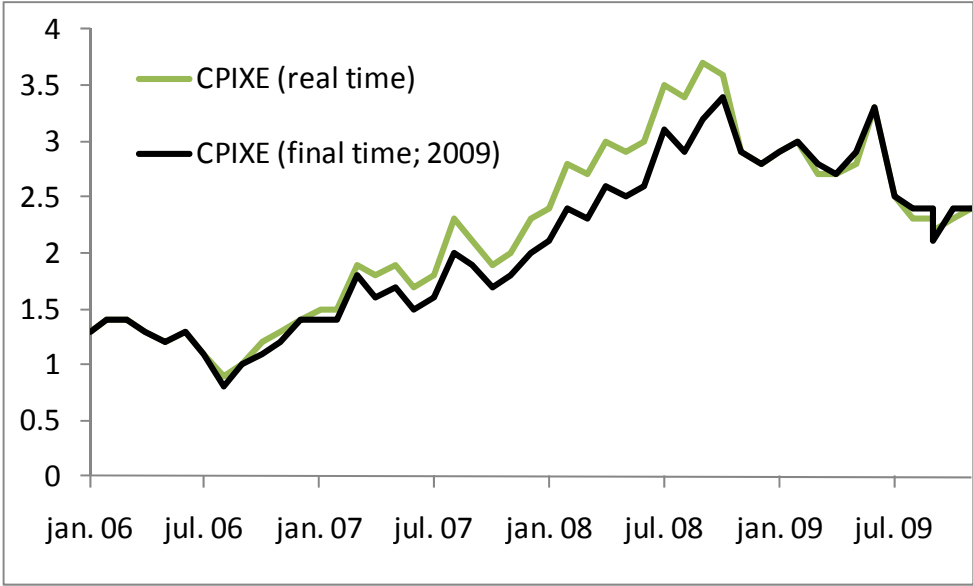
Norges Bank Watch 2009 recommended that Norges Banks should **not** publish CPIXE as its main indicator of underlying inflation. Their main concern was that the historical index values have to be revised as new observations of energy prices are added to the sample. Sometimes these revisions can be substantial. This is because the Hodrick-Prescott filter is an one-side filter, that will encounter endpoint problems. NBW 2009 also pointed out the CPIXE would be very sensitive to how they had predicted future energy prices. Relying too much on CPIXE as the main indicator of underlying inflation would therefore make monetary policy less robust according to this report.

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<sup>10</sup> To obtain the forecast for CPIXE Norges Bank condition on the forecast for the energy trend (constructed outside NEMO) by allowing for shocks in the AR equations.

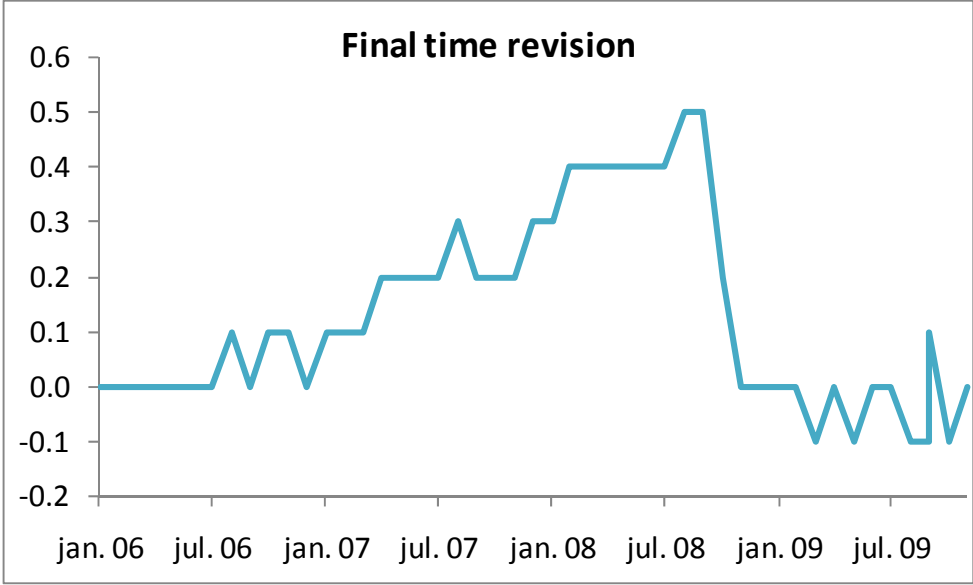
Figure 7.1. CPIXE first estimation (real time) and revised (final time), monthly data.

A) CPIXE real values and revised



Source: Norges Bank and Norges Bank Watch 2010

B) Difference between CPIXE real and final time

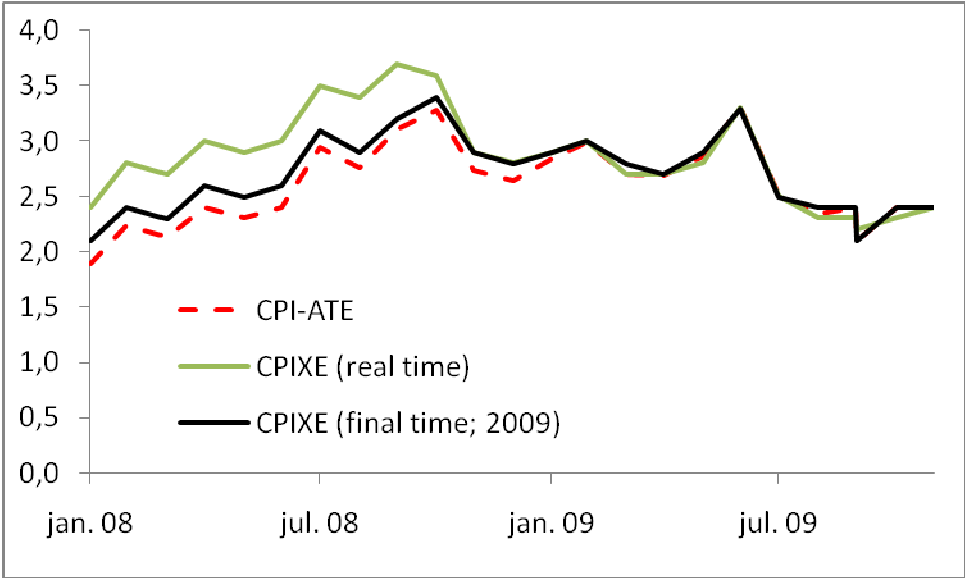


Source: Norges Bank and Norges Bank Watch 2010

Figure 7.1 illustrates the effect of the revisions due to new observations of energy prices. Panel A) graphs monthly observations of CPIXE in real time together with the final revised vintage of CPIXE in 2009. The monthly data for the real time values for CPIXE are taken from the MPR 3/09, whereas the final time (revised) values are taken from Norges Bank’s webpage, where they publish monthly updates. Panel B plots the difference between these two graphs. A positive number means that the first vintage was too high compared to the final values; hence the index numbers have been revised downward. Clearly there are at times large differences. In July 2008 for example, CPIXE was perceived to be 0.5 percentage points higher than what Norges Bank in December 2009 estimates CPIXE to have been in July 2008.

The downward revision is mainly due to the fact that since July 2008, oil prices have plummeted, causing a downward revision of the energy price trend.

Figure 7.2. CPIXE (real time) and revised (final time) compared with CPI-ATE



Source: Norges Bank and Norges Bank Watch 2010

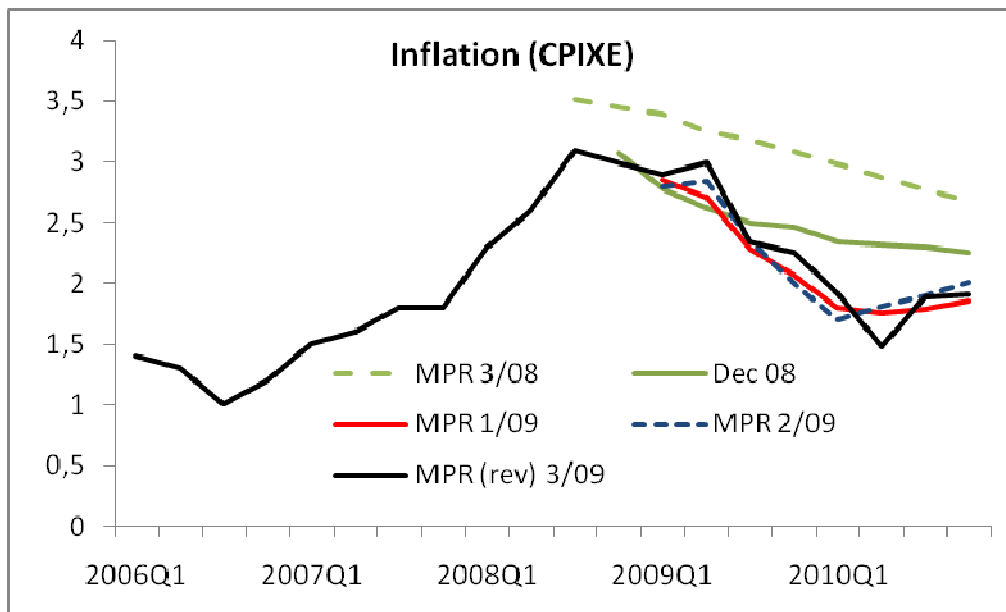
In their monetary policy reports, Norges Bank publishes CPIXE calculated in real time. Hence, the effect of the revisions will be suppressed. The fall in inflation by the end of 2009 noted in Figure 7.1 will therefore seem much steeper in the graphs published in the monetary policy report, since Norges Bank plots the real time series for CPIXE rather than the updated final time series. With the benefit of hindsight, we now know that the series has been revised down, hence this should be the relevant information that Norges Bank should publish in the reports.

Note also that the difference between the (final time) CPIXE and CPI-ATE has declined in the last two years (see Figure 7.2). This feature disappears when investigating the real time CPIXE. Again, this is mainly due to the fact that since July 2008, oil prices have plummeted, reducing also the measured energy trend in CPIXE. This episode illustrates how sensitive this measure of underlying inflation is to inclusion of new data on energy prices.

Finally, the impact of the downward revision for policy analysis can also be seen in Figure 7.3, where we include the inflation forecast. The forecasts shown here are all identical to the forecasts graphed in Figure 3.3 in Chapter 3, the only difference is that now we use the final values of CPIXE for the period known at the time the forecast is given; (2006Q1-2009Q2), instead of the real time values used in MPR3/09.<sup>11</sup> We denote this series MPR (rev) 3/09. Clearly, the forecast in MPR3/08 now seems out of place. At the time this forecast was given, CPIXE inflation was close to 3.5 percent. However, already by December 2008 when the updated forecasts were given, CPIXE had been revised downwards. Hence, the forecast in December start out at a much lower level, even though the forecast was given just one month after the previous MPR3/08 forecast.

<sup>11</sup> We have averaged the monthly data published in the figures 7.1.-7.2 to quarterly frequencies.

Figure 7.3. Forecast of CPIXE, MPR 3/09 with revised final numbers for actual CPIXE.



Source: Norges Bank and NBW 2010.

#### NBW's view:

**If Norges Bank continues to publish CPIXE in their monetary policy reports, we recommend that the final numbers are published as they are revised, not the real time values that does not incorporate recent revisions. This is Norges Bank's practice when publishing the output gap. Given that the final revised values of CPIXE will always be uncertain by construction, Norges Bank should also extend the fan charts back in time to reflect this uncertainty, as is customary in the Bank's graphs for the output gap.**

Another problematic issue related to CPIXE is that both the process of defining and measuring underlying inflation is delegated to Norges Bank, while previously it was Statistics Norway that published underlying inflation (CPI-ATE). As both processes involve elements of judgment, it becomes difficult to argue that the measure serves both policy purposes and makes policy accountable at the same time. The NBW committee does not, however, claim that the problems associated with CPIXE are solved if Norges Bank leaves it to Statistics Norway to compute and publish CPIXE. Statistics Norway has concluded (see Sandberg 2008) that only CPI-ATE (and CPI-AT) will be included in their portfolio of official price statistics published each month. In this article, Sandberg argues that when CPI-ATE was chosen as the main indicator of underlying inflation in 2001, it was emphasized that it was important that an independent institution like Statistics Norway could produce and publish the operational target used in monetary policy as their official statistics. CPI-ATE was seen as a transparent indicator consistent with the mandate. Other indicators could be useful supplements, and some of these could be calculated by Statistics Norway on request (Sandberg, 2008).

*"Ved utarbeidelsen av KPI-JA og KPI-JAE i 2001 ble det pekt på viktigheten av at Statistisk sentralbyrå som uavhengig institusjon produserte og publiserte det operative målet for pengepolitikken som offisiell statistikk. I dialogen som Statistisk sentralbyrå*

*hadde med sentrale brukere inkludert myndighetene fremkom det klart et behov for én sentral indikator, og valget falt på konsumprisindeksen justert for avgiftsendringer og uten energivarer. Dette ga en transparent indikator i tråd med forskriften. Andre indikatorer kan imidlertid utgjøre et supplement for ulike ekspertbrukere. Siden noen av disse allerede beregnes på oppdrag kan de selvsagt også utleveres til andre ved forespørsel."*

Through the present Norges Bank Watch group's dialogues with Statistics Norway, this viewpoint was clearly still maintained. Furthermore, as the construction of CPIXE involves judgment and revision of history, it does not make it a transparent indicator that Statistics Norway would normally produce. We therefore conclude that the previously used index of underlying inflation, CPI-ATE should still be used as the main measure of underlying inflation since it has been tested, evaluated and has good properties at least compared to other alternative measures of underlying inflation.

#### **NBW's view:**

**As last year Norges Bank Watch committee, we think Norges Bank should not use CPIXE as it is not an optimal and transparent indicator of underlying inflation using standard criteria. CPIXE should therefore not be used as the main indicator when designing monetary policy. Our view is that CPI-ATE should still be used as the focus measure, but that Norges Bank should use more judgment when they observe deviations between CPI and CPIATE in periods of rapid energy prices.**

We would, however, like to state that our critique refers primarily to the use of CPIXE as the *main* indicator of underlying inflation. As Norges Bank, we believe energy price changes can have an impact on the underlying inflation level, although the pass-through (the extent to which changes in oil prices affects underlying inflation) may have declined somewhat over time, see e.g. Hooker (2002) and Chen (2009) for international comparisons and Cappelen, Eika and Olsen (2006), Bjørnland (2000, 2009) and Solheim (2008) for analysis of Norway. To learn more about the importance of pass-through from energy prices to inflation, we suggest that Norges Bank conduct a more detailed empirical analysis.

Furthermore, we recommend that Norges Bank investigate alternative methods of separating the permanent and transitory component of energy prices using for instance a structural VAR method, panel data analysis or factor models, see e.g. Hahn (2003), Giannone and Matheson (2007) and Landau and Skudelny (2009) among many others.

#### **NBW view:**

**We recommend that Norges Bank analyses the pass-through from oil prices to inflation in Norway, to better evaluate how energy prices influence underlying inflation. We also recommend that Norges Bank investigate whether there are other more suitable methods of separating the permanent and transitory component of energy prices, than the Hodrick-Prescott filter that they are currently using.**

## **7.2. Analysis of the current situation – Regional network**

In autumn 2002, Norges Bank established a regional network of enterprises, organizations and local authorities throughout Norway. The idea was to construct a survey by talking to business

and community leaders concerning expected financial developments in their enterprises and industries. The contacts reflect the production side of the economy, both in terms of industry sector and geographic area.

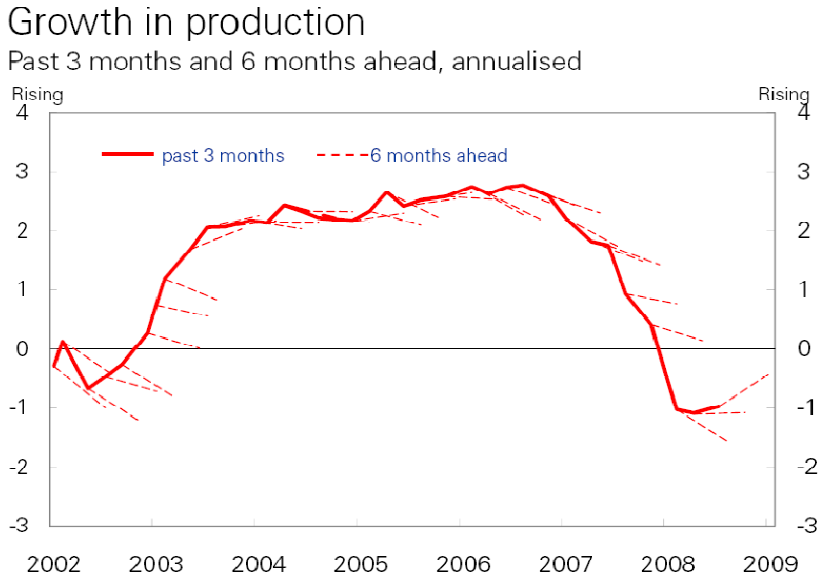
The network divides Norway into seven regions. Based on the reports from the regions following each round of contacts, Norges Bank publishes a national summary and charts. The summary was up until 2008 a pure region average. From Regional Network report no. 3/2009, the observation in the regional Network has been improved by constructing the weights differently see Martinsen and Wulfsberg (2009). The new weights better capture the variation in size between the different regions over time than previously. The economic developments reported are published regularly and made available on Norges Bank's website.

Norges Bank has emphasized that the insight from the enterprises in the network, together with the regular reports on economic developments, makes the regional network an important factor in decision-making by Norges Bank's Executive Board in its conduct of monetary policy. Regular interviews with contacts in Norwegian industry are used to obtain information about enterprises' view of the current situation and outlook before other official statistics are available. In a recent study, Brekke and Halvorsen (2009) analyses how information from the regional network correlates with other official statistics on growth, capacity utilization, employment etc. They find that the network is highly correlated with economic activity. Hence, we conclude that there is clearly useful information in the regional networks in assessing current macroeconomic conditions. In that sense, the regional network may provide a clear signal about developments in the Norwegian economy.

Furthermore, we find that the regional network may also enhance the understanding of the dynamics within and between sectors. This may give Norges Bank a better insight into what is driving current economic developments. We draw the attention to many recent interesting analysis based on information from the regional network, for instance, the short article on "Competition and Prices" in MPR1/07 and the one on "Developments in Productivity Growth", published in MPR2/07.

The ability to forecast well 3-6 months ahead is less certain. In particular, we find some evidence that it is more of a coincident indicator than a leading indicator. Looking back at the reports since 2008, it was only in the fifth report published in December 2008 that the survey indicated a severe fall in activity six months ahead. Prior to that, there had been signals of weaker growth prospect from the third report (published June 24, 2008) and onwards. However, the index was still positive in June, not yet indicating a future fall in output (see Figure 7.4).

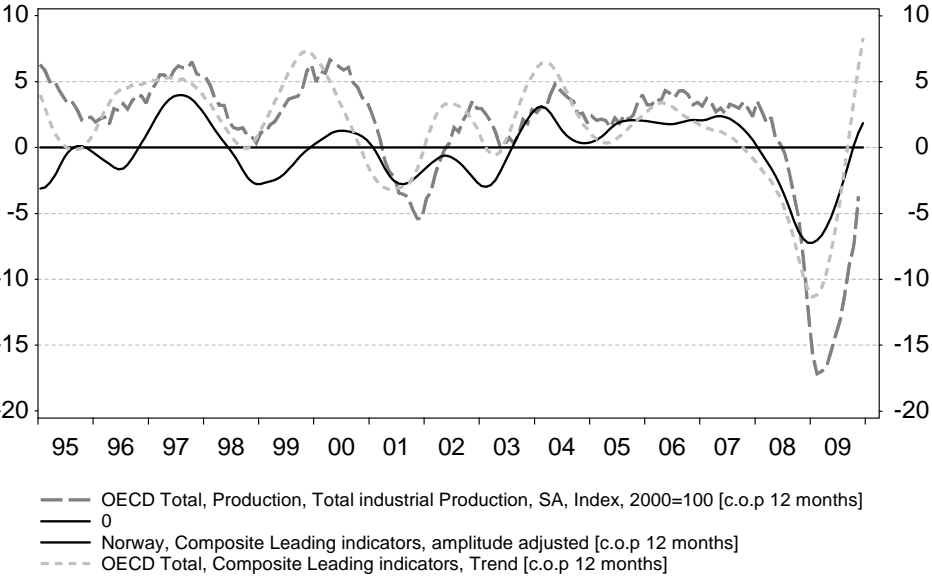
Figure 7.4. The regional Network for Norway (obtained in June 2009)



Sources: Norges Bank and regional network:

However, with the benefit of hindsight, we know now that the (quarter on quarter, s.a.) growth rates for mainland GDP turned negative already by the third quarter of 2008 (see Figure 2.1 in Chapter 2). Other indicators had pointed to a fall in activity prior to that, see for instance the business survey tendency published by Statistics Norway and OECD composite leading indicator for Norway graphed in Figure 7.5 here.

Figure 7.5. OECD Composite leading indicator for Norway

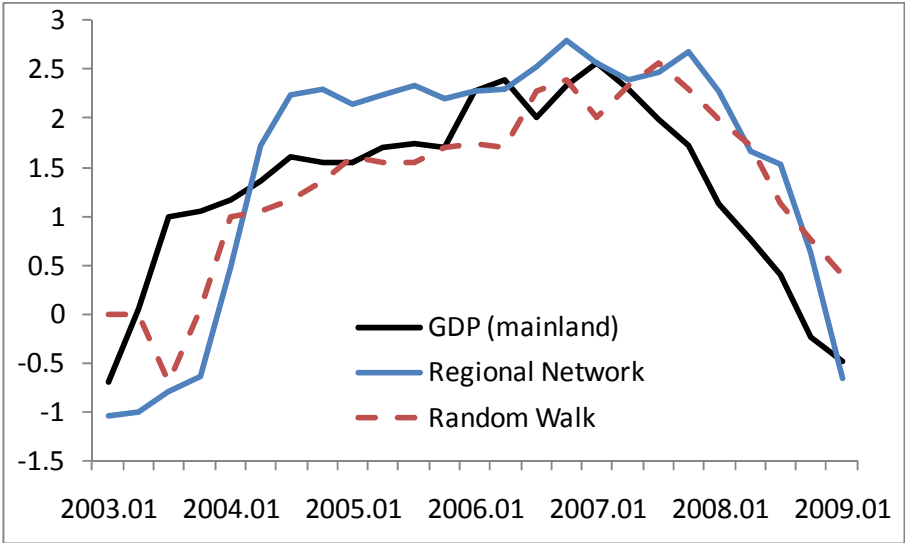


Source: Reuters EcoWin

A simple evaluation of the network compared to some alternative forecasting models is provided in Figure 7.6 and 7.7. Figure 7.6 displays the forecasts two quarters ahead from the

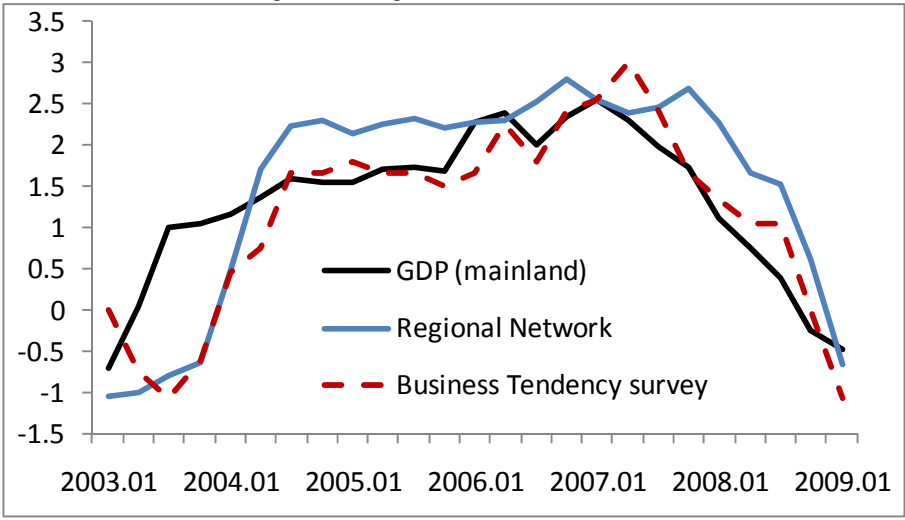
regional network together with the normalized annual growth in GDP mainland Norway.<sup>12</sup> The Figure is an adaption from Figure 17 in Brekke and Halvorsen (2009). Figure 7.7 reveals that the forecast series from the Regional Network seems to lag output slightly, both in the booming years from 2003/2004 and in the recession towards the end of 2008, which is consistent with what we have argued just above. Correlation coefficients reported in Brekke and Halvorsen (2009) also suggest that the maximum correlation between the forecast series from the regional network and GDP is found when the two series are coinciding, and not when the regional network is leading GDP.

Figure 7.6 Forecast from the Regional Network and a random walk, compared with GDP, 2003Q1-2009Q1.



Source: Norges Bank and NBW 2010.

Figure 7.7 Forecast from the Regional Network and the Business Tendency Survey, compared with GDP, 2003Q1-2009Q1.



Source: Norges Bank and NBW 2010.

<sup>12</sup> GDP is normalized to be the same as the regional network in 2007Q2. This does not, however, influence the results.



In the figure we also plot forecast from a random walk. To be consistent with the regional network, the forecasts are two quarter ahead forecasts. This is the simplest form of a forecast, stating that the forecast for GDP at time  $t+2$  is equal to actual GDP at time  $t$ . Figure 7.7 is identical to Figure 7.6, except that now we replace the random walk with the Business Tendency Survey calculated in Statistics Norway.

Evaluating the forecast performance by the root mean square error (RMSE), we find that the RMSE for regional network is 0.80 while RMSE for the random walk is 0.65 and for the Business Tendency Survey is 0.69. Hence, the forecast from the random walk and the Business Tendency Survey both outperform forecast from the regional network, in this period. Given the short sample, though, these numbers should be interpreted with care.

Hence, we have argued that the network provides an signal about current economic developments in Norway, but that it may not be best indicator for forecasting 3-6 months ahead, as it seems to be more of a coincident rather than a leading indicator.<sup>13</sup> One reason why the network may not be the best forecaster in this recession is that it focuses on the supply side. The production side in the economy was only affected when the financial crisis affected confidence through changes in banking and financial institutions lending practice. As emphasized in chapter 2, private consumption and house prices declined already in the spring of 2008, half a year before the financial turmoil in the fall. Hence, measured from the demand side, there were by then clearer signals of a fall in activity than the network provided in the spring 2008.

However, to evaluate the forecasting power of the network any further than this requires us to assess forecasting performance systematically over time. Given the amount of resources that are put into constructing the indicator, as well as the weight that is given to the network in the monetary policy reports, we suggest that the forecasting power of the regional network is systematically assessed and compared to other leading indicators such as Statistic Norway business tendency survey.

#### **NBW's view:**

**There is clearly useful information in the regional networks in assessing current macroeconomic conditions. In that sense, the regional network may provide a clear signal about developments in the Norwegian economy before data are published. The regional network may also enhance the understanding of the dynamics within and between sectors. This may give Norges Bank a better insight into what is driving current economic developments. The ability of the network to forecast aggregate economic activity 3-6 months ahead is less clear, as it seems to be a coincident rather than leading indicator. Given the amount of resources that are put into constructing the indicator, we suggest that the forecasting power of the regional network is systematically assessed and compared to other leading indicators such as Statistic Norway business tendency survey.**

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<sup>13</sup> That said, information from the regional network has also been used together with other relevant information in econometric models in Norges Bank to improve forecast of GDP. However, we have not evaluated these combined forecasts.

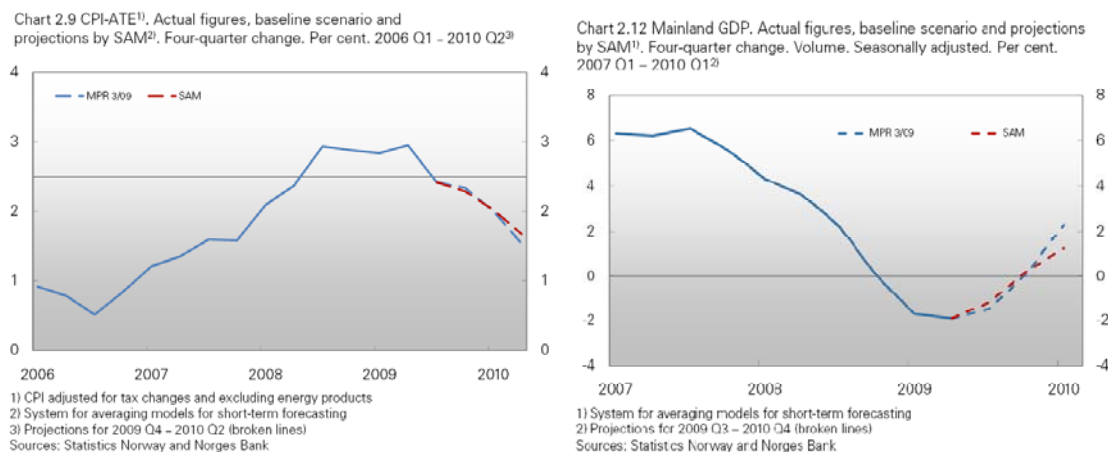
### 7.3 Short term (nowcast) forecast

In recent years it has become increasingly common among central banks to combine different models or forecasts. Rather than arrive at a single specification, one entertains a wide variety of models and then weights together the output from these models in a systematic manner. Starting in 2006, Norges Bank initiated a project to improve its short-term forecasting using statistical and econometric models.<sup>14</sup> The short term forecasting project (the ‘Nowcasting’ project) aimed at producing model-based short term forecasts for the Norwegian economy for each round of monetary policy discussions. These forecasts are unconditional forecasts. At the heart of the evaluation and combination of short-term forecasts at the Norges Bank is a set of programs collectively referred to as SAM – the System for Averaging Models.

The (staff) forecasts from SAM are published in every monetary policy report, starting with MPR 2/2008 which also describes the project briefly. The forecasts are published together with the official forecast, three quarters ahead, see for instance Chart 2.9 and 2.12 in MPR 3/2009 depicted in Figure 7.8 here.

More recently, the forecast have been supplemented with fan charts that communicate the degree of forecast uncertainty. Models can then be combined based on the forecast uncertainty, i.e. not only based on point forecast. This ensures that point forecasts that have wide confidence bands get a lower weight than models with narrow confidence bands.

Figure 7.8. Forecast for CPI-ATE and Mainland GDP using SAM compared to Norges Bank short term forecast published in MPR3/09.



An important part of the project was to evaluate the forecasts obtained from a broad spectrum of models, and to consider whether particular combinations of models or forecasts combination improve short-term forecasts of the Norwegian economy. Bjørnland, Gerdrup, Jore, Smith and Thorsrud (2009) show that with regard to CPI-ATE, SAM adds value to the official forecast from Norges Bank. The results also illustrate that, for the period 2001-2009, SAM's forecast outperform Norges Bank's forecast up to a horizon of one year. More recently, Gerdrup, Jore, Smith and Thorsrud (2009) evaluate density combinations and show that

<sup>14</sup> Hilde C. Bjørnland, member of NBW 2010, was directly involved in the nowcasting project from December 2007 to June 2008.

forecast performance can be further improved by combining groups of similar model (ensemble) densities, rather than individual model densities.

Regarding publishing schedule, the forecasts are updated each month when new data for CPI-ATE are published and again when data for quarterly GDP are published, giving a total of 16 updates each year. Regarding the transparency of these forecasts, the forecasts are distributed internally and to the Executive board.

Since these forecasts are part of the information distributed and discussed in the executive board at the monetary policy meetings, we recommend that Norges Bank publishes them regularly, preferably after each monetary policy meeting. Although these forecasts are not the official forecast from Norges Bank, short term technical (staff) forecasts provide valuable information about unexpected shocks that affect monetary policy outcomes. Publishing them will only enhance Norges Bank's transparency.

**NBW's view:**

**Norges Bank has the last few years developed and implemented forecasting methods of model combinations used in the monetary policy operations. This work is encouraging and we recommend that Norges Bank continues to develop, test and evaluate these forecasting tools both for point forecasts and densities. Furthermore, as last years Norges Bank Watch group, we recommend that Norges Bank publishes the short term forecast regularly, at least after each monetary policy meeting.**

We also suggest that the forecast horizon be extended to 2-3 years. The forecasts can be published together with the regular forecast update from NEMO. That way the unconditional forecast from SAM can serve as useful cross checks for the forecast from NEMO, which are conditional on the interest rate (see also the discussion in the next section).

**NBW's view:**

**We suggest that the forecasts for GDP and inflation (CPIATE) are extended to the two years horizon and used as cross check against Norges Banks model (NEMO) forecasts.**

#### ***7.4. Analysis of the medium and long term using NEMO***

The last few years, Norges Bank has made impressive progress in developing a small structural model, called NEMO. This model is an open economy Dynamic Stochastic General Equilibrium (DSGE) model that builds on the New Keynesian framework for modeling the macroeconomic effects of monetary policy. The development of NEMO has required highly trained macroeconomists with a strong modeling culture coupled with statistical, econometric and programming skills. The model has been in use for policy analysis and forecasting since the Monetary Policy Report 3/07.

As previous Norges Bank Watch groups, we support Norges Bank's efforts to build a structural model that also captures the effects of monetary policy through the expectations of market participants of future monetary policy. However, as with any model, there is always room for improvement. For example, the recent financial crisis has pointed to some severe deficiencies in NEMO and many other DSGE models with respect to credit markets and asset

prices, resulting in severe forecast failures. In the following we will discuss the potential for improving forecast from NEMO, before discussing if asset prices and oil prices could be part of the model framework.<sup>15</sup>

NEMO is a micro founded DSGE model which implies that market agents make optimal decisions under uncertainty, subject to realistic expectations of the macroeconomy as well as future monetary policy decision. The decisions of households and firms are aggregated into dynamics general equilibrium. In forming their expectations agents take into account all available information, including the stochastic processes of shocks that might hit the economy, the behaviour of other agents and the expected course of monetary policy. The current parameterisation of NEMO is based on calibration and Bayesian estimation. For more details, see Brubakk et al. (2006).

Overall, DSGE models like NEMO offer a lot of potential for monetary policy making. They can help identify source of shocks and predict the effect of policy changes. The DSGE models also allow one to establish a link between structural features of the economy and reduced form parameters, something that was not always possible with large-scale macroeconomic models that previously were used by central banks.

A typical critique of DSGE models is that they are too stylized to be truly able to describe successfully the dynamics of the data, see Sims (2006). Clearly, that can be said for any structural model that by construction has to abstract from a lot of empirical details that are not conceived as sufficiently important for the main analytical purpose of the model. However, there are some inherent features of the DSGE models that make them too stylized in their treatment of financial markets and asset markets in particular. At the outset, DSGE models are highly non-linear and can not be solved analytically. Therefore, linear approximations around a steady state were used to permit detailed analysis, but such approximations also restricted applications of the models to large shocks such as those released by the recent, global financial crisis.

When estimated on data, DSGE models are also stripped of irregularities by using suitable data transformations, such as de-trending, smoothing or the elimination of structural breaks. As a consequence, DSGE models are not designed to predict sudden drops in activity (crisis). They are useful for “normal” times as a way of understanding economic fluctuations, and for learning about optimal policy.

The financial crisis has emphasized the need for good forecasting models that can divert from a stylized linearized world. Norges Bank has already developed many such models, either in the short term econometric forecasting project (SAM) discussed above or as part of ongoing research in the Research Department, see for instance the paper Hoogerheide, Kelijn, Ravazzolo, van Dijk and Verbeek (2010) that show promising results in terms of forecasting both macroeconomic and financial variables using econometric (non-linear) methods.

Hence, Norges Bank already possesses many econometric models than can be extended to make forecast 2-3 years ahead. In order to improve future forecasts, we suggest that Norges Bank should use empirically validated econometric models (including simple time-series models) systematically as cross checks when making forecast from NEMO. Although the models may be unconditional on the future interest path, they can still provide the

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<sup>15</sup> See Norges Bank Watch 2008 for a more in depth evaluation of NEMO.

policymaker with useful information as the forecast will be an extrapolation of recurrent conditions.<sup>16</sup>

Note, however, that simple econometric models, like unrestricted VARs, may have an advantage in forecasting compared to DSGE models.<sup>17</sup> As a result, it may not be surprising that the former will generally outperform the latter when forecasting. However, we believe that the approach of reporting forecast from the DSGE model side-by-side with econometric models, offers transparency about the NEMO strengths and weaknesses. This will help the policymaker make better decisions.

#### **NBW view:**

**We support Norges Bank's efforts in terms of building a theoretically consistent structural model of the Norwegian economy, for evaluating monetary policy alternatives in the medium and long term. To strengthen its forecast properties, we recommend that Norges Bank should use empirically validated econometric models systematically as cross checks when making forecast from NEMO. This will offer transparency about the models strengths and weaknesses.**

#### **7.5. Financial frictions**

The credit market liberalisation process of the 1980s increased the scope of spillovers from asset prices, and in particular house prices to the wider economy in many countries including Norway; see IMF (2008, 2009). Furthermore, the liberalisation also made house prices more responsive to monetary policy shocks, as emphasized by Iacoviello and Minetti (2003). The importance of house prices in the business cycle may therefore have increased.

Bjørnland and Jacobsen (2010) analyze empirically the role of house prices in the business cycle and the monetary transmission mechanism in Norway, Sweden and the UK, using a structural vector autoregressive (VAR) model. They find that the effects of house price innovations are non-trivial. In particular, housing contributes around 4-6 percent of GDP variation in all countries, with the largest effect seen in the UK. Concerning inflation, housing explains 10-15 percent of the variation, with Norway and UK experiencing the most pronounced effect. Finally, they also find house prices influence the (three-month) interest rate response in all countries, most notable in the UK. Interest rates in Norway also eventually respond to house price shocks, but the immediate response is small and not significant.

The different role that house prices play in the business cycles could be related to issues regarding the mortgage market and the accessibility of credit. Two recent studies, IMF (2008) and Assenmacher-Wesche and Gerlach (2008), assess a series of indicators for credit accessibility and the mortgage market in several OECD-countries. The latter study finds that Norway, Sweden and the UK have fairly similar mortgage credit accessibility. However, Norway and the UK have higher owner-occupier and mortgage-debt-to-GDP ratios than

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<sup>16</sup> Related to this approach is of course the Del Negro and Schorfheide's (2004) DSGE-VAR approach.

<sup>17</sup> That said, some DSGE models can also provide good forecast in certain periods. For instance, Smets and Wouters (2003) found that DSGE models could track and forecast time series as well as, and sometimes better than, a vector autoregression estimated with Bayesian techniques (BVAR).

Sweden, suggesting that house price shocks can have a stronger influence on real activity and inflation in Norway and the UK, than in Sweden.

In the wake of the financial crisis, many central banks have come to realize that some simplifications embedded in popular DSGE models developed before the crisis make it difficult or impossible for these models to account for the role of asset prices and quantities in the business cycle. It is important to note that this critique *is not* the same as the observation that existing DSGE models ‘assume away’ asset market bubbles. While that is indeed true, it is also the case that virtually all DSGE models in use before the crisis ‘assumed away’ financial frictions more generally and ignored the role of asset quantities, leverage, and collateral constraints which can be crucial influences on the business cycle even when asset prices are ‘rational’ and fully explained by ‘fundamentals’ that include a realistic set of asset market variables.

As many central banks, including Norges, rely heavily on DSGE models in assessing policy scenarios, the appropriate role of asset prices and quantities in these models has also received a great deal of attention. In the view of Cecchetti, Disyatat and Kohler (2009) of the BIS

*[B]oth gross and net quantities of financial assets and liabilities matter for real activity. This is surely new, as nothing like this appears in modern mainstream macroeconomic models. What place should gross financial quantities have in macroeconomic models? For financial instruments, the amount outstanding, as well as the capital and collateral backing them, matter; for financial markets, the amount of trading, and the platform on which the trading occurs, matter; for financial institutions, their size and that of their counterparties matter; and for central banks, the size and composition of both sides of their balance sheet matter. .. We need to study the past with a much more critical eye. Economics is fundamentally about history. It is about the interplay between modeling and data. But we have missed something truly fundamental: financial crises are frequent events. In the past 25 years, there have on average been three or four banking crises every year (Reinhart and Rogoff (2008)). Rather than seeing financial crises as rare and one-off, we need models that deal with financial crises as regular events.<sup>8</sup> This leads us to the central task macroeconomists face: we need to build macroeconomic models that create severe financial stress endogenously. If financial crises are just “bad luck” – the result of an exogenous shock that comes along regardless of the framework of the financial system or policy measures that have been put in place – then there is little we can do about them. But if, as we strongly suspect, financial crises are endogenous to the economy, recurring naturally, then we must build a new generation of macroeconomic models that take account of the linkages between the financial system, the real economy and the potential actions of policymakers. (Cecchetti, Disyatat and Kohler (2009), pp. 3-4).*

Charles Bean, Deputy Governor of the Bank of England makes a similar point:

*We need to put credit back into macroeconomics in a meaningful way. Financial intermediaries are conspicuous by their absence in the workhorse New Keynesian/New Classical DSGE model. The focus is on intrinsic dynamics resulting from inter-temporal decision-making in the face of a*

*variety of adjustment costs and impediments to price adjustment; there are no financial frictions to speak of. That such a framework has developed is unsurprising in the light of the Great Inflation and its subsequent Great Moderation. But the fact that financial intermediation plays a negligible role in Mike Woodford's magisterial state-of-the-art opus, **Interest and Prices**, speaks volumes. (Bean (2009), pp. 26 – 27).*

Although there is an influential theoretical literature on the credit channel of monetary policy (Kiyotaki and Moore, 1997, Benanke, Gertler and Gilchrist, 1999, Iacoviello, 2005), for a variety of reasons these mechanisms were largely absent from DSGE models at central banks at the time of the financial crisis. In these models, asset markets are often assumed to be complete, asset prices are redundant as they are completely pinned down by exogenous fundamentals (productivity, time preference) and asset quantities are irrelevant. The Modigliani-Miller theorem holds, which implies that balance sheet positions do not affect real decisions. The monetary transmission mechanism is simplified to focus on a path for the short term interest rate which influences' consumption and investment directly without any role for financial intermediation either via bank or the security markets.

Research efforts at prominent central banks and international organizations such as the ECB and the IMF have commenced active programs to model and include realistic financial frictions in DSGE models used for policy analysis. Notable contributions include Christiano, Motto, and Rostagno's (2009) work at the ECB and Kannan, Rabanal, and Scott (2010) research at the IMF. An important feature that Norges Bank should seek to include in its DSGE model is a Bernanke, Gertler, and Gilchrist (1999) financial accelerator mechanism that works through housing finance in addition to firms' capital investment financing requirement as intermediated through banks. This is important for Norway given that housing loans are intermediated and held by the banking sector with interest rates that adjust in a timely manner to the policy rate. As with business credit, which is also held by banks in the form of direct loans and not so much by corporate bond holders or holders of securitized structures, leverage ratios and credit spreads are key variables in the monetary transmission mechanism that need to be modeled to assess the impact of different policy paths on the economy as well as the scope and scale of fluctuations in inflation and the output gap from shocks to the financial sector.

Fortunately, the model group at Norges Bank is quite capable and is actively working on adding financial frictions to their DSGE policy models. In the judgment of the committee, we would encourage the staff to build on and refine as appropriate the modeling approach pursued by Kannan, Rabanal, and Scott (2010) at the IMF (WEO Chapter 3) which explicitly and tractably incorporates housing finance in a DSGE model and also the work of Christiano, Motto, and Rostagno's (2009) work at the ECB which incorporates a Bernanke Gertler Gilchrist financial accelerator for business investment.

#### **NBW view:**

**Leverage ratios and credit spreads are key variables in the monetary transmission mechanism that need to be modeled to assess the impact of different policy paths on the economy as well as the scope and scale of fluctuations in inflation and the output gap from shocks to the financial sector.**

## **7.6. The oil price and wealth effects**

Higher oil prices may affect an energy producing economy in two ways. 1) Through positive income and wealth effects, and 2) through negative trade effects. Regarding the first channel, higher oil prices represent an immediate transfer of wealth from oil importers to oil exporters. If this income is transmitted back to the economy, then higher oil prices would be expected to lead to higher levels of economic activity, in a similar way as for other asset prices. In particular, asset prices; and stock prices in particular will be affected by the price of oil, through the cash flow of oil related firms. Asset prices may then influence consumption and investments and, moreover, increase a firm's ability to fund operations (the so called credit channel). Hence, asset prices may be an important transmission channel of wealth in an oil abundant country.

The effect in the medium to long term will, however, depend on what the oil producers (i.e. governments) do with the additional income. If this income is used to purchase goods and services in their own country, higher oil prices can generate a temporary increase in activity in the domestic economy. Hence, overall national wealth and demand increase. The potential for profitable output from the energy sector can also provide huge investment and business opportunities in the overall economy, with increased demand for labour and capital. However, the high level of activity may put upward pressures on inflation and on the domestic currency, which often appreciates in oil exporting countries (see Haldane, 1997). Eventually, this can lead to a crowding out of the manufacturing production as discussed in Chapter 5.

Regarding the second channel, the negative trade effect, as the oil importing trading partners will suffer an oil induced recession, they will demand less export of traditional goods and services from the oil exporting countries. To the extent that the oil exporting country has a large export sector, this channel may provide a negative stimulus to the oil exporting countries.

The net effect of the two channels remains uncertain. Further, empirical studies of the effects of oil price changes in oil exporting countries are not unequivocal. For instance, Bjørnland (2000, 2009), Jiménez-Rodríguez and Sánchez (2005) and Solheim (2008) find that whereas Norway so far has benefited from increased oil prices, displaying temporary higher consumption and output growth rates, other oil exporting countries like the UK and Canada have behaved more in line with oil importing countries, showing declining growth rates. As was discussed in Chapter 5, more recently there is also a concern that higher oil prices has lead to higher government spending, high labor cost, real exchange rate appreciation and a loss of competitiveness in the non-oil tradable sector.

In their model NEMO, Norges Bank does not model the energy sector nor include oil prices. Petroleum investment is included, but is modeled as an exogenous process. To obtain forecast, Norges Bank assumes that oil investment follows an autoregressive process. Norges Bank also use judgment to obtain short term forecast that one can condition on in NEMO. Fiscal policy is modeled in the same way. It is an exogenous variable in NEMO, and the forecast is given in the same way assuming autoregressive processes for the shocks. Judgment is also used to allow fiscal policy to reflect the forecast in the National Budget.

We suggest that Norges Bank should assess the value added of having oil prices into NEMO. As described above, oil prices may have large wealth effects that may influence consumption and investment, in a similar way that any asset price. Furthermore, since oil revenue now constitutes a large component of total government revenue, fiscal policy will be affected in



the long run by changes in the oil price (see Chapter 5). We acknowledge that this mechanism is difficult to model, and suggest Norges Bank start by empirically validate (or refute) the importance of the oil price for consumption and investment.

**NBW view:**

**We suggest that Norges Bank explore the importance of the oil price for aggregate demand and include the oil price explicitly in NEMO. Oil price changes may have large wealth effects that are likely to influence consumption and investment. Furthermore, since oil revenue now constitutes a large component of total government revenue, fiscal policy will be affected in the long run by changes in the oil price.**

## REFERENCES

- Assenmacher-Wesche, K. and S. Gerlach (2008), "Financial Structure and the Impact of Monetary Policy on Asset Prices", Swiss National Bank Working Paper 2008/16.
- Bank for International Settlements Annual Report 2009
- Bean, C. (2009): "The Great Moderation, the Great Panic and the Great Contraction," Schumpeter Lecture Annual Congress of the European Economic Association Barcelona, 25 August 2009.
- Bernanke, B.S., Gertler, M., Gilchrist, S. (1999), 'The financial accelerator in a quantitative business cycle framework', in J.B. Taylor and M. Woodford (eds.) Handbook of Macroeconomics, pp. 1341-1393. North-Holland.
- Bjørnland, H.C. (2009) "Oil price shocks and stock market booms in an oil exporting country". Scottish Journal of Political Economy, 56(2), 2009, 232-254.
- Bjørnland, H.C. (2000) "The Dynamic Effects of Aggregate Demand, Supply and Oil Price Shocks - A comparative study". The Manchester School of Economic Studies, 68, 578-607.
- Bjørnland, H., Gerdrup, K., Jore, A.S., Smith, C. and L.A. Thorsrud. "Does forecast combination improve Norges Bank inflation forecasts?" Norges Bank Working Paper 2009/01.
- Bjørnland, H. and D.H. Jacobsen (2010): "The role of house prices in the monetary policy transmission mechanism in small open economies" Forthcoming in Journal of Financial Stability.
- Brekke, K.W. and H. Halvorsen (2009): "Norges Bank's regional network: fresh and useful information", Norges Bank Economic Bulletin 2/2009.
- Brubakk, L., Husebø, T.A., Maih, J., Olsen, K. and M. Østnor, "Finding NEMO: Documentation of the Norwegian economy model", Norges Bank Staff Memo 2006/6.
- Cappelen, Å., Eika, T. and Ø. Olsen (2006): "Høyere oljepriser gjør Norge rikere, men reduserer aktivitetsnivået", Økonomisk Forum nr. 2/2006.
- Cecchetti, S., P. Disyatat, and M. Kohler "Integrating financial stability: new models for a new challenge," Bank for International Settlements, September 2009
- Chen, S.S. (2009): "Oil price pass-through into inflation", Energy Economics, 31, 126-133.
- Christiano, L., R. Motto, and M. Rostagno (2008): "Financial Factors in Economic Fluctuations" paper presented at December 2008 ECB Conference on Financial Frictions.
- Clarida, R. "The Empirics of Monetary Policy Rules in Open Economies, NBER Working Paper 8603, November 2001.

Claussen, C.A. (2008): “Comparing monetary policy transparency. The Eijffinger and Geraats index - a comment”, Norges Bank Staff Memo 10/2008.

Dincer, N. N. and B. Eichengreen (2007) “Central Bank Transparency: Where, Why, and with What Effects?,” NBER Working Papers 13003, National Bureau of Economic Research, Inc

Eijffinger, S. and P. Geraats (2006) “How Transparent Are Central Banks?” *European Journal of Political Economy* 22(1), March, pp. 1-21.

European Commission (2004), *How Vulnerable is the Euro Area Economy to Higher Oil Prices?*, Quarterly Report on the Euro Area, 3(2):15-20.

Geraats, P. (2009) "Trends in Monetary Policy Transparency", *International Finance* 12(2), Summer 2009, pp. 235-268.

Geraats, P., Giavazzi, F. and C. Wyplosz (2008): “Transparency and Governance”, *Monitoring the European Central Bank (MECB) Report 6*, Centre for Economic Policy Research (CEPR).

Gerdrup, K., Jore, A.S., Smith, C. and L.A. Thorsrud (2009): “Evaluating ensemble density combination - forecasting GDP and inflation”, *Norges Bank Working Paper* 2009/19.

Giannone, D. and T. Matheson (2007) “A New Core Inflation Indicator for New Zealand”, *International Journal of Central Banking*, 3, 145-180.

Hahn, E. (2003): “Pass-through of external shocks to euro area inflation”, *European Central Bank Working paper* no 243.

Hoogerheide L., R. Kelijn, F. Ravazzolo, H.K. van Dijk and M. Verbeek (2010): “Forecast accuracy and economic gains from Bayesian model averaging using time varying weights”, forthcoming in *Journal of Forecasting*.

Hooker, M.A. (2002) Are oil shocks inflationary? Assymetric and nonlinear specifications versus change in regime. *Journal of Money, Credit and Banking* 34(2), 540-561.

Iacoviello, M. (1995): *House Prices, Borrowing Constraints and Monetary Policy in the Business Cycle*. *American Economic Review*, 95(3):739–764.

Iacoviello, M. and R. Minetti, (2003), “Financial Liberalization and the Sensitivity of House Prices to Monetary Policy: Theory and Evidence”, *Manchester School, University of Manchester*, 71, 20-34.

IMF (2009) *IMF World Economic Outlook: September 2009*.

International Monetary Fund (2008), “The Changing Housing Cycle and the Implications for Monetary Policy”, *World Economic Outlook*, April 2008, 103-132.

International Monetary Fund (2009), “Lessons from Asset Price Fluctuations for Monetary policy”, *World Economic Outlook*, October 2009, 1-28.

Jiménez-Rodríguez, R. and M. Sánchez, (2004) "Oil price shocks and real GDP growth: empirical evidence for some OECD countries," Working Paper Series 362, European Central Bank.

Kannan, P., A. Scott, P. Rabanal, "Monetary and Macprudential Policy Rules in a Model with House Price Booms," IMF Working Paper (Washington: International Monetary Fund).

Kiyotaki, N., Moore, J. (1997), 'Credit cycles', Journal of Political Economy, vol. 105(2), pp.211-248.

Landau, B. and F. Skudelny (2009), "Pass-through of external shocks along the pricing chain: A panel estimation approach for the euro area", European Central Bank Working paper no 1109.

Leitemo, K. (2004). A Game between the Fiscal and Monetary Authorities under Inflation Targeting. European Journal of Political Economy, 20(3), September 2004, p. 709-724.

Minegishi, M. and B. Cournède (2009): "The Role of Transparency in the Conduct of Monetary Policy," OECD Economics Department Working Papers 724, OECD, Economics Department.

Simensen, A.M. and F. Wulfsberg (2009): "CPI-FW: a frequency weighted indicator of underlying inflation", Economic commentaries 7/2009, Norges Bank.

Solheim, H (2008): "Effects of higher oil prices on the Norwegian economy", Economic commentaries 2/2008, Norges Bank.

Squam Lake Group <http://www.squamlakeworkinggroup.org/>

Svensson L. (2009): "Flexible Inflation Targeting: Lessons from the Financial Crisis" speech given at the workshop "Towards a new framework for monetary policy? Lessons from the crisis", organized by De Nederlandsche Bank, Amsterdam, September 21, 2009.

Temin, P. (2010): "The Great Recession and the Great Depression", NBER Working Paper no. 15645.