

SPEECH



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■ **“Translating” forecasts into repo-rate decisions – no easy task***

My speech here today is about making forecasts. In order to be able to conduct a well-balanced monetary policy we need to make good forecasts, which in turn requires good models. Models cannot of course capture everything, so the forecasts that the Riksbank presents are the result of a structured interaction between models and assessments. Further assessments are then made when the time comes to make a repo-rate decision. Not even the best forecasts can simply be “translated” into a repo-rate decision. This is always a difficult process, but it becomes even more difficult when the economy is subject to major disruptions such as the financial crisis that hit in the autumn of 2008.

The Riksbank, and most other analysts, made significant forecasting errors at that time. The basic problem was that our models do not capture a number of the financial links that played a role during the crisis, and the risks associated with these links were therefore underestimated. I think that we all agree that we need to increase our understanding of the various financial links that affect the Swedish economy.

The step from forecast to repo-rate decision is also affected by other considerations. One issue is whether our assessments should stop short at the end of the forecast horizon. Another issue is that positive and negative deviations from our inflation target may entail different costs and affect the balance of monetary policy. Finally, I would like to underline my view that flexibility is crucial in monetary policy. The fact that we quickly changed the course of monetary policy during the crisis is a clear sign of flexibility. But even in more normal times it is important to remember that our knowledge of the future is incomplete and uncertain I am therefore in favour of repo-rate changes being made gradually in normal circumstances. This makes it possible to continuously analyse developments and to determine whether to continue to follow the chosen path, to call a halt or to change direction. Sudden and dramatic changes in monetary policy can then be avoided.

*I would like to thank Hans Dillén for his help with this speech and Lina Majtorp for her help with the illustrations.

We cannot do without forecasts

I worked with macroeconomic forecasts long before I became a member of the Executive Board of the Riksbank. At that time I was involved in the nitty gritty of forecasting, now I am part of a process in which the spadework is done by others. My role in this process is to contribute assessments.

A question I have often been asked is why economists bother producing economic forecasts – everyone knows that they often prove to be wrong. The answer is that many activities cannot do without forecasts as a basis for their planning. The spring budget bill that was presented recently is, for example, based on a macroeconomic forecast of the levels of central government income and expenditure in the years ahead and the potential scope for reforms that will therefore be available. Forecasts of different kinds also play a practical role for the planning of companies, even though they may not call their underlying assessments forecasts. Financial investors, who are better able than others to forecast macroeconomic developments, have an advantage in the search for yield as financial prices such as interest rates, exchange rates and share prices are strongly affected by business cycle developments. A final but important example concerns households who, when planning to buy a home, largely base their decision on what they believe about the development of interest rates in the future.

Although forecasts are seldom entirely correct, I would still say that they are often correct enough to provide a reasonable basis for planning. It is mainly in connection with turning points in economic activity and with different types of crisis that forecasts prove to be wrong. On the other hand, we should be aware that forecasts are predictions of what will happen in the future and are therefore shrouded in uncertainty. We must always be prepared to change our course of action if events move in a different direction.

Monetary policy is based on forecasts

The Riksbank also uses forecasts to “plan” monetary policy. This planning is reflected in our repo-rate path and if developments take a different turn than forecast then we have to adjust the repo-rate path. It may seem that the Riksbank uses forecasts in roughly the same way as other players whose operations are also affected by the development of economic activity. There is, however, an important difference. The Riksbank can, in contrast to most other forecasters, affect the forecasts. This is the whole point of monetary policy. Put simply, we can say that a well-balanced monetary policy is characterised by the forecast for inflation being close to the inflation target and the forecast for resource utilisation being close to its normal level.¹

There is nothing to say that we have to publish our forecasts. Life would in some respects be easier if we did not publish them. We would avoid the criticism we are subjected to when our forecasts prove to be wrong and we

¹ Apart from the fact that it is considered desirable to stabilise resource utilisation, resource utilisation is also an important inflation indicator. Resource utilisation is thus an important factor that plays several roles in the monetary policy analysis and there is an almost constant discussion of what measures of resource utilisation are the most relevant. I believe that we should make an overall assessment on the basis of several measures but otherwise I lack space in this speech to go into further detail on this important subject. For a review of different methods of measuring resource utilisation I refer to Svante Öberg's speech “Potential GDP, resource utilisation and monetary policy” of 7 October 2010.

■ would be able to write in more general terms about economic developments without needing to present a detailed and cohesive forecast. For a long time, central banks were rather closed and secretive bodies and when, for example, the Riksbank began publishing its inflation forecasts in 1997 there were many people, not least in the world of central banking, who had misgivings; wouldn't confidence be eroded if the forecasts turned out to be wrong? This proved not to be the case and these days we present the entire cohesive forecast for the inflation target, wages, GDP and its components, the repo rate and so on. I believe that by doing this we have increased the public's understanding of monetary policy and reduced the drama surrounding the entire monetary policy process. Assessing economic activity entails reviewing material that is in a constant state of flux, and when we change our monetary policy these changes can be concretely related to changes in real-economic conditions. I would also like to add that the quantified forecasts are of course interesting, but the associated analyses of the driving forces behind different courses of development are at least as interesting.

How do we make our forecasts?

Developments abroad play an important role

For a small open economy like the Swedish economy, the international outlook is the point of departure for the forecast. We cannot influence events abroad, but what happens there has a major impact on developments here at home. Here I would like to highlight some of the special aspects relating to the forecast of developments abroad.

The world is a big place...

To start with, the rest of the world is a big place and we do not have the resources to produce detailed forecasts for individual countries in the same way as we do for Sweden. Instead we have to limit the number of forecast variables and focus on those parts of the world that are most significant to the Swedish economy. For other regions we have to rely to a great extent on the assessments of other forecasters, although this of course does not mean that we copy their forecasts directly.

Another important aspect is that the forecasts for the different regions of the world must hang together in a consistent way. If, for example, we change the forecast for the United States then this also affects the forecast for the euro area (and other regions) and vice versa. This mutual interdependence is not always easy to manage but the preconditions have improved recently following the introduction of a new model for the international outlook. It is called the Global Projection Model (GPM) and its main aim is to produce cohesive and consistent forecasts for different regions of the world.² The GPM also plays an important role when we want to produce different risk scenarios.

² The GPM has been developed by the IMF. It is available in several versions. For a description of a smaller version of the GPM, see Carabenciov, I., I. Ermolaev, C. Freedman, M. Juillard, O. Kamenik, D

■ *...and changeable*

So, what regions of the world are most important to Sweden? The region on our doorstep is of course very important. This primarily includes the euro area, but also the UK, Denmark, Norway and a couple of other countries in central and eastern Europe. Most of our trade takes place with this region. A region that has increased in economic importance over time is Asia. The emerging economies in Asia, led by China, have been the driving force behind the recovery of the global economy following the financial crisis. The importance of these countries for Sweden's foreign trade has also shown an increasing trend since the early 1990s. This of course means that it is now more important to monitor these countries than previously.

The United States affects Sweden through financial links

Finally, developments in the United States are always important even though in trade-weighted terms the United States only accounts for about 10 per cent. The reason for this is that the US economy often sets the tone for the development of stock markets and bond rates around the world. It is true that our knowledge and understanding of these financial links is limited³ but it appears to be the case that they play a particularly important role during slowdowns. The global financial crisis that originated in the US housing market is perhaps an all too clear example of this. The IT crash that took place just over 10 years ago is a more normal example of how events in the United States affect the global economy via financial prices.

Assessing the current situation – the essential starting point for the forecast for Sweden

Assessing the current situation entails producing a forecast for the current quarter, and perhaps the next quarter. At such a short forecasting horizon, not so much importance is attached to large macro models; the assessment is instead based on many different economic indicators. An assessment of the current situation is a kind of mapping of the disruptions and imbalances that are currently affecting the economy; in other words it describes the situation at the starting point for the forecast. It goes without saying that it is difficult to assess where you are going if you do not know where you are today. Assessing the current situation thus lies at the very core of all forecasting.

Such an assessment does not simply entail producing forecasts for outcome data like GDP and the CPI, it also involves having to assess demand and supply factors in the economy. In this context the assessment of resource utilisation plays a prominent role. If resource utilisation is low then the economy can grow rather rapidly without prices and wages increasing in an alarming way. If

Korshunov, D. Laxton, and J. Laxton (2008), "A small MultiCountry Global Projection Model with Financial-Real Linkages and Oil Prices", IMF Working Paper No. 08/280, International Monetary Fund.

³ For a more detailed analysis of how the United States affects the global economy and the role that financial links play in this see Chapter 4 of the IMF's (International Monetary Fund) World Economic Outlook from April 2007.

■ it is strained then high growth may lead to overheating tendencies that could be reflected in excessively high inflation. So, even if the Riksbank produces fair forecasts of economic growth monetary policy may be less well-balanced if we misjudge resource utilisation. A complicating circumstance in this context is that resource utilisation, unlike GDP growth, cannot be observed directly. This underlines the fact that the assessment of the current situation is fundamentally an assessment of the state of the economy that is very difficult to make.

Confidence indicators, which capture the mood of the economy, play an important role in the assessment. High values in the confidence indicators normally entail relatively strong growth in consumption, exports and investment, all else being equal. Important confidence indicators include the purchasing managers' index, data from various business tendency surveys and surveys on expectations relating to wages and prices, but there are many more. We also conduct our own company interviews in which we get direct information on how various sub-markets are functioning in practice.

The indicators often provide a slightly diffuse picture of the state of the economy. Here we find various indicator models useful in that, on the basis of an analysis of the historical significance of different indicators, they help us to put our most important forecasts into figures. Ultimately, we also have to weigh information that is not captured by our indicators into our assessment of the current state of the economy.

Model forecasting is the next step

Once we have produced a forecast for the outlook abroad and performed an assessment of the current situation we are ready, with the help of various large macro models, to produce forecasts for longer time horizons. It could be said that the models give a description of how prevailing impulses from abroad and the initial state of the Swedish economy will affect the development of the economy. In the very long term, however, the effects of the prevailing impulses will have faded and the economy will then follow a balanced path in the long run. This balanced state, which in model terms is often called a steady state, is an important characteristic of a model. We could perhaps say that an assessment of the current situation tell us where we are while models tell where we are going in the very long term.

In the monetary policy analysis, however, the focus is often on what will happen in the period in-between, or on developments two to three years ahead. It is generally accepted that it is at this time horizon that monetary policy has its greatest effect. As I said earlier, monetary policy aims to make monetary policy decisions that provide as good a target attainment as possible and the models are important in this context because they make it possible for us to evaluate different monetary policy alternatives in forecast terms. Models are on the whole very useful when we want to evaluate alternative scenarios in which development takes a different course than predicted in the main scenario. However, the analysis of alternative scenarios must not be reduced to

■ a purely model exercise and it is important that such analyses are also complemented by assessments.⁴

Let me conclude the discussion of model forecasts by saying that they are sometimes described as being in some way at odds with forecasts that are based on assessments. In my opinion there is no such opposition between them. A forecast is always an assessment. We develop models so that they can help us to make better assessments. A good and well-founded forecast is often produced in a structured interaction between models and assessments by experts.

Forecasting, extreme scenarios and the financial crisis

In normal circumstances, a forecast path can be described as a probability-weighted average of different reasonable scenarios. Note that I use the term reasonable scenarios, which means in practice that in practical forecasting work we disregard certain kinds of scenario. Examples of scenarios that we choose to disregard include a decision to abandon the inflation target, the outbreak of war, major natural disasters or an epidemic that infects a large part of the labour force. We ignore such scenarios partly because they are very unlikely and partly because they would entail a radical change in the preconditions for monetary policy. If such a scenario did nevertheless occur, we would have to decide what would be required of monetary policy at the time.

The financial crisis can also be seen as a kind of extreme scenario, even though this was not an event that could be regarded as being highly unlikely. Most analysts believed that there was a clear risk that the problems that arose on the financial markets in 2007 could get worse. The problem was that the crisis not only became unusually severe; it also took a course that few of us could predict.

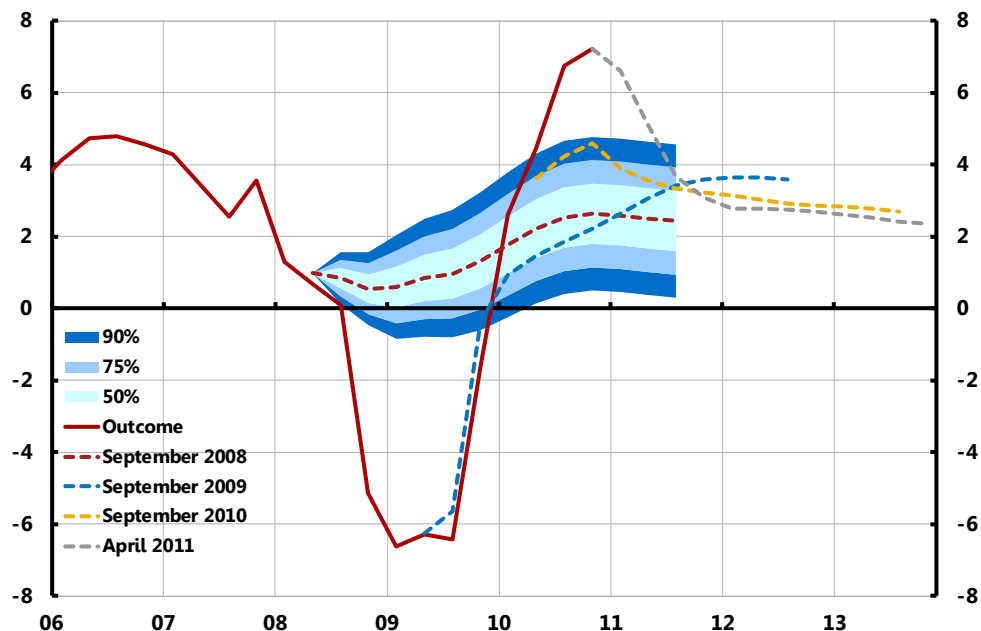
The crisis spread throughout the global economy through various international financial links and fundamental functions in the financial system were seriously disrupted. This had dramatic, negative effects on, for example, the possibilities of companies to get funding and on world trade. This was a case of crisis mechanisms that we had very little experience of and that were therefore not included in our forecast models. We were unable to take in the complexity of the financial system and the contagion that this entailed.

Although it was extremely difficult to make forecasts, the Riksbank did not stop making them. However, the forecasts were unusually uncertain and we were prepared to revise them significantly, which is what subsequently happened. The forecast for GDP was revised so much that we ended up far outside the uncertainty bands that surrounded the forecast before the crisis (see Figure 1). At a later stage, we also underestimated the strength of the recovery.

⁴ For a more detailed discussion of the role of assessments in relation to alternative scenarios see the speech "Flexible inflation targeting in theory and practice" that Stefan Ingves held on 12 May 2011.

Figure 1. GDP and forecasts for GDP at different times

Annual percentage change, seasonally-adjusted data

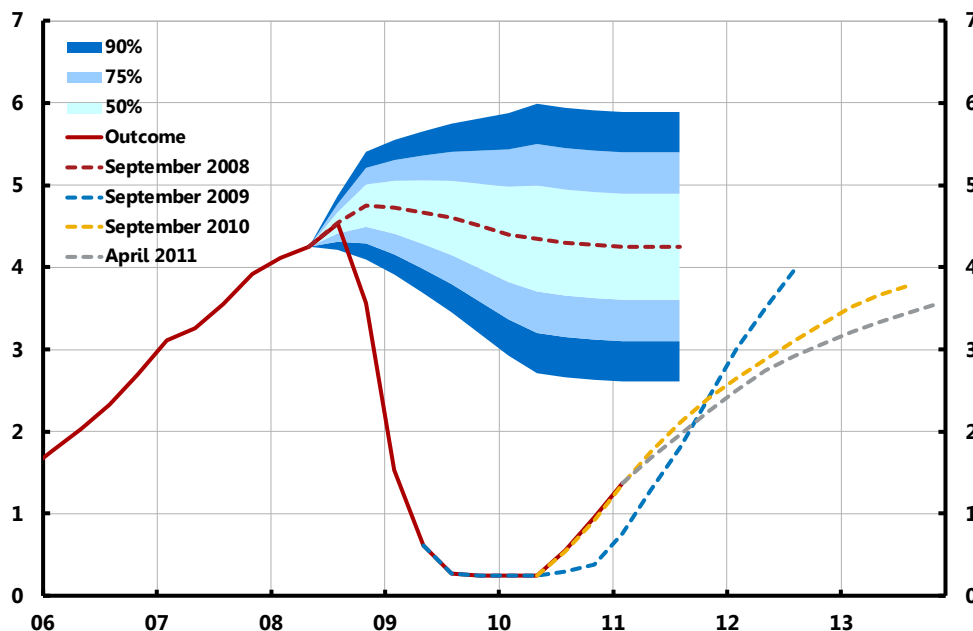


Note: All forecasts entail a degree of uncertainty but to preserve the graphic profile only uncertainty bands for the September 2008 forecast are shown.

Sources: Statistics Sweden and the Riksbank

The radically-changed economic conditions of course had a major impact on the repo-rate forecast. It was revised so much that the repo-rate path also ended up far outside the uncertainty bands that surrounded the forecast produced in September 2008. It could also be said that the monetary policy actually conducted was closer to crisis management than to forecasting. Let me illustrate this with an analogy.

Figure 2. The repo rate and forecasts for the repo rate at different times, per cent



Note: All forecasts entail a degree of uncertainty but to preserve the graphic profile only uncertainty bands for the September 2008 forecast are shown.

Source: The Riksbank

Monetary policy is sometimes compared to driving a car, in that it is a case of moving forward safely along a road at a good speed. The forecast can be compared to looking ahead along the road and then adjusting the speed of the car and the movements of the steering wheel to keep the car on the road. The financial crisis can be compared to a collision that threatens to throw the car off the road. In such a situation, it is a case of using all the means at your disposal to ensure that you stay on the road and do not fall into the ditch. What the road looks like 50 meters further ahead is highly uncertain and, in effect, less important. Once you are back relatively safely on the road your speed will be very low and you will be able to look ahead and try to return to more normal driving.

In the upturn: patterns had been broken, parallels with previous crises

Thanks to resolute action on the part of central banks and other authorities the crisis entered a less acute phase. However, the financial markets were still not functioning effectively and support measures were still needed. But, a total collapse had been avoided and it was possible to see signs of a normalisation on some financial markets. Nevertheless, the situation was highly uncertain. It was also difficult to assess the real economy. Did the major falls in GDP in Sweden and abroad mean that potential GDP had declined? In many countries the households had experienced substantial falls in house prices. To what extent would the need of the households to strengthen their balance sheets

■ mean that consumption would decline and that the ability of monetary policy to stimulate the economy would be weakened?⁵

It was clear that the economic patterns that prevailed before the financial crisis had largely been broken. In such a situation it was natural to study the form of the economic recovery following previous crises. The overriding conclusion that could then be drawn was that the recovery would be slower than normal.⁶ However, it is also the case that every crisis is unique in many respects and there were circumstances that pointed in the opposite direction. Among other things, the emerging economies in Asia, led by China, recovered relatively quickly and became something of a driving force for the recovery in the rest of the world. Another positive factor was that growth was rather good around the world when the crisis began.⁷ With hindsight, it can be noted that the recovery in many areas, and not least in Sweden (see Figure 1 above), has been much more rapid than we could have expected. As can be seen in Figure 2, the Riksbank began to increase the repo rate somewhat earlier than predicted during the most severe phase of the crisis and the repo-rate path was given a somewhat more "top heavy" profile.

It is natural to try to learn from previous crises, but at the same time we must be careful not to draw too far-reaching historical parallels. In the midst of the crisis there was, for example, sometimes a slightly careless tendency to refer to the Swedish crisis of the 1990s, despite the fact that the circumstances at that time were entirely different. My point here is that if somewhere at the back of your head you have a preconceived idea of how a crisis should develop then it is easy to miss signals that may indicate that the course of the crisis is moving in a different direction.

Some personal reflections on forecasting

The things I have said about forecasts so far are fairly general observations that I believe my colleagues on the Executive Board would essentially agree with, even though they would probably express themselves differently. In this concluding part of the speech I would therefore like to take up some aspects of forecasting that are perhaps more personal.

The development of interest rates abroad and the krona exchange rate

Let me begin with the forecast for economic activity abroad, which I think in some respects has been given too much significance in the discussion of our forecasts for, for example, the krona exchange rate. As I see it, changes in interest rates abroad relative to Swedish interest rates say more about the current exchange rate for the krona than about the future development of the

⁵ If the households need to consolidate their balance sheets then an expansionary monetary policy may be less effective as the households will be less inclined to take new loans. Such a situation is sometimes called a balance sheet recession. Lars Nyberg discussed balance sheet recessions in more detail in the speech "After the crisis – new thoughts on monetary policy" which was published on 6 December 2010.

⁶ See Reinhart, C. and K. Rogoff, (2008), "Is the 2007 U.S. Sub-Prime Financial Crisis So Different? An International Historical Comparison". NBER Working Paper No. 13761.

⁷ There are studies that indicate that the recovery after a financial crisis is slower if the crisis was preceded by low growth, see Cecchetti S., M. Kohler and C. Upper (2009), "Financial Crises and Economic Activity" NBER Working Paper 15379.

■ krona. The fact that interest rates increased more in Sweden than in the euro area in the first half of 2010 is thus an explanation of why the krona strengthened against the euro in the same period, but high Swedish interest rates relative to those in the euro area will not necessarily lead to the krona strengthening in the period ahead.⁸ My belief that too much importance has been attached to forecasts of policy rates abroad does not mean that financial prices abroad are of no interest. On the contrary, developments in 2010 illustrate that long-term Swedish rates often appear to be strongly affected by developments abroad, and especially in the United States, without these shifts being motivated by changes in economic activity in Sweden. We need to improve our understanding of international financial links of this kind.

Can assessments stop short at the end of the forecast horizon?

Another point that I usually make is that it can be difficult to draw monetary policy conclusions from our forecasts as they only cover a limited forecast horizon of three years. A certain repo-rate path may appear to provide better target attainment than other paths over this limited forecast horizon but could well lead to poorer target attainment beyond it. It is therefore desirable when making monetary policy decisions to take into account the possible state of the economy beyond the forecast horizon, even though it is difficult to do this in terms of quantified forecasts. One way to do this is to choose a repo-rate path that provides good target attainment at the end of the forecasting period but does not entail serious tendencies towards poorer target attainment beyond the forecast horizon. Even though we have a limited forecast horizon, the monetary policy decisions must also to some extent look ahead to what can happen afterwards.

The development of house prices and household indebtedness could, for example, entail risks that materialise beyond the current forecast horizon, especially if monetary policy remains far too expansionary for far too long. The question of whether risks of this type should be considered in the monetary policy decisions has been widely debated. One view is that such risks should already be taken into account in our standard quantified forecasts. Although I hope that the analysis will eventually develop to the extent that it is possible in a reasonably reliable way to take account of this type of risk in our forecasts we are not there yet. My view is that it may sometimes be justified to consider this kind of unforecastable risk in our monetary policy decision-making. Ignoring such risks completely is, in my view, the same as saying that they do not exist, and that is a position that I would not want to defend.

⁸ According to the theory of uncovered interest rate parity, the market expects the krona to weaken against the euro in the period ahead if Swedish interest rates are higher than those in the euro area. Uncovered interest rate parity also explains why the krona strengthened at the same time (and not afterwards) as Swedish interest rates increased relative to those in the euro area in 2010. However, the empirical support for uncovered interest rate parity is weak and there are many examples of deviations from the theory. For example, the krona strengthened more against the euro in 2010 than implied by uncovered interest rate parity. I refer to my speech "Many dimensions to well-balanced monetary policy", dated 26 January 2011, for a more detailed discussion of the development of interest rates and the krona exchange rate in 2010.

■ ***Positive and negative risks can have different costs***

There are also other cases where it may be a mistake to let monetary policy be guided by forecasts alone. A forecast-based monetary policy is good if it is believed that the costs of negative deviations from the target are the same as for positive deviations, but this is not always the case. Greater importance should be attached to a scenario in which the collapse of an asset bubble leads to a state of deflation that is difficult to escape from than to a scenario with high inflation, assuming that the inflation target still has credibility. Experience from Japan in the 1990s illustrates this. During the financial crisis, there were discussions in the Executive Board⁹ about temporarily allowing inflation to be relatively high with the aim of pushing up inflation expectations, which would lead to lower real interest rates and a well-needed stimulation of the economy. Stimulating the economy with lower nominal interest rates was not possible as the Riksbank had already reduced the repo rate as far as was considered possible. I was doubtful about experimenting with our monetary policy framework in this way during an ongoing crisis. I admit, however, that there is a certain logic in the argument that underlines the fact that it is sometimes more costly for inflation to become too low than for it to become too high. However, if the credibility of the inflation target is threatened by high inflation then the reverse may also be true.

We can learn from our mistakes

Let me now say something about forecasting errors. It is sometimes argued that monetary policy was well balanced at a certain point in time given the information that was available at that time. Such a stance seems to be based on the attitude that at the time of the decision the decision-makers were guided by the best conceivable forecasting model and that any forecasting errors were only due to entirely unforeseen events. It is normally not quite as simple as this, however, and forecasting errors are usually a combination of unforeseen events and shortcomings in the assessment of the economy.

Allow me to be a little self-critical and to go back the autumn of 2008 when the Riksbank raised the repo rate in September but then changed direction and adopted a highly expansionary monetary policy when the crisis got dramatically worse. Even later in the autumn, when the financial risks were increasingly apparent, we underestimated the seriousness of the situation. We, like most other analysts, simply lacked the ability to fully assess the incredible impact that the crisis would have on the global economy and on the Swedish economy. Even though I entered a reservation against the repo-rate increase in September I can honestly admit that I also underestimated the risks on the international financial markets. With hindsight, it is possible to identify several areas where the Riksbank could have made a better analysis. The basic problem was that our models do not capture the various financial links that played a major role during the financial crisis, and we therefore underestimated the risks.

You might think that in such situations we should tone down the model analysis and instead rely on assessments of various indicators, which in fact the

⁹ See the minutes of the Executive Board's monetary policy meeting from 10 February 2009.

Riksbank did, but we could have performed better here too. We made substantial downward revisions in the figures for GDP, but we did not expect the fall to be as great as it actually was. When assessing GDP during the fourth quarter of 2008 we should, in my opinion, have attached more weight to the alarm signals that came from our company interviews, especially as data from the business tendency surveys, the statistics on redundancy notices and falling share prices all pointed in the same direction. On the other hand, the underestimation of the fall in GDP did not affect the conduct of monetary policy as the repo rate was still reduced substantially, by several percentage points, over a short period of time.

Nor do I believe that the conduct of a less restrictive monetary policy earlier in 2008 would have had much effect on the course of the crisis. That is not the point. The point is that the misjudgements made by the Riksbank were partly due to shortcomings in the analysis. The models that have been developed entail a tacit assumption that the financial markets will continue to perform their central functions of mediating payments, converting saving to funding and managing risks. We, and all the other macroeconomic analysts, were given a rude reminder that the analysis models lacked important elements. This is an important lesson that is reflected in the discussions and in the research work now underway. We need to gain greater insight into, and more knowledge about, the branches of the global financial system and the connection between real and financial variables.

Flexibility is the be all and end all in monetary policy

Even if the Riksbank, like many others, made a number of misjudgements, one positive aspect of the situation is that we quickly changed the course of monetary policy and implemented extraordinary measures in an attempt to mitigate the downturn in the economy and support the financial system. There was no question of trying to stick to previous forecasts and assessments. This is testimony to an essential flexibility. We must be able react like this when reality turns out to be radically different to what we imagined it would be. Even in more normal times we must always bear in mind that our knowledge of the future is by no means complete. I have on several occasions expressed my view that gradual changes in the repo rate are to be preferred in the normal case¹⁰. It is, I think, a wise strategy to proceed cautiously and to continuously observe what is happening around you in order to decide whether to continue following the chosen path, call a halt or change direction. Strongly driving policy in a particular direction may be a success factor in other policy areas, but for monetary policy it is a case of carefully monitoring the state of the real economy and being constantly prepared to adapt policy so that our predetermined target, the inflation target, is not put at risk. There are no absolutes in monetary policy. If we fail to realise this there is a risk that monetary policy will be subject to sudden and radical changes of direction.

¹⁰ The realisation that uncertainty about economic relationships often justifies a more cautious policy goes back to Brainard, W. (1967) "Uncertainty and the Effectiveness of Policy", *American Economic Review* 57(2), 411-425.