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Dear reader!

2018 has been an anniversary year in several ways. The most important of these, of course, is that this year we commemorated the Riksbank's 350th anniversary.

But 2018 also saw two other anniversaries. Firstly, it is now 10 years since the global financial crisis reached its full strength with the collapse of Lehman Brothers in September 2018. This anniversary has been observed in many different connections, both internationally and in Sweden. In addition, at the Riksbank, we have celebrated the 65th birthday of Governor Stefan Ingves. As a birthday present to him, we arranged an internal seminar in September – '10 years since Lehman' – for which some papers were written. This gave Stefan Ingves the opportunity to do what he enjoys most of all – discussing financial crises and crisis management!

In this issue of Economic Review, we publish the papers written for the seminar and the comments and own views that Stefan Ingves gave on this occasion. There are a total of five articles:

- **Reflections on the financial crisis and its aftermath**

  Governor *Stefan Ingves* gives his perspectives on the financial crisis and the decade that has passed since then. The account describes some of the challenges of decision making in the midst of a crisis.

- **Dramatic years in Sweden and globally: Economic developments 2006–2017**

  Claes Berg, Pernilla Meyersson and *Johan Molin* describe economic developments globally and in Sweden from the years immediately preceding the crisis up to 2017, and how the crisis has left its mark in various ways during this period. Together with globalisation and technological advances, the financial crisis contributed to a number of comprehensive changes being made in the economic, financial and political areas, both in Sweden and in other parts of the world.

- **The Riksbank's communication before, during and after the financial crisis**

  Pernilla Meyersson and *Ann-Leena Mikiver,* the previous and current Directors of Communications, describe the large changes that have been made in the Riksbank's communication in the past 25 years. The Riksbank has gradually made it easier for external observers to follow and evaluate the Riksbank's activities, and is today considered to be one of the most transparent central banks in the world.

- **The Riksbank's work with financial stability before, during and after the global financial crisis**

  Martin W. Johansson, Johan Molin, Jonas Niemeyer and *Christina Nordh Berntsson* describe how the Riksbank, after the domestic financial crisis of the 1990s, built up its capacity for analysing risks and vulnerabilities in the financial system. They discuss the measures taken during the global financial crisis that culminated around 2008–2009, and some of the lessons learned from it. Furthermore, they discuss how work has changed focus since the crisis subsided. The authors conclude by pointing out some future challenges for work with financial stability.

- **The storm after the calm – lessons for monetary policy analysis**
  Jesper Hansson, Marianne Nessén and *Anders Vredin,* the current plus two previous heads of the Monetary Policy Department, argue that the financial crisis and experiences since then have exposed a number of weaknesses in the monetary policy analysis framework applied under the inflation targeting regime. This article describes some of these experiences and discusses areas into which they consider it to be particularly important to expand monetary policy analysis: the role of the financial system in the monetary policy transmission mechanism, the supply side of the economy, and the links between monetary policy and fiscal policy

Read and enjoy!

Jesper Lindé and Marianne Nessén, editors of Economic Review
Pernilla Meyersson, deputy head of the General Secretariat and chief organiser of the seminar

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Reflections on the financial crisis and its aftermath

Stefan Ingves*

The author is the Governor and Chair of the Executive Board of Sveriges Riksbank

In this article, Governor Stefan Ingves reflects on the financial crisis and the experiences over the decade that has passed since then. Against a personal recollection of different episodes, Governor Ingves describes the origin of the crisis, how insight into the seriousness of the situation gradually dawned and how the situation became acute in autumn 2008 when the Swedish economy was affected in earnest and the Riksbank's crisis management work began. One aim of the account is to provide an insight into the difficulties of decision-making in the midst of a crisis and to stress the importance of being prepared.

1 A look back at the crisis

The 15 September this year marked exactly ten years since the Lehman Brothers investment bank filed for bankruptcy and confidence in the financial system evaporated. It is natural to commemorate such an anniversary and it is easy to get the impression that this was the starting-point for the financial crisis that hit the global economy at the end of the 2000s. But the problems in the financial sector had been building up over a long period of time and just like a volcanic eruption, there were signs that something serious was about to happen long before Lehman went bankrupt, even though it was difficult to say when, where and how the eruption would occur.

Neither was it the end of the matter when the most acute crisis management had been completed and confidence in the financial markets had begun to be restored. In many ways, central banks are still struggling with the after-shocks of the crisis, with regard to both financial stability and monetary policy, and it is important to point out that the crisis was in practice a process with a build-up and climax, subsequently followed by a long aftermath. This anniversary issue of Sveriges Riksbank Economic Review contains four articles that, from different perspectives, provide a good description of this process.

An introductory article by Claes Berg, Pernilla Meyersson and Johan Molin, all with considerable experience of policy work, looks at economic developments during the financial crisis, the deep recession that followed and the economic upturn with low inflation that we have experienced in recent years, see Berg et al. (2018). The Riksbank's current and former communication directors, Ann-Leena Mikiver and Pernilla Meyersson, then describe the challenges involved in communicating the Riksbank's stability work and monetary policy during and after the crisis, see Meyersson and Mikiver (2018). Martin W Johansson, Johan Molin, Jonas Niemeyer and Christina Nordh Berntsson have been heavily involved in the Riksbank's work on financial stability before, during and after the financial crisis and their article describes how the work has changed over these periods, see Johansson et al. (2018). Finally, the current and two previous heads of the Riksbank's Monetary Policy Department, Jesper Hansson, Marianne Nessén and Anders Vredin,

* This article is based on a presentation made at a seminar where the other articles in this issue of Sveriges Riksbank Economic Review were presented to the Riksbank staff. Thank you to Björn Andersson for his help in adapting the presentation. Thank you also to Frida Fallan, Jesper Lindé, Pernilla Meyersson, Marianne Nessén, Anders Vredin and Dilan Ölcer for useful comments and help with the work on this article. The opinions expressed in this article are those of the author and are not necessarily to be seen as the views of other members of the Executive Board of the Riksbank.

summarise the monetary policy experiences during and after the financial crisis and highlight critical areas that need to be in focus in monetary policy analysis going forward, see Hansson et al. (2018).

It is of course difficult in articles like these to capture not only the mood and general economic disorder that prevail in times of crisis, but also the anguish of decision-making under such circumstances. Ten years on, as you try to draw conclusions and explain how you actually managed to land on your feet, there is a risk of the story taking on a large dose of reconstructed logic, in which the correlations look clearer and the decisions seem more sensible than they were perceived to be at the time. It is therefore up to those who were involved to provide as clear a picture as possible of the reasoning, premonitions and occasionally instant assessments that lay behind the decisions made, so that there is also a story that provides an insight into the logic that was actually in use. If one has experienced such troubling sequences of events before, as I have, one begins to suspect that things might go off the rails and this gives a gradually rising preparedness to take action.

As Meyersson and Mikiver note in their article, one of the most important events during the financial crisis, from the Riksbank's perspective, was the publication of the press release in October 2008, in which we basically guaranteed to supply the banking system with all the liquidity required to ensure its continued function. Such a press release obviously does not come out of nowhere, but is the result of a process in which the realisation gradually emerges that, yes, this is perhaps something we have to do. I shall not give an account of all the events that led up to the press release and all the decisions we took in view of it – a good summary can be found in the article by Berg, Meyersson and Molin – but I would nevertheless like to give some examples of things that shaped my picture of how the situation gradually deteriorated at the end of the 2000s. [1] I will also comment briefly on developments after 2010 and reflect on the experiences of the last decade and on crisis management in general.

2 The road to a press release

2.1 Here we are again

Financial crises, both their emergency remedy and prevention, have in one way or another been a large part of my professional life ever since I came walking down the corridor at the Ministry of Finance and was given the responsibility for what was colloquially referred to as the 'banking ER' during the Swedish financial crisis in the early 1990s. The Swedish Bank Support Authority, its official name, was responsible for the support measures implemented by the state for Swedish banks, a responsibility that included taking over and selling the assets of failed banks. Financial market issues and financial stability later continued to be one of my focus areas, firstly as Deputy Governor of the Riksbank and then as head of the Department for Monetary and Financial Systems at the International Monetary Fund (IMF). You may therefore think that it is one of life's ironies that it was I who came walking down the corridor as Governor of the Riksbank when a new financial crisis broke out, less than two decades after being involved in dealing with the previous one.

At the same time, we should not read too much into such coincidences. Sweden is a small country and the number of people with knowledge of the technicalities of the financial system and banking operations is limited for obvious reasons. It is not so strange, therefore, that many of those holding key position in both authorities and banks during the most recent financial crisis also had experience of the Swedish 1990s crisis and knew each other from that period. The fact is that, in many cases, this made dealing with the most recent financial

1 See also Molin (2010) and Elmér et al. (2012) for more details on the stability-enhancing and monetary policy measures taken by the Riksbank during the crisis.

crisis significantly easier as there was somewhat of a collective memory of how things panned out last time. Consequently, there was often a fairly rapidly-emerging consensus on the decisions that needed to be taken and on who should take them. This helped Sweden to successfully cope with the financial crisis, despite less than optimum conditions for doing so bearing in mind the prevailing institutional structure and legal frameworks at that time.[2]

2.2 Sweden okay to start with, but with worrying regulatory shortcomings

Even if there are some similarities – not just with regard to the cast of characters – between the Swedish 1990s crisis and the financial crisis of the 2000s, an important difference is that the starting position was entirely different.[3] A somewhat simplistic way of expressing this is that Sweden was not okay during the 1990s crisis, while the rest of the world was. This, together with the reforms of the economic policy framework, was one of the fundamental explanations for why the Swedish economy was able to get back on its feet. During the 2000s crisis, on the other hand, Sweden was okay, while the rest of the world was not. The starting position in the 2000s was therefore significantly better from a Swedish perspective, even though the problems abroad naturally had a major effect on us. While the 1990s crisis was about insolvency in the banking system here at home, the 2000s crisis was about insolvency in the banking systems in the Baltics, on Ireland, in Spain, the United States and many other places outside Sweden. As far as we were concerned, the crisis essentially became a question of inadequate liquidity in the financial system.

Broadly speaking, therefore, Sweden's initial position was relatively healthy when the financial crisis began. But an obvious problem was our lack of an adequate financial regulatory framework, for example when it came to handling financial institutions in distress. During the 1990s crisis, a regulatory framework was created with lightning speed that included a general bank guarantee to protect bank creditors and rules to make it possible to handle and reconstruct banks in distress. This regulatory framework had sunset clauses making the rules only temporary, and they disappeared in the mid-1990s. When problems started to arise in banks towards the late 2000s, there was consequently very little left to lean on in order to deal with the problems. Basically, what remained was the general bankruptcy legislation, which is not suited to handling banks, and a deposit guarantee system from 1996, that essentially was not in working order.[4]

This had been made perfectly clear in the handling of Custodia, a credit market company that had its license to conduct financing business revoked by Finansinspektionen (the Swedish financial supervisory authority) in January 2006.[5] By requesting suspension – which involved temporary cancellation of the revocation – and twice appealing the decision in court, Custodia was able to continue conducting business for a number of months before the company was finally declared bankrupt in August of the same year. In conjunction with the Finansinspektionen decision, the company had frozen its payments as it was unable to cope with the run on it from savers and other creditors. Instead, many focused on obtaining compensation via the state deposit guarantee, but the regulatory framework for this dictated that the processing of applications could not start until the company had been declared bankrupt. This meant that the first disbursements of compensation from the guarantee were delayed until October, a full nine months after Finansinspektionen has decided to revoke the company's license.

2 See Goodhart and Rochet (2011). These shortcomings were one of the reasons for the Riksbank's submission to the Swedish Riksdag for a review of the financial regulatory framework, see Sveriges Riksbank (2010).

3 Molin and Ingves (2008) go into more detail about the similarities between the 1990s crisis in Sweden and the financial crisis of the 2000s.

4 Draft legislation on a new procedure for handling banks in distress had been tabled in 2000 by the Banking Law Committee, although its proposals had not resulted in new legislation.

5 Details of the Custodia case can be found in Sveriges Riksbank (2006).

For my part, this provided an important background against which later events during the financial crisis unfurled. The Custodia episode, which took place in 2006, obviously received considerable attention as it progressed. But I suspect that we were no more than a handful of people in September 2007 who reflected upon the episode and what it said about Sweden's preparedness, while the television news showed pictures of long queues of savers wanting to withdraw their money from the British bank Northern Rock. This was obviously not the time for a large-scale test of the Swedish deposit guarantee, given the prevailing regulatory framework. We should remember that Custodia was a relatively small credit company with about 1,300 depositors. It was bad enough that so many people's private finances were adversely affected for nine months. If problems had occurred in a larger institution with several hundred thousand savers, a delay in compensating people from the deposit guarantee of several months – or perhaps of just a few weeks – would probably have created major uncertainty and tightened liquidity in a way that would have been felt by the entire economy.

2.3 Starting to realise the seriousness of the situation

From 2006 onwards, the seriousness of the situation began to emerge with increasingly worrying signals coming from abroad. As Berg, Meyersson and Molin describe in their article, the unease on the financial markets in the United States spread to Europe, where bank's funding problems started to become apparent. During the summer of 2007, several European banks chose to refrain from lending their liquidity surpluses on the interbank market and instead deposited them at central banks, causing the shortest interbank rates to skyrocket. At the beginning of August, the French bank BNP Paribas suddenly closed three of its funds due to, as the bank put it, a complete evaporation of liquidity. The following day, several central banks made coordinated efforts to increase liquidity in different ways.

The Riksbank did not participate in these efforts as the situation at the time was not as troublesome for Swedish banks. But we obviously followed carefully what was happening via our participation in committees at the Bank for International Settlements (BIS), our other international work and our network of international contacts. Even though it was not possible just then to say whether, and how, Sweden might be affected, you started to sense that something was fundamentally wrong and that the problems on the financial markets were indeed more serious than many had perhaps hoped they were. It was actually this feeling, rather than any concrete problem that needed to be rectified, that prompted me to raise the question of setting up a so-called swap agreement in euro with the European Central Bank (ECB).[6] The agreement subsequently entered into by the Riksbank and the ECB was one of only a few struck by the ECB with other central banks and initially it was kept secret on both sides. This agreement enabled the Riksbank to borrow up to EUR 10 billion in exchange for Swedish krona. It was good to have this option as a safety back-up when we subsequently lent euro to the Icelandic and Latvian central banks at the height of the crisis in 2008.

But, as I said, in the autumn of 2007, there were no acute problems facing Swedish banks. Increasingly worrying, however, were developments in the Baltics, where Swedish banks dominated the credit markets, and the total lending and the results of a couple of banks were increasingly dependent on their Baltic operations. Strong economic growth, underpinned by rapid credit expansion, had contributed to an overheating of the Baltic economies and a build-up of major imbalances. The risks increased of an imminent, sharp economic downturn that might also have a noticeable effect on Swedish banks. In hindsight, we know that the global financial crisis was the triggering factor and that the downturn in

6 A foreign exchange swap agreement is an agreement to buy or sell a currency at today's rate and then sell or buy back the same currency on a later date at a pre-determined rate.

the Baltic economies was rapid and substantial. The austerity subsequently experienced by the residents of those countries in order to reverse the trend was considerable.[7]

If I may be frank, I do not think we can close the books completely as regards the financial crisis until we have seriously considered the responsibility borne by Sweden and Swedish banks for the disarray in the Baltic economies during the 2000s. Naturally, the heaviest responsibility falls on the countries themselves and the economic policy that, among other things, actively encouraged banks to sustain rapid credit growth. But clearly the banks' interest in restraint was also minimal. And when it eventually became obvious to everyone that the trend was unsustainable, and signals were sent to Sweden that help was needed to come to grips with the situation, not much happened anyway. So Sweden bears some responsibility for the disarray and many have avoided criticism. The willingness and courage to make difficult decisions was lacking – the stance 'this far and no further' was conspicuous by its absence.

The Riksbank issued warning signals relatively early about developments in the Baltics and the risks associated with the strong credit growth. Even though the wording was probably too cautious to start with, the article by Johansson, Molin, Niemeyer and Nordh Berntsson describes how the tone was gradually sharpened in our financial stability reports, particularly from 2006 onwards, when the risks posed to Swedish banks by the developments became increasingly clear. The fact that the Riksbank began publishing special stability reports was due to the experiences from the Swedish 1990s crisis. Our idea was that if the Riksbank openly talked about its view on the stability situation, not an entirely uncontroversial idea when we started it, it would hopefully help to highlight the problems in time so that we wouldn't end up in the same situation again. The concept undeniably fulfilled a necessary function, proven not least by the fact that similar reports are now published by a large number of countries and organisations. But, as it turned out during the 2000s, highlighting risks is not enough to avoid crises – more practical means are also needed.

While developments in the Baltics became increasingly worrying, the Icelandic problems also started to manifest themselves. In the spring of 2008, it was clear that the Icelandic economy was basically falling apart under the weight of problems facing Icelandic banks, whose balance sheets had grown to a size several times larger than Iceland's gross domestic product (GDP). The country needed support to safeguard both its macroeconomic and its financial stability. We sent our own observers to Iceland, and they returned with reports that the situation was not under control. This led to frenetic activity at Swedish authorities and I recall the traditional spring meeting at the IMF being entirely different to the normal gathering for me personally. Instead of attending formal meetings as planned, myself and the other Swedish representatives from the Ministry of Finance and the Riksbank sat in the Nordic-Baltic Office at the IMF drilling down into the details regarding the Icelandic financial sector. As far as the Riksbank was concerned, this later led to us and our central bank colleagues in Norway and Denmark entering into a swap agreement in euro with the Icelandic central bank in mid-May. In effect, the transaction including the commitments by Iceland was an IMF programme without the IMF.

But, as we know, the situation for Iceland worsened, and another clear memory I have is from a breakfast meeting concerning Iceland in conjunction with the annual meeting at BIS during the summer of 2008, at which a large number of the world's central bank governors gathered. At the breakfast, attended by a small group of people, in the cellar of the Hilton Hotel, the atmosphere was so bad that no one had any appetite. The feeling that the Icelandic economy was on the brink of a precipice was firmly rooted.

7 More about the details of developments in the Baltics, Swedish banks' operations and the Riksbank's measures can also be found in Ingves (2010).

2.4 Emergency stations

Then the autumn came, Lehman Brothers went bankrupt in September and the crisis entered an acute stage, the serious effects of which were also felt here at home. Swedish banks started to find it increasingly difficult to secure long-term funding. The uncertainty created by the Lehman Brothers bankruptcy caused investors and banks to keep hold of their money. The demand for secure investments increased sharply, while riskier securities were sold off. Many wanted to hold government securities, few wanted to sell and in Sweden supply was already limited to start with, as the state had no particular need to borrow. However, the Swedish National Debt Office had a commitment to lend fixed-rate treasury bills on demand from banks that acted as government security dealers. A few days after the Lehman Brothers crash, the market became entirely dependent on this option and the demand for treasury bills was then so high that the National Debt Office chose to discontinue the arrangement, which basically led to closure of the government security market. This was of course not a solution to the problem and it was very important for the market to reopen for business as soon as possible.

I happened to be on a visit to the ECB when the telephone started to ring and I then had to spend a few intensive hours behind a pillar at the entrance to the kitchen, where there was an electric socket so that I was able to keep my phone alive while talks continued. In the end, the solution was for the National Debt Office to increase the supply of treasury bills on the market by holding extra auctions. The money it generated was then lent to banks in so-called reverse repo transactions with housing bonds as collateral, which simultaneously helped to improve the situation on the bond market.[8]

It was excellent that the National Debt Office was able to solve the problem this way. But roles were undeniably reversed as the National Debt Office basically took over the Riksbank's role as the institution that is quickly able to supply money to the financial system, in other words it took on the role of lender of last resort. However, the Riksbank did not have everything in place to be able to supply liquidity to banks at such short notice. The preparations for such operations had been going on for some time and they were ready in principle – just a few weeks later the Riksbank began lending dollars and krona to the banks. But on that day, right then, we were not able to do it and that was naturally a very important lesson for the Riksbank to learn.

At the end of September, the Riksbank obtained a swap agreement in dollars with the US Federal Reserve, and we then, as I said, started to lend dollars to facilitate bank funding. In early October, we also established an initial loan facility for SEK 60 billion to increase access to longer-term credit.

Literally on the same day as the Riksbank announced the loan facility, we received another sign that the problems on the financial markets were having a serious impact on Sweden. For me personally, this sign came in the form of a piece of paper that suddenly arrived on my desk informing me that the Riksbank's RIX system was at a standstill. RIX is the hub of the Swedish financial infrastructure, through which large inter-bank payments are settled. Normally, this is a process that is completed by 17.00 each day, but mistrust among banks had led to a process failure that day. The core of the problem was the shortage of liquidity with which all the banks were having to struggle to an increasing extent. For RIX to be able to close for the day, the banking system as a whole had to be balanced. A step in this process is for banks with liquidity surpluses to lend to those with deficits at the end of the day. But with the situation as it was, some of the banks with liquidity surpluses felt that others were taking advantage of the system to obtain funding. And on 2 October, one of the banks felt the need to set an example and simply refused to lend.

8 A repo (short for repurchase agreement or transaction) is a repurchasing agreement similar to a short-term loan, in which one party undertakes to sell a security to a counterparty today and simultaneously undertakes to buy it back at a pre-determined price at a certain point in the future. The party that lends the security pays an interest rate comprising the difference between the purchase and sale price. For the party borrowing the security, the transaction is described as 'reverse'.

Perhaps this would not have been such a big deal if it had not been for the fact that the entire financial system was already in disarray. At that point, notifying the rest of the world that the Swedish payment system was at a standstill because Swedish banks were not lending to each other would have been devastating for confidence in the Swedish financial market and Swedish banks – *all* Swedish banks. It was therefore of the utmost importance for this problem to be solved, and solved in a way that did *not* involve extraordinary lending by the Riksbank. Now it just so happened that most bank CEOs were at the Riksbank regarding another matter when this happened and we were able to discuss the problem directly with them. I can say that the tone of that discussion and the subsequent deliberations that evening reflected the seriousness of the situation, to put it diplomatically. But after a few hours, the problem was solved. The late closure of RIX set off a rumour that the payment system had collapsed and the following day, the Riksbank was forced to publicly declare that this was not the case, but that it was a matter of 'confusions and misunderstandings' among the banks that was now resolved.

This episode was a forewarning of what was to come. The crisis on the international financial markets was affecting the Swedish banks and other financial agents to an increasing extent and the long-term credit markets were working less and less efficiently. On 6 October, we therefore decided to increase the amount in the initial loan facility to SEK 100 billion and to carry out another auction of SEK 100 billion a week later. In conjunction with this, we also published the press release I mentioned above, in which the Riksbank pledged that we stood ready to provide the liquidity necessary in the Swedish financial system to safeguard financial stability and ensure the smooth functioning of the financial markets (see Sveriges Riksbank 2008). Leading the work on this type of commitment and being responsible for it takes a toll on you both mentally and physically.

As I have described, it was a long road to that press release. It was not a question of suddenly realising we needed one and of composing it in five minutes, but rather the realisation that the Riksbank needed to publicly guarantee liquidity in this way emerged gradually. But when we published the press release, it was still with a slight feeling of dread, as we would have to stand by our pledge. And it was obvious that the Riksbank was about to embark on a balancing act. Because even if we were naturally able to create unlimited amounts of krona, the foreign exchange reserves were actually too small – and if there had been a skyrocketing demand for dollar and other currencies, the funds would have been inadequate. That was the truth, plain and simple. But it was a risk we had to take. And then it was merely a question of relying on our ability to communicate and on the measures implemented by ourselves, the National Debt Office, the Government and Finansinspektionen being enough to turn the whole thing around.

In late 2008, new measures came along almost every day. Other articles in this issue describe the Riksbank's efforts more in detail, so I won't dwell on them here. But it can be worth saying a few words about the special liquidity support given by the Riksbank to Kaupthing Bank Sweden and the Carnegie Investment Bank.

In the background loomed the Custodia experience, which I outlined earlier, and given the situation in October 2008, the suspension of payments by one bank risked affecting public confidence in the entire Swedish financial system. At the same time, it is important to point out that it is never easy to take this type of decision – it is a question of deciding, often under considerable time pressure, to lend huge amounts of money and it is not possible to say what is right or wrong in advance. In addition, details about the assets used as collateral for the loans can be difficult to come by. As regards Kaupthing Bank Sweden, for example, we managed to obtain their last good collateral just before the Icelandic parent company went bankrupt. Ultimately, we did not lose any money on either Kaupthing or Carnegie. All in all, the support measures during the crisis, in the form of loan facilities and liquidity support actually entailed a profit for the Riksbank of around a couple of billion. But the point is that it is impossible to know for certain that this will be the case when the decision on support is taken.

One last thing about crisis management that links back to what I mentioned earlier about the Baltics. In late 2008, Latvia encountered major difficulties when capital started to flow out of the country at a rapid rate. The situation was uncertain and on the financial markets, there were growing concerns that Swedish banks could be adversely affected by developments in the Baltics. The year before, the Riksbank had no options available other than to communicate the risks we saw. There was now a risk that a crisis in Latvia could have consequences for the Swedish banking system and something needed to be done to stabilise the situation. The Riksbank's assessment was that it was more justified to strengthen Latvia and the other Baltic countries, and hence Swedish banks' subsidiaries and branches there, than to wait until the parent company in Sweden ran into problems. So at short notice, the Riksbank and Danmarks Nationalbank entered into a swap agreement with the Latvian central bank allowing it to borrow up to EUR 500 million. A few months later, the Riksbank also pledged a loan commitment to the Estonian central bank regarding currency support.

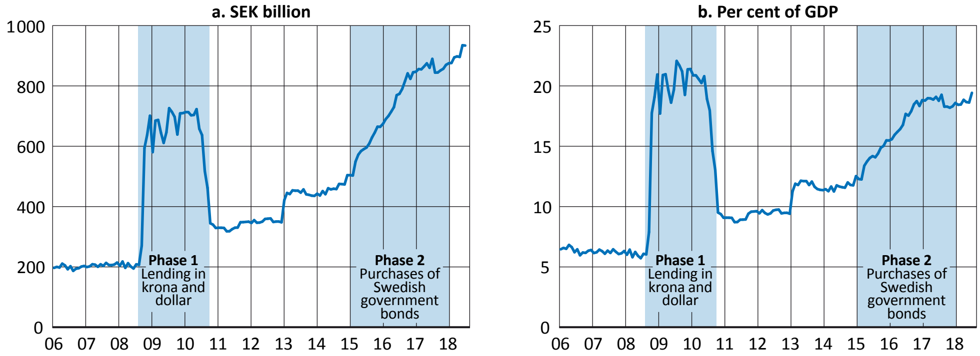
The primary purpose of the agreement with Latvia was to support the country's foreign exchange reserves until there was an IMF programme in place – something which the Swedish Ministry of Finance worked hard to bring about – and payments from the IMF and the EU could reach Latvia. The agreement with Latvia and the later agreement with Estonia, which was, however, never utilised, obviously supported the Baltics through the difficult situation in which they found themselves. Without going into any details, I can verify that the discussions with our counterparts were forthright and hard-handed. But we should not prevaricate about the fact that it was ultimately a question of maintaining financial stability at home.

3 From SEK 700 billion back to SEK 700 billion – and beyond

One way of illustrating the crisis management and the activity that prevailed in 2008/09 is by looking at the volume of press releases published by the Riksbank at the time. Between September and December 2008, the Riksbank issued an average of almost three press releases a week, compared to one a week in the years leading up to the crisis. And in 2009, we published a total of 108 press releases – more than were published in 2006 and 2007 put together. As Meyersson and Mikiver describe in their article, the trouble we took to tell people what was going on was an important part of our crisis management.

Another way of illustrating the crisis management and the measures actually taken by the Riksbank is to look at what happened to the size of our balance sheet (see Figure 1). Our balance sheet increased dramatically to around SEK 700 billion, equivalent to 20 per cent of GDP, as a result of our lending to the banks. Once the crisis was over and the Riksbank's large-scale programme of fixed-rate loans was terminated in late 2010, the balance sheet decreased as quickly as it had increased, although it was slightly larger than prior to 2008 due to the Riksbank having bolstered the foreign exchange reserves during the crisis.

Figure 1. The Riksbank's total balance sheet



Sources: Statistics Sweden and Sveriges Riksbank

During 2010 the feeling was that the economy was getting back to normal. This is how things usually are after this type of crisis. Banks' access to wholesale funding had improved and in our stability report, the Riksbank could ascertain that the resilience of banks to negative events was high. There were some question marks with regard to the recovery in the euro area, but the Swedish economy had begun to recover from the deep recession of 2009 and at a faster pace than expected. Both our own forecasts and those of other analysts indicated an economic upturn according to the usual pattern, albeit from an unusually deep hollow. But as we know, the pattern turned out to be anything but normal.

The recovery in Sweden and the rest of the world was interrupted by fresh unease on the credit markets during 2011, now linked to sovereign debt problems in several European countries. The Swedish economy slowed and GDP fell again in 2012 along with inflation. A decision taken by the Riksbank in 2012, and which later would prove to be significant, was to establish a securities portfolio of SEK 10 billion. In terms of size, it was a modest portfolio, and establishing it was mostly a precautionary measure in light of experiences during the crisis of 2008, and it proved that the Riksbank had learnt its lesson. The idea of the portfolio was to ensure that all systems, agreements, know-how, and so on, were in place if it became necessary either to take measures to maintain financial stability or to ensure that monetary policy had the desired effect.

To provide support to the economy and bring up inflation, the Riksbank cut the repo rate in 2012 and 2013 and in early 2014, there were signs of a brighter economic outlook. But inflation, which was unexpectedly low, fell even further. The long period of below-target inflation also started to leave its mark on long-term inflation expectations. At the same time, the ECB made its monetary policy more expansionary and announced a comprehensive support package with loans to companies and bond purchases. This was much-needed support to the euro area economy, but for the Riksbank, the risk was that it would simultaneously strengthen the krona against the euro. There was therefore a risk that inflation in Sweden would continue to be low or fall even further below our target. The Riksbank therefore needed to focus on returning inflation to 2 per cent and on maintaining confidence in the inflation target. We managed to do that, but it took a long time and required significantly more support from monetary policy than we could have imagined.

One illustration of this is the fact that the repo rate remains in negative territory three years after the Riksbank cut to below zero in early 2015. But even more striking is the development of our balance sheet. At the beginning of 2015, the ECB began its large-scale asset-purchasing programme, and in February 2015, the Riksbank decided not only to cut the repo rate to below zero but also to purchase government bonds to make monetary policy even more expansionary – the technical capacity to do so being, as I said, already in place.

In retrospect, it is remarkable how the balance sheet gradually grew to the same size as during the crisis management in 2008/09 as the government bond purchasing scheme was expanded and, as early as at the start of 2016, the balance sheet was back to a level of around SEK 700 billion (see the left-hand panel in Figure 1). Since then, the balance sheet has increased further to about SEK 900 billion, which means that it is currently approximately the same size as during the crisis when compared to GDP (see the right-hand panel in Figure 1). When the Riksbank took the decision to create a small portfolio of government bonds to provide us with an extra tool in our toolbox, we obviously had no idea that things would turn out the way they did. But, quite simply, we have had to play the hand we were dealt.

This development of the Riksbank's balance sheet also illustrates a point made by Hansson, Nessén and Vredin in their article, namely that we need to reflect more on how monetary policy is actually conducted and how it spreads through the economy via the financial system, i.e. what is normally referred to as the transmission of monetary policy. If we hold on to a framework that equates monetary policy with changes to the policy rate – a reasonable assumption prior to the crisis – it will be difficult to understand what happens in an economy where 'unconventional measures', such as bond purchases, play an important role. And as experience has also shown us, we need a deeper understanding of how different monetary policy measures, via financial markets, affect the interest rates that households and companies actually pay and how and why the effect on market rates varies.

There is really nothing dramatic about this if we look at it all in a longer-term perspective. The Riksbank, just like other central banks of course, constantly struggles to understand the transmission mechanism. We find an intellectual framework that seems to work and we then tend to take it for granted until developments don't turn out as expected and we have to have a rethink. That is how we move forwards. In this respect, there is a clear parallel with how the monetary policy operational framework itself also changes over time.[9]

Another point in the article by Hansson, Nessén and Vredin that is worthy of further consideration, given the monetary policy experiences after the crisis, is the relationship between monetary policy and fiscal policy and how to bring about a suitable combination of the two. During the fixed exchange rate era of the 1970s and 1980s, fiscal policy took care of stabilisation policy, which was funded by extensive borrowing. National debt skyrocketed as a result. After the 1990s crisis and the transition to a flexible exchange rate, the approach has instead been that monetary policy should be responsible for active stabilisation policy. This has been successful in many ways. But as the idea of monetary policy is to cut interest rates when the economy is in need of stimulation, it has also contributed to an accumulation of debt, now in the private sector. So we need to think of ways of striking a good balance, because if indebtedness rises too high – regardless of whether this is in the public or private sector – it risks leading to difficulties later on.

4 Flying through fog with only one eye

Looking at developments during and after the financial crisis, what have we learnt from the last ten years or so? The articles published in this issue of Sveriges Riksbank Economic Review contain many lessons about crisis management and sensible conclusions about what the experiences mean for our work on stability and monetary policy analysis going forward. I have a few reflections to add to these.

Good communication is of course always important, and this is particularly true during crises. It is basically a question of conveying stories about the future that seem reasonable. If the story is fairly convincing, you will manage to keep most people on-board, even though they don't, for obvious reasons, have full insight into all the details and technicalities of the measures implemented. But saying 'there is no reason to worry' never works. People will just head for the lifeboats immediately. If there isn't anything more substantial to communicate,

9 A good description of how the monetary policy operational framework in Sweden has developed over a longer time period can be found in Sellin (2018).

you can always talk about the process – what will happen next, what shall we do next and when? My experience is that this works well and helps to reduce general unease and uncertainty. On the other hand, it won't work at all if you subsequently don't do as you said you would. Actually delivering on your promises is important.

A lesson from the crisis, that I have already discussed, is the importance of being prepared and having the necessary tools in place. If we look back on what has happened, and compare with our expectations about the future in 2006, it is clear that virtually nothing turned out as we expected it to. The Riksbank has done a great deal more than we imagined we would, due to us being forced to play the hand we were dealt, given our remit. An important lesson is therefore to ensure that all the various measures a central bank might conceivably need to take can be implemented technically, legally and in terms of knowledge. Whether or not these measures will actually be implemented is a different thing, and for some generations the preparations will never be put to practical use. But if the infrastructure is not in place, it may be difficult for other generations who need to dig deeper into the toolbox.

It also means that it is important to practice. Crisis exercises are particularly important, as they are a way of recreating at least a hint of the right atmosphere. Exercises can otherwise be too theoretical and even if case studies are useful, it goes without saying that the cases studied are those that have been successful. Few have trained what to do from an initial position of total misery.

As I have tried to show, it is also important to understand that there are no guarantees of taking the right decisions. Navigating through crises such as the one in 2008/09 is like flying through fog with only one eye. If you knew exactly where you were and what was going on around you, it wouldn't be a problem and the crisis would be over. So basically, it is a question of coping with the unknown. And when you do that, things seldom turn out as you imagined. Crisis management therefore becomes a series of events in which you do the best you can. If the world changes, you do something else or adjust until everything seems to sort itself out. But if you don't change things along the way, problems will arise. Neither must the great uncertainty become an excuse for not taking decisions, because decisions must be taken and often at short notice. It also means that protracted group-work, which is often a characteristic of institutions like the Riksbank, needs to be put to one side. The discussion must have a conclusion and someone must take the lead.

Something that is difficult to capture in crisis management exercises is the perseverance needed by leaders in such situations – having the stamina to lead. If you don't have the stamina, you have to step aside. Neither is it possible to have a constant dialogue with oneself on whether you can go on any longer, because then your decision-making will suffer.

Essentially, it's a question of two things. Firstly, you must do your best to prove your worth. If you are high up in the hierarchy, you need to have more stamina so that you can stand there when everyone else is tired. It is therefore important to delegate and ensure that you can rest while others are active – if *no-one* sleeps, the end-result will be guaranteed failure. Secondly, not all people can handle stress. People react very differently and it is impossible to know in advance how someone will cope with stressful situations where, for example, a decision on support needs to be taken immediately and without full information. Standing there in the middle of the confusion, there is unfortunately no time for coaching, and you have to leave the coaching until after it is all over.

Finally, after episodes like the financial crisis and its long aftermath, the attitude can easily be that the event was so improbable that the likelihood of it happening again is so incredibly, ridiculously minuscule that we can almost certainly say that it can't happen again. And we then count on everything returning to how it was, because changing things is heavy going.

But although we can never say *when* the next crisis will come along, we can be certain *that* it will. So what can we do on an overall level to prepare? A lesson that is obvious from both the global financial crisis and our own crisis in the 1990s is to ensure that we do not create unnecessarily large home-made imbalances, given the considerable openness of the Swedish economy and our banks' substantial dependence on foreign funding. This is why it is so important to put the Swedish housing market in order. If we have no control of it and allow both prices and household indebtedness to grow and grow, there is a major risk that things will go in the opposite direction very rapidly sooner or later, with very bad consequences for both the macroeconomy and many individuals. At the same time, we must not allow the nominal anchor in the economy to slip. Because history has also taught us that if we add inflation troubles to other problems, the situation risks becoming much worse.

Let me conclude by noting that I have here in a few brief pages tried to capture a long and at times economically perilous sequence of events. With the benefit of hindsight, we can see that Sweden has coped well. I believe that the Riksbank has contributed to this result. Landing on one's feet under such circumstances is not possible without the knowledge, perseverance, presence of mind and understanding of the seriousness of the situation by many very loyal employees when they were needed the most. The same applies to my colleagues in the Executive Board, who recognised when the time had come to make decisions.

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Dramatic years in Sweden and globally: Economic developments 2006–2017

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It is ten years since the global financial crisis broke out. This article describes economic developments globally and in Sweden from the years immediately preceding the crisis up to 2017, and how the crisis has left its mark in various ways during this period. Together with globalisation and technological advances, the financial crisis contributed to a number of comprehensive changes being made in the economic, financial and political areas, both here in Sweden and in other parts of the world. This gave rise not least to a number of existential issues, which included a broad discussion of the legitimacy and tasks of the central banks. The dramatic crisis years also showed how the financial markets had become global and cross-border to a much greater extent than before. Regulation, supervision, analysis and not least cooperation at global and intergovernmental level needed to be substantially reinforced.

1 Origin of the crisis

After several years of strong developments, the US housing market began to slow down in 2006. One could see the first signs of an approaching financial crisis when the premiums for credit derivatives linked to mortgages in the United States began to rise. The problems for borrowers with low credit scores on the US mortgage market were already well known, but now they began to spread to lenders and their financiers.

Over a long period of time, many US households with poor finances had been tempted to borrow money to buy homes. The banks had set low requirements on the borrowers' credit worthiness and tempted them with initially interest-only loans at low interest rates. This meant that the amount of poor quality loans – what were known as subprime loans – aggregated grew rapidly. This was largely based on banks and investors believing they had found a miracle machine in the form of mortgage backed securities (MBS). That is, the banks had developed a technique for packaging subprime loans together with other loans, convert the merged loans into securities and then sell them on the secondary market. The diversification effect appeared to make the risks of investing in MBSs manageable for investors.[1] And the banks felt they had got rid of the risks linked to subprime loans in that they had sold the securities.

It later became obvious that the risks had been severely underestimated. But why did this happen? There are several explanations. Firstly, the complex design of the securities made

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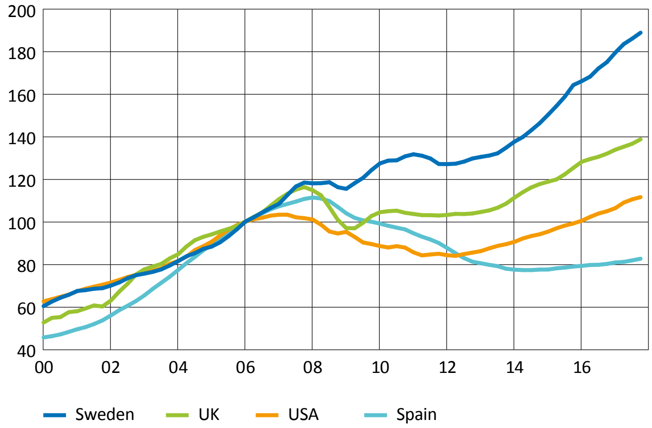
1 The diversification effect was based on the (unfortunately incorrect) assumption that a general downturn in house prices throughout the United States was not likely. This meant that the risk in a security that combined mortgages with a broad geographical spread was thought to be much lower than the risk for a collection of mortgages from a given geographical region.

it difficult to detect the risks, for both investors and credit rating agencies. Secondly, explicit and implicit guarantees given by the banks meant that the risks could quickly find their way back to the banks' balance sheets. But as long as house prices continued to rise rapidly, temporarily favourable funding conditions contributed to concealing the risks that were building up.

When the house price upturn slowed down and house prices eventually began to fall in 2006, house owners with low credit scores were the first to experience problems (see Figure 1). The problems were amplified by the fact that the banks' low interest rates on mortgage loans were adjusted upwards at the same time as monetary policy was tightened and market rates rose. Lenders also began to tighten their credit standards. All of this contributed to an increasing number of borrowers experiencing problems paying their mortgages.

Figure 1. House price levels in the USA, the UK, Spain and Sweden
Index, 2006kv1 = 100



Source: Federal Reserve Bank of Dallas

During 2007, the borrowers' problems began to spread to the lenders. Several agents were affected. First, it was the banks and financial companies who had lent money. These credit granters retained only a certain part of the loans on their own balance sheets, the rest were distributed to other agents such as pension funds and insurance companies. Ultimately, they were also affected by the credit losses that arose on the mortgage market.

The concern over increased credit losses meant that the credit rating agencies began to review all their bonds and downgraded the ones whose credit ratings had deteriorated. The rising loan losses spread throughout the chain from borrowers via mediators to lenders and holders of mortgage bonds.

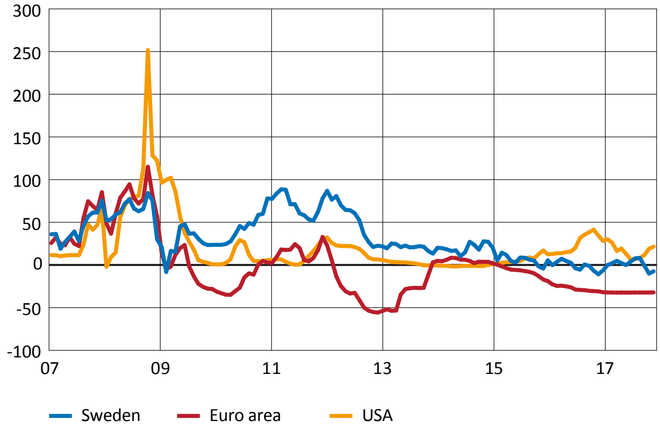
In addition, many banks had created special investment vehicles and conduits that bought other banks' structured credit products with mortgages as underlying assets.[2] But despite the banks having created these investment vehicles outside their own balance sheets, it was difficult for the banks not to take responsibility for them when they experienced problems. This was partly due to the formal credit lines the banks had opened, and partly due to the banks being anxious of how other parts of their operations might be affected if they gained a bad reputation for not taking responsibility for their off-balance sheet activities.

When the banks' special investment vehicles suffered problems, interbank rates (the interest rates paid by the banks on loans from other banks) rose substantially, and the banks suffered major liquidity problems. In other words, it became expensive and difficult for the banks to borrow money to finance their operations.

2 Collateralized Debt Obligations (CDO) are an example of a structured credit product that had considerable significance for the financial crisis. A CDO consists of mortgages with different credit ratings packaged into one bond. The credit rating of the packaged instrument was set higher than is justified by the sum of its parts, which made it easier to sell before the crisis broke out.

The banks entered a period of external stress. Many financial institutions in the United States suffered major problems, and some received support from the government and the Federal Reserve. When investment bank Bear Stearns was on the verge of collapse in March 2008 it received an emergency loan from the Federal Reserve. Despite this, Bear Stearns could not be saved, but was taken over by another investment bank, JP Morgan Chase. The two large institutions that financed home purchases in the United States, Fannie Mae and Freddie Mac, were taken over by the state in September 2008. When it became clear that the United States' fourth largest investment bank, Lehman Brothers, could not be saved by the Government, a period of extreme price fluctuations on the financial markets began.[3] Lehman Brothers had counterparts all over the world, and when they filed for bankruptcy protection on 15 September 2008, interbank rates soared, which is shown in Figure 2. Many banks around the world came to experience funding problems.

Figure 2. Interbank rate minus policy rate in the USA, Sweden and the euro area
Basis points



Note. The difference between a 3-month interbank rate and the Federal Funds Target Rate (Federal Reserve), Main refinancing operations rate (ECB) and the repo rate (the Riksbank).
Sources: Thomson Reuters, the ECB and the Riksbank

The disruptions on the financial markets soon spread from country to country. Risk premiums on interest rates on the loans between the banks rose overall on the interbank markets all over the world. When the US money market funds suffered bank runs in September 2008, where a lot of people tried to get their money back at the same time, they reduced their dollar lending to banks in Europe (see Gunnarsdottir and Strömqvist 2010).

Partly as a result of counterparty exposures – and the lack of transparency regarding them – several European banks suffered funding problems during the years 2007–2009. The background to this was the financial imbalances built up over several years with overheated housing markets in the United Kingdom, Spain and Ireland, which contributed to serious banking crises there. In Iceland, all three commercial banks collapsed and were taken over by the state. Also Austria, Belgium, Denmark, Germany, Luxembourg, and the Netherlands suffered problems in their banking sectors. The Swedish banks were affected to a large degree by the crisis in the Baltic countries, which we will describe in the next section. The European debt crisis is described in section 5.

3 The question of whether it was right to support some financial institutions or not and whether the state should have saved Lehman Brothers is still subject for discussion. For an analysis of these issues, see for instance Blinder (2013).

2 The Swedish banks and the Baltic countries

Following the Swedish banking crisis of the 1990s, the consolidated and restructured Swedish banking sector began to expand fairly aggressively, primarily in the Nordic and Baltic countries. Swedish banks rapidly built up a dominant market position in the Baltic countries in particular. In 2004, the Swedish banks had around 90 per cent of the market in Estonia, 50 per cent of the market in Latvia and 60 per cent of the market in Lithuania.

Credit expansion in the Baltic countries was fuelled by the pent-up demand for credit and the rapid economic growth in the transition from Socialist Soviet republics to liberal market economies. In the mid-2000s, the annual rate of credit growth in the Baltic countries was around 40–50 per cent in the corporate sector and around 60–85 per cent among Baltic households (see Sveriges Riksbank 2006).

For the Swedish banks, particularly Swedbank and SEB, their operations in the Baltic countries comprised an increasingly important contribution to their profits during the first decade of the 2000s, with higher profit margins than the investments in the Swedish market.

But when unease on the financial markets increased in 2007–2008, credit was squeezed in the overheated Baltic economies. Property prices fell, consumption and investment plummeted and production in the Baltic countries came to an almost complete stop. Loan losses increased alarmingly.

When Lehman Brothers went bankrupt in September 2008, 16 per cent of Swedbank's lending and 27 per cent of its operating profits came from its operations in the Baltics. The corresponding figures for SEB were 12 and 20 per cent respectively. For Nordea, which was a larger bank that also conducted operations in the Baltic region, the relative shares were smaller: 3 and 2 per cent respectively of the bank's total lending and operating profits.

Estonia and Lithuania had pegged their currencies to the euro a few years earlier via currency boards and the Latvian currency was pegged to the euro with a fixed exchange rate arrangement. Many of the banks' borrowers had borrowed in foreign currency, which made them vulnerable to depreciations in the exchange rate. The risk of devaluation was imminent in the Baltic countries, which made the situation worse for the Swedish banks with exposures in these countries. It became increasingly evident that the problems in the Baltic countries would rebound forcefully in the Swedish banking system.

The Baltic countries were not able to obtain sufficient funding from international investors and could not borrow euros from the European Central Bank (ECB). This made the situation more problematic for them and therefore for Swedish banks. Latvia in particular had problems as a result of a crash in the country's largest domestically-owned bank, Parex Bank. The solution was that the countries received a loan programme from the International Monetary Fund (IMF) and the EU. Before this was in place, however, the Riksbank and Danmarks Nationalbank provided a bridge loan in December 2008 in the form of an agreement allowing Latvia's central bank, Latvijas Banka, to temporarily borrow EUR 500 million in exchange for Latvian lats (see Sveriges Riksbank 2008).

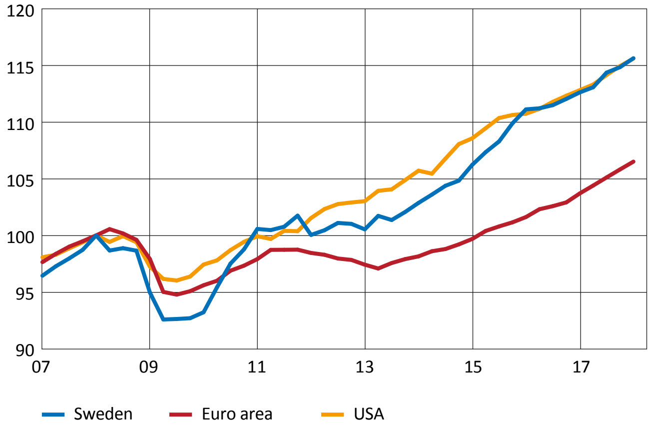
The Riksbank later also entered into a similar temporary loan agreement with the Estonian central bank, Eesti Pank (see Sveriges Riksbank 2009a). The agreement gave Eesti Pank the possibility of borrowing up to SEK 10 billion against Estonian krooni to strengthen Estonia's preparedness to provide liquidity support in domestic currency should this become necessary. However, the problems in Estonia were not nearly as great as in Latvia and the credit never needed to be utilised.

Ultimately, neither Estonia, Latvia nor Lithuania needed to devalue their currency. Instead of changing their exchange rate policy, these countries managed to implement what is sometimes called 'internal devaluation', which is to say that wages and public expenditure were cut to bring down the level of costs. This allowed them to restore international competitiveness and relatively quickly convert their large deficits in the balance of payments to surpluses when growth in the region increased after the crisis.

3 The deepest recession of the post-war period

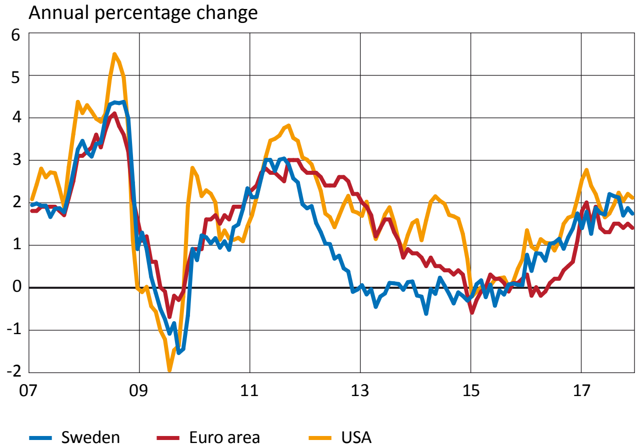
The consequence of the global financial crisis was a very deep international economic slowdown that intensified dramatically after Lehman Brothers entered into bankruptcy protection in the autumn of 2008. Many emerging market economies were also affected when world trade collapsed. The global recession deepened in 2009 and the crisis became truly serious in Sweden when gross domestic product (GDP) fell by 5 per cent over the year (see Figure 3). This was the greatest downturn since 1931, when GDP fell by 7 per cent. Sweden was so utterly impacted by the crisis due to its strong dependence on exports, the Swedish banks' comprehensive and high-risk operations in the Baltic countries and the way that households and companies postponed their consumption of durable goods and their investments until the financial unease had eased. Figure 4 illustrates how inflation fell sharply and became negative for a period in the United States, Sweden, the euro area and elsewhere.

Figure 3. GDP level in the United States, Sweden and the euro area
Index, 2007=100



Sources: The Bureau of Economic Analysis, Eurostat and Statistics Sweden

Figure 4. Inflation in the United States, Sweden and the euro area
Annual percentage change



Note. This refers to the HICP for the euro area and the CPI for the United States and Sweden.
Sources: Bureau of Labor Statistics, Eurostat and Statistics Sweden

Around the world, the demands on central banks to provide the economy with liquidity increased. In coordination, the central banks also heavily cut their policy rates in the autumn of 2008. During the financial crisis, many central banks also adopted so-called unconventional (or complementary) monetary policy measures that involved, for example, providing loans for longer maturities or in foreign currency, approving more securities as collateral for loans and expanding the circle of monetary policy counterparties. After the central banks jointly cut their policy rates worldwide, the Riksbank continued to briskly cut the repo rate by a further 0.5 percentage points at the end of October and by no less than 1.75 percentage points in December 2008. All in all, the Swedish repo rate was thus cut by 2.75 percentage points over a couple of months and, in the course of just over half a year, it had been cut further, by a total of 4.5 percentage points.

In the EU, finance ministers and central bank governors entered an agreement for how affected authorities should cooperate across borders during financial crises. The EU countries also decided to harmonise the regulations for deposit guarantees and introduced a harmonised level for all deposits by private individuals and companies of EUR 100 000 per bank.

At the outset of the crisis, the four major Swedish banks were financially strong. They had low loan losses and the debt-servicing ability of their borrowers was considered to be good. Neither were they significantly exposed to the structured credit products that formed the root of the crisis. This meant that the Swedish interbank market initially functioned relatively well, with no need for liquidity support measures of the kind the ECB had introduced in the summer of 2007. But when Lehman Brothers entered bankruptcy in September 2008, the Swedish banks were also impacted by the worldwide lack of liquidity. They found it more difficult and more expensive to obtain funding. In addition, problems started to gather in the Baltic countries like storm clouds on the horizon. It became clear that extraordinary measures would be necessary to maintain financial stability in Sweden.

Alongside the Riksbank, other government authorities were involved in fighting the crisis. The Swedish National Debt Office increased the stock of treasury bills to meet the market's demand for safe assets. It then lent the money received from these issues to the banks against collateral in mortgage securities. In this way, the Swedish National Debt Office made it easier for the banks to fund their lending to the general public in the beginning of the crisis. It thus acted as a financial intermediary.

In November, the Government also intervened by presenting a guarantee programme to support the banks' and mortgage institutions' medium-term funding. When unease mounted over the possibility that the problems in the Baltic countries could lead to major loan losses, the Government also set up a stability fund to manage any future solvency problems in Swedish institutions. The Swedish state also participated in a new issue of shares in Nordea to increase the bank's capital strength.

The Riksbank, the National Debt Office and the Government thus implemented a range of measures to make it easier for the banks to find funding and thus to manage their credit supply. On an international level, the Riksbank offered loans in euros to the central bank of Latvia, as we mentioned earlier, as well as to the central bank of Iceland, against collateral in domestic currencies. This support was part of a range of measures taken by central banks and the IMF to reduce the risk of the local financial crisis in the two countries spreading to other countries in the region, including Sweden.[4]

The crisis made clear how important it is for Swedish authorities to cooperate in this way. According to the Riksbank, this cooperation worked well and made it possible to take powerful measures to reduce the socioeconomic costs of the crisis (see Sveriges Riksbank 2008b).

The crisis also made clear the need for authorities in different countries to coordinate international efforts. Several central banks, including the Riksbank, received temporary US dollar loans from the Federal Reserve to allow them to supply US dollars to their national financial markets. The Riksbank also entered into an agreement with the ECB with the

4 See also 'Measures taken by the Riksbank and other Swedish authorities during the financial crisis in autumn 2008' in the Riksbank's Annual Report for 2008 (Sveriges Riksbank 2009).

corresponding aim of lending euros. The temporary loan agreement with the Federal Reserve was extended on two occasions and the foreign exchange reserves were expanded through borrowing via the Swedish National Debt Office to improve preparedness to safeguard financial stability.

The financial crisis provides examples of how the boundaries between the Riksbank's different operations, primarily monetary policy and financial stability, are not so sharp. Financial stability is decisive for payments to be made securely and efficiently and for the supply of credit and liquidity in a society to function. In addition, it is crucial for monetary policy to function and supply stable prices. According to this point of view, financial stability is a precondition for the implementation of an efficiently functioning monetary policy.

4 The Riksbank's 'unconventional' measures

The Riksbank lent amounts equal to at most just above 9 per cent of GDP to Swedish banks. The large cuts in the repo rate meant that the level of the repo rate approached zero, which at the time limited the Riksbank's capacity to use further rate cuts if the economy needed stimulation. However, further monetary policy stimulus was necessary, as GDP continued to fall heavily in early 2009.

The Riksbank therefore took unconventional (complementary) monetary policy measures. Firstly, the Riksbank offered its counterparties loans in SEK at longer maturities and loans in USD, secondly, more securities were accepted as collateral, including lending against collateral in commercial papers to facilitate corporate funding, and thirdly, the Riksbank increased its circle of counterparties (see Sveriges Riksbank 2009b and Sveriges Riksbank 2009c). The first loans were disbursed in October 2008 and after that loans were offered regularly right up to the end of October 2010.

The Riksbank granted loans in US dollars to Swedish banks partly with the help of funds from the foreign currency reserves, and partly via a temporary lending facility offered by the Federal Reserve to the Riksbank and other central banks (see Elmér et al. 2012).

In July 2009, the Riksbank announced that it intended to leave the interest rate at the low level of 0.25 per cent for more than a year. At the same time, the Riksbank decided to offer fixed-rate loans. Banks were offered SEK 100 billion in fixed-rate, low-interest loans with a maturity of around 12 months. The monetary policy toolbox needed to be supplemented with such unconventional measures in a situation where the repo rate was approaching its lower bound but monetary policy stimulus was still required. In total, the Riksbank offered three fixed-rate loans with a maturity of around one year, totalling 100 billion Swedish kronor each at the monetary policy meetings in July, September and October 2009. The Riksbank also provided emergency liquidity assistance in 2008 to two individual banks, Kaupthing Bank and Carnegie.

5 Brief recovery – debt crisis on the way

The global economy began to slowly recover during the second half of 2009, most noticeably in Asia. In the United States and the euro area, the downturn slowed, and signs of a turnaround began to appear. Global trade started to increase again, and the financial markets stabilised. In Sweden, a relatively rapid recovery in GDP growth began from the end of 2009. In 2010, the acute phase of the crisis had passed, and banks were able to borrow themselves on the global financial markets. The rapid recovery led to the Riksbank beginning to raise the repo rate again in July 2010 and increases continued until July 2011 when the repo rate reached 2 per cent. The Riksbank's work was moreover increasingly aimed at reforming the regulatory framework, above all the requirements of the banks' capital adequacy and liquidity buffers, and the supervision of the financial markets, and in particular the need to supplement the traditional institution-focused supervision with macroprudential policy, with a focus on identifying and counteracting risks to the system as a whole (see further Johansson et al. 2018).

From 2010 onwards, however, there was growing unease over sovereign debt problems in Europe. Developments were particularly troublesome in Greece, Ireland, Portugal and Cyprus, countries that were unable to find funding on the international bond market. They therefore received support from the IMF, the EU and the European Monetary Union via support packages and requirements for measures to reduce budget deficits and public debt. In addition, large countries such as Spain and Italy had weak public finances and had their credit ratings cut. Several banks in the euro area also had poor capital adequacy, weak profitability and a large amount of non-performing loans, which have slowed recovery for a long time.

Several problem countries had also lost competitiveness compared with the average in the euro area. With a common currency, there was no scope for correcting this by weakening the exchange rate. Instead, competitiveness needed to be restored by holding back price- and wage increases.

In several countries, public finances were made worse by distressed banks being given state aid. A negative spiral emerged in which weak public finances caused interest rates to rise and this increased funding costs for already weak banks who in turn tightened their lending to households and companies, which hampered recovery.

The serious imbalances in public finances led to a situation in 2011 in which only 3 out of 27 EU Member States were not in contravention of the rules on excessive deficits and debt ratios laid down in the 1998 Stability and Growth Pact.[5]

During the summer and autumn of 2011, unease over developments in public finances in both the United States and the euro area increased, and growth prospects abroad deteriorated. This unease also affected developments on the financial markets, and stock markets around the world fell substantially as a result. At the end of the year, the European debt crisis escalated and Swedish growth slowed. Swedish inflation was also lower than expected and led to the Riksbank cutting the repo rate in December.

In 2012, the Swedish economy weakened further as a result of weak developments abroad, inflationary pressures were subdued and the repo rate was cut on three more occasions.

The extensive problems in the euro area had consequences in many areas. The European debt, banking and cost crisis was managed by several authorities. The ECB cut its policy rate and introduced a number of bank lending programmes. In 2012, the ECB also announced a programme, Outright Monetary Transactions (OMT), which made it possible to buy unlimited amounts of government bonds from euro countries that needed support measures from the newly established support authority, the European Stability Mechanism (ESM). OMT was justified by the fact that the ECB needed to ensure that monetary policy had a uniform impact through an efficient transmission to the real economy. Merely offering the option of buying government bonds helped to dampen the unease on the financial markets.[6]

Work on building a banking union was also started. In the wake of the debt crisis, the Riksbank once again considered that the foreign exchange reserves needed to be increased and the Government established a Council for Cooperation on Macroprudential Policy in Sweden at the beginning of January 2012.

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5 These three countries were Finland, Luxembourg and Sweden, see further on the website of the EU-Commission under 'ongoing and closed excessive deficit procedures'.

6 In 2015, the Court of Justice of the European Union ruled that the programme was within the ECB's mandate for price stability and designed in a way that did not contravene the ban on monetary funding, see ECB (2015).

6 Inflation continued to fall and monetary policy was faced with difficult considerations

As early as 2006, the Riksbank had begun to issue warnings that household indebtedness and housing prices were increasing at a rate that was not sustainable in the longer term (see Sveriges Riksbank 2006, p. 9). When the repo rate was increased between July 2010 and July 2011, it was pointed out on several occasions that the risks of household indebtedness had substantially increased. However, the primary grounds stated for the rate rises were that inflation had to be stabilised around the target of 2 per cent and that excessively high resource utilisation needed to be avoided. But the Riksbank noted that a gradually rising repo rate can also contribute to slower growth in household borrowing and reduce the risk of imbalances building up in the Swedish economy (see Sveriges Riksbank (2010). The Riksbank therefore considered the risks of household indebtedness and housing prices in its assessment, which later contributed to the debate on the Riksbank's attempt to 'lean against the wind'.[7]

The international economic slowdown and lower import prices contributed to lower-than-expected inflation in Sweden in 2013. It also proved difficult for companies to pass on their increased costs to the consumer (see Apel et al. 2014). But the monetary policy discussion also continued to revolve around the increased risk for high household indebtedness that low interest rates potentially pose. Household indebtedness accelerated once again and between 2012 and 2017, housing prices rose by 10–20 per cent per year.

This monetary policy consideration came to a head towards the end of 2013. Inflation outcomes had been unexpectedly low during the autumn, despite economic activity being roughly as expected for most of the year. Inflationary pressures were lower than the Riksbank had previously assumed. The repo rate was cut to 0.75 per cent and the forecast for the repo rate was revised down. Despite household indebtedness being assessed as a risk in the longer run, the unexpectedly low inflationary pressure was nevertheless considered to weigh heavier, which justified a more expansionary monetary policy.

In 2014, inflation outcomes continued to be lower than the Riksbank's forecast and the forecasts for inflation were gradually revised down. At the same time, inflation expectations continued to fall. Monetary policy therefore needed to become even more expansionary and the repo rate was cut to zero to contribute to anchoring inflation expectations close to the target.

But there was a clear dilemma that Stefan Ingves expressed on several occasions, for instance, in a speech held in November 2015: 'Monetary policy is the policy area that has the best conditions for influencing the exchange rate and inflation. But to restrain household indebtedness, we would actually need an "extra policy rate", aimed at households and able to be set at a higher level than the usual policy rate. However, as the Riksbank can only steer the general level of interest rates and a part of the transmission is that households borrow more when interest rates are low, we now have to turn to other policy areas to manage household indebtedness.' (See Ingves 2015)

The Riksbank did not remain passive, but recommended measures that the authorities concerned should take to dampen the growing household indebtedness. These recommendations covered everything from more housing, higher capital requirements for the banks, extended direct loan limits for households, to reduced tax relief on interest expenditure.

Stefan Ingves commented in his introduction to the Riksbank's Annual Report for 2014 that measures were urgently needed to limit the rate of increase in household indebtedness.

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7 'Leaning against the wind' is when a central bank uses interest rate policy to try to counteract financial imbalances. The general picture at this time was, however, that the Riksbank's monetary policy was well-founded and primarily based on traditional monetary policy considerations. See Jansson (2014) for an analysis of this issue and of how domestic and international criticism of the Riksbank's monetary policy arose.

'We could choose from among a series of measures to reduce household indebtedness, for example amortisation requirements, limiting the proportion of variable interest-rate loans, abolishing tax relief and lowering the cap on the loan-to-income ratio. In the prevailing zero interest-rate situation, other policy areas must reduce the risks linked with household debt as a matter of urgency. Both measures aimed directly at households' demand for credit and reforms to improve the functioning of the housing market are needed.' (See Sveriges Riksbank 2015)

In the euro area, too, inflationary pressures were subdued. The ECB revised down its inflation forecast for 2014, 2015 and 2016 and decided that the deposit rate, which is the rate governing the overnight rate in the euro area, would be negative with effect from June 2014.

In January 2015, the ECB decided to begin an extensive asset purchase programme, with the focus on government bonds, to make its monetary policy even more expansionary and to ensure that inflation began to rise. This contributed to supporting the recovery in the euro area, but the purchases also risked strengthening the krona exchange rate, which had an impact on Swedish monetary policy. The ECB decided to extend its asset purchase programme in December 2016 up to the end of 2017, or if necessary even longer, until inflation could be seen to be approaching the target in a sustainable manner.[8]

When making monetary policy decisions in recent years, the Riksbank has thus not solely taken into account the low inflation and falling inflation expectations in Sweden. Sweden is a small, open economy and strongly dependent not only on global growth and inflation but also on monetary policy abroad. If Swedish monetary policy were to deviate too far from that in other countries, it could lead to severe exchange rate fluctuations. The ECB's low policy rate and extensive asset purchase in the period 2014–2017 therefore affected Sweden and the Riksbank's monetary policy.

In 2015 the Riksbank cut the repo rate below zero for the first time and also decided to purchase government bonds so that monetary policy would become even more expansionary and have a broader impact. The Riksbank then gradually cut the repo rate to –0.50 per cent. At the end of 2018, the total purchases are expected to amount to a total of around SEK 350 billion, excluding reinvestments.

7 Strengthened international financial regulation

The global financial crisis made it clear that the financial regulatory framework and supervision had serious shortcomings. After deregulation and financial innovations in the 1980s and 1990s, the financial sector had grown too large and complicated, rendering it impossible to effectively gain an overview of it using the structures available at the time. The global scope of the crisis made it obvious that both new institutions were required to come to grips with the complex system and an infrastructure was needed to coordinate the cross-border actions of authorities. It was also clear that new tools needed to be added to the authority toolbox, both to counteract the build-up of systemic risks and to handle financial problems in large and complex banks.

These insights triggered extensive global efforts to strengthen the regulation and supervision of financial markets. This globally coordinated reform work began in 2009, when G20 leaders met in Pittsburgh. One of the measures agreed was to task the Financial Stability Board (FSB) to tackle the problem of banks being too big to fail.[9] The results of these

8 The German federal constitutional court announced in August 2017 that it considered there were clear indications that the ECB's programme for bond purchases was in breach of the ban on monetary funding and therefore referred the case to the Court of Justice of the European Union, see Germany's Second Senate of the Federal Constitutional Court (2017).

9 Financial Stability Board (FSB) is an international organisation that monitors and makes recommendations about the global financial system. FSB members consist of representatives from the major G20 countries and international organisations such as BIS, ECB, European Commission, IMF, OECD and the World Bank. The FSB is based in Basel.

efforts included guidelines on how to handle global systemically important problem banks more effectively (see FSB 2011). The idea of the framework was to be able to wind up or reconstruct a bank in a way that made it possible to maintain socially important functions without the taxpayer having to foot the bill for any losses that may be incurred. Based on these guidelines, the EU adopted the Bank Recovery and Resolution Directive (BRRD) in 2014. The BRRD was incorporated into Swedish law in February 2016, and, pursuant to the new act, the Swedish National Debt Office was appointed as the resolution authority for Swedish banks. This also marked the introduction of 'resolution' as a concept in Swedish law to denote the handling of crisis-stricken banks.

After the crisis, intensive efforts were also initiated to plug gaps in the financial supervisory regulatory framework. The Basel Committee on Banking Supervision (BCBS) took a number of initiatives within the framework that came to be known as 'Basel III' (see Niemeyer 2016). This was above all a matter of strengthening the resilience of banks to shocks by not only setting higher capital requirements for them, both in terms of quantity and quality, but also tightening the requirements for how they managed liquidity risks. For example, a requirement was introduced for banks to maintain capital buffers in excess of the basic minimum requirements. In addition, banks were to have sufficiently large liquidity reserves to be able to cope with at least one month of liquidity stress. From 2011 onwards, the work of the Basel Committee was led by Stefan Ingves, who took over as its chair.

During this period, a new policy area – macroprudential policy – was launched on a broad front. The focus of macroprudential policy was to be on the risks in the financial system as a whole, and it therefore constituted a complement to traditional, narrower, institution-focussed supervision. One of the tasks of macroprudential policy is to counteract the 'boom and bust' tendencies that often characterise the financial sector, which is to say excessive risk-taking in economic upswings and destructive herd behaviour in slowdowns. Another focus area of macroprudential policy is the often intricate links that arise between various financial agents and that can contribute to the rapid spread of problems within the financial system.

At the end of August 2013, the then Minister for Financial Markets, Peter Norman, announced that the Government intended to hand the Swedish macroprudential policy remit to Finansinspektionen (Swedish financial supervisory authority) and that a financial stability council would be established, in which the Minister for Financial Markets, the directors-general of Finansinspektionen and the Swedish National Debt Office and the Governor of the Riksbank would be members. In many respects, the Government's proposal went against the division of responsibility for financial stability advocated by the Riksbank in its consultation response to the Financial Crisis Committee's interim report (see Sveriges Riksbank 2013).

New authorities within the EU were also formed in the wake of the crisis. In January 2011, the European Systemic Risk Board (ESRB) was established with the task of monitoring the build-up of systemic risks in the EU and warn EU Member States when necessary. The ESRB also came to play an important role in developing the macroprudential policy toolbox, work very much driven forward by the ESRB's Advisory Technical Committee (ATC). The ATC, later chaired by Stefan Ingves, developed the ESRB's macroprudential policy manual, which provides guidance in how various macroprudential policy tools are to be used, for example capital buffers, loan-to-value versus income-to-value ratios (LTV and LTI) and sectoral capital requirements, etc.[10]

10 For a detailed list and description of macroprudential policy tools, see, for instance, ESRB (2014).

But, without a doubt, the most comprehensive institutional change within the EU in the wake of the crisis was the creation of the European Banking Union. The Banking Union meant that the responsibility for banking supervision was transferred from the national level to the European level. The Banking Union covers the entire euro area and other Member States that choose to join. The arrangement is based on the common European regulatory framework and currently includes both a single supervisory mechanism (SSM) and a single resolution mechanism (SRM). It means, for example, that the European Central Bank (ECB) has taken over the supervisory responsibility and that a single resolution authority, the Single Resolution Board (SRB), has taken over the responsibility for crisis management for banks in banking union member countries. The longer-term aim is for the Banking Union to include a single deposit guarantee system. However, the issue of a single deposit guarantee, which is intended eventually to be jointly funded by the Banking Union member countries, is extremely controversial and is far from settled within the EU. Especially Germany and other northern European countries are worried about being forced to pay disproportionately large amounts of money to save depositors in other countries (see Reuters 2016).

When the Banking Union was created, Sweden elected not to join for the time being. One reason for this was the uncertainty surrounding the obligations membership would entail and how any possible losses in European crisis banks would be distributed (see, for instance, Dagens Nyheter 2012). Another important reason was the lack of influence Sweden would have over the supervision of its cross-border banks, as Sweden is not a euro country.

The work and role of the IMF was also affected by the global financial crisis. In the wake of the collapse of Lehman Brothers, several countries in the euro area were forced to turn to the IMF for financial support. The IMF increased its lending capacity by around 500 billion US dollar via temporary bilateral loans from its member countries. The Riksdag (Swedish parliament) decided to increase its preparedness to lend to the IMF by 100 billion Swedish kronor to help dampen the effects of the debt crisis in the euro area.

During the IMF annual meeting in the autumn of 2008, global finance ministers and central bank governors agreed on a five-point plan to restore confidence in financial markets. The agreement basically meant that all IMF member countries would ensure that their national deposit guarantee systems were sustainable and consistent. Authorities in all countries were to take the necessary measured to kick-start the secondary market for various securities. The IMF would also be given a central role in coordinating the continued process of re-establishing confidence in global financial markets, partly by lending to assist countries with payment problems and partly by functioning as a platform for discussions on what should be done to avoid similar crises arising in the future. The IMF also established a number of new alternatives to be able to assist more countries with loans. The financial crisis reinforced the role of the IMF as the international financial system's firefighter.

8 Clear global recovery not until ten years after the crisis

In all, the financial crisis contributed to a deep and drawn-out global recession. After the crisis, GDP in the United States and Sweden has grown considerably quicker than in the euro area, which has fallen behind as a result of the European debt crisis. At the end of 2016, the GDP level in the United States was 16.5 per cent over its level at the start of 2007. In Sweden, GDP has risen by 14.1 per cent during the same period, while GDP in the euro area was only 4.8 per cent higher in late 2016 than in early 2007.[11] Unemployment in the euro area also rose sharply, particularly in the crisis countries. Both the measures taken and the lack of measures contributed to public dissatisfaction and an unstable political situation in several

11 Measured as GDP per capita, the recovery after the crisis was even slower. GDP per capita between 2007 and 2016 increased by 4.4 per cent in the United States and 5 per cent in Sweden but only by around 0.5 per cent in the euro area, see Ingves (2017).

euro countries. In 2017, however, some positive economic signals were noted in the euro area even if the imbalances had decreased slowly.

Long after the most urgent phase of the financial crisis, interest rates in many developed countries remained at very low levels. One of the explanations to the historically very low policy rates was the pre-existing downward trend in global real interest rates. Global real interest rates had fallen by just over 4 percentage points since the end of the 1980s to just below 1 per cent in 2016, as a result of, for example, structural changes in the economy in several countries.[12] Earlier in history, real interest rates have also been at very low levels and then returned to more normal levels (see also Hansson et al. 2018 and Rachel and Smith 2015). There was considerable uncertainty, however, as regards how long the global real interest rate would continue to be so low.

In 2017 and most of 2018, the global economy has nevertheless been in a recovery phase. Forward-looking indicators have strengthened for a period and public finances in the euro area have improved. However, the combination of political uncertainty and remaining financial imbalances are still contributing to risks in Europe that can hinder recovery. For example, there are still a risk of certain euro countries not complying with the applicable macroprudential policy and fiscal policy regulations. In addition, there is a lack of structural reforms in several euro countries to increase the potential growth rate. The consequences of the United Kingdom's decision to exit the EU is also contributing to political and economic uncertainty. In the United States, the new administration after the presidential election of 2016 has pursued policies that restrict trade and if a trade war were to escalate, there is a risk of a significant slowdown in global growth.

In Sweden, however, monetary policy has had a clear impact on the economy. Inflation has been rising since the beginning of 2014, as have long-term inflation expectations, which have risen to around 2 per cent. During the second half of 2018, CPIF inflation has been over 2 per cent. Economic activity in Sweden is also strong and unemployment has declined. Monetary policy has contributed to this positive development.

9 Conclusions

The years 2006–2017 were dramatic, both in Sweden and globally, and were characterised to a great extent by the global financial crisis that broke out in 2008. Together with the continuing globalisation and technological advances, the financial crisis contributed to a number of comprehensive changes being made in the economic, financial and political areas, both here in Sweden and in the world as a whole. This gave rise not least to a number of existential issues, which included a detailed and broad discussion of the legitimacy and tasks of the central banks.

Among other things, experiences from the financial crisis gave rise to important questions about what mandates and tools central banks should have. Before the crisis, many central banks considered that monetary policy should not have the explicit goal of counteracting the accumulation of financial imbalances. It was considered more appropriate to use monetary policy to 'tidy up' after a financial crisis had occurred. But after the highly comprehensive cleaning operations required after the global financial crisis – which are still under way in some countries ten years after the start of the crisis – some economists have argued that, alongside the inflation target, monetary policy should have a clearer task of counteracting imbalances and risks like those that accumulated ahead of the outbreak of the crisis. It could be said that one justification for clarifying the tasks of monetary policy in this way is that a stable financial system forms a precondition for the monetary policy

12 There are several different explanations for the falling trend in global real interest rates. Among the most important are increased saving as a result of longer life expectancy and an ageing population, reduced innovativeness and lower growth, and higher demand for safe assets. See Ingves (2017) for a review of various possible causes.

transmission mechanism, the basis of which is that the impact of the central bank's interest rate decisions comes from how the banks set their interest rates for households and companies.

Other economists have instead emphasised the need for a new policy area – *macroprudential policy*. The global financial crisis was considered to be due not merely to shortcomings in how monetary policy had been applied. Instead, some economists saw it as a failure of traditional financial supervision, which had myopically focused on the development of individual institutions at the same time as it essentially ignored the financial bubbles that were expanding around the world. The existing financial supervision largely lacked both the knowledge and the mandate to adopt such a bird's eye view. According to many analysts, what was needed was a complement to the short-sighted 'microprudential policy' – a 'macroprudential policy' with the task of monitoring and counteracting risks in the system as a whole. Macroprudential policy could also be given more *targeted* tools to counteract the accumulation of risk in specific sectors than, for example, the central banks' relatively blunt interest rate tools. Examples of such targeted tools include loan-to-value ceilings and amortisation requirements, which can be aimed at counteracting risks specifically on the mortgage market. With macroprudential policy in place, monetary policy, according to some economists, should be able to continue primarily to stabilise inflation and the real economy.

Following the crisis, macroprudential policy came to be established in many parts of the world, for example in the form of special councils between authorities and as additions to the existing mandates of central banks or supervisory authorities. In Sweden, macroprudential policy came to be granted to Finansinspektionen, albeit with a slightly restricted mandate. A financial stability council was also set up, in which the Ministry of Finance, Finansinspektionen, the Riksbank and Swedish National Debt Office participate.

The crisis also demonstrated that the financial markets had become global and cross-border to a much greater extent than before. Regulation, supervision, analysis and not least cooperation at global and intergovernmental level therefore needed to be substantially reinforced (see also Johansson et al. 2018).

The crisis entailed that comprehensive work was initiated in many different areas at the point of intersection between macroeconomics and finance, for example, both among central banks and academics. This work is expected to continue for a long time to come. A discussion is also under way on the political level concerning the role of central banks in general and monetary policy in particular. For example, at the end of 2016, the Swedish Government appointed a parliamentary committee with the task of performing a review of the monetary policy framework and the Sveriges Riksbank Act (see Ministry of Finance 2016).

As we noted, the central banks in general had to carry a heavy burden in stabilising the world's economies after the financial crisis. The central banks' unique ability to rapidly create large amounts of liquid funds gives them a special position as lender of last resort, which is to say the party able to assist banks encountering temporary liquidity problems and thereby prevent disastrous domino effects in the financial system. The stability of the financial system has great significance for the role of the central bank as lender of last resort and for its tasks of both promoting a safe and efficient payment system and implementing monetary policy efficiently. In practice, this means that, in the future, central banks will also have to follow the development of the financial system closely and address tendencies towards risk accumulation in the system with the means at their disposal.

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The Riksbank's communication before, during and after the financial crisis

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It is not easy to communicate concern without concerning, but by being open and clearly communicating the present situation, what problems have arisen and what measures are available to remedy the problems, communication can nevertheless be a positive force in crisis management. Over the past 25 years the Riksbank has gradually enabled outsiders to follow, examine and assess the Riksbank's operations. During the years just before, during and after the financial crisis the Riksbank made comprehensive changes in its communication. The windows were opened wide, for instance by the Riksbank beginning to hold press conferences after every monetary policy meeting, by publishing its own forecast for the repo rate and by publishing attributed minutes of the monetary policy meetings. The Riksbank also began to state reservations in the press releases and we invested in introducing plain language throughout the organisation. We changed our way of thinking, by turning around the question 'can we publish this?' to 'why shouldn't we publish this?' This attitude came to characterise the Riksbank's communication during the financial crisis.

1 Introduction

There are very few provisions regarding the Riksbank's responsibility to provide information and reports in the Sveriges Riksbank Act. All that is stated is that the Riksbank shall provide a written account to the Riksdag (the Swedish parliament) twice a year and compile an Annual Report. But a central bank like the Riksbank, which is very independent, has an inflation target and is located in a country with a large financial sector, must nevertheless put a lot of effort into communication. The overall purpose of our communication is to ensure the Swedish people understand the significance of an inflation target and what tools are available to safeguard financial stability – otherwise it will be difficult for the Riksbank to attain its objectives. A high degree of independence namely requires a high degree of transparency to legitimise the Riksbank's decisions and measures, enable evaluation and scrutiny and also to increase the efficiency of our operations.

During autumn 2008 the international financial unease developed into a financial crisis that had major repercussions on the Swedish financial system. The crisis led to the deepest economic recession in Sweden since the Second World War. The stability of the entire global financial system was threatened and Swedish authorities were forced to take dramatic measures to ensure that the financial system in Sweden could function, see also Berg et al. (2018). The crisis came to affect the Riksbank's view of communication and also how we

* This description is to some extent based on Meyersson and Petrelius Karlberg (2012), and on the Riksbank's Annual Reports and the authors' own experiences, analyses and views. Pernilla Meyersson was Director of Communications at the Riksbank 2006–2013 and Ann-Leena Mikiver has been Director of Communications since 2013. A special thank you to Charlotta Edler for valuable comments.

developed our communication work and communication channels. This article describes what we did and how we did it and how it led to the Riksbank now being ranked as one of the world's most open and transparent central banks.

2 Communication on financial stability – a balancing act

In the field of financial stability in general, and particularly during a crisis, it is especially important to consider how much information can be mediated, at what point in time, who should mediate it and how. What risks can a central bank like the Riksbank describe and how can one communicate about them without arousing concern? How clearly can one point out individual banks and what one thinks that banks, other authorities and politicians need to do to reduce the risks in the system? The answers to these questions are not entirely clear.

In addition to being able to provide liquidity support to individual banks or to all participants in the financial system, when the crisis is already upon us, the Riksbank in practice has only one tool to prevent financial crises – to inform of and communicate about our assessments, the risks, and the measures that need to be taken to reduce the risks. The Riksbank has been criticised for being too low-key in communicating the risks in the financial system during the period prior to the financial crisis (see Hallvarsson & Halvarsson 2010).

As early as 2006 the Riksbank published its first so-called stress tests of the Swedish banks in the Financial Stability Report. These show how resilient the banks are to a severe deterioration in various areas. One of the stress tests consisted of a scenario where developments in the Baltic countries were much worse than expected. Two clear conclusions were communicated: Firstly, that this scenario was probable and secondly that it could radically deteriorate the Swedish banks' resilience. Despite the Riksbank having warned about economic developments in the Baltic region in its Financial Stability Reports since 2005, and despite using an increasingly sharp tone in each report that followed, the warnings were apparently insufficiently clear and sharp.

There are a number of factors that make it particularly difficult for this type of communication to have an impact with regard to financial stability. Firstly, it is difficult to arouse an interest in it and build up knowledge as long as everything is functioning as it should. The press conferences the Riksbank held in connection with the publication of the Financial Stability Reports attracted at most a handful of journalists up until 2008. It was only when the financial crisis reached our doors and US investment bank Lehman Brothers was declared bankrupt that interest dramatically increased. Secondly, the Riksbank needs to modify its tone when a crisis actually occurs. Then it is important to emphasise not the risks, but what is stable and to talk about the measures that are available to resolve the problems so that one can as far as possible create confidence in the financial system so the measures will have an effect.

During a financial crisis, there can also arise a conflict between transparency and confidence in certain situations. If the Riksbank were to say that a particular bank would not survive if it did not receive liquidity support soon, this could contribute to the bank going under. If the Riksbank instead were to say that the entire Swedish banking system is having problems obtaining funding, but that the Riksbank is prepared to provide the system with the liquidity it needs, then we are perhaps not completely transparent but we probably create confidence in the system and give the individual bank some breathing space to try to resolve its own problems. On the other hand, if the Riksbank were to claim in this situation that the banks have no problems whatsoever or were to refrain from communicating at all but nevertheless prepare liquidity support for the entire system, this would undermine confidence in the Riksbank. People would then no longer trust what we said, and would instead wait to see the results. During a crisis this could be costly.

3 The Riksbank's initial crisis communication

When the financial crisis occurred in 2008, the Riksbank decided early on that we would communicate anything that did not come under the headings of national security or corporate confidentiality. The data and material on which decisions were based, the considerations and reasoning behind these decisions, stress tests, estimates of loans losses, assessments of individual banks – more or less everything was communicated. All of the measures taken were communicated via press releases, press conferences or documents on which decisions were based. The Riksbank's website also carried a greater weight, now that new communication windows were opened, with web articles such as 'Financial unease', 'What does the Riksbank do?' and 'Frequently asked questions'. This was not the case in all countries. There were not many central bank governors who dared to conduct so much communication at the height of the crisis.

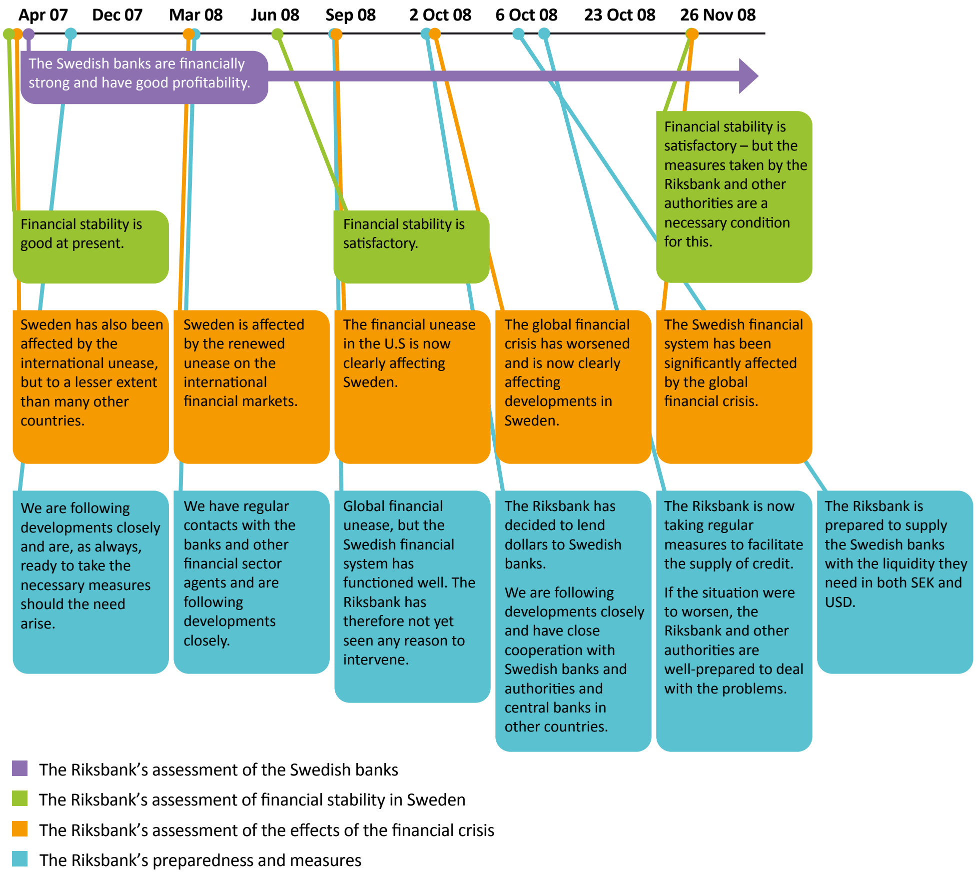
What had affected the Swedish financial markets at this point in time was essentially a problem with communication and confidence. The financial agents did not know whether one of their counterparts was sitting with a 'bad hand' in the form of non-performing loans or liquidity problems. They did not dare to trust one another, but withdrew, causing a liquidity shortage on the interbank market. In addition, developments in the Baltic region were a major cause of concern for the Riksbank.

3.1 The tone was gradually raised

A week after Lehman went bankrupt, the Riksbank began a long communication series of press releases that gradually raised the tone to mark what threat the current developments entailed for financial stability. In its press releases, the Riksbank focused on the message that the banks would receive the liquidity they needed. One aim was now to issue stability messages every other day in leading media. At the same time, the Riksbank made assessments and deliberations prior to every publication to anticipate the effect it might have and determine whether the timing was appropriate.

Figure 1 illustrates how the Riksbank gradually raised the tone as the financial crisis began to affect Sweden more and more. Firstly an assessment of financial stability and how Sweden was affected at that point in time. In the boxes at the bottom of the diagram it says which measures were available or were used. At the end of the most acute crisis stage, the final blue box in the figure was formulated with a quote form Stefan Ingves that the Riksbank was prepared to provide the Swedish financial system with the liquidity needed. A Riksbank employee recalls when Mr Ingves himself was editing the final details of the press release and said 'we are issuing a blank cheque here, we have to in this situation.' The Riksbank was clear about mediating the obvious during the crisis. This is where we are now, this is where we want to go and this is what we intend to do with the help of these tools.

Figure 1. The Riksbank's crisis communication



Source: Sveriges Riksbank

Access for the media was also increased, all media should quickly receive some form of response to their questions in the form of interviews, factual information or referrals from the Riksbank, and the Riksbank's experts and heads of department should be visible in the relevant fields. An endless amount of information and knowledge-building was needed with regard to how the financial system worked, how the Swedish payment system worked and why Swedish financial markets and participants were affected in the way they were.

There was frantic activity around the world. Governments, central banks and other public authorities were forced to take unique measures at high speed. When smoothly functioning financial markets suddenly cease functioning and financial institutions experience problems that threaten the stability of the entire system, measures need to be taken to maintain stability. But first one needs persistent and constant communication regarding the measures that will be taken if the situation requires it.

3.2 Balance between crisis awareness and normality

Communication that creates confidence in times of crisis is completely decisive. Although the Riksbank had, for instance, pointed out the risks in the Baltic region, the analyses and assessments did not gain a foothold. During the acute phase of the crisis, the Riksbank continued publishing our stress tests and showed how these would affect the individual banks to try to bring about changes. The Riksbank's own assessments indicate that this contributed to creating confidence in the financial sector. By describing different developments and calculating what might happen, one reduces the scope for speculation. Some banks use the Riksbank's stress tests in their own communication to create confidence.

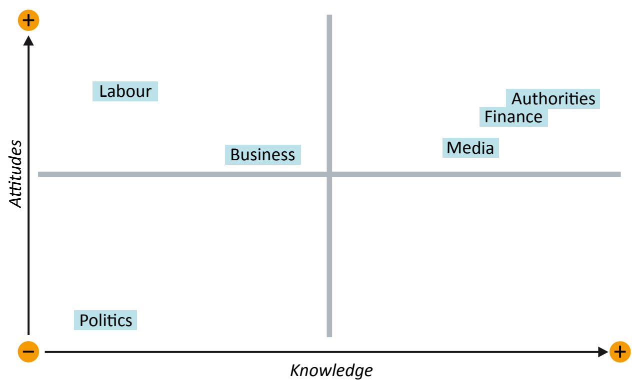
Despite Sweden's GDP falling by almost 6 per cent during the crisis, unemployment rising and the Riksbank having misjudged the strength of the financial crisis, as did most other analysts, confidence in the Riksbank increased during the height of the financial crisis and for a long time afterwards. Media researchers Johansson and Nord (2011) found in their report that the Riksbank's choice of message was marked by a balancing act between crisis awareness and normality – acknowledging the seriousness of the situation but not contributing to increasing concern.

4 Communication is a core business

Long before the crisis, the Riksbank had systematically worked to increase insight into its work and to make communication a core activity. Being clear about one's objectives, means and analyses is important to create a broad public support for an independent institution like the Riksbank. The independent status of the Riksbank places great demands regarding insight into the bank's activities so that they can be examined and evaluated. For almost 25 years the Riksbank has therefore been gathering experience of communicating the complicated relationships behind interest-rate decisions and assessments of financial stability. It has been a long journey, and not without problems, and it has led to the attitude that everything that is not covered by national security should be made public. Being criticised from time to time did not change this attitude – communication is a core activity and the Riksbank must deliver the messages over and over again, perhaps in a different way, but must never close the door.

Plain language has been another important part of the Riksbank's work on communication. What this entails is that information provided by public authorities should be simple, correct and comprehensive, and adapted to the target group. A large part of the Riksbank's management's job is to communicate so that all groups in society can understand, and to simplify, clarify and sharpen their messages and arguments. This became even more important during the financial crisis. New target groups began to be more interested in the Riksbank, to ask questions and want information not just about whether the repo rate would be raised or cut, but also about banks and their roles in society, the payment system, the financial lifeblood – the RIX system – and what tools the Riksbank could use in the crisis to prevent it spreading. To understand what information the different target groups need, the Riksbank has been measuring attitudes and knowledge levels among our primary target groups, see Figure 2. In 2007, three out of six primary target groups had a low level of knowledge about the Riksbank's work in the field of financial stability.

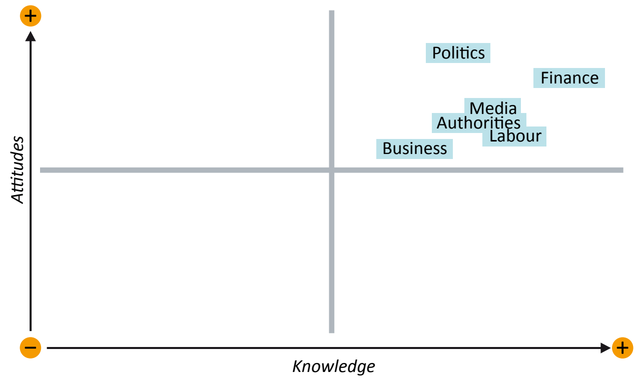
Figure 2. The target groups' attitude and knowledge about financial stability 2007



Source: StrandbergHaage Målgruppsanalys 2007

The first of these target group analyses thus showed that the knowledge level among some important target groups was low. In particular members of parliament and parts of the business sector showed deficiencies in knowledge about what financial stability entailed and what the Riksbank's role was. Confidence in monetary policy, on the other hand, was generally better among all of the target groups. One focus area for our communication during the period 2007–2016 was therefore to invite and communicate especially with the target groups with the lowest knowledge levels. In 2016, all target groups were in the upper right-hand corner of the figure, that is, they showed high levels with regard to both knowledge and attitude, see Figure 3. The measures taken, focusing on educating important target groups in the field of financial stability, had shown results.

Figure 3. The target groups' attitude and knowledge about financial stability 2016



Source: StrandbergHaage Målgruppsanalys 2016

5 Own forecast for the repo rate – windows wide open

The year before the financial crisis, the Riksbank started publishing its own forecast for the repo rate, known as the repo-rate path. At this point in time, there were not many central banks who dared to stick their necks out publicly in this way and say how they believed the policy rate would develop over the coming three years. There are still not many central banks that do this. At this point we also coined the expression 'this is the Riksbank's forecast and not a promise'.

The Executive Board decided at the same time that press conferences would be held following every monetary policy meeting, not just when the repo rate was adjusted. Not adjusting the repo rate was equally important information as adjusting it. Furthermore, the members of the Executive Board were to be named in the minutes of the monetary policy meetings, which until then had not been attributed. All of these measures were implemented to increase transparency and clarity with regard to the Riksbank's decisions and processes.

At first there were only a few professional communicators employed at the Riksbank and much of the information was formulated by the Riksbank's experts or by members of the Executive Board themselves. But the Riksbank's communications division was reorganised in 2007, just before the decision to begin publishing our own forecasts for the repo-rate path. More economists with experience of the Riksbank's policy departments were recruited and they came to take a much more active part in the internal processes leading up to external communication. Today there are communication experts involved in almost all of the Riksbank's activities from beginning to end, to ensure that the messages can be communicated to all target groups, that the external debate on the Riksbank's work is addressed and that the members of the Executive Board can answer all of the questions asked about the Riksbank's operations. The communication work at the Riksbank is not a support function, but an integrated and strategic part of the whole of the bank's operations.

5.1 Responsibility for transparency, information and dialogue

Long before the financial crisis in 2008 the Riksbank was publishing Monetary Policy Reports, Financial Stability Reports and our own journal Economic Review. Speeches and lectures at universities and schools in Sweden were regular features of the Riksbank's communication work, as were many meetings with various groups in society to explain the Riksbank's operations. But the financial crisis entailed a need to communicate more often and to new groups. We began to use the Riksbank website much more than before. This channel enabled us to address a broader target group and to introduce new communication activities. For instance, chats were introduced, both on newspaper websites and on the Riksbank's own website. Short analyses, known as Economic Commentaries, became another new channel to address more current issues. Open forum, Riksbank Studies and Staff memos are further communication activities and products that have been added.

But despite the major changes, it has been important to the Riksbank to change gradually, both what we do and how we communicate it, to avoid confidence problems. It is only when the analyses and tools are in place and have been tested, and when knowledge has been built up within important target groups to interpret and assess more information, that we have made and implemented the decisions on increased transparency and openness. The gradual increase in transparency has applied not only to monetary policy but also to financial stability.

5.2 Reservations in the press releases – risk of cacophony

In 2009, the Riksbank began to make public how individual board members had voted on the monetary policy decisions. In this way, it would become clear immediately whether the decision was unanimous or whether someone had entered a reservation against it. Such possible reservations were published with the name and a brief motivation for the reservation, and it was only when the minutes of the meeting were published around two weeks after the monetary policy meeting that the individual members could describe their stances and deliberations in more detail in speeches and interviews. This was to avoid a cacophony of different opinions when the actual decision needed to be communicated to all target groups.

Although it was of course not just the Governor who took the decision, but all of the members of the Executive Board of the Riksbank, it is the Governor who represents the Riksbank for natural reasons. In a media context it works better to allow one individual to speak on behalf of the bank rather than a collective, even if the Governor has had to put up with considerable criticism over the years.

The Riksbank's aim to increase insight into its work by becoming clearer and more predictable was not always correctly understood. The change in the regulatory framework for giving information, which was an expression of this aim, was publicly criticised (see more in Meyersson and Petrelius Karlberg 2010). This criticism was at times loud, sometimes warranted, sometimes not. Sometimes we needed a retake and sometimes we needed to repeat what we had done.

As a complement to the press releases and similar one-way communication, the communicators, experts and Executive Board members proposed a new approach in the form of more dialogue. For instance, a chat was introduced into the website, financial analyst meetings were webcast and opportunities were created for discussions with target groups. The Governor of the Riksbank became the first central bank governor to chat with the general public and is, as far as we know, still the only one to do so.

5.3 Plain language prize – an important milestone

To come to terms with the occasionally complicated and cryptic language used in the Riksbank's reports and other texts, a plain language project was started in 2007 for all employees of the Riksbank. Plain language means that information provided by public authorities should be simple, correct and comprehensive, and adapted to the target group. The reward came in 2009, when the Riksbank received the Language Council of Sweden's prize for plain language, the Plain Swedish Crystal, with the motivation:

'From complicated material, the Riksbank has succeeded in creating texts which are easy to grasp and can be understood by an interested general public. Factual material is summarised on several levels – in shorter and longer summaries, in informative headings and in the introductory sentences of each section. The Riksbank's plain language work is conducted in a long-term and sustainable manner and has been integrated into the bank's daily work.'

This prize was proof that working on improving clarity pays off. Plain language work is currently part of our day-to-day activities and we have employed a full-time plain language 'coach'. As Governor Stefan Ingves put it: 'Our job is to speak and write in a manner that everybody can understand. This is a never-ending task.'[1]

The communication during the actual crisis functioned well and was perceived both in Sweden and abroad as transparent, clear and confidence-inspiring. But the fact that the communication work functioned smoothly during the crisis was largely due to the preparatory work in the previous years, when the Riksbank increased its transparency, gained a new organisation and educated employees regarding the importance of communication.

6 Openness creates challenges – disagreements leave their mark

The global and for Sweden acute stage of the financial crisis came to an end in late 2009, although the after-effects were felt over many more years. Between the years 2010 and 2014, the disagreement between members of the Executive Board of the Riksbank increased, covering everything from repo-rate decisions and forecasts to questions regarding the Riksbank's equity and foreign exchange reserves. This coincided with a fall in confidence in the Riksbank (see Sommerstein 2013). Never before had individual members been so strongly criticised by their peers. This had always been a risk, as less transparent central banks were quick to point out.

One can reasonably say that transparency was used in a new way by the Executive Board of the time. How should one manage this disagreement without being criticised for attempting to gag the board members? The new Executive Board decided to resolve this issue by revising the communication policy (see Sveriges Riksbank 2016). During 2013, an approach for the Executive Board's external communication was introduced, partly to create clearer game rules and a more collegial atmosphere. The Executive Board members then agreed that they have joint responsibility for spreading knowledge about the Riksbank's views, tasks and work in addition to expressing their own views in the economic debate. They shall naturally be able to hold and express their own personal views, which is one of the points of having six different members on the Executive Board, but this shall be done with respect for colleagues and consideration for the Riksbank as a public authority.

External analysts said that the damage was already done to some extent. Marvin Goodfriend and Mervyn King, who evaluated the monetary policy conducted by the Riksbank between the years 2010 and 2015 wrote: 'The extent of divisions, and in particular the way they were expressed, was damaging to the reputation of the Riksbank. Members of

1 Quotation from a radio interview with Stefan Ingves in 2006.

the Executive Board must remember that their role is to present coherent arguments in a reasonable and persuasive fashion. If they use language which is designed to attack other members of the Board the public standing of the Executive Board is damaged. Minutes and interviews by Executive Board members displayed a degree of brusqueness uncharacteristic of normal public debate in Sweden' (see Goodfriend and King 2016).

6.1 The art of communication

Communication tools require a good hand, planning and constant evaluation, and yet there is very little advice on how to 'talk the walk', or as Alan Blinder said: 'Central bank talk can be done well or badly, and no one has yet formulated a set of clear principles (much yet clear practices) for "optimal" communication strategy, whatever that might mean [...]). Poorly designed or poorly executed communications can do more harm than good. So it is not obvious that a central bank is always better off by saying more.' (see Blinder 2009).

Transparency is always linked to risks and thus carries a price. Too much information, so that the main message is devalued, is one possible price. Communicating about risks and vulnerabilities in the financial system during a financial crisis is another risk that can aggravate the crisis. But a lack of transparency in a crisis is probably worse for credibility and confidence. It is a difficult balancing act that requires analysis and assessment in every situation. The Riksbank managed this during the financial crisis.

6.2 Communication developing as a monetary policy tool

In 2014, inflation fell further and inflation expectations declined. Moreover, the repo rate began to approach its lower boundary. The credibility of the inflation target was threatened and communication here needed to become more focused, uniform and clear, similar to when the inflation target was established in the early 1990s. But there was not the scope for nuances or reasoning in the same way as before. The Riksbank needed to convince people of the Executive Board's aim to attain the inflation target and the Executive Board communicated with a united front and clear message. The monetary policy decisions were supplemented with an insistent communication of why it was important to get inflation back on target.

At the same time as the message about the inflation target was clarified, communication also became a more important monetary policy tool. Oral and written communication was increasingly used to guide the financial market and financial journalists, although the repo-rate path itself has all along been a form of future guidance. Together with the repo-rate decisions, for instance, we communicated a 'high level of preparedness to act even between the ordinary monetary policy meetings' which further reinforced the message to the market and economic agents. Quantitative easing in monetary policy, that is, the Riksbank buying government bonds to push down interest rates and at the same time having a negative policy rate, are new elements in our monetary policy and once again require more dialogue with target groups to ensure that they understand the consequences of the Riksbank's decisions.

The Riksbank began warning as early as 2010 that the combination of rising housing prices and household indebtedness was unsustainable. The Executive Board of that time were strongly criticised for holding back and not cutting the repo rate enough or quickly enough, although the Board talked about holding back more than it did. The Riksbank was nevertheless perceived as tightening policy too much. But when inflation then continued to persistently undershoot the target, inflation expectations fell and the major central banks began to buy government bonds – then it was necessary to be clear about our main task: safeguarding price stability, which in this situation meant lower interest rates. But communicating the need to introduce a negative interest rate at the same time as households are continuing to borrow at a rapid rate is of course difficult.

7 Optimal level of transparency

The financial crisis showed how important it was to have one's own house in order before a crisis hits. Stability in the banking system and strong public finances makes it easier to communicate in a financial crisis. Furthermore you need the central bank to be ready to implement new measures quickly. Finally there is a need for communication to be ready to deliver messages creating stability and confidence.

A long row of measures to become more and more transparent led to the Riksbank receiving in 2014 the Central Banking Transparency Award from the Central Banking Journal (see Central Banking Journal 2014). The citation for the prize says that the Riksbank plays a pioneering role in central bank openness and clear communications by determinedly ensuring its processes and decision-making are transparent and clearly communicated.

Transparency, clarity and predictability have been and continue to be important ingredients for confidence in the Riksbank. Greater insight has contributed positively to confidence, but at the same time it is necessary to find the right balance. There is probably some form of optimal level for transparency, which varies depending on the surrounding factors. Too much and above all unclear information could be devastating at the wrong point in time. If there is too much disagreement at times and a lack of respect for different points of view, it can counteract its purpose and create instability instead of confidence, not only in monetary policy but also in questions relating to financial stability and the foreign exchange reserves, or the governance and management of the Riksbank. A high level of transparency also assumes that the Riksbank's own employees are constantly trained in formulating their analyses in such a way that they can be communicated to all target groups. We can never blame the recipient. If a message does not get through, it is because we who work at the Riksbank have not succeeded in explaining the context sufficiently well or that it is at a too abstract level – or possibly both.

Good crisis communication requires that structures and relationships based on trust have been built up earlier. During the 2008–2009 crisis, the media had a completely different 'monopoly' on news and information than they have today. Technology and social media enable individuals to become influencers, to set the tone and form opinions. The younger the target group, the fewer who have traditional media as their primary source of information. Working preventively to have a good crisis organisation ready currently means having ensured a stable and strong presence in social media. Today we cannot expect that a major newspaper interview will suffice to have a major nationwide impact on these target groups or the general public. Although traditional media will continue to be important in the Riksbank's crisis communication, the pace is faster and there are more channels now than during the financial crisis. Now it is necessary to communicate in more digital channels and the world around us has greater requirements regarding clarity, speech, responsiveness and dialogue. Getting one's message across in this media buzz through our own activities in social media is necessary to reach target groups that cannot be reached through the traditional media. The communication map looks different now. The Riksbank also needs to be on this map and to have wisely built up a position before the next crisis arises. Working preventively also means having cultivated a credible dialogue with the financial market agents, media and politicians who follow and examine the Riksbank.

8 Some lessons regarding communication

Sveriges Riksbank is today one of the world's most open central banks in terms of all possible measures, in both academic studies and also internal comparisons between different central banks (see for instance Dincer and Eichengreen 2014). There is a clear structure for most things that are communicated and with this comes a strategy that is currently based on being where the important discussions on the future of central banks are taking place – whether this is Sundsvall, Basel or Shanghai.

The financial crisis made the Riksbank pick up speed in building a more open, clear and modern authority. Communication has been and still is near the top of the Riksbank's agenda and it is always natural to bring in communicators at all levels. Central banks and other academic knowledge organisations are easily afflicted by the 'curse of knowledge'[2]. The financial crisis forced all employees to work in a completely new way with plain language to increase confidence in society.

Some of the lessons on communication learned by the Riksbank during the crisis were that it is particularly important in a crisis to push out the information before it is asked for and thus work more preventively and proactively than normal. One can always say something. Even if one does not know which measures need to be taken, how serious the situation is or who will be hit hardest, one can always talk about the facts. It is also important not to close any doors during the acute phase. If the Riksbank is forced to supply emergency liquidity assistance to a bank, it can rarely answer the question of whether the bank will go bankrupt later or whether it will need more money. It is also important to talk all the time about what is happening now and what the Riksbank's assessment is on the basis of the information that is available. Other lessons from the crisis were that the Riksbank's Financial Stability Report needed to become clearer and that the knowledge in this field was rather deficient at the time of the crisis. In December 2010 the Riksbank therefore began to publish recommendations to banks and authorities regarding which measures we considered needed to be taken to reduce the risks in the financial system.

Communicating clear and unambiguous messages is difficult. Doing so in a crisis is even more difficult. If one does not have the competence, routines, role allocations and systems in place before an acute crisis breaks out, it is difficult to communicate effectively. A lack of communication has moreover proved in many cases to aggravate crises for authorities, politicians and organisations. Good crisis communication means that one can instead affect the course of events and be a positive force in crisis management. The importance of cooperation and clear allocation of roles and responsibilities throughout the financial sector is also critical. One concrete example is the FSPOS network, (Finansiella Sektorns Privat Offentliga Samverkan – the group for private-public cooperation in the financial sector), which contributed to an open dialogue between authorities and the private financial agents during the financial crisis.[3]

To sum up some more general lessons from the last 25 years we have described in this article

1) The importance of having one's house in order prior to the crisis, namely having an established communication function. This includes both a strategic internal discussion of communication throughout the operations and a conscious build-up of relevant channels that can be used in both normal times and in a crisis.

2 This expression means that employees who know a lot about a particular subject can easily assume that everyone else knows as much as they do when they are communicating with others and this means they end up talking over the heads of important target groups and forgetting to explain contexts and meaning.

3 This group provides an important hub for the sector and one of the networks included consists of the head of communication from all of the organisations. The group has drawn up a clear agreement, which has been anchored with the management groups of all of the organisations (see FSPOS 2017). This describes who shall take the initiative for communication in the next crisis or attack and how we as a group want this to be done (proactively, openly and quickly).

2) A crisis will occur, it is only a question of when and how. We therefore need to have a constant focus on maintaining proactive crisis communication updated. This can mean, for instance, that under normal circumstances we need to use new channels to reach broader target groups so we do not need to do this in the midst of a crisis. It is also important to speak and write in plain language and ensure that there is relatively good knowledge of the Riksbank's work in Swedish society.
3) Transparency must be cultivated. The past 25 years have shown us that this requires a balancing act. The more open our communication, the more internal discussion of regulations and structure there will be to ensure confidence in the institution is maintained, even if opinions on factual issues are divided. An openness towards the outside world requires that we are also open internally so that the best analyses and messages can be produced.

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The Riksbank's work with financial stability before, during and after the global financial crisis

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When, following deregulation in the 1980s, Sweden was hit by an extensive banking crisis at the beginning of the 1990s, participants from both the private and government sectors were unprepared. The term 'financial stability' was coined, and work commenced on reducing the risks of a new banking crisis, and preparing in case a crisis nevertheless emerged. It was natural for the Riksbank to assume a leading role in this process, because it has a task of promoting a safe and efficient payments system, and a role of 'bank for the banks'. In this paper we describe how the Riksbank, after the domestic financial crisis of the 1990s, built up its capacity for analysing risks and vulnerabilities in the financial system. We also discuss the acute measures taken during the global financial crisis that culminated around 2008–2009, and a few lessons from that. Furthermore, we discuss how work has changed focus since the crisis subsided. We conclude by pointing out some future challenges for the work on financial stability.

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1 Background

Throughout history, from all parts of the world, there are plenty of examples of banks suffering liquidity problems, which have sometimes led to serious shocks and financial crises for the economy at large. A fundamental reason lies in the nature of banking business. Put simply, a bank's business concept is to lend money to companies and households on *long* term contracts, and raise funding through *short* term deposits from customers and *short* term borrowings on the capital market. This usually works without hitches. However, if for some reason doubts arise about the bank's financial position, this can lead to a bank run – that is, the bank's depositors wanting to withdraw their money at the same time, and the bank encountering problems in obtaining refinancing on the capital market. In that case, the bank's payment problems can force it to close. The problems can easily spread throughout the entire financial system due to concerns and uncertainty about the exposures and financial status of other banks.[1] When this occurs, we have been hit by a systemic financial crisis. The original concerns about the bank's financial position need not even be well-founded. It can suffice that there are concerns for this course of events to commence.

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1 A bank's exposure is an amount. The exposure is the result when the bank for instance grants a loan to a company or buys a bond. Exposures can also be created through derivatives and other transactions.

The economic costs of such financial crises are very high. In Sweden, the average growth rate of the economy was 3 per cent annually from 1950 to 1990. During the banking crisis in 1991–1993, Sweden's gross domestic product (GDP) instead dropped by 4 per cent in total. During the 2008–2009 financial crisis, it fell by 6 per cent in total. Since 1950, the only periods with tangibly negative effect on GDP are the two financial crises. Financial crises therefore also have significant monetary policy consequences.

The desire to avoid consequences of this nature is a fundamental reason for the existence of an extensive financial safety net in most countries, in the form of for example deposit guarantees and special supervision and regulation of banks. The central bank of the country naturally plays an important role in this safety net. The ability to quickly create large volumes of liquid funds enables the central bank to provide extra liquidity (for example in the form of emergency liquidity assistance) to banks facing temporary liquidity needs. The central bank is also the hub in the payment system used by the banks for intrabank payments. In Sweden, the Riksbank's role in this area is reflected in the Sveriges Riksbank Act, which stipulates that the Riksbank shall 'promote a safe and efficient payments system'.

There are thus good reasons for central banks to have a central role in both counteracting financial risks to reduce the risk of financial crises, and ensuring sound crisis management should a crisis nevertheless arise. The need for this work became obvious in connection with the banking crisis of the 1990s. It might therefore be of interest to describe in more detail how these efforts have progressed since then.

The Riksbank's work with financial stability in the past 20 years can be divided roughly into three periods – before, during and after the global financial crisis. These three periods are quite distinct and different in nature from each other. Before the crisis, focus was on drawing lessons from the Swedish financial crisis of the 1990s. Financial stability was established as a new policy area, and efforts primarily focused on assessing and explaining the risks in the financial system, and developing crisis management for future crises. During the global financial crisis, the work was about preparing and implementing concrete crisis measures. Many such measures had to be improvised, and there was not much time for theoretical rationale. Following the crisis, work was instead dominated by developing the global regulations and devising new, often cross-border institutions and collaborative initiatives to bolster the resilience of the global financial system. Put somewhat simply, it can be said that the pre-crisis financial 'fire brigade' attempted to analyse where the local risks of a fire were, and prepare to respond, while during the crisis they had to respond urgently and find new ways of putting out the fire. Finally, after the crisis, focus has largely been on preventive efforts to reduce the risk of both local fires and global financial forest fires.

2 Before the crisis

In the 1980s, after decades of strict regulation, some much-needed deregulation of the Swedish financial sector was carried out. However, the dramatic banking crisis that hit Sweden at the beginning of the 1990s made it painfully clear that both Swedish authorities and the banks themselves were ill-equipped to deal with the new financial landscape. Neither the Riksbank, nor the Bank Inspection Board (the predecessor of the Financial Supervisory Authority), nor participants in the financial sector had a sufficient overview of the risks that built up before the crisis. Furthermore, none of the authorities held an explicit mandate to systematically monitor developments in the financial system.

The crisis of the 1990s led to the insight that the Riksbank, in order to be able to carry out its task, needed to strengthen its analytical capacity relating to factors that could threaten the stability of the financial system. Not least, the analysis of banks needed reinforcing, as the banks' central role in the payment system meant that, in practice, stability in the banking system was fundamental to stable payments. When Urban Bäckström was appointed

Governor of the Riksbank and soon thereafter Stefan Ingves took the position of Deputy Governor, two people stepped into the bank who had each held a key role in managing the financial crisis of the 1990s – Mr Bäckström as State Secretary at the Ministry of Finance, and Mr Ingves as Head of the Swedish Bank Support Authority. From the mid-1990s, the new governors of the Riksbank focused consciously on building up a financial stability analysis. The objective was to avoid a new financial crisis. The means was to describe the existing risks.

2.1 The Financial Stability Report – a way of systematising the analysis

Much of the stability analysis came to be focused on the semi-annual report on stability in the financial system, which the Riksbank started issuing in November 1997. The Riksbank was clearly inspired by the Bank of England, which in the previous year had issued its first *Financial Stability Review*. Although at the time that publication did not contain any evaluation of the stability in the financial system, it nevertheless did contain a number of stand-alone articles on the theme of financial stability (see Bank of England 1996). Also, in December 1996, Norges Bank had published a report on financial stability with analyses of the banking sector and financial risks (see Norges Bank 1996).

So, although there were a couple of forerunners, the Riksbank was undeniably a pioneer in terms of publishing a separate, periodic financial stability analysis. In the beginning, disclosing the stability assessment of the central bank – or any other authority – was not without controversy. Many argued that it could rather lead to instability on financial markets. However, the Riksbank stuck to its view that there was a value in issuing a balanced assessment and that it would facilitate communication with financial market participants and other stakeholders (see for example Andersson 2008). Today, stability reports are issued regularly in a vast number of countries, as well as by a number of large international organisations such as the International Monetary Fund (IMF) and the European Central Bank (ECB).

From the start, the stability report was primarily an important tool for steering the Riksbank's internal analytical process. It forced the Riksbank to structure work and systematise the analysis. It also became an important channel for conveying messages to banks as well as authorities and politicians. By publishing in-depth analyses of observed risks in the financial system, the Riksbank hoped – in the absence of more concrete tools – that 'moral suasion' (that is, influencing through the power of words) could nudge Swedish banks into taking measures to reduce the risks.[2] The very approach of influencing through publicly discussing risks has come to serve as a model.[3]

During the well over 20 years in which the report has been issued, it has changed form and focus a few times. From the beginning, there were very limited analytical work to fall back on, and the Riksbank had to develop most of it on its own. The analyses were originally based more or less exclusively on public data, gathered from for example annual reports, quarterly reports, etcetera.

The analysis was subsequently refined with more detailed data, for example about the banks' lending and external financing as well as their exposures, which gave a clearer picture of potential contagion risks. This information was used in, for instance, stress tests, in which the banks' resilience to different types of shocks was tested. Initially, these stress tests were rather simple, even primitive, performed using, for instance, free software downloaded from the internet.

2 For a description of challenges in public communication, see for instance Meyersson and Mikiver (2018).
3 Examples include the IMF's Financial Sector Assessment Program (FSAP) and evaluations of different regulations, such as the Basel Committee's Regulatory Consistency Assessment Programme (RCAP).

2.2 Cross-border banks placed new demands

In 1997 the Swedish banking sector was essentially domestic, but at the end of the 1990s and beginning of the 2000s, the banks started to undergo sharp expansion in the Nordic and Baltic regions. As the foreign operations of Swedish banks expanded, it became clear that the Riksbank's stability analysis needed supplementing with information on the Swedish banks' foreign exposures and economic conditions in the countries concerned.

Because the banks were increasingly operating across borders, there was also a risk that dealing with a future crisis would be much more complex. Therefore, at the beginning of the 2000s, the Riksbank took a number of initiatives to improve cooperation and coordination in crisis management with the authorities of the Nordic and Baltic countries. For example, a number of cross-border *Memoranda of Understanding* were prepared (see for example Sveriges Riksbank 2006a, ECB 2005 and ECB 2008), and various working groups were set up to devise principles for both information sharing and burden sharing in a crisis. In the autumn of 2007, a large-scale crisis management exercise was carried out, involving a total of 18 authorities from the Nordic and Baltic countries (see Sveriges Riksbank 2007b, p. 73, for more details). A new such exercise is planned for 2019.

The Riksbank also pointed out early on the need for certain supranational agreements for managing crises in cross-border banks. Before the global financial crisis, however, political interest was limited in the EU, to put it mildly. The fact that Sweden subsequently chose not to join the Banking Union, which was launched in the wake of the crisis, might therefore possibly seem ironic in the context. Being part of the Banking Union would however have entailed a risk of Sweden losing influence, because it is not part of the euro zone. There is therefore good reason to hold back and carefully analyse what the consequences would be of deciding to join the Banking Union.

2.3 Articles in the stability report

Pretty much from the start, the Riksbank's stability report contained, besides the stability analysis itself, also articles on various themes. In the initial years, these articles focused on describing conceptually different types of risk in the financial system, although the articles also addressed current issues. For example, risks related to the 'millennium bug' and measures to deal with those risks were a recurring theme at the end of the 1990s, and ahead of the referendum on the euro in 2003, the euro and the potential effects on financial stability of switching to the euro were of course an important theme.

An article from the autumn of 2002 focused on the international expansion of Swedish banks. At that time, for instance, the banks' Baltic operations had not had time to grow to such a size that prompted concerns, and the risks were discussed at a fairly general and theorising level. The conclusions drawn were on the cautious side: '… [the risks] must be weighed against the lower risk concentration the banks achieve through diversifying their operations' (Sveriges Riksbank 2002, p. 69).

As the analysis was developed, however, the articles often started to have a more policy-focused content, in which the Riksbank could for instance point out deficiencies in financial regulations (Sveriges Riksbank 2001, pp. 66–73), develop the analysis regarding its role of acting as the lender of last resort – LoLR (Sveriges Riksbank 2003, pp. 57–73). It could be said that the Riksbank's fundamental stance during that period was that special regulation required the ability to demonstrate what, in microeconomic terminology, is usually called market failures, such as the presence of externalities or collective goods. Although it was easy to point to many well-known market failures that motivate special regulation and supervision of the financial sector, it could probably be said that the attitude to regulation before the global financial crisis was based more on theoretical rationale than in the subsequent years, when the view of the need for regulation was based more on tangible experience from the crisis.

2.4 The risks that led to the global financial crisis

How well did the Riksbank's stability report succeed in identifying the problems that led to the global financial crisis? With hindsight, it could be said both well and not so well. Pretty much nobody in the whole world had predicted a crisis of the global proportions that commenced in 2007 and became acute in September 2008, when the US investment bank Lehman Brothers filed for bankruptcy. However, in its stability report, the Riksbank highlighted at a relatively early stage the rapid credit expansion in the Baltic countries, and the risks this presented. However, like most other central banks, the Riksbank largely missed the risks in the banks' growing foreign funding, which, as it turned out, led to them encountering funding problems during the crisis.

2.4.1 The stability report and the Baltic countries

In the spring of 2004, the Riksbank warned of the risk of overheating in the Baltic countries (see Sveriges Riksbank 2004, p. 13). At the same time, the Riksbank pointed out that Estonia and Latvia had pegged their currencies to the euro via currency boards. Also, Latvia had pegged its currency via a basket of currencies which, in 2005, was to switch to a fixed rate against the euro. The Riksbank remarked – rather dryly – that, with fixed exchange rates, monetary policy would not be useful in curbing any overheating tendencies. In the 2005 autumn issue of the stability report, the Riksbank had a specific article on the lending of the large banks in the Baltic countries. Therein, the Riksbank observed that the expansion in the Baltic countries gave 'a positive diversification ... [but] that the development to date cannot continue at the same high rate ... [and that] increased volatility in earnings and more extensive exposures to non-traditional customers must therefore be seen as potential risks' (Sveriges Riksbank 2005b, pp. 38–39). In the spring of 2006 it was clear that credits in the Baltic countries were escalating at an unsustainably high rate in both the corporate and household sector, and in the summary of the stability report the Riksbank warned that the sharp credit growth could not continue 'indefinitely' (Sveriges Riksbank 2006b, p. 8). In the autumn of 2006, the Riksbank also pointed out that the risks to Swedish banks had become increasingly evident, especially for the two banks with the greatest exposure to the Baltic countries, and whose earnings largely came from operations there (Sveriges Riksbank 2006c, pp. 10–11, 29). The signs of the Baltic economies overheating were now becoming increasingly clear. The Riksbank determined that the fiscal policy measures taken by the Baltic countries had not sufficed to curb the growing demand, while at the same time the fixed exchange rates made it difficult to use monetary policy to counteract the overheating (Sveriges Riksbank 2006c, pp. 10–11, 29).

While the Riksbank pointed out worrying factors in the Baltics early on, with hindsight it could be said that the language used in the report initially toned down the risks that these developments posed to Swedish banks (Sveriges Riksbank 2005a, p. 30, and Sveriges Riksbank 2005b). It was not until 2006 that the tone of the stability report started to sharpen, and the risks to the Swedish banks were taken seriously.

2.4.2 The liquidity crisis of 2007–2008

In the spring of 2007 – in the yet relative calm before the storm – the Riksbank described, in a separate article in the stability report, the incipient problems on the American subprime market – a factor that had not yet had any really serious repercussions in the global financial system. However, these problems later came to largely form the basis of the confidence and liquidity crisis that broke out among banks with international operations. The subsequent analysis showed that nobody had fully understood how American banks had repackaged mortgages into investment-grade instruments, and what the link was between the US mortgage market and global financial markets.[4]

4 Some leading academics, such as Rajan (2005), pointed out that there were problems, but often underestimated the consequences and did not reach a wider circle.

In the stability report, the Riksbank also pointed out the historically low risk premiums on various asset markets, and the risks of sharp price corrections ahead in such markets (Sveriges Riksbank 2007a, p. 17). In light of the turbulence that prevailed during the period just before the bankruptcy of Lehman Brothers, the Riksbank published an article in the stability report on new challenges relating to financial stability. A number of 'new' risk factors were noted: reduced transparency due to complex instruments, increased dependence on market liquidity, faster-moving financial markets, an increased risk of cross-border contagion of problems, and growing operational risks. The Swedish authorities thus possibly had a somewhat greater understanding of the global financial risks than had been the case before the crisis of the 1990s. At the same time, they hardly suspected the full extent of the contagion risks before the crisis that commenced in 2007.

3 During the crisis

In August 2007, the Executive Board of the Riksbank found that the global risks could create a situation in which the Riksbank and other Swedish authorities would need to take concrete action at home too. The Swedish financial fire brigade needed to review its toolkit. Since there was no hardware store offering ready-made tools, the Riksbank had to largely develop its own, often completely new instruments. Although there was inspiration to be found in international and past examples, a lot thus had to be home-crafted (see Ingves 2018).

After the bankruptcy of Lehman Brothers in September 2008, the Riksbank developed several new extraordinary facilities by providing liquidity in different forms to different parts of the financial system.[5] At most, the Riksbank lent USD 30 billion in the spring of 2009, and around SEK 375 billion in November 2009 (see for example Sveriges Riksbank 2010a, p. 35). The size of the Riksbank's balance sheet more than tripled. During the crisis, the Riksbank negotiated swap agreements with the Federal Reserve (Sveriges Riksbank 2008b) and ECB (Sveriges Riksbank 2009b, p. 36, or Sveriges Riksbank 2010a, p. 24) and provided support to Latvia (Sveriges Riksbank 2008f) and Iceland (Sveriges Riksbank 2008a).[6] Furthermore, the Riksbank gave emergency liquidity assistance to the Swedish subsidiary of the Icelandic bank Kaupthing (Sveriges Riksbank 2008d) and Carnegie (Sveriges Riksbank 2008e) and assisted the Government with devising a stability plan and a guarantee programme for bank funding.

With a certain degree of self-criticism, it can be said that, before the crisis, the Riksbank had possibly focused too much on theoretical rationale and too little on operational issues in terms of how to provide liquidity in different ways. In operational issues, the Riksbank was forced to improvise and learn quickly from other central banks. Also, before the crisis, the departments worked rather in parallel and independently of each other. The crisis demanded new forms of decision-making, new forms of collaboration and new activities to create the facilities that were necessary for the Riksbank to fulfil its task of ensuring the functioning of the financial system in Sweden.

3.1 Central bank measures

More fundamentally, it could be said that there are at least six different types of measures that a central bank can implement in a financial crisis, besides the task that it normally performs.

5 For a summary of the measures taken by the Riksbank and other Swedish authorities during the financial crisis in autumn 2008 (see Sveriges Riksbank 2009a, pp. 29–31). Riksbank.se also contains a summary of the measures taken in 2007–2010.
6 A currency swap is an agreement to buy (or sell) a currency today and then sell (or buy) it back at a given future day and at a given price. A swap agreement between central banks is in practice a form of loan from one central bank to another.

First, the central bank can introduce general facilities that provide liquidity in the domestic currency to a greater extent than in normal times.[7] The central bank can create more central bank money by a simple push of a button, and there are no limitations on this type of liquidity supply. For example, during the crisis the Riksbank lent at most SEK 375 billion in various general facilities. As the payment system is closed, these measures are primarily aimed at creating trust between participants in the financial system. It means that a bank that borrows from the Riksbank must pledge collateral with a value equalling what the bank may borrow in liquid funds; collateral that it could normally otherwise use on the markets to access liquid funds. A bank granted a loan from the central bank uses these funds to pay another bank, and at the end of the day, everything comes back to the central bank. This type of central bank lending is thus primarily important if confidence between different financial entities has been undermined. In the same way, quantitative easing involves the central bank buying collateral and paying with central bank funds. Hence, the central bank's balance sheet expands and the banks can replace less liquid funds (such as different types of securities) with the most liquid ones – central bank funds. By lending on longer maturities at a predetermined interest rate, the central bank can also signal that the interest rate will remain low for a long period of time. This is exactly what the Riksbank did with the loans issued at a fixed rate in 2009 (see Elmér et al. 2012).

Second, a central bank can direct liquidity support at an individual bank, in the form of emergency liquidity assistance. During the crisis, for example, the Riksbank provided emergency liquidity assistance to Kaupthing's Swedish subsidiary, and Carnegie. There is a long tradition of emergency liquidity assistance, and it has long been considered a core task for central banks (see Sveriges Riksbank 2003, pp. 57–73). The background is the problem we described in the introduction – that banks normally lend on a long maturity, while their funding often has a short maturity and is determined nominally. This difference in maturities, combined with the fact that the deposits are nominally determined, creates a risk of bank runs (see for example Diamond and Dybvig 1983). Much of the discussion regarding emergency liquidity assistance comes from Walter Bagehot (Bagehot 1873), and Paul Tucker has summed it up as 'to avert panic, central banks should lend early and freely (i.e. without limit), to solvent firms, against good collateral, and at "high rates"' (Tucker 2009, p. 3). Another premise for a bank to obtain emergency liquidity assistance is normally that it must be systemically important. If all banks can obtain liquidity too easily from the central bank on extraordinary terms, this would risk weakening the banks' incentives to reduce their own risks, that is, it would create a moral hazard. However, it is not easy to quickly assess whether a bank is solvent and systemically important. Such assessments also vary significantly over time, as illustrated by the Kaupthing and Carnegie cases. It is highly improbable that either of these banks would have been considered systemically important before the crisis. However, in the volatile landscape that ensued from the bankruptcy of Lehman Brothers, and before more structural crisis measures (such as the reforms of the deposit guarantee) had been launched, the Riksbank found it far too risky to let these banks go bankrupt (see also Ingves 2018).

Third, the central bank can provide liquidity in a foreign currency. For example, during the crisis the Riksbank lent USD 30 billion in general facilities.[8] In order to do so, the central bank must have access to the foreign currency, either in its own foreign exchange reserve or by means of borrowing the currency as needed. Sometimes – if the international relations are good and it is in the interest of the counterparty – the central bank can borrow the foreign currency from other central banks via a swap agreement. If the central bank must instead obtain the foreign currency via markets, there is a risk that this would be very expensive if it

7 Normally, the central bank serves as a liquidity provider, by ensuring that the economy has access to the liquidity it needs. In order for this to work, however, the liquidity needs to flow fairly freely between different banks and other participants in the economy. In a financial crisis, these transfers do not function as smoothly, and the central bank may need to provide extra liquidity to ensure that the payment system continues to work.

8 Emergency liquidity assistance in foreign currency is also possible.

only borrows once a crisis has struck. During the crisis in 2008–2009, the Riksbank used both its own foreign exchange reserve and the swap agreement with the Federal Reserve that was specially created in the crisis. Liquidity support in foreign currency can either be granted in the form of a general facility, or directed at an individual bank. The banks need foreign currency if for instance they have obtained funding abroad, and need to repay the debt in a foreign currency. It should be noted that, if the central bank lends foreign currency and the banks can use collateral in Swedish krona, the total privately held collateral pool in Swedish krona shrinks.

Fourth, the central bank can adjust which collateral it accepts from banks. In normal times, the banks must have collateral for executing payments in the payment system. If the central bank accepts a wider set of collateral (or makes a downward adjustment to the haircut), banks can increase their borrowings. This measure was also used by the Riksbank during the crisis, as the banks were permitted to a greater extent to use their own covered bonds as collateral for loans from the Riksbank.[9]

Fifth, the central bank can interact with a wider set of counterparties in the economy. Normally, the banks are intermediaries between the central bank and the rest of the economy. For example, the main monetary policy tool is the repo rate which governs what the banks need to pay when they borrow from or deposit money with the central bank. Usually, only larger banks are included in this monetary policy process directly with the central bank. The repo rate directly affects the interest rates that the large banks (and other banks) charge to their customers, and through expectations about future interest rates which then also affect economic development. In a crisis, trust between the banks can vanish, and in that case the banks are not uniformly affected by the repo rate and the 'transmission mechanism' loses momentum. One way for the central bank to alleviate this is to increase the number of counterparties, that is, by acting directly in relation to more participants in the economy. Often, however, it is difficult to do anything about the number of counterparties in the short term, since this requires substantial operational resources, and takes time to implement. During the crisis, however, the Riksbank was also considering this to reach out to a broader set of banks.

Sixth, the central bank can also contribute its knowledge about financial crises by assisting in devising appropriate measures elsewhere. For example, during the crisis, the Riksbank seconded a number of its employees to the Ministry of Finance to participate in efforts to devise the Government's stability programme. Through its international contact network, a central bank can also sometimes act to reduce risks abroad, which can be important to the domestic financial stability. During the crisis, for instance, Riksbank employees helped analyse the problems in Iceland, and the Riksbank helped out with a swap agreement. In Latvia, Riksbank employees contributed to the IMF's evaluation of Latvia's banking problems and currency board. The Riksbank also signed a swap agreement with Latvia. A clear purpose of these measures was to reduce the risks of the crises in these countries spilling over to the Swedish financial system.

3.2 Some lessons from the crisis

In many ways, the global financial crisis put the Riksbank up against a number of challenges, and now, ten years later, it might therefore be important to consider which lessons can be learned from this.

One lesson is that it is important to *quickly identify the problem*. As early as when the problems on the global financial markets escalated in August 2007 – on 9 August the ECB was forced to provide EUR 95 billion in liquidity when French banks were teetering on the brink of collapse – signs could be seen of international liquidity risks increasing, and therefore a risk of a spillover into Sweden.

9 Covered bonds have an additional protective layer for the investor. In order for the investor to make a loss, two factors would be required – the bank would need to go bankrupt, and also the underlying assets, often mortgages, included in the cover pool would need to fail to generate sufficient cash flows.

Another lesson is that it is a case of *quickly identifying potential, concrete measures*. There is often urgency in a crisis and measures need to be implemented based on incomplete and uncertain information. The question is what can be done, and how fast. For a central bank, it is often a case of using its balance sheet. It is also a matter of being concrete, and finding measures that can be put into practice.

It is also a case of *carrying out measures sufficiently quickly and to a sufficient extent*. This requires decision-making power. Measures that are too small risk aggravating the situation – it is a matter of showing that the central bank is prepared to do what it takes to restore confidence.

It is therefore also important that there is *political consensus and coordination between authorities*. Authorities and politicians need to agree on the grounds of the various crisis measures, because political disunity can undermine confidence in the measures. Work must be distributed and coordinated both within the country and with relevant foreign authorities. Communication regarding measures and decisions also needs to be coordinated. An example of such coordination is the actions of the Swedish authorities and the Swedish government when international financial markets ceased functioning after Lehman Brothers went bankrupt. At the time, the banks could no longer borrow on capital markets, or could only do so by pledging their very best collateral. The Swedish National Debt Office then quickly offered a facility which, in practice, meant that the banks could exchange their covered bonds for treasury bills. The Riksbank carried out a number of crisis measures and supplied liquidity in a number of ways. The Government presented a bill for a higher deposit guarantee and a more extensive crisis package, including a government program whereby the banks could issue debt with a government guarantee.

There was also substantial and close cooperation on the international front. The large central banks continually shared information with each other, for instance as part of the Bank for International Settlements (BIS) cooperation. Important informal cooperation was also gained through the IMF. In the crisis, central banks also coordinated various measures to attain maximum effect. One example of this is that many of the terms and conditions for auctions in US dollars were synchronised across countries. As a longstanding member of the BIS and the central bank of a G10 country, the Riksbank could benefit from this cooperation, which facilitated crisis management, hence benefiting the Swedish economy. Dependence on *good relations and advanced cooperation with foreign authorities* thus increases drastically in an international financial crisis. It is therefore crucial, in times of financial stability, to build effective information channels and trust between authorities, both within the country and across borders.

Another lesson is that financial stability is ultimately about *trust*. This was the reason why the Riksbank, early on in the crisis, declared that it 'is prepared to provide the liquidity necessary to safeguard financial stability and ensure the smooth functioning of the financial markets in Sweden' (Sveriges Riksbank 2008c). In order to build trust, *transparency* is key (Meyersson and Mikiver 2018). Publicly disclosing the extent of the problems reduces the risk of speculation about how bad it is. Often, the very uncertainty about the scope of the problems is at least as large a source of concern as the actual problems themselves. When Kaupthing and Carnegie received emergency liquidity assistance, it was therefore important to the Riksbank to have the banks publish information about this. Also, it turned out that the information had a calming effect on markets, and strengthened the markets' confidence in these banks.

An internal lesson is that a *wide variety of different types of knowledge and expertise* is needed, of both an analytical and a more operational nature, in order to be able to deal with a financial crisis, and that it is crucial to have carried out *crisis simulation exercises*. During the financial crisis, it became clear that operational knowledge is essential to the ability to devise sufficiently concrete and viable measures. It is however too late to build up such knowledge once the crisis has actually struck. It is also important to create a climate internally at the organisation that breathes ‘decision time’. Questions cannot be discussed for too long, it’s a case of trial and error. It is more important to act fairly quickly and about right, than to analyse everything yet again to get everything completely right – but too late. If a decision is not quite right the first time, it can be corrected the next day. In such a situation it is important that there are clear lines of responsibility, that senior managers can delegate, that there are common goals and that there is sufficient flexibility to use new forms of working and cooperation. Experience also shows that *having a substantially different organisation in a crisis than in normal times does not work*. Before the crisis, the Riksbank had concrete plans to activate a separate crisis organisation in the event of a crisis. It turned out that this was not used in practice however; rather, the work fell back on the Riksbank’s regular organisation, with each department preparing the decisions of the Executive Board in their respective areas of responsibility. However, one aspect did change; in the crisis the cooperation between the departments increased considerably.

Many of the crisis measures that were launched during the financial crisis were analysed based on their expected effects, and how they could be introduced in practice. However, an aspect that attracted less attention was what happens afterwards, and the risk of the crisis measure being permanent. It is however important to *consider different exit strategies at an early stage*. The need to *follow up on what the banks do with emergency liquidity assistance* was also a new lesson. Before the crisis, the Riksbank assumed that one of the central bank’s most important roles in restoring financial stability in a crisis was deciding whether or not a bank should receive emergency liquidity assistance. It was not foreseen that the decision to grant emergency liquidity assistance was merely the start of that work.

In retrospect it is probably fair to say that the crisis management of the Riksbank and other Swedish authorities during the global financial crisis was relatively successful. The massive liquidity supply initiatives eased the financial crisis. Although such massive lending posed risks, it paid off. The payment system worked without any major disruptions. Lending and possibilities of managing risks took a blow in the most acute stages, but could nevertheless gradually be restored. While GDP indeed fell drastically in 2008 and 2009, the Swedish economy recovered relatively quickly. It can also be noted that the Riksbank actually made a profit from it.

4 After the crisis

Globally, the financial crisis exposed major risks in the banks’ operations, which both authorities and the banks themselves had grossly underestimated. The banks had too little capital, and insufficient liquidity. The contagion risks between banks in the same country and between banking systems of different countries were greater than most had imagined. The risks needed to be limited in many ways. It was clear that stricter rules were required, and that these rules needed to be global in order to promote financial stability effectively. The ten years that have passed since the crisis have therefore been dominated by a global regulation agenda, and this has also had institutional consequences. The crisis and the global changes have also affected developments in both the EU and in Sweden.

4.1 Global level

The aftermath of the global financial crisis gave rise, as we have described, to broad, global reform efforts aimed at reducing the risk of further financial crises and limiting their consequences should they nevertheless occur. The regulatory changes were so vast that some experts have spoken of a ‘regulatory tsunami’.

4.1.1 The institutional framework

At the global level, the Basel Committee took the lead following the crisis and tightened demands on the banks. As a consequence the Basel Committee became much more political than it had been before.[10] The Financial Stability Board (FSB) also took on a greater role in coordinating reform efforts between the global standard-setters and also transformed itself into a formal legal unit, which has given it a more significant role as the extended arm of the G20 countries in the financial area.[11, 12]

4.1.2 New rules and a new policy area

The most obvious examples of new rules after the crisis are found in the banking sector. In the Basel Committee on Banking Supervision, new and stricter requirements were agreed for banks in a comprehensive new set of standards, Basel III.[13] According to the new global standards, the banks must hold much more capital and also of better quality, that is, capital that can immediately cover losses. They also entail an obligation for the banks to fulfil a complementary capital requirement, the leverage ratio requirement, in which exposures are not risk-weighted. Basel III also contains completely new liquidity requirements; one that banks must have a certain volume of liquid funds (LCR) and one that the maturity of liabilities may not be too short in relation to the maturity of assets (NSFR).[14] Another element of Basel III is that countries shall introduce a capital floor forcing banks permitted to calculate their own risk weights to hold capital not lower than a percentage of what banks that use the Basel Committee's standard models have to hold. These standard models have also been reviewed and made stricter.[15]

Requirements on banks have thus been tightened. At the same time, another clear lesson from the global financial crisis is that it does not suffice to merely ensure that each individual institution is stable. The authorities must also analyse and assess the risks in the financial system as a whole, and tools are also needed for counteracting the system-wide risks identified. These insights have given rise to the development of a completely new policy area – macroprudential policy.[16] Unlike traditional (micro)prudential policy focusing on risks in individual financial institutions, macroprudential policy is about the risks in the financial system *as a whole*. It focuses on the links within the financial system, that is, how different institutions are exposed to each other, and the extent to which different institutions are exposed to the same type of sectors or risks, such as the real estate market.

Although macroprudential policy is still a policy area with theory and practice under development, and many macroprudential issues are rather national, the crisis led to some concrete measures at the global level. For example, Lehman Brothers' bankruptcy made it clear that, from a financial system perspective, it was more important to ensure that some banks survived than others. It was therefore natural to impose stricter demands on these *global systemically important banks* (G-SIBs) than on other banks. It also became clear that

10 The Basel Committee on Banking Supervision is the global standard-setter for banking rules. Its purpose is to promote global financial stability by improving and harmonising both banking rules and supervision of banks. Members of the committee are central banks and supervisory authorities from 27 countries worldwide. Both the Riksbank and Finansinspektionen are members.

11 Some of the most important global standard-setters in the financial area include the Basel Committee on Banking Supervision (BCBS), the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO).

12 The FSB is an international organisation that monitors and assesses vulnerabilities affecting the global financial system and proposes actions needed to address them. Its members consist of the Ministry of Finance, central banks and supervisory authorities from the G20 countries, as well as a number of global standard-setters. No Swedish authorities are formal members of the FSB, but in a handful of cases Swedish authorities may participate by special invitation from the FSB.

13 The first part of Basel III was adopted in December 2010 (BIS 2010) and the last part in December 2017 (BIS 2017).

14 The Liquidity Coverage Ratio – LCR – entails, somewhat simplified, that a bank must hold sufficient liquid funds to survive a stressed scenario in which outflows are greater than normal during 30 days. The Net Stable Funding Ratio – NSFR – entails, somewhat simplified, that the bank must hold a sufficient amount of stable funding to cope with a stressed scenario for a year.

15 For a description of the Basel III standards, see for example Niemeyer (2016).

16 It can in any case be said that macroprudential policy has been *presented* as a new policy area. Some of the macroprudential measures discussed today however resemble measures that existed during the period with more regulated capital markets, see for example Sweden before 1985. A number of Asian countries introduced similar rules even before the global financial crisis.

the risks to financial stability varied over time. National authorities were therefore given the possibility of setting higher capital requirements during certain periods, and other countries undertook to respect these higher requirements under certain conditions.[17]

Also, together with IOSCO, the Basel Committee agreed on margin requirements when an institution trades in derivatives that are not centrally cleared. One of the reasons is to ensure that trade in standardised derivative contracts is largely cleared through central counterparties in order to reduce contagion risks.

Other global standard-setters also tightened demands on various financial institutions. For example, the FSB prepared guidelines for recovery and resolution plans for banks. The FSB also developed standards for a new type of debt that banks must have.[18] If the bank defaults, this type of debt must be able to cover losses or be converted to shares.

4.1.3 The Riksbank's work globally

For Sweden, which is a small, open economy with a large banking sector that largely obtains its funding abroad, the global risks of contagion to the Swedish financial sector are evident. After the crisis, the Riksbank has therefore put a lot of effort into working towards sufficiently strict global rules. When global agreements are actually in place, the strategy has been to ensure that they are not watered down. These efforts have been eased considerably by the fact that Stefan Ingves was elected Chairman of the Basel Committee in 2011. Although he does not represent Sweden in his chairmanship, employees of the Riksbank have, through this, gained a unique opportunity for insight into the negotiating game and for influencing the new global standards. His chairmanship has also made other countries' representatives much more interested in the Riksbank's views. The Riksbank has also actively participated in the IMF's work on global imbalances and risks.

4.2 EU level

It is difficult to make global agreements legally binding. Instead, the legislative acts are taken at EU or national level. The EU has largely introduced the new global standards and has chosen to increasingly do so in legislation through regulations that are directly applicable in all Member States, rather than through directives, which must be interpreted and introduced in national law. This has meant that EU regulations have been harmonised to a greater extent than was previously the case.

Negotiations regarding how the global regulations are to be implemented in the EU have been challenging however, because the structure of both the financial sector and other key sectors varies considerably between EU countries. For example, many of the identified imbalances have come from real estate markets, which function quite differently in different EU countries. Finding common EU frameworks for macroprudential policy regulations has therefore been particularly challenging, while at the same time there has been a great need for, and political pressure on, a common framework in order to promote the single market.

4.2.1 The institutional framework

The crisis also led to a significant change in the institutional framework in the EU. In 2011, the EU's three supervisory committees at the time were transformed into new, independent authorities: one for banks – European Banking Authority (EBA); one for insurance – European Insurance and Occupational Pensions Authority (EIOPA); and one for securities markets – European Securities and Markets Authority (ESMA). The powers of these authorities were

17 An example is the countercyclical capital buffer (CCyB); all Basel members are committed to follow the levels (additional capital requirement of up to 2.5 percentage points) applied by other Basel Committee member countries to exposures in that country.

18 Total Loss Absorbing Capacity (TLAC) for global systemically important banks involves, somewhat simplified, a requirement for the world's largest and most important banks to have sufficient capital – or debt that can be converted to capital – to tackle a major financial crisis.

also extended and now consist of making sure that the new financial rules are correctly implemented; devising technical standards to supplement the rules; and ensuring that regulation and supervision are appropriate, effective and harmonised in the EU. The supervisory authorities are the members of these three authorities.[19] If a country's banking supervision authority is outside of the central bank, the country's central bank is normally an observer in the EBA's board.[20]

Furthermore, insights that a system-wide perspective was needed had clear institutional consequences at EU level. The EU decided to create an entirely new organisation, a European macroprudential body – the European Systemic Risk Board (ESRB). This body, which started operating in 2011, was tasked with identifying, preventing and mitigating risks in the European financial system. The ESRB has soft tools, that is, the possibility of issuing warnings and recommendations to national and European authorities or organisations. Its board mainly comprises the heads of central banks and supervisory authorities in the EU, and the central banks hold the voting right.

A few years later, in 2014, further important steps were taken in developing the institutional framework for the financial sector in Europe, through the creation of the Banking Union. This involved the ECB assuming responsibility for supervising significant banks in the countries of the Banking Union.[21] The ECB was also given shared responsibility with national authorities for macroprudential policy in these countries. The institutional framework in the EU was further enhanced at the beginning of 2016, when the Single Resolution Board (SRB) started operating. It was given responsibility for the recovery and resolution of crisis banks under ECB supervision, and cross-border banking groups in these countries. A resolution fund to finance such measures is being built up.

4.2.2 The Riksbank's work at EU level

The Riksbank has been actively involved in the intensive regulatory work in the EU after the crisis, and contributed analyses and opinions to the Ministry of Finance ahead of the various EU negotiations in which the Government has participated. This has included how to devise the new European supervisory framework, the revised capital requirement regulation and directive and the new framework for crisis management in the banking sector.

The Riksbank has also been very active in the work of the ESRB. Already when the ESRB started operating at the beginning of 2011, Stefan Ingves was elected chairman of the ESRB's Advisory Technical Committee (ATC), a position he held until the spring of 2017. The Advisory Technical Committee came to develop into much of an 'engine' for the ESRB work.

For what will soon be eight years, the ESRB has highlighted risks to stability in the financial system in a number of different areas. For example, the ESRB has recommended that the authorities concerned reduce the risks related to the banks' lending in foreign currency and funding in USD, and issued warnings to a number of EU countries, including Sweden, regarding risks in the housing market. The ESRB has also been a driving force recommending EU countries to introduce effective organisational structures and instruments for macroprudential policy.

Through Stefan Ingves' chairmanship of the ATC, the Riksbank has had close contacts with the ESRB secretariat and good opportunities to help devise the ESRB's operations. This has also given a valuable insight into how the participants concerned view various issues. Also, Riksbank employees have participated in a large number of expert groups, enabling the Riksbank to influence the ESRB's work in specific areas. As Sweden is not part of the Banking Union, we lack access to the ECB's macroprudential discussions. It is therefore particularly important for Sweden to safeguard the ESRB as a forum for macroprudential discussions in the EU.

19 In Sweden's case, Finansinspektionen.
20 In Sweden's case, the Riksbank.
21 These countries are currently the same as those included in the euro area, but other EU countries are able to join.

4.3 Swedish level

The global regulatory agenda has also largely determined the development of the Swedish financial regulatory framework, particularly via directly applicable EU regulations. Furthermore, institutional changes within the EU have been reflected in Sweden, although the division of responsibility between the Swedish authorities has partly deviated from the structures in the rest of the EU.

4.3.1 The institutional framework

In early 2014, Finansinspektionen became responsible for macroprudential policy in Sweden and, in parallel, the Financial Stability Council started its operations. The idea is that the council would function as a forum for the authorities concerned and the government to share information and experience with regard to financial stability issues.[22] In March 2015, the Government decided that the National Debt Office would become the resolution authority for banks in Sweden. In addition, an inquiry is currently under way looking into the pros and cons for Sweden of entering into or remaining outside the Banking Union, and in a separate inquiry the Sveriges Riksbank Act is under review, so the Swedish institutional framework for financial stability is not necessarily finalised.

For the Riksbank, Stefan Ingves' chairmanship of the Basel Committee and the ESRB's Advisory Technical Committee (ATC) gave Riksbank officials opportunities to influence international reform work that would not otherwise have been available. As a result of primarily the global financial crisis, but also partly to give the Riksbank the staffing levels and brain power required to participate in the work, there was also a substantial reallocation of resources within the Riksbank, and the Financial Stability Department (AFS) grew from 35 full-time employees in 2007 to 68 full-time employees in 2013.[23] The entire Executive Board also became much more involved in matters relating to financial stability.

4.3.2 Greater focus on financial stability issues

The Executive Board's heightened interest in financial stability issues was, among other things, reflected in the financial stability report being transformed from an analytical product to a more policy-oriented document. For example, since the autumn of 2010 the Riksbank has been submitting recommendations to external parties in the report. These recommendations were initially aimed at the banks, which at the time were being encouraged to make their public reports more transparent.[24] However, over time the Riksbank's recommendations became firmer. The banks not only needed to satisfy the global minimum requirements. The Riksbank was of the opinion that Swedish banks' capital levels should be higher than that. The rationale was that the banking system is concentrated, that a large share of the major banks funding is market funding in foreign currency, that the market expects the major banks to have an implicit state guarantee and that the Swedish banks are big in relation to the Swedish economy (see Sveriges Riksbank 2011b). Certain recommendations were also gradually aimed at Finansinspektionen and politicians. The fact that the Riksbank chose to recommend what action other authorities should take was not uncontroversial, but the Executive Board believed it was important for the Riksbank to be clear about what measures were needed to improve financial stability in Sweden.

22 Members include the Ministry of Finance, the Riksbank, Finansinspektionen and the National Debt Office. A less formal collaboration between these authorities existed previously as well.

23 However, the number of employees in the Financial Stability Department has declined in recent years, to 52 full-time employees in June 2018. This is partly due to the completion of the intensive work on global reforming of the banking sector following the crisis. It is also in part a consequence of the fact that Stefan Ingves' chairmanship of ESRB's Advisory Technical Committee came to an end.

24 In the report from the autumn of 2010 the Riksbank writes, for example, that 'the transparency of the banks' public liquidity reporting needs to be improved, as shortcomings in public liquidity reporting create uncertainty' (Sveriges Riksbank 2010b, p. 11).

The analysis of the risks to financial stability has also gained significance in recent years for the Riksbank's monetary policy assessments. The financial crisis made it clear that, in practice, it is hard to separate financial stability from monetary policy. Measures taken in one area affect the other. The Riksbank has therefore gradually improved its analysis in order to facilitate a more effective assessment of how risks to financial stability can affect, and be affected by, the real economy. One example of this is how macroprudential measures affect financial stability risks and therefore the real economy and thus the conditions for monetary policy.

4.3.3 The Riksbank's views on the foreign exchange reserve and household debt

There are also certain financial stability issues that have been the subject of keen debate in Sweden over the past few years. The two most central of these are the size of the foreign exchange reserves, and household debt. It may be useful, therefore, to explain in greater detail how the Riksbank has formulated its policy and influenced opinion on these issues.

4.3.4 Foreign exchange reserves

Swedish banks' funding in foreign currency increased during the years leading up to the global financial crisis. In this way the banks financed currency-hedged assets in Swedish krona, and assets in foreign currency, particularly EUR-denominated loans to households and companies in the Baltic States. It was not an exclusively Swedish phenomenon, but part of an international trend that was often welcomed at the start of the 2000s for efficiency and diversification reasons. However, the course of events in 2008 and 2009, both in Sweden and internationally, revealed that the risks of extensive foreign funding had been underestimated. When the crisis hit in 2008–2009, the Riksbank had to lend the equivalent of USD 30 billion to Swedish banks and entered into a credit agreement with the Latvian central bank to help Latvia maintain its exchange rate. Although the Riksbank did not lose any money on this – quite the opposite – there were a number of fortunate circumstances that meant that, despite everything, Sweden emerged from the crisis relatively unscathed. The consequences could have been considerably more severe for the Swedish economy, public finances and households if, for example, the Riksbank had not had access to US dollars via the swap agreement with the Federal Reserve – dollars that could then be lent to Swedish banks – or if Latvia had devalued its currency. It was a wake-up call for the Riksbank to see the speed and scope of action required to assist Swedish banks with foreign currency loans, and it has affected the Riksbank's approach both to the regulation of banks' liquidity risks and the size of the Riksbank's foreign exchange reserve, and who should decide this.

One of the purposes of the new Basel III regulatory framework was precisely that: to restrict banks' liquidity risks. One important regulatory tool to restrict banks' liquidity risks in Basel III was the Liquidity Coverage Ratio, LCR, but several of the most influential countries in the Basel Committee have banking systems that either fund themselves in domestic currency or have access to reserve currencies via standing swap agreements with other central banks. Liquidity risks in foreign currency therefore did not have as prominent a role in Basel III or in the subsequent EU directive as had been justified from a Swedish perspective. The Riksbank was therefore quick to recommend that the major Swedish banks immediately reduce their funding and liquidity risks in foreign currency, and introduced such a recommendation in the first financial stability report for 2011 (Sveriges Riksbank 2011a, p. 76). In the following stability report the recommendation was further clarified to state that the major banks should at the time of writing already satisfy the LCR separately in EUR and USD (Sveriges Riksbank 2011d, p. 71). The Riksbank therefore welcomed Finansinspektionen's decision to introduce the LCR in USD and EUR in its regulations at the beginning of 2013.

Although the purpose of the LCR is for banks to insure themselves against liquidity risks, central banks have an important role in being able to act as the lender of last resort (LoLR), as a central bank has a unique, and in principle infinite, capacity to create money in the country's own currency. However, the logic that underpins the role of the central bank as the lender of last resort cannot be applied to liquid assets in *foreign currency*. A central bank's possibilities of providing liquidity support in foreign currency are limited to the currencies that the central bank has in its own foreign exchange reserve, or can borrow. Furthermore, liquidity support in domestic currency is free in accounting terms, provided the central bank does not make a credit loss on the lending, while the return on a foreign exchange reserve is typically negative if the funds also need to be borrowed.

Although the Riksbank had access to a certain amount of USD during the global financial crisis through its arrangement with the Federal Reserve, future access to dollars is by no means guaranteed. During the 2008–2009 financial crisis, it was in the interests of the USA to distribute dollars in the global economy. However, there is a good deal of uncertainty as to whether this will be the case in the next crisis. The Riksbank's analysis has therefore been built on the premise that the Riksbank should principally be able to lend from its own foreign exchange reserve. This begs the question of how large the foreign exchange reserve should be.

Before the crisis, the foreign exchange reserve amounted to an estimated SEK 200 billion. It was increased in 2009, and by the end of that same year totalled SEK 300 billion.

With the lessons learned from the financial crisis, the Riksbank launched an inquiry in 2012 looking into what the size of the foreign exchange reserve should be. What is a reasonable foreign exchange reserve for a country like Sweden is an important policy matter, with the answer ultimately depending on the risk aversion of the decision-maker. However, it also presents an analytically challenging task, as most rules of thumb and methods for calculating the need are based on developing countries or emerging economies whose circumstances cannot always be transferred to a financial system like that of Sweden. Based on data regarding the banks' liquidity risks, the Riksbank instead came up with various scenarios illustrating how much liquidity the Riksbank might need to contribute to the financial system in the event of a new crisis. The analysis indicated that between SEK 70 billion and just over SEK 900 billion would be needed, depending on the length of the crisis and the extent to which foreign central banks would assist Sweden. In 2012, following extensive discussions, the Rikbank's Executive Board decided to increase the foreign exchange reserve to SEK 400 billion. This was financed using loans from the National Debt Office. This process raised controversial questions as to the limits of the Riksbank's independence, the extent to which the Riksbank is able to request that the National Debt Office borrow currency for the foreign exchange reserve and who is therefore the ultimate decision-maker for Sweden's foreign exchange reserve. The Executive Board's decision coincided with the Government's inquirer Harry Flam presenting his findings from an inquiry into the Riksbank's financial independence and balance sheet (see Swedish Government Official Reports 2013). Put simply, the inquiry proposed that the Riksbank's foreign exchange reserve should be reduced to SEK 200 billion, thereby limiting the Executive Board's decision-making rights regarding the size of the foreign exchange reserve. But the proposal never became a bill, and the issue of the size of the foreign exchange reserve and who should make decisions regarding this is instead being addressed by the Sveriges Riksbank Act review, which is due to be completed in 2019.

4.3.5 Household debt and macroprudential policy in Sweden

Another matter that has played a significant role in the Riksbank's analyses and decisions is household debt and house prices, which have seen a rapid increase since the beginning of the 2000s. The Riksbank was one of the first to warn that households were building up greater debt. Increasing household debt was already being highlighted as a concern in the stability reports in 2005 (see for example Sveriges Riksbank 2005a, p. 24, and Sveriges Riksbank 2005b, p. 28).

An important issue was whether increasing household debt would cause direct credit losses for banks in a negative scenario, that is, if a sufficient number of households would struggle to pay off their loans if interest rates rose or if unemployment increased. It is true that the banks only made minor losses on their loans to households during the Swedish financial crisis in the early 1990s, but this experience may not necessarily serve as a compass for the future. Naturally the matter gained relevance in light of the rapid increase in subprime residential mortgages in the US at the time.

In response to the issue, the Riksbank had for some years been gathering large amounts of data from Statistics Sweden (SCB) regarding the financial status of individual households. This material included anonymised data about incomes, debts, assets, interest expenses and various household details such as number of children and geographical place of residence. Based on the data, the Riksbank was able to construct a large number of typical households and simulate how financial conditions for these households would be impacted if interest rates were adjusted, or if a member of the household lost their job. The conclusion from the simulations was that resilience among households with mortgages was generally high, and that the largest debts were in households with high incomes and two earners. Accordingly, the risk was small that a crash on the Swedish housing market would shake the Swedish banking system solely through the banks making *direct* credit losses on mortgages.

But there were still *indirect* channels through which a housing market crash could have serious consequences for financial stability in Sweden. For example, a major fall in house prices would make households that own their own homes poorer, and push them to save more to bolster their depleted balance sheets ('deleveraging'), which could in turn mean an extended period of weak economic development in Sweden. Another channel through which a weak trend on the housing market could affect the Swedish economy was through the banks' foreign funding. As we have previously mentioned, the Riksbank was surprised following the Lehman Brothers' bankruptcy in 2008 by how unstable foreign funding could be for the Swedish banking system. So it did appear reasonable to assume that a crash on the Swedish housing market could also cause funding problems for Swedish banks, and thus weaken the supply of credit for the Swedish economy, giving rise to negative macroeconomic outcomes.

To find out more, the Riksbank carried out an extensive inquiry into the housing market (see Sveriges Riksbank 2011c). The inquiry aimed to analyse the causes behind the increase in house prices and household debt, the role of monetary policy in this issue, the risks conveyed by the housing market trend and, in particular, measures that might reduce such risks. The inquiry was carried out by Riksbank officials and external consultants, and was completed in the spring of 2011. A key finding was that there is no single level at which it is possible to conclude that household debt or the risks to financial stability are too high. Instead it is the decision-maker (in this case the Riksbank's Executive Board) that must ultimately decide the extent of the risks that should be taken in order to determine the appropriateness of trying to reduce household debt, or at least lower its growth rate. A majority of the Executive Board then decided that the risks were so great that interventions were justified in the form of macroprudential measures.[25]

In the economic policy debate in Sweden, macroprudential policy has come to be more or less synonymous with measures or tools to tackle household debt, which reflects the fact that this has clearly been the dominant risk to financial stability in recent years.

Alongside the development of theory and empiricism about macroprudential policy, the Government and Swedish Parliament considered which authority should have primary responsibility for implementing macroprudential measures in Sweden. In early autumn 2013 it became clear that the Government intended to give primary responsibility to Finansinspektionen. However, the Riksbank continued to display a keen interest in household

25 This article does not refer to how the risk assessment of household debt affected the monetary policy conducted.

debt, and focused operations on developing policy proposals and recommending that Finansinspektionen adopts them. For example, in its first stability report of 2015, the Riksbank presented a catalogue of 'Measures to manage financial stability risks in the household sector' (see Sveriges Riksbank 2015, pp. 22–32). In all subsequent stability reports, household debt has been a constant theme when discussing risks to financial stability. Understanding of the risks posed by high household debt to the real economy has also filtered through to the Swedish political debate. Many of the measures that the Riksbank called for (mortgage caps, amortisation requirements, loan-to-income cap and adjustments to risk weights on mortgages) have been implemented, albeit later and to a lesser extent than advocated by the Riksbank. But there may still be cause for self-criticism. Namely that the Riksbank's analysis and policy proposals were for a long time focused exclusively on the demand side of the housing market, on the effect of monetary policy and on how various macroprudential measures could be devised. However, many of the factors that determined the housing market trend were of a more structural nature, such as demographics, the tax system and supply factors. These circumstances have been known for a long time, and the Riksbank identified some of them back in 2011 (Sveriges Riksbank 2011c). Yet it was not until the end of 2015 that the factors took on a key role in the Riksbank's analysis of the measures needed on the housing market.

5 Future challenges

In conclusion, it is natural to look ahead and think about what the most important challenges for safeguarding financial stability will be in the future. We will limit ourselves here to three.

A significant challenge is the ability to halt excessive growth in household debt and thus reduce the risks for a future financial crisis. Household debt continues to grow, although not as rapidly. Despite broad acceptance of the major risks associated with this trend, the measures that have been adopted to curb growth in household debt have almost exclusively only affected new borrowers. Furthermore, there have been almost no supply measures at all.

A second challenge is timely identification of the risks that are emerging as a result of the structural transformation of the financial sector. For example, there are clear indications that certain traditional banking services are starting to be provided by other operators as a consequence of technological advances and stricter rules for banks. Such a development will likely be positive, as it may make the financial sector more efficient, but it may also mean that risks arise in new ways and with new participants. Monitoring and understanding such risks will be a challenge for the Riksbank.

A third challenge is partly related to the previous one. Technological advances have meant that Swedes are using less cash. This poses new challenges for households and companies, but also for the Riksbank. Many households and companies are quick to adopt new technology and are increasingly using electronic forms of payment, but for some households and companies, new technology involves challenges. If cash cannot be used as it was previously, customers without access to banking services may get caught out and all customers may be forced to use payment methods that are determined by private interests.[26] The rapidly declining use of cash means that there may be a need for state-issued electronic money, an e-krona. This in turn brings to a head the question of the difference between public electronic money and funds kept at private banks' accounts. How would an e-krona differ from standard bank deposits, and how would an e-krona affect banks' deposits? How is the relationship between the two affected in normal times and during a crisis? What does this mean for the opportunities to promote financial stability? These are important questions for further investigation (see Sveriges Riksbank 2018).

26 An additional side effect of the decline in the use of cash for the Riksbank is that demand for its products is disappearing, which means that the seigniorage is plummeting, which in turn may hamper the ability to maintain the Riksbank's financial independence.

To sum up, we can note that much has happened since the Swedish financial crisis in the 1990s. The Riksbank's work and analysis of financial stability risks has evolved and changed. Both the global financial crisis and the ensuing work has created a new regulatory and institutional landscape. Requirements for banks have been tightened and macroprudential policy has emerged as a new policy area. Meanwhile, major structural changes are occurring on the financial markets, which means that entirely new risks may materialise ahead. This presents a significant challenge for central banks, as for other authorities, as there is always a tendency to 'prepare for the previous war'.

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The storm after the calm – lessons for monetary policy analysis

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The financial crisis and our experiences since then have exposed a number of weaknesses in the monetary policy analysis framework applied under the inflation targeting regime. This article describes some of these experiences and discusses areas into which we consider it to be particularly important to expand monetary policy analysis: the role of the financial system in the monetary policy transmission mechanism, the supply side of the economy, and the links between monetary policy and fiscal policy.

1 Introduction

The material underlying monetary policy decisions, which is to say monetary policy analysis, looks largely the same today as it did before the financial crisis. This is not to say that new types of analyses in important areas have not been made. But the actual material upon which monetary policy decisions have been based, for example monetary policy reports, have not changed very much. Our view is that this is the situation not only in Sweden but in other countries too. At the same time, the financial crisis and subsequent experiences showed that the materials, communication and analyses need to be expanded in certain regards. For example, this applies to the way monetary policy affects inflation and economic developments in general via the financial system, the so-called transmission mechanism, and what consequences changes to this mechanism may have. The latter could, for example, concern how changes in credit- and asset market conditions influence the pass-through of policy changes, the point at which so-called quantitative easing (or tightening) may be justified in addition to changes in the policy rate, or whether risks to financial stability should be considered in monetary policy decisions. Experience also shows that analysis needs to focus to a greater extent on more permanent structural changes in addition to the more short-term cyclical developments that are traditionally in focus. The relationship between monetary policy and fiscal policy is a further area to which sufficient attention has not been paid under the inflation targeting regime. We are not saying that these issues have been ignored – on the contrary there are many boxes, working papers, and other types of publications – but the new analyses have not had a lasting impact on how actual decision making is made. An important task going forward is incorporate the new research and insights into practical monetary policy decision making.

In our view, the lack of major changes to monetary policy analysis, despite these experiences, is not because central banks and other forecasters are unwilling to rethink,

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but because the new analyses that must be made and the new models needed for this are genuinely difficult to develop and adapt to the needs of central banks. At present, there is no generally accepted new benchmark framework from which to proceed, unlike when the Riksbank about fifteen years ago more explicitly adopted the flexible inflation targeting framework and started using a set of new macro models designed for that framework. But it is also because the basic structure of the analytical tools applied before and after the financial crisis are still seen as highly useful and are considered, for good reason, to have served monetary policy and the economy well.[1] No widespread support exists, either among central banks themselves or among leading researchers in the area, for completely new thinking. The so-called inflation-targeting policy is perceived, on the whole, as a successful monetary policy strategy. For example, in the decades before inflation targeting was introduced, inflation in Sweden averaged 8 per cent.[2] Average inflation is now considerably lower. Calculated as an average between January 1995 and October 2018 it is 1.3 per cent in terms of the consumer price index (CPI) and 1.6 per cent if the CPI with a fixed interest rate, the CPIF, is used instead.

Sweden's development reflects an international trend towards lower and more stable inflation, so it would be misleading to claim that the development of inflation in Sweden is entirely a result of the Riksbank's successes or shortcomings. In addition, in the 1990s the framework for wage formation – formalized in the Industrial Agreement of 1997 – was changed, as was the framework for fiscal policy in Sweden with an increased focus being placed on long-term sustainable public finances. Budget consolidation in the first half of the 1990's strengthened the general government structural balance by the equivalent of 7 per cent of gross domestic product (GDP) between 1994 and 1998.[3] Fiscal policy was also reformed in many other EU countries after the implementation of the Maastricht Treaty. In international discussions on economic policy, the period from the middle of the 1980s until 2008 is often referred to as the Great Moderation.[4] After the problems in the 1970s with stagflation, which is to say high inflation combined with low growth, inflation fell to low and stable levels at the same time as economic growth was good.

This period of calm came to an end, initially in the United States in 2007 and then transitioned into the Great Recession in 2008, when the international financial crisis advanced like a storm over large parts of the world economy – 'the storm after the calm'. Central banks and governments around the world adopted powerful measures with the aim of mitigating the effects of the financial crisis on inflation, growth and employment. Sweden was among those countries experiencing the greatest falls in GDP and the Riksbank and other authorities were highly active. The repo rate was cut from 4.75 to 0.25 per cent over the course of 7 months from October 2008 to April 2009, and at the same time as the Riksbank lent large amounts of foreign currency and Swedish krona to banks to stabilise the financial sector and stop a credit crunch.

Ten years have now passed since the economic 'storm' of the autumn of 2008. It can be noted that the recovery from the financial crisis has been much more sluggish than expected, both in Sweden and globally, despite unprecedented measures from central banks and governments (see Berg et al. 2018). No normalisation of monetary policy has taken place yet, at least not in Europe. Neither is there any new consensus on how monetary policy should best be conducted, as there was during the Great Moderation. When the financial crisis spread around the world in 2007–2008, inflation targeting was not abandoned, but the relatively simple principles of interest rate management that had been established during the Great Moderation needed rapidly to be complemented by other measures.

1 See GalÍ (2018) and Lindé (2018) for recent descriptions of the analytical framework.
2 Average in 1973–1992 for the annual percentage change in the CPI.
3 Structural balance in the public sector, per cent of potential GDP according to Konjunkturinstitutet (2018).
4 In Sweden, this more stable development did not start until a little way into the 1990s.

In this article, we present an overall picture of monetary policy and experiences in Sweden and other countries over the last decade or so. We discuss the questions monetary policy analysis has struggled with and highlight a few areas to which we believe more attention will have to be paid in the future. As we do this, we will indicate areas in which the analytical framework that became dominant during the Great Moderation need to be complemented. This framework often involved a heavily simplified view of how the financial system works, of the role of central banks and of what should be included in the concept of monetary policy. In addition, it was primarily developed to understand short-term fluctuations in economic development, where more long-term structural phenomena could not be analysed as easily. And fiscal policy was not usually included, meaning that its effects on economic development gained too little attention. More in-depth analyses are needed of these three areas.

The primary aim of this article is not to make any new assessment of *monetary policy* but to describe some of the challenges facing *monetary policy analysis*.[5] One common view, both in Sweden and abroad, is that central banks and monetary policy have been misled by imperfect models of the macro economy. Careful studies, however, suggest that this criticism is misplaced.[6] Even so, as having been responsible for monetary policy analysis we have reason to be self-critical and, in light of the experiences gained, to draw a few conclusions about areas in which analysis needs to be improved. This article is just input in a discussion. In order for concrete progress to be made deeper analyses will be required.

In the next section we continue by describing the development of inflation and monetary policy in Sweden, the United States and the euro area over the last decade or so. This account aids us in illustrating some of the areas in which we believe that the simple analytical framework for inflation targeting needs to be expanded.

2 Low inflation despite low interest rates and good average growth

Figure 1 shows the development of the rate of inflation in Sweden, the euro area and United States from 2000 to 2017.[7] For Sweden, this refers to the CPIF, which was not yet our target variable in this period, but which became increasingly important as guidance for interest rate decisions as it became more and more clear that the direct effects on the CPI of interest rate adjustments were obscuring the general trend of inflation.[8] For the euro area and the United States the official targeted inflation indices are used, HICP for the euro area and the price index for personal consumption expenditures (PCE) for the United States. Neither of these are directly affected by interest rate adjustments in the way that Swedish CPI is. The figure shows that there are differences in the development – inflation was lower in Sweden between 2004–2007 and 2011–2013 – but also clear shared traits. The rate of inflation peaked in 2008, before the financial crisis erupted in earnest. After this, there followed several years with a downward trend in the rate of inflation. Particularly in 2014 and 2015, inflation in all of these currency areas became unexpectedly and undesirably low. Since then, however, inflation has risen again.

The downward trend in the rate of inflation would be easier to understand if it had coincided with unusually weak growth and falling resource utilisation. But, as can be seen from Figure 2, GDP growth was comparatively good a few years after the financial crisis. Average

5 For evaluations of monetary policy in Sweden, see Goodhart and Rochet (2011), Bryant et al. (2012) and Goodfriend and King (2016).

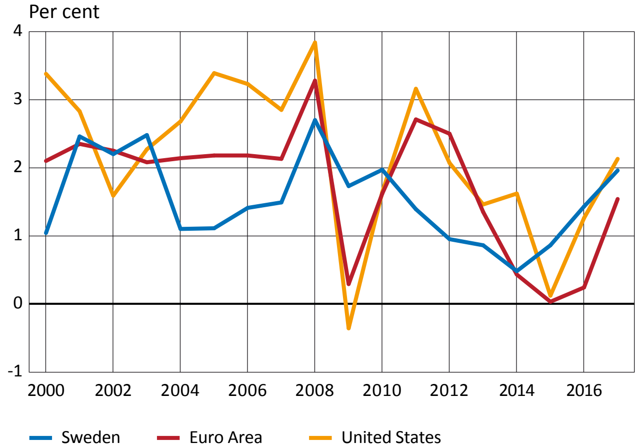
6 For Swedish studies, see Iversen et al. (2016), who show that the Riksbank's model forecasts have been more accurate than the published forecasts. An earlier study by Adolfson et al. (2007) reached similar conclusions. Lindé and Reslow (2017) show that the Riksbank's published forecasts over the medium term are mostly based on assessments, rather than model forecasts.

7 Together, the euro area and United States account for just over half of Sweden's international trade.

8 Until September 2017, the CPI was the official target variable. However, as the CPI has been affected so mechanically and strongly by the last decade's major interest rate fluctuations, in practice, monetary policy has been guided by the CPIF. See Sveriges Riksbank (2016).

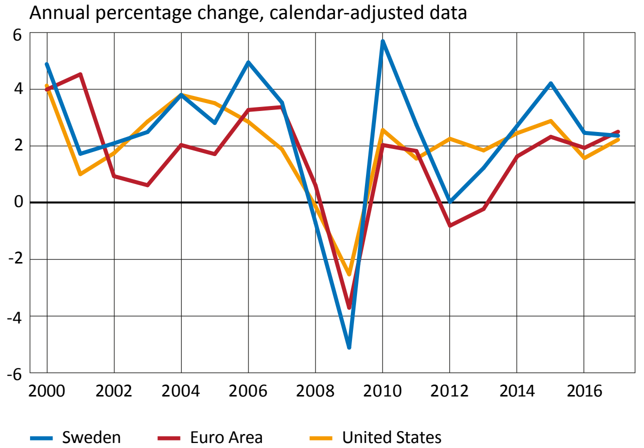
growth in the period 2014–2015 was about 3.5 per cent in Sweden, just over 2.5 per cent in the United States and about 2 per cent in the euro area. Resource utilisation was lower than normal during 2014–2015 according to for example the assessment made by the OECD, but was improving after a weak period in 2012–2013.

Figure 1. Rate of inflation 2000–2017
Per cent



Note. For Sweden, this means the CPIF, for the euro area it is the HICP and for the United States it is the deflator for private consumption.
Sources: Bureau of Economic Analysis, Eurostat and Statistics Sweden

Figure 2. GDP-growth 2000–2017
Annual percentage change, calendar-adjusted data

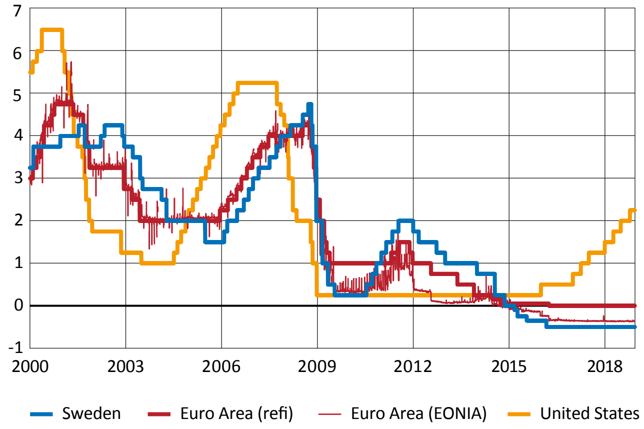


Sources: Bureau of Economic Analysis, Eurostat and Statistics Sweden

The downward trend in the rate of inflation has also been unexpected considering the highly expansionary monetary policy that has been conducted since the financial crisis. Figure 3 shows the development of policy rates in Sweden, the euro area and the United States. Once again, there are similarities in this development. During the economic upswing prior to the financial crisis, policy rates were gradually raised for a few years before peaking in the range 3–5 per cent. Policy rates were then cut heavily in 2008–2009, after which they have remained at historically low levels. In the United States, the Federal Reserve held the policy rate at 0.25 per cent for almost 7 years, from December 2008 until the end of 2015, after which cautious policy rate increases were initiated. The Riksbank and (to a lesser extent) the ECB raised their policy rates in 2010–2011 before then cutting them again as the sovereign debt crisis in the euro area worsened. When inflation continued to fall in 2014 and 2015, both the Riksbank and ECB cut their policy rates to below zero. Since 2015, due to its negative rate, the Riksbank has had a lower policy rate than the Federal Reserve, although it has been at about the same level as the ECB's.

However, to obtain a more comprehensive view of monetary policy and the degree of monetary policy stimulus, we need to observe three more conditions.

Figure 3. Central bank policy rates 2000–2018
Per cent

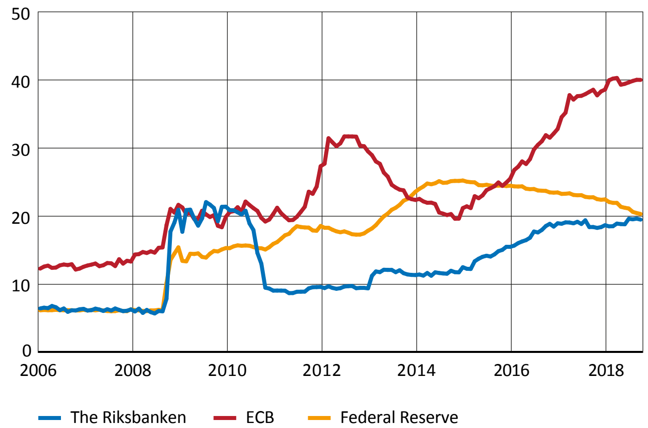


Note. For Sweden, this refers to the repo rate, for the euro area to the refi rate and EONIA since the latter since 2009 has been below the refi rate, and for the United States to the ceiling of the range for the Fed Funds Target Rate.
Sources: Macrobond and national central banks

2.1. There are more monetary policy instruments than the policy rate

Firstly – monetary policy is not just changes in the policy rate. During the financial crisis, several central banks started conducting monetary policy via various measures that led to growing balance sheets. Figure 4 shows central bank balance sheet totals as a percentage of GDP in the three currency areas studied. The Riksbank, ECB and Federal Reserve heavily increased the size of their balance sheets at the end of 2008, initially primarily via various kinds of lending programmes aimed at banks. The Federal Reserve also lent to other financial intermediaries and bought government bonds and government-guaranteed mortgage-backed securities. The Federal Reserve's balance sheet has remained at high levels and has even increased further in recent years as the result of continued asset purchases. The Riksbank's balance sheet total fell in the autumn of 2010 when the large one-year fixed-rate loans to the banks were repaid. An equivalent development can be seen in the ECB's balance sheet in 2013 and 2014, when large loans to European commercial banks were repaid. However, since the start of 2015, the balance sheets of the Riksbank and ECB have expanded again due to large-scale purchases of government bonds.

Figure 4. Central bank balance sheet totals
Per cent of GDP



Sources: ECB, Federal Reserve and the Riksbank

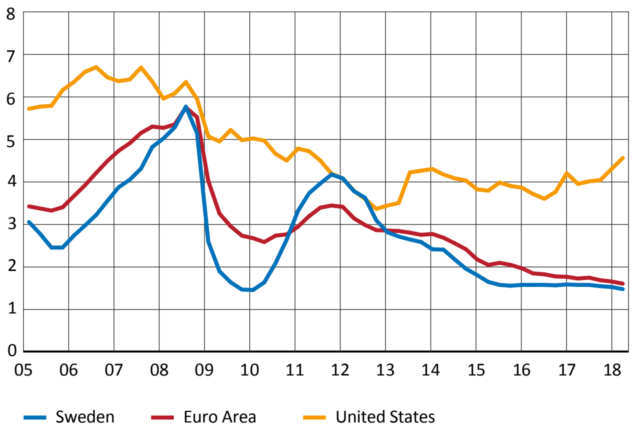
2.2 A given level of the policy rate can have different effects

Secondly – to describe the monetary policy being conducted and the effects the monetary policy can reasonably be expected to have on the economy, we also have to examine how final interest rates to companies and households have developed and how lending has been. During the financial crisis, it became particularly clear that a certain given level of the policy rate could be linked with different levels of final interest rate and credit growth. Of course, this was not a new phenomenon, but it became particularly clear during the financial crisis.

An illustration of this is given in Figure 5, which shows the development of the interest rates faced by households in the three currency areas, Figure 6 which shows the difference between these rates and central bank policy rates, and Figure 7 which shows how lending to the household sector has developed. Looking first at household rates in Figure 5, it can be seen that these are higher than central bank policy rates and that the difference between them internationally does not resemble the difference between policy rates. Figure 6 illustrates this in another way in the form of the difference between household rates and policy rates. These spreads increased rapidly during the acute phase of the financial crisis, 2008–2009, especially in the United States. In the euro area and in Sweden they continued to rise in the years after, partly due to the European sovereign debt crisis. Since then spreads have decreased – among other reasons due to central bank measures – but not back to the levels that prevailed in 2007. Finally, the growth rate of lending to households, shown in Figure 7, dropped during 2008 and 2009, in particular in the United States and the euro area. But whilst it has since rebounded in the US, household credit growth has been very slow in the euro area. In Sweden household credit growth has been much more stable, with growth rates between 5–10 per cent yearly.

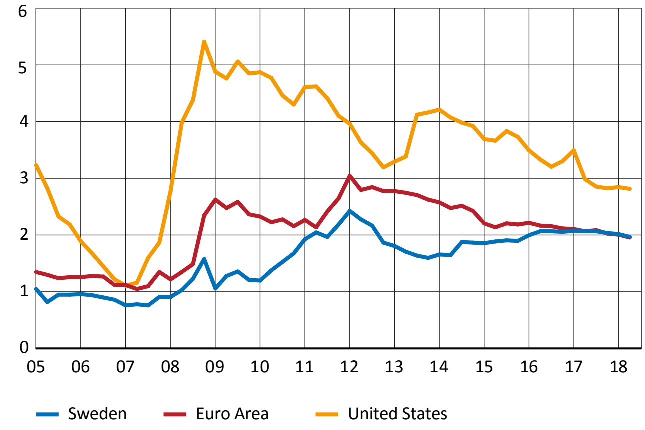
Figure 5. Lending rates to households, new mortgage loans with short maturities

Per cent



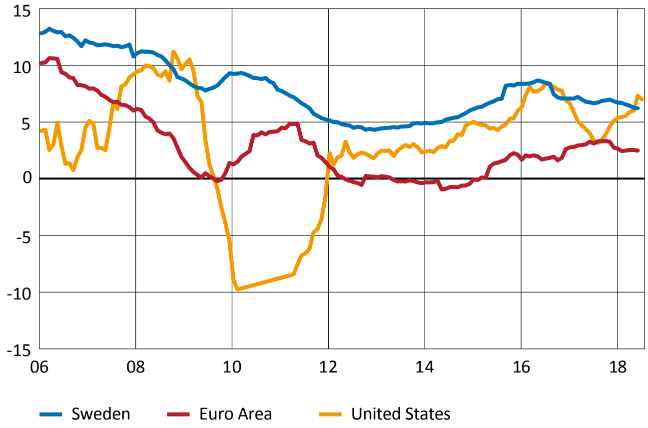
Sources: Macrobond and the Riksbank

Figure 6. Difference between household rates and central bank policy rate
Percentage points



Note. Difference between rates on mortgages with short maturities and central bank policy rate.

Figure 7. Lending to households
Annual percentage change



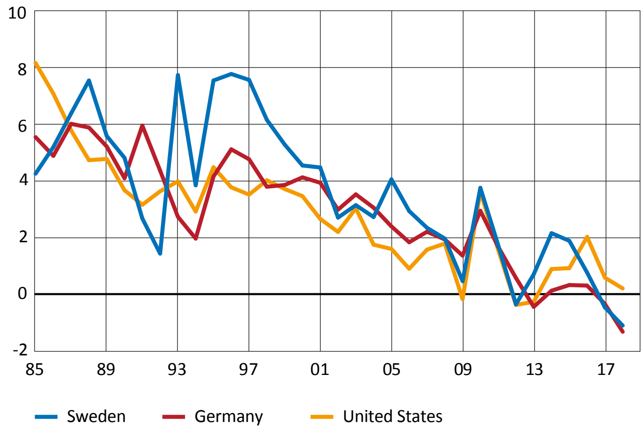
Note. Households' debt to banks and other monetary financial institutes.
Sources: Macrobond and the Riksbank

What these figures illustrate is that the transmission mechanism and degree of monetary policy stimulus (or its opposite) cannot be described solely by the level of central bank policy rates. One example concerns lending volumes and lending rates to households 2013–2015 in Sweden and the euro area. Despite a higher policy rate in Sweden, lending rates to Swedish households were lower and lending grew faster than in the euro area. Credit growth is affected both by demand for credit, which is affected by economic activity and monetary policy, and by the supply of credit, which can be affected by monetary policy. Weak economic activity in the euro area may form part of the explanation for the weak credit growth, but supply probably also plays an important part. The transmission mechanism is thus strongly affected by factors that affect banks' rate-setting for loans and for their lending, over and above the central bank policy rate. These may include various risk premiums demanded by investors, as well as the state of banks and other financial intermediaries, and we will return to these issues in Section 3.

2.3 The general level of interest rates has fallen in the past decades

Thirdly – a discussion of the monetary policy stance and how contractionary or expansive it is, also needs to consider the downward trend in global real interest rates in the past decades. The international level of interest rates has shown a falling trend for several decades, which has also affected the level of interest rates in Sweden, see Figure 8. From levels of around 5–7 per cent during the 1980's, real rates on government bonds with long maturities have fallen to around 2 per cent before the financial crisis, and after that down to zero per cent or even lower. Falling interest rates result from the supply of savings exceeding demand. A growing body of research in recent years has studied in detail different factors that affect supply and demand, for example falling productivity, ageing populations, rising income inequality and a lack of safe assets (see, for example, Del Negro et al. 2017 and Ingves 2017). For a small open economy such as Sweden it is of particular interest that the international comovements in real interest rates seem to have become more synchronized, with developments in the US becoming increasingly important (see Del Negro et al. 2018). Global real interest rates have thus been falling a few decades, but it was not until after the financial crisis that broad attention has been drawn to this development in a policy context, and as a main reason for central bank policy rates being so low and, in recent years, even negative.

Figure 8. Real rates on government bonds
Per cent



Note. 10-year nominal government bonds yields deflated with CPI.
Sources: Bank of England, Federal Reserve, Macrobond and the Riksbank

2.4 What have we learnt from developments during the past decade?

What can we learn from developments over the last decade or so? An initial observation takes its starting point in the development of inflation, which has become considerably lower than there has been reason to expect in light of the highly expansionary monetary policy implemented in Sweden and the major economies during most of the past decade. As monetary policy affects inflation primarily via demand, it is reasonable to see the unexpectedly weak inflationary pressures as an effect of different changes to the economy's supply side. Phenomena like digitalisation and globalisation have often been discussed as conceivable explanations but, in the absence of clear research findings in the area, it has been difficult to discuss the mechanisms other than in general terms. There is, however, new research in the area and this will be important for central banks to follow it.[9]

9 See for example the papers presented at Jackson Hole 2018 (see Federal Reserve Bank of Kansas City 2018).

Another observation – that we have already mentioned – concerns the impact of monetary policy, which is to say how changes in the policy rate and other central bank measures spread throughout the financial system and ultimately affect the interest rates that matter for economic development. The financial crisis and the measures adopted because of it have made it clear that the monetary policy transmission mechanism cannot be expected to be stable. In order to properly account for this in the day-to-day analysis in monetary policy, this requires a focus on how financial assets and risk are priced, how banks and other financial intermediaries act and the implications of various financial frictions. By the latter we mean for example asymmetric information or agency costs, see Adrian and Liang (2018) or Finocchiaro and Grodecka (2018) for a discussion. As we return to below, most macro models and rules of thumb used for practical monetary policy analysis feature a heavily simplified description of financial markets and, most often, no explicit role for financial intermediaries. It can be said that these models assume that financial markets are 'perfect' and thus financial frictions do not need to be modelled. However, developments over the last decade show that this simplification needs to be abandoned if the effects of things such as changed relationships between policy rates and final interest rates or effects of central banks' purchases of government securities are to be analysed.[10] Furthermore, in a forecast evaluation of the models used at the Federal Reserve Bank of New York, Cai et al. (2018) show that models that include financial frictions perform better than models that do not.

A third observation: a fundamental difficulty when studying macroeconomic developments is that of distinguishing between temporary ('cyclical') shocks and those of a more permanent ('structural') nature. The downward trend in global real interest rates that we discussed above is one example of a long-term structural change that has made short-term analyses more complicated, but there are others. Technological changes, increased international trade and increased mobility for capital and labour across national borders in recent decades have contributed towards increased competition and a 'globalisation' that has affected inflation, wage formation and financial markets in addition to the mechanisms and short-term fluctuations associated with normal economic cycles. The models developed for monetary policy analysis during the Great Moderation are based on research aimed primarily at understanding economic fluctuations, which is to say variations in data around these trends. In other words, these models are not intended for studying breaks in trends or other more permanent structural changes.

Fourthly: the links between monetary policy and fiscal policy also belong to this list of areas that need to be emphasized more in order to improve our understanding of the effects of monetary policy. We noted above that the monetary policy framework in Sweden was reformed at approximately the same time as fiscal policy reforms. In the same way as a more sustainable fiscal policy, in terms of public finances, may have contributed towards restraining inflation when the reforms were implemented, it may also have contributed towards the low inflation of recent years. However, when both policy areas were reformed in the 1990s, issues concerning the links between monetary policy and fiscal policy were not prioritised. Experiences of active stabilisation policies in the 1970s and 1980s were mainly negative. The ambition was to design new regulations for each area individually. An inflation target was introduced, the task of maintaining price stability was confirmed by law and the Riksbank was given increased independence. In the area of fiscal policy, a new law for the government budget (the Swedish Budget Act), a municipal balanced-budget requirement and, slightly later, a surplus target for public finances were introduced. The inflation target and the surplus target were both seen as ambitious but also as independent of each other. The Riksbank's independence and prohibition against instructions have led politicians

10 The assumption of sticky prices and wages – a 'friction' in economic language – is a central assumption in neo-Keynesian models and is a reason that monetary policy is assumed to have real effects. It should be just as natural to explicitly include frictions in the financial markets (to the extent that they are deemed to be significant). See also, for example, Woodford (2012).

to refrain from expressing opinions on monetary policy and neither has the Riksbank commented on fiscal policy. These clear boundaries between monetary and fiscal policy may turn out to be harder to maintain going forward, both in Sweden and in other countries. For example, the 'unconventional' measures of central banks start to look more like fiscal policy if increased credit risk is taken on, and questions on the distributional effects of monetary policy are raised increasingly often. At the same time, it seems reasonable for the scope for countercyclical fiscal policy to increase as public finances become more robust. In addition, the lower level of global interest rates means that policy rates set by the Riksbank and other central banks will in the future more often reach the effective lower bound. Even if there are other monetary policy instruments, this means that going forward countercyclical fiscal policy can become more important for stabilising the economy.

It is thus possible to identify a number of development areas for monetary policy analysis that we believe should be prioritised. In the next section we discuss some of them in more detail.

3 Lessons for monetary policy analysis – which issues need more focus in the period ahead?

3.1 More in-depth understanding of the financial sector and its role in the monetary policy transmission mechanism

Standard models used for monetary policy analysis with an inflation-targeting regime are often based on a simplified way of looking at how monetary policy affects inflation and economic development in general. The central bank sets its policy rate and this then influences the decisions taken by households and companies. The relationships between the central bank's policy rate and the interest rates that more directly guide households and companies' behaviour (such as banks' deposit and lending rates and rates for various bonds) are assumed to be stable. Short-term market rates are assumed to be closely linked to the central bank's policy rate and long-term rates are connected to short-term ones according to the so-called expectation hypothesis: long-term rates quite simply equal the average of future expected short-term rates. Central bank measures can thereby be described in terms of a single variable, the policy rate, and, according to these assumptions, other measures than changes to this do not need to be adopted.

As was noted in the introductory description of macroeconomic developments in Section 2, the difference between the central bank's policy rate and lending rates to households and companies varies both over time and between countries. The so-called transmission mechanism is not stable but is affected by factors such as different premiums in financial markets, how risk is priced, how robust the banking system is or is perceived to be. As mentioned above, this means that the level of the policy rate is not the only relevant measure of 'how expansionary' monetary policy is and neither is it the only instrument with which the central bank can influence the economy. This became particularly clear during the run-up to the financial crisis of 2007–2008 and, as far as Sweden is concerned, when the Swedish Government, Riksbank and Swedish National Debt Office were forced to intervene in 2008 and 2009. But even later, during the slow recovery, when the level of the policy rates of the Riksbank and other central banks had come close to their lower bounds and other measures such as bond purchases had been implemented, it became clear that monetary policy is about more than just determining the level of a short-term policy rate. Other factors connected to the central bank as 'the banks' bank' also have effects on financial conditions and are thereby monetary policy instruments. Examples of these are: which financial institutions may borrow from or invest funds in the central bank? On which terms, regarding, for example, maturity, collateral for loans and other demands for the institution? In which other ways can the central bank's balance sheet be used to influence interest rates and credit volumes in the economy? For example, how can a central bank's purchases of government bonds or other financial assets affect market rates and thereby be seen as a complement to or substitute for policy rate changes?

All of these questions are very important for a central bank, not just in a financial crisis or when one is approaching, but also under normal circumstances. The fact that the level of interest rates has shown a falling trend in recent decades and that central banks thereby risk increasingly often hitting the lower bound of the policy rate emphasises the need to also incorporate monetary policy measures such as bond purchases in the standard model for monetary policy analysis (see Nessén 2016 for a discussion and further references). But even when the policy rate is at an adequate distance from its lower bound, the central bank, via purchases and sales of financial assets (which also affects the amount of reserves in the financial system), affects the general credit conditions in the economy and thereby inflation and economic activity. This is an old insight in macroeconomic research that is associated, among other things, with contributions to the research literature by the Nobel laureate James Tobin, but it seems to have partly been lost during the Great Moderation.[11]

Some consequences for practical monetary policy analysis

Once the concept is accepted that there are different types of frictions in the financial system and that these influence the transmission and effects of monetary policy, several important conclusions for practical monetary policy analysis then follow.

Firstly, the fact that the presence and importance of financial frictions can vary over time means that the central bank continually needs to follow how the transmission mechanism develops (see, for example, Woodford 2010). Thus, the day-to-day monetary policy analysis needs to include, for example, monitoring and analysing the evolution of different premiums associated with different types of risk, how funding- and financing costs for banks and firms change over time, and how the availability of credit develops. This is needed so as to be able to determine whether a certain level of the policy rate or the balance sheet (or its composition) can be assumed to have the same consequences for inflation and economic activity as previously. It could even be the case that changes in the transmission mechanism – for example in the form of changed interest rate spreads – call for new monetary policy measures, even if the macro conditions in general have not changed.[12]

Secondly, there is reason to believe that the size and composition of the central bank's balance sheet is of significance for inflation and economic activity (see, for example, Gertler and Karadi 2013 and Greenwood et al. 2016). If the central bank, for example, purchases government bonds, this will lower market rates for government bonds, but it will also spread to interest rates for households and companies. If the central bank purchases assets other than government securities, this can be expected to have even greater effects on the financial markets and the macroeconomy, but, as the central bank in this case takes on more risk, this may be considered to lie outside what is normally considered to be monetary policy. At any rate, the occurrence of financial frictions suggests that asset purchases (and sales) may thus be a complement to or substitute for changes in the more short-term central bank policy rates. In recent years, much work has been conducted in both central banks and by academic economists in estimating the effects of central banks' asset purchases.[13] But

11 In conjunction with a speech the chairman of the Board of Governors of the Federal Reserve at the time, Ben Bernanke, said that quantitative easing 'works in practice, but it doesn't work in theory' (see Brookings Institution 2014). As discussed in, for example, Dell'Ariccia et al. (2018) this applies only to theoretical models without financial frictions.

12 See Adrian and Liang (2018) for suggestions of the type of analyses that could be part of such a process. Vredin (2015) links such suggestions to an inflation targeting strategy. Gertler and Gilchrist (2018) summarize recent research on the role of financial factors in 'the Great Recession'.

13 See Dell'Ariccia et al. (2018) for a summary of empirical studies for the Euro Area, Japan and the United Kingdom, and Kuttner (2018) for the United States. De Rezende (2017) studies the effects of the Riksbank's bond purchases.

this has often been a matter of studies that attempt to capture the effects of central bank decisions as such, without measuring the significance of the size of the asset purchases made.

Thirdly, the presence of frictions in the financial markets can affect the view of what the central bank's tasks, and targets for monetary policy, should be. This is a much-debated question – whether the central bank's monetary policy should take *particular* account of risks of financial instability, *in addition to* the consequences such risks may have for inflation and the stability of the real economy. It now seems to be generally accepted that the degree of financial stability affects the monetary policy transmission mechanism, even if such effects remain difficult to explicitly incorporate into the day-to day monetary policy analysis. The degree of financial stability is thus something that the central bank should consider when monetary policy decisions are taken. But the question is whether it is sufficient to consider the effects that the degree of financial stability has on forecast deviations from the inflation target and any possible target for output or employment, or whether financial stability should be a further target for monetary policy *in itself*. According to Woodford (2012), the answer to this question is, in principle, yes. Just as price rigidities and a lack of competition on the markets for goods and services create inefficiencies in the economy that the central bank can counteract by stabilising inflation and resource utilisation, frictions in the financial system can give rise to imbalances that monetary policy may need to counteract. However, there can hardly be said to be any consensus on this issue in the literature.[14]

One reason for the absence so far of financial intermediaries, financial frictions and important financial mechanisms from the recurrent monetary policy analyses is that these are difficult to incorporate into the standard models used so far. Leeper and Nason (2015) suggest that it is difficult to understand the importance of financial stability and thereby its implications for monetary policy, if the basis is the simplifying 'representative agent' assumption, which is most often made in macroeconomic models. Costs for financial instability arise to a great degree because the risks are not evenly divided among different individuals in the economy, but this is difficult to analyse if only aggregate data is studied and hence only the development of the average individual is analysed. There are therefore many indications that monetary policy analysis in the future will need to be based to a greater extent on models (both theory and data) in which differences between different households and companies can be observed. More micro data will therefore be needed, both for monetary policy analyses and analyses of financial stability.[15]

Different approaches can be seen among both central bank economists and academic researchers, which may each be internally consistent, but which have different consequences for policy in practice. One approach is to believe that financial frictions are not of such great significance (except, possibly, in crisis situations). In this case, a short-term policy rate is seen as the central bank's only instrument (at least in normal situations), asset purchases are not considered to have such great importance, financial stability is not considered to be a target for monetary policy and, consequently, analyses of monetary policy and financial stability can be essentially be conducted separately within the central bank. An alternative approach is to believe that financial frictions are of particular significance, even in normal situations. It then follows that the policy rate is not the only monetary policy instrument, that asset purchases, for example, are a complement, that a secure and efficient financial system should also be one of the targets for monetary policy and that the basis for central banks' monetary policy decisions should be integrated with their analyses of financial stability. So far, inflation targeting policy has typically been characterised by the first approach. We consider that it is high time we moved towards the second approach. This applies also in countries where

14 For accessible overviews of various arguments, see, for example, Mester (2016), Schnabel (2016) and Svensson (2017, 2018), as well as the proposed new law for Norges Bank, Norwegian official report (2017), Chapter 11 in particular.

15 The so-called Heterogenous Agent New Keynesian (HANK) models are attempts at abandoning the representative agent assumption. See, for example, Kaplan et al. (2018) or Debortoli and Galí (2018).

other authorities than the central bank have the main responsibility of safeguarding financial stability, and have been assigned for example macroprudential tools.

To finish, regardless of whether financial stability should be a separate target for monetary policy or is only important to the transmission mechanism, there are many indications that analyses of financial stability should and can play a much greater role in the drafting of monetary policy decisions than they have done so far. It is not unlikely that a greater awareness of the risks of financial instability could have affected monetary policy internationally and in Sweden prior to the financial crisis and that the crisis would possibly have been less severe.[16] But in any case, knowing *whether* financial stability should affect monetary policy and, if so, *how*, requires careful analyses of financial stability as part of the background material for monetary policy.

3.2 Greater consideration of structural changes

Traditionally, the work on forecasts of inflation, GDP, unemployment, etc., and analyses of appropriate monetary policy (or fiscal policy) responses to such variables have focused strongly on the demand side of the economy. This is true both of the forecasting work and policy analyses performed on the private market, by banks, etc., and of similar analyses carried out at central banks and other authorities. The focus on the demand side is due in turn to macroeconomic analysis drawing a traditional distinction between explanatory models (theories) for short-term cyclical fluctuations and long-term structural phenomena such as different trends. The assumption has been that the short-term changes often in focus are best understood as short-term fluctuations around relatively stable trends and that variations in demand dominate these short-term fluctuations, while supply factors (demography, technology, the functioning of the labour market, incentive effects of the taxation system, competitive conditions) are of greater significance for the long-term trends. This is also how growth in GDP, in a somewhat misleading way, is regularly presented; as caused by changes in demand as reflected in various demand components such as consumption, investment and exports. And changes in unemployment are often presented as a result of changes in the demand for labour – although changes in supply could very well be just as relevant, even in the short term. The dynamic stochastic general equilibrium (DSGE) models that have been in use in central banks the past 10–20 years give a fairly large role for temporary and permanent changes to technology in driving the business cycle.[17] However, they lack several of the factors that are needed for studying the implications of shifts in trends, often associated with the supply side of the economy.

According to Faust and Leeper (2015), the focus on short-term fluctuations around trends is a major weakness in the analyses performed by central banks, finance ministries and other forecasters the world over, as the problems that decision-makers have de facto struggled with have been about changes in trends or other permanent shifts in the economy, and not about cyclical phenomena.

We have already discussed the secular decline in global real interest rates, which is another example of a long-lived shift in the economy. Next we discuss yet another, concerning changes in labour supply.

Changes in labour supply

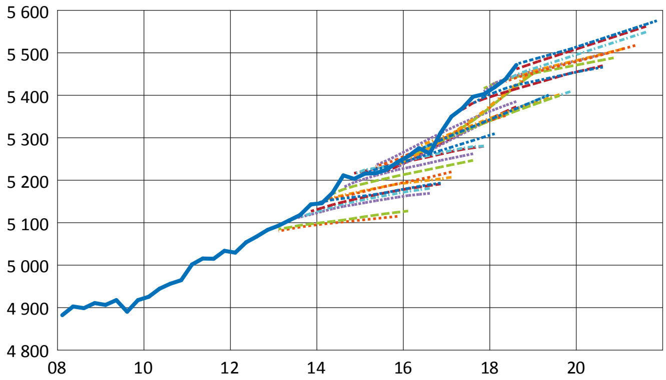
Labour market developments in Sweden provide further examples of changes in trends that forecasters, not just the Riksbank, have found difficult to capture. Figure 9 shows developments in the size of the labour force in Sweden in recent years together with the Riksbank's forecasts from various points in time. As can be seen, the Riksbank has

16 Rajan (2005) made this point, among others, interestingly enough *before* the financial crisis.

17 This type of analysis has however not had much of an impact on practical monetary policy analysis and communication, the latter being dominated by a more demand-oriented narrative.

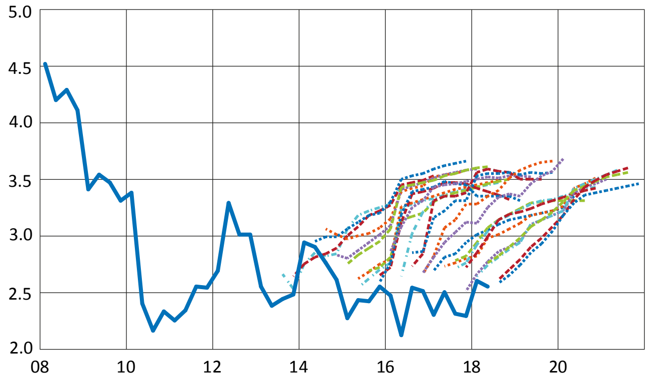
underestimated the increase in the labour force. This is due partly to an underestimation of the population (also in Statistics Sweden's forecasts, on which the Riksbank bases its own forecasts), and partly to a rise in the labour force participation rate as a percentage of the population (see Flodberg and Löf 2017). The reasons for the latter are difficult to identify, but it could be an effect of the various reforms implemented through the years aimed at stimulating labour supply and employment. Added to this is an increased supply of foreign, unregistered labour, for example people working in Sweden on various forms of temporary contracts and who are difficult to capture in the statistics. The fact that the forecasts for wage development have resulted in overestimations – see Figure 10 – at the same time as the labour force and employment have been underestimated (and maybe even more so than official statistics indicate) suggests that the modest wage growth is partly due to increased labour supply. There may in turn be several different explanations for the increased labour supply: migration and other changes to the population, stronger incentives to work due to changes in taxes and pension schemes, other behavioural changes, etc. Such changes are normally not captured by the models used in practical monetary policy analysis.

Figure 9. Labour force participation 2008–2018 and Riksbank forecasts since 2013
Thousands



Sources: SCB and the Riksbank

Figure 10. Wage growth 2008–2018 according to short-term statistics and Riksbank forecasts since 2013
Annual percentage change



Sources: Swedish National Mediation Office and the Riksbank

Jonsson and Theobald (2018) is an example of the kind of analysis that we think should be a more common component of day to day monetary policy analysis. This study tries to identify effects of changes in the labour market. With the aid of a quantified theoretical general equilibrium model, they conclude that there is reason to expect the changes in labour supply and the bargaining power of employees, observed since the financial crisis, to generate lower growth in real wages, nominal wages and the general price level.

If slow wage increases contribute to lower inflation, not because there is a weak demand for labour (which could be associated with weak GDP growth, which we have not seen in Sweden), but because the supply of labour has increased (which could be linked to strong GDP growth, more in line with developments in Sweden), it could be of significance not only for interpretations of the hitherto low inflation and for the forecasts for developments in the period ahead, but also for what is deemed to be a well-balanced monetary policy. However, it is not obvious precisely what the monetary policy implications are. Lower resource utilisation usually justifies a more expansionary monetary policy regardless of whether resource utilisation has decreased because of the fall in demand or because of an increase in resources as a result of an increased supply (due to increased labour supply or increased competition). But, it is reasonable to assume that assessments of the need for monetary policy stimulus is affected by whether one believes that it is mainly consumption that determines output via effects on demand, or whether it is technological development and the supply of labour that steers output and hence consumption. Both mechanisms are surely relevant. The difficulty lies in determining which driving forces are of the greatest significance at various points in time and for different time horizons. But supply side developments need to be given more focus in analysis and forecasting work to make possible these types of questions.

3.3 The links between fiscal and monetary policy

During the late 1990s in Sweden, the perception of monetary policy having the main responsibility for stabilisation policy started to emerge. Fiscal policy was to be focused on creating sustainable public finances prior to forthcoming demographically driven expenditure increases and only be used for stabilisation policy purposes in crisis situations. This view was expressed in, for example, the so-called STEMU inquiry prior to the referendum on the euro in 2003 (Swedish Government Official Reports 2002, p. 35) and more recently for example in Fiscal Policy Council (2018). The underlying analysis is based on the simple Mundell-Flemming model, which predicts that fiscal policy only has small effects on demand in an open economy with a flexible exchange rate. Probably a more important reason for drawing the conclusion that monetary policy is more suited than fiscal policy to stabilisation policy was the bad experience from fiscal policies in the 1970s and 1980s. According to this view the conclusion is that automatic stabilisers of fiscal policy should be allowed to have their full impact, while active fiscal policy should be reserved for periods of exceptional circumstances. Monetary policy should focus on price stability, but take the real economy into consideration whenever possible (so-called flexible inflation targeting). Active monetary policy will then in practice be used more than active fiscal policy to stabilise resource utilisation. However, and despite this, monetary and fiscal policy share responsibility for stabilisation policy, partly because the most important role of monetary policy is to create price stability, and partly because fiscal policy is of considerable significance for economic developments via the automatic stabilisers.

The long trend of falling global real interest rates implies that central bank policy rates risk reaching the so-called effective lower bound more often. Previously, this bound was considered to be at zero per cent as the interest on cash is zero per cent, but experiences from, for example, Sweden, Switzerland, Denmark and the euro area have shown that slightly negative policy rates are possible (see Nessén 2016). Even though it is not possible to cut the policy rate without bound, there are other ways of making monetary policy more expansionary, such as asset purchases and foreign exchange interventions. It is clear, however, that it becomes more difficult to stimulate demand in the economy when the former main policy tool, short interest rates, cannot be utilised to the same extent. This means, in turn, that the role of fiscal policy in stabilising both economic activity and inflation becomes more important.

At the same time, the long period of below-target inflation after the financial crisis in large parts of the world has brought research into what actually determines inflation to the fore. According to the so-called fiscal policy of the price level, the price level, and hence inflation, is determined by the total public sector debt in relation to expected future primary surpluses. Total public sector debt includes both the public's claims on the central bank (cash and the monetary base) and the normal national debt. It is perhaps not so strange that the amount of cash, which is a non-interest-bearing claim on the state, affects inflation in the same way as the state's interest-bearing bonded debt. There are many who are sceptical about a literal interpretation of this theory, see, for instance, Swedish Fiscal Policy Council (2018). On the other hand, it is generally accepted that resource utilisation and inflation are affected by both fiscal and monetary policy. How much each policy area contributes depends on circumstances that can vary over time. Fiscal policy probably has a greater effect in a small economy with a fixed exchange rate than in an economy with an inflation target and a flexible exchange rate, but even with a flexible exchange rate, fiscal policy has a significant effect on economic development. Even if one shares the view of for example Hassler (2017) that the current division of responsibility between fiscal and monetary policy has worked well in Sweden, today's partially new circumstances may lead to different conclusions going forward. Corsetti and Müller (2015) discuss circumstances under which fiscal policy has the greatest effect on demand and when it is appropriate to intervene with active fiscal policy. One of the conclusions they draw is that fiscal policy is particularly effective in stabilising large (negative) shocks if public finances are solid to start with (low national debt) and in situations when monetary policy is constrained by the effective lower bound for the policy rate.

Exactly how the interaction between fiscal and monetary policy determines inflation is still a disputed area of research. The effects of monetary policy on the economy depend on what the fiscal policy rule looks like and vice versa, see, for example, Leeper (2018). Leeper argues that current monetary policy cannot sustainably bring up inflation to the target without the support of an appropriate fiscal policy framework and questions whether the Swedish frameworks for monetary and fiscal policy are mutually compatible. Under the circumstances that prevailed during the Great Moderation, the fiscal policy rule did not decisively affect the capacity of monetary policy to stabilise inflation and fiscal policy had a subordinate role in most of the models used for monetary policy analysis. But experiences from developments after the financial crisis have drawn the attention of economists to the role played by the fiscal policy rule as regards the effects of monetary policy.

At the same time, conducting active fiscal policy to stabilise resource utilisation is associated with significant problems. The risk of so-called deficit bias, that is to say an upward trend in public debt, and the risk that fiscal policy measures take such a long time to implement that, instead of stabilising demand, they amplify cyclical fluctuations, should not be underestimated in light of historical experiences. However, the arguments for active fiscal policy are stronger now than previously due to monetary policy now having less room for manoeuvre when the general level of interest rates is lower. The use of active fiscal policy will probably also be justified under less exceptional circumstances than the prevailing view has been in Sweden and the EU. The challenge is to design ground rules for fiscal policy that facilitate stabilisation policy without eroding the long-term sustainability of public finances. If fiscal policy cannot take a greater responsibility for stabilisation, we may be forced to accept longer periods of low resource utilisation and deviations from the inflation target. This would pose a challenge for central banks to explain and would also influence the design of a well-balanced monetary policy.

Against this background, it is our view that for example the Riksbank's analyses and forecasts will need to consider how fiscal policy is conducted to a greater extent than during the Great Moderation. The model support for fiscal policy analysis will need to be developed. It is a question of gaining a better understanding both of the effects of different types of fiscal policy measures and of how fiscal policy is typically conducted in Sweden and in other countries. Just as is the case with analysis of financial stability issues, the models required are ones that do not assume a representative agent set-up (see the discussion and references above).

4 Conclusions

The financial crisis and our experiences since then have exposed a number of weaknesses in the monetary policy analysis tools applied under the inflation targeting regime. During the recovery, inflation – in Sweden and in the rest of the world – has often been lower than forecast, despite real economic developments often being stronger than expected. At the Riksbank considerable effort has been put into interpreting the low inflation and interesting results have emerged from these analyses.[18] But these analyses of monetary policy, made both within and outside central banks, and material on which monetary policy decisions are based look largely the same today as they did before the financial crisis. We believe this to be the case both in Sweden and in other countries. One could pointedly say, that it is as if the financial crisis never occurred. In this article, we have highlighted a few areas where we think there is a particular need to improve the analyses, in light of the experience gained over the last ten years.

Firstly, the implications of frictions on the financial markets need to be considered to a greater degree. They influence both the effects of a given monetary policy and the view on how monetary policy should be conducted. If it is considered that the asset purchases and growing balance sheets of central banks have had the intended effects, this conclusion, at least implicitly, is then based on the assumption that financial frictions are important. But this can also imply that stability and efficiency in the financial system should be one of the objectives for monetary policy.

Secondly, structural (long-term) relationships in the economy need to be given greater attention, since inflation and cyclical fluctuations are not only governed by short-run changes in demand. The downward trend in global interest rates is an example of a structural change that has considerable consequences for monetary policy. The consequences of an increased labour supply (broadly speaking, including immigration and changes in the power relations between the social partners) for inflation and monetary policy also needs to be analysed more.

Thirdly, a deeper understanding of the interaction between fiscal and monetary policy is required and probably needs to be considered more explicitly in monetary policy analysis. Depending on the conclusions drawn by this analysis, the frameworks for both these policy areas may require adjustment.

The sought-after analyses will need support in the form of new frameworks, data, and models. The most important role of models in monetary policy analysis is to identify, illustrate and quantify economic mechanisms.[19] They always have limitations, and in order to produce a good basis for decisions and forecasts they need to be used with good judgement and be complemented with assessments. The Riksbank has never used models mechanically to make forecasts and neither will it do so in the future. New models will improve the material underlying monetary policy decisions, but will of course not solve all the problems emanating from an uncertain and changing world.

18 See, for example, the study by Andersson et al. (2015).

19 Refers here to structural economic models. Furthermore, statistical models are used – both now and probably in the future – for short-term forecasts.

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