

# Account of monetary policy

2018





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The Riksbank is an authority under the Riksdag, the Swedish Parliament, with responsibility for monetary policy in Sweden. Since 1999, the Riksbank has had an independent position with regard to the Riksdag and the Government. This means that the six members of the Executive Board decide on monetary policy issues without seeking or taking instructions. Nor may any other authority determine how the Riksbank should decide on issues concerning monetary policy.

The way in which the Riksbank carries out the delegated task is followed up in various ways by the Riksdag. For instance, every year the Riksdag Committee on Finance examines whether the General Council of the Riksbank and the Executive Board can be discharged from liability for their administration during the past year. Every year, the Riksdag Committee on Finance also examines and assesses the monetary policy conducted by the Riksbank during the preceding years. The Riksbank compiles and publishes material for this assessment.

The material compiled by the Riksbank is thus a basis for assessment - not an assessment in itself. On the other hand, this does not mean that it is a pure compilation of figures. The account also includes analyses of outcomes, forecasts and events as the Riksbank believes that those who evaluate monetary policy should have access to the Riksbank's interpretation of the material. It is then up to the Committee on Finance, and others who wish to assess the material, to concur with the Riksbank's conclusions or to make another interpretation.

The Account of Monetary Policy 2018 may be downloaded in PDF format from the Riksbank's website [www.riksbank.se](http://www.riksbank.se), where more information about the Riksbank can also be found.

# Monetary policy in Sweden

## MONETARY POLICY STRATEGY

- According to the Sveriges Riksbank Act, the objective for monetary policy is to maintain price stability. The Riksbank has defined this as a 2 per cent annual increase in the consumer price index with a fixed interest rate (the CPIF).
- At the same time as monetary policy is aimed at attaining the inflation target, it is also to support the objectives of general economic policy for the purpose of attaining sustainable growth and a high level of employment. This is achieved through the Riksbank, in addition to stabilising inflation around the inflation target, endeavouring to stabilise production and employment around paths that are sustainable in the long term. The Riksbank therefore conducts what is generally referred to as flexible inflation targeting. This does not mean that the Riksbank neglects the fact that the inflation target is the overriding objective.
- It takes time before monetary policy has a full impact on inflation and the real economy. Monetary policy is therefore guided by forecasts for economic developments. The Riksbank's publications include an assessment of the future path for the repo rate. This repo-rate path is a forecast, not a promise.
- In connection with every monetary policy decision, the Executive Board makes an assessment of the repo-rate path needed, and any potential supplementary measures necessary, for monetary policy to be well-balanced. It is thus normally a question of finding an appropriate balance between stabilising inflation around the inflation target and stabilising the real economy.
- There is no general answer to the question of how quickly the Riksbank aims to bring the inflation rate back to 2 per cent if it deviates from the target. A rapid return may in some situations have undesirable effects on production and employment, while a slow return may have a negative effect on confidence in the inflation target. The Riksbank's ambition has generally been to adjust monetary policy so that inflation is expected to be fairly close to the target in two years' time.
- To illustrate the fact that inflation will not always be exactly 2 per cent each month, a variation band is used that stretches between 1 and 3 per cent, which captures around three quarters of the historical monthly outcomes of CPIF inflation. The Riksbank always aims for 2 per cent inflation, regardless of whether inflation is initially inside or outside the variation band.
- According to the Sveriges Riksbank Act, the Riksbank's tasks also include promoting a safe and efficient payment system. Risks linked to developments in the financial markets are taken into account in the monetary policy decisions. With regard to preventing an imbalance in asset prices and indebtedness, the most important factors, however, are effective regulation and supervision. Monetary policy only acts as a complement to these.
- In some situations, as in the financial crisis 2008-2009, the repo rate and the repo-rate path may need to be supplemented with other measures to promote financial stability and ensure that monetary policy is effective.
- The Riksbank endeavours to ensure that its communication is open, factual, comprehensible and up-to-date. This makes it easier for economic agents to make good economic decisions. It also makes it easier to evaluate monetary policy.

## THE DECISION-MAKING PROCESS

The Executive Board of the Riksbank usually holds six monetary policy meetings per year at which it decides on monetary policy. A Monetary Policy Report is published in connection with these meetings. Approximately two weeks after each monetary policy meeting, the Riksbank publishes minutes from the meeting, in which it is possible to follow the discussion that led to the current decision and to see the arguments put forward by the different Executive Board members.

## PRESENTATION OF THE MONETARY POLICY DECISION

The monetary policy decision is presented in a press release at 9.30 a.m. on the day following the monetary policy meeting. The press release also states how the individual Executive Board members voted and provides the main motivation for any reservations entered. A press conference is held on the day following the monetary policy meeting.

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## CHAPTER 1 – Target attainment

For several years, the Riksbank has conducted a very expansionary monetary policy to bring up inflation and stabilise it close to the inflation target. The policy has contributed to good growth, high employment and reduced unemployment. In 2018, inflation was still around the target and inflation expectations became established around 2 per cent, both in the short and the long term. Target attainment was therefore good. Measured in terms of the Riksbank's CPIF target variable, inflation amounted to 2.1 per cent. Underlying inflation was somewhat lower and the median of a number of different measures of underlying inflation amounted to 1.6 per cent. This lower level of underlying inflation illustrates that there was uncertainty regarding the strength of inflationary pressures even though price development indicators pointed to an upturn going forward.

### Economic developments and inflation in 2018

#### Inflation around the target in 2018

Measured in terms of the CPIF, inflation was 2.1 per cent on average in 2018, which was on a level with the outcome for 2017, but higher than the average inflation rate since 2000 (see Figure 1:1 and Table 1:1). CPIF inflation can sometimes be temporarily pushed up or down due to individual price movements. To create a general picture of how much of the development in the CPIF is temporary and how much is persistent, the Riksbank calculates various measures of 'underlying' inflation. These measures were generally weaker than CPIF inflation and the median was 1.6 per cent in 2018, which can be compared with 1.7 per cent in 2017 (see Figure 1:2 and Table 1:1).

Much of the inflation in 2018 reflected temporarily rising energy prices, as a result of rising oil prices globally and an increase in electricity prices due in part to the unusually hot and dry summer (see Table 1:2). CPIF inflation excluding energy amounted to 1.4 per cent in 2018 (see Figure 1:2 and Table 1:1).

**Table 1:1. Inflation according to different measures**  
Annual percentage change, annual average

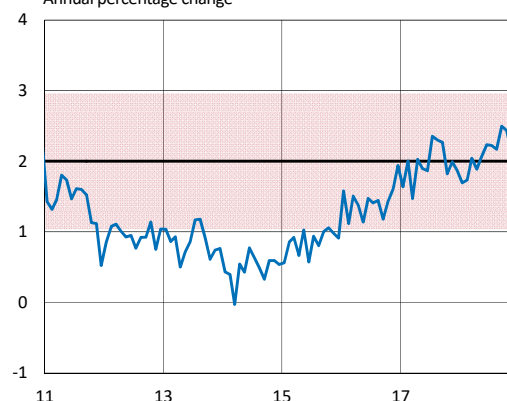
	2016	2017	2018
CPIF	1.4	2.0	2.1
CPIF excluding energy	1.4	1.7	1.4
Underlying inflation (median)	1.5	1.7	1.6

Note. Underlying inflation refers to the median of a number of measures of underlying inflation. The measures included are the CPIF excluding energy, UN24, Trim85, CPIF excluding energy and perishables, persistence-weighted inflation (CPIFPV), factors from principal component analysis (CPIFPC) and weighted mean inflation (Trim1).

Sources: Statistics Sweden and the Riksbank

In 2018, the rate of increase in service prices, which are affected to a large extent by domestic cost pressures, was in line with the average since 2000, but less than the previous year (see Table 1:2). Food prices rose by 2.2 per cent, which is slightly faster than the historical average. Prices for goods, which normally fall slightly, did the same in 2018, and were more or less in line with the average.

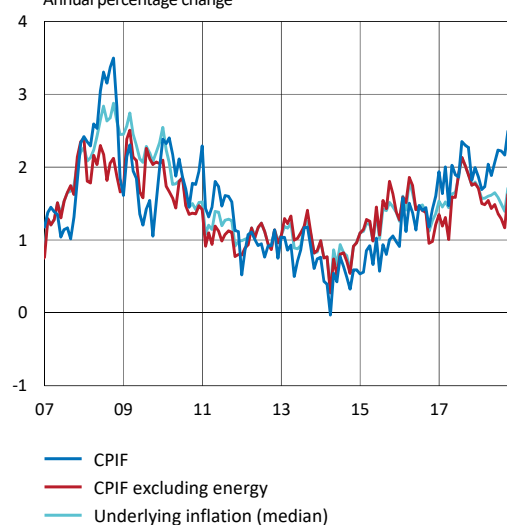
**Figure 1:1. CPIF and variation band**  
Annual percentage change



Note. The pink area shows the Riksbank's variation band and covers about three-quarters of the outcomes since January 1995. The variation band is a way of showing whether the deviation from the inflation target is unusually large.

Sources: Statistics Sweden and the Riksbank

**Figure 1:2. CPIF, CPIF excluding energy and underlying inflation**  
Annual percentage change



Note. Underlying inflation refers to the median value for a number of measures of underlying inflation. The measures included are CPIF excluding energy, UN24, Trim85, CPIF excluding energy and unprocessed food, persistence-weighted inflation (CPIFPV), factors from principal component analysis (CPIFPC) and weighted median inflation (Trim1).

Sources: Statistics Sweden and the Riksbank

The component that measures the value of households' housing stock (referred to as capital stock in Table 1:2) increased by 7.1 per cent in 2018. This is less of an increase than the previous year which reflects the fact that developments on the housing market were weaker.<sup>1</sup>

**Table 1:2. Development of the CPIF and its components**  
Annual percentage change, annual average

	Weight (per cent)	2000–2017	2017	2018
Services	44.9	1.8	2.4	1.9
Goods	27.1	-0.5	-0.7	-0.4
Food	17.7	1.8	2.1	2.2
Energy	7.0	3.5	5.8	10.5
Capital stock	3.4	5.2	9.4	7.1
CPIF	100	1.5	2.0	2.1

Note. The weights are those applying for 2018.

Source: Statistics Sweden

During the year, inflation expectations were established around 2 per cent, on all horizons (see Figure 1:3). The policy conducted by the Riksbank has thus helped maintain confidence in the inflation target.

**Relatively strong economic activity in Sweden and high pressure on the labour market**

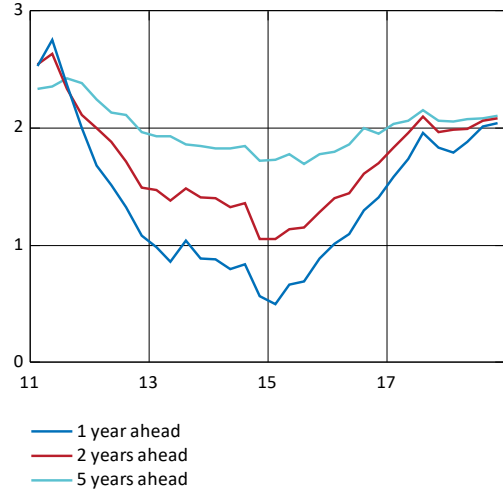
The Swedish economy performed relatively strongly in 2018, while growth in the most important export markets for Sweden slowed down somewhat, with the exception of the United States, where growth continued to rise (see Figure 1:4). As in 2017, Swedish GDP growth in 2018 was in line with a historical average since 2000. Housing investment contributed less to GDP due to weak developments on the housing market since the autumn of 2017. Neither did household consumption expenditure increase as much in 2018 as in 2017. On the other hand, exports were stronger than in the previous year. The increase in economic prosperity measured in terms of GDP per capita has slowed down somewhat in recent years. But in an international comparison, development in Sweden since the financial crisis has been relatively good (see Figure 1:5).

The situation on the labour market has improved more or less constantly since the beginning of 2015, with a rising employment rate and falling unemployment. In 2018, the supply of labour continued to increase rapidly, which, together with the relatively high economic activity, contributed towards the rates of employment and labour force participation being on historically high levels (see Figure 1:6).

The favourable economic situation has led to a high demand for labour and the percentage of companies reporting labour shortages increased to its highest level since the Economic Tendency Barometer began reporting measurements for labour shortages for the whole of the business sector in 1996 (see Figure 1:7). The high demand for labour was expected to lead to higher wages and wage increases over and above central agreements.

**Figure 1:3. Inflation expectations**

Per cent, mean

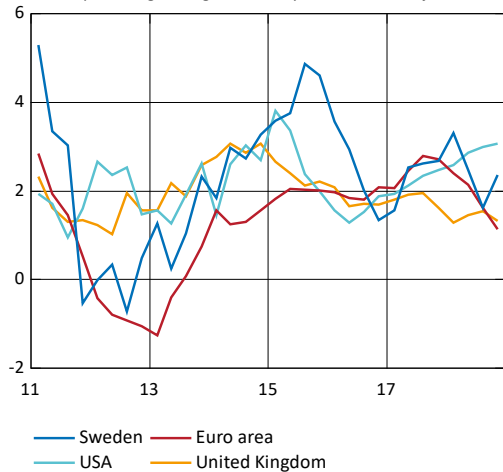


Note. Refers to inflation measured with the CPI. Participants surveyed are social partners, purchasing managers and money market participants.

Source: Kantar Sifo Prospera

**Figure 1:4. GDP growth in Sweden and abroad**

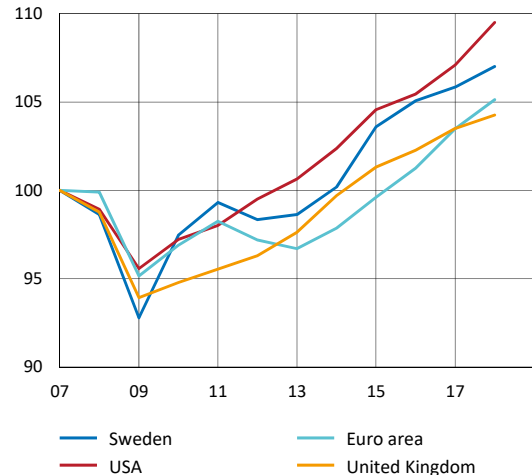
Annual percentage change, seasonally- and calendar-adjusted data



Sources: Bureau of Economic Analysis, Eurostat, Office for national statistics and Statistics Sweden

**Figure 1:5. GDP per capita in Sweden and abroad**

Index, 2007 = 100



Sources: Eurostat and OECD

<sup>1</sup> The higher-than-average increase in 2017 and 2018 is partly due to a method change, according to which tenant-owned homes have been included in the index since the start of 2017. See further the box "Minor direct effects of housing prices on the CPIF", Monetary Policy Report, December 2017.



But despite increasingly high activity in the economy and constantly decreasing unemployment, wage growth has been weak given the economic situation.

### High resource utilisation in the economy

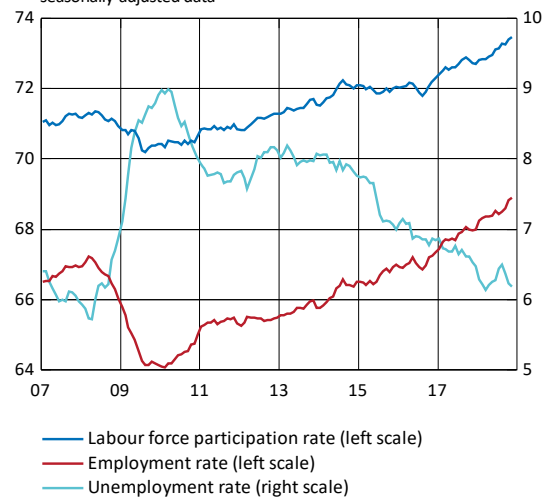
The level of activity in the economy is often summarised in the form of a measure of resource utilisation. However, there is no clear-cut method for measuring this. The Riksbank therefore uses a number of indicators to assess the level of resource utilisation. Two of these indicators are the GDP gap and the hours worked gap, which measure the percentage deviations of GDP and the number of hours worked from their respective estimated long-term levels. The third indicator, known as the RU indicator, summarises information from various surveys and labour market data. A positive measure indicates higher-than-normal resource utilisation and vice-versa if the measure is negative. If the measurements are equal to zero, the situation is normal and there is cyclical balance. All three indicators show that resource utilisation was higher than normal in 2018 (see Figure 1:8). The Riksbank expects resource utilisation in the Swedish economy to fall back in 2019 but nevertheless remain higher than normal.

### A repo rate rise in December

The expansionary monetary policy in recent years has contributed to the strong Swedish economic activity and an inflation rate close to the target. As the conditions are assessed to be good for inflation and inflation expectations to remain close to the inflation target in the period ahead, the need for a very expansionary monetary policy has decreased slightly. Therefore, the Executive Board decided to raise the repo rate from  $-0.50$  per cent to  $-0.25$  per cent in December 2018. Chapter 2 describes the monetary policy conducted last year in more detail. As monetary policy affects the economy with a time-lag, Chapter 3 describes the Riksbank's forecasts and monetary policy in 2016–2017.

**Figure 1:6. Labour force, employment and unemployment**

Per cent of the population and per cent of the labour force, 15–74, seasonally-adjusted data

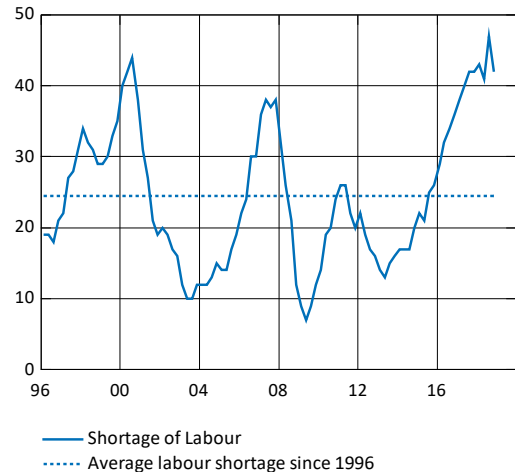


Note. Three-month moving averages.

Source: Statistics Sweden

**Figure 1:7. Share of companies reporting labour shortage**

Per cent



Source: The National Institute of Economic Research

**Figure 1:8. GDP gap, hours gap and RU indicator**

Per cent and standard deviation respectively



Note. GDP gap refers to the GDP deviation from trend, calculated using a production function. The hours gap refers to the deviation of number of hours worked from the Riksbank's assessed trend. The RU indicator is normalised so that the mean value is 0 and the standard deviation is 1.

Sources: Statistics Sweden and the Riksbank

## CHAPTER 2 – Monetary policy in 2018

The expansionary direction of monetary policy was maintained in 2018, with a negative repo rate in combination with extensive holdings of government bonds. For some time, the Riksbank had communicated that the time for a repo rate increase was approaching. But when underlying inflationary pressures in April 2018 were lower than expected, the Riksbank revised the forecast for the interest rate slightly so that the first rise was expected to occur just before or just after the turn of the year 2018/2019. The economic prospects did not change so much during the year and the prospects for inflation largely remained the same during the autumn. In December, therefore, the Riksbank implemented the first repo rate rise since 2011, from  $-0.5$  to  $-0.25$  per cent. At the same time, the Riksbank's forecast indicated that further rate rises would occur in cautious steps. One important question in the Executive Board's discussions over the year concerned the stability of inflation and inflation expectations around the 2 per cent target and when it would be appropriate to begin making monetary policy less expansionary.

### Monetary policy in brief

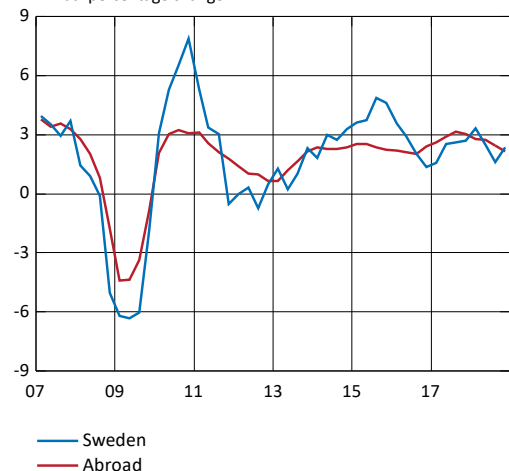
Sweden is a small economy that is very much affected by international developments. In 2018, economic activity abroad was still relatively strong (see Figure 2:1). However, there were several uncertainty factors that left their mark on developments. The trade conflict between the United States and China contributed to uncertainty, especially if the conflict were to escalate and include several countries and regions, or have a negative impact on confidence among households and companies. There was also uncertainty surrounding the economic and financial effects of the United Kingdom's planned withdrawal from the European Union as well as the euro area's structural problems in the banking sector and weak public finances in several countries.

Energy prices pushed up inflation abroad temporarily during 2018. Despite relatively strong development in the real economy, price increases, excluding energy and food, were moderate. Increasingly higher global resource utilisation, however, caused wages and labour costs to increase at a faster rate.

Monetary policy abroad remained significantly expansionary, even though there were major differences between regions. In the United States, the Federal Reserve increased its policy rate by one percentage point in total and continued to reduce its holdings of financial assets. The European Central Bank (ECB) continued to increase its asset holdings during the year and signalled that the policy rate would remain on the same level at least until after the summer of 2019. However, the ECB reduced the rate of its bond purchasing during the autumn and decided not to make any new purchases after the turn of the year.

The Swedish economy continued to show relatively strong growth over the year. Employment continued to rise and unemployment fell further. Measured in terms of the CPIF,

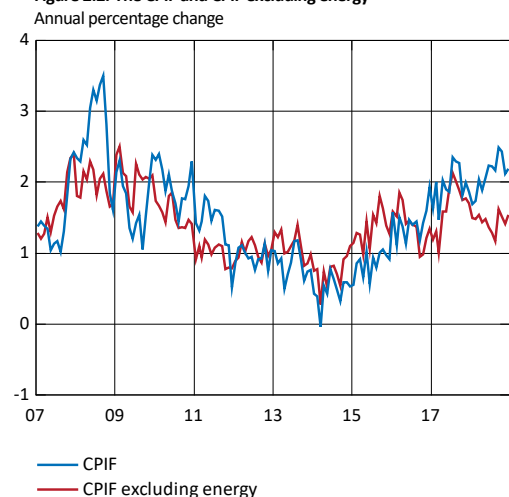
**Figure 2:1. GDP growth in Sweden and abroad**  
Annual percentage change



Note. GDP abroad is weighted using the weights in the krona index (KIX). For GDP abroad, 2018 Q4 refers to the Riksbank's forecast in February 2019.

Sources: National sources, Statistics Sweden and the Riksbank

**Figure 2:2. The CPIF and CPIF excluding energy**  
Annual percentage change



Source: Statistics Sweden.

inflation had been close to the Riksbank's target since the beginning of 2017 (see Figure 2:2). The strength of underlying inflationary pressures in Sweden was still uncertain, however. The weak wage growth in relation to the level of economic activity was an issue that prompted further discussion in 2018.<sup>2</sup>

Below follows a brief account of monetary policy in 2018 and the assessments made by the Riksbank. The forecasts for the most central variables, which formed a basis for the decisions taken, are shown in Figures 2:3–2:7.

### Continued expansionary monetary policy at the start of the year

Ever since April 2017, the Riksbank's forecasts had indicated that an initial repo rate rise would occur during the second half of 2018. This was suggested in part by surveyed inflation expectations being close to target for a long time and inflation in Sweden being expected to continue to be close to target, according to the Riksbank's forecast.

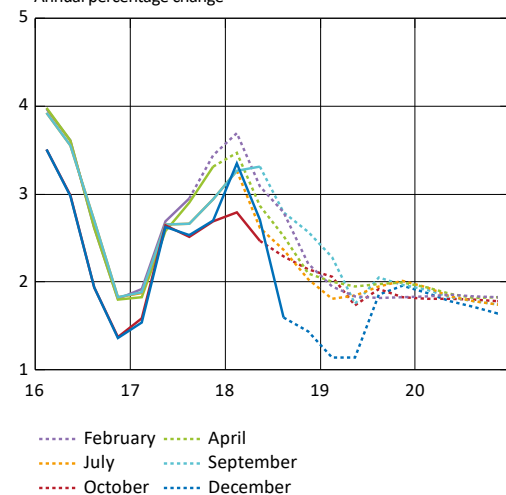
At the beginning of 2018, economic prospects were characterised by an ever-stronger global economy and in Sweden, growth was high, the labour market strong and inflation had for some time been close to 2 per cent (see Figures 2:3–2:4). Strong economic activity had contributed to service prices increasing faster in 2017. But in its February Monetary Policy Report, the Riksbank noted that services prices were not increasing as quickly and wages were rising more slowly than expected, which indicated lower inflationary pressures than in previous assessments. Even though the inflation forecast was then revised down slightly, inflation was expected to be close to 2 per cent from 2019 and the forecast for the repo rate was left unchanged (see Figure 2:5).

### Greater uncertainty about inflationary pressures – forthcoming rate rises postponed until the end of the year

The state of the Swedish economy was still strong in April and, at the beginning of the year, unemployment had fallen to its lowest level since 2008 (see Figure 1:6 and Figure 2:6). Underlying inflation, on the other hand, had been unexpectedly low, raising questions regarding the strength of the development in inflation. The krona exchange rate had indeed weakened, contributing to higher inflation (see Figure 2:7). But the Riksbank's assessment was that it was important for economic activity to remain strong and have an impact on price growth so that inflation would continue to stay close to target in the period ahead. It was also important for the exchange rate to develop in a manner compatible with inflation stabilising close to target.

The assessment was that inflation needed continued support from monetary policy and the repo rate was therefore held unchanged at –0.50 per cent. Bearing in mind the question-mark over underlying inflation, the repo rate forecast was revised slightly down and now indicated an initial rate rise towards the end of the year.

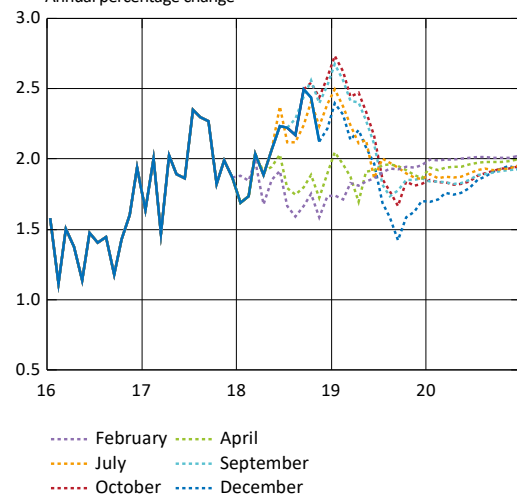
Figure 2:3. GDP, forecasts 2018  
Annual percentage change



Note. Several outcome lines are shown in the figure. This is because the outcomes have been revised by Statistics Sweden.

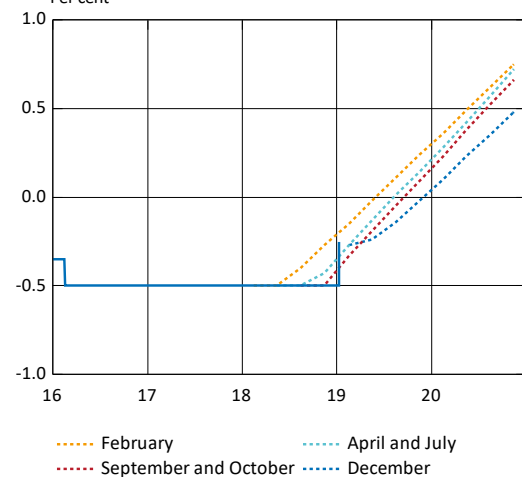
Sources: Statistics Sweden and the Riksbank

Figure 2:4. CPIX, forecasts 2018  
Annual percentage change



Sources: Statistics Sweden and the Riksbank

Figure 2:5. Repo rate, forecasts 2018  
Per cent



Note. Outcome data are daily rates and forecasts are quarterly averages. The forecasts from April and July are identical, and so are the forecasts from September and October.

Source: The Riksbank

<sup>2</sup> See, for instance, the article "The Phillips curve and monetary policy" in Monetary Policy Report, July 2018.

### More concrete plans regarding forthcoming rate rises

In July, the forecast for the repo rate was left unchanged as the economic outlook was basically the same as before, but in September, the repo rate forecast was once again revised down slightly.<sup>3</sup> The new forecast meant that a first repo rate rise was expected to occur either at the meeting in December or at the meeting in February 2019, provided that the economy developed as expected.

Inflation was indeed close to the target of 2 per cent but that was largely due to rapidly rising energy prices that contributed for a period of time to higher CPI inflation. Different measures of underlying inflation indicated that inflationary pressures were still moderate. As previously, however, the strong economic activity provided good conditions for inflationary pressures to rise and CPI inflation was therefore expected to remain close to target even when the rate of increase in energy prices slowed down.

As the time for a first rate rise was approaching, the Executive Board wished to clarify at the September meeting that repo rate increases were expected to occur in steps of 0.25 percentage points.

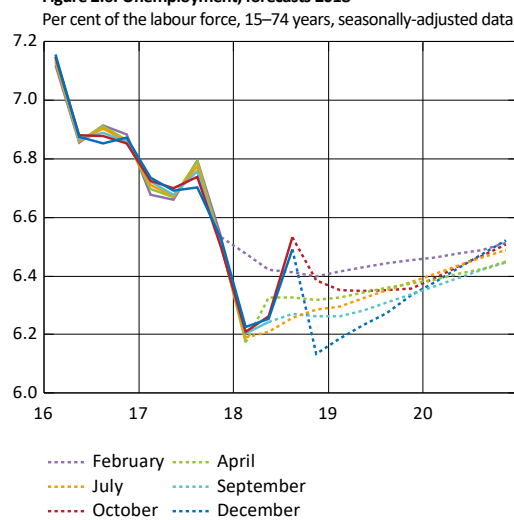
### In December, the repo rate was raised for the first time since 2011

At the monetary policy meeting in October, the Riksbank Executive Board noted that developments had largely been as expected and that the forecasts were more or less unchanged, even though uncertainty over the outlook for the global economy had increased. The assessment that a first repo rate increase would probably happen at the meeting in December or at the meeting in February 2019 still held.

In its Monetary Policy Report in December, the Riksbank noted that the global economy had, as expected, started to enter a phase of slower GDP growth. Monetary policy abroad was moving in a less expansionary direction, but there was still considerable uncertainty over global economic developments. Economic activity in Sweden was still strong, although GDP growth and inflation had become weaker than expected. The employment rate was historically high and companies' labour costs were rising. Even though inflation had come in lower than expected, the conditions remained good for inflation to stay close to target going forward.

As inflation and inflation expectations had become established at around 2 per cent, the need for a highly expansionary monetary policy had decreased slightly. And as the prospects for inflation were also largely unchanged since October, the Executive Board considered it appropriate to raise the repo rate by 0.25 percentage points to -0.25 per cent. As before, the new forecast for the repo rate indicated that future rises were expected to occur at a slow pace.

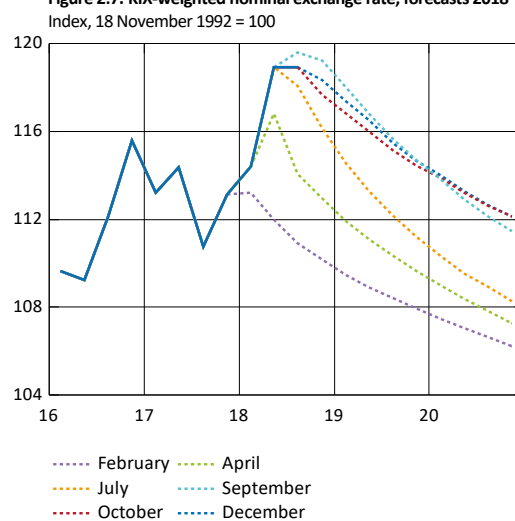
Figure 2:6. Unemployment, forecasts 2018



Note. Several outcome lines are shown in the figure. This is because the series have been seasonally adjusted and the seasonal adjustment can change when a new outcome is published.

Sources: Statistics Sweden and the Riksbank

Figure 2:7. KIX-weighted nominal exchange rate, forecasts 2018



Note. The KIX (krona index) is a weighted average of the krona exchange rate against currencies in countries that are important for Sweden's international transactions. A higher value indicates a weaker exchange rate.

Sources: National sources and the Riksbank

<sup>3</sup> Apart from deciding on an unchanged repo rate and repo rate path at the monetary policy meeting in July, the Executive Board also decided to extend the mandate facilitating rapid intervention on the FX market. The mandate was extended until February 2019.

### Reinvestments but no new purchase of government bonds in 2018

The Executive Board of the Riksbank made no decisions on new purchases of government bonds during the year, but principal payments and coupons from the government bond portfolio were reinvested until further notice (see Figure 2:8). In December 2017, the Executive Board had decided to bring forward reinvestments of the large principal payments that were due during the spring of 2019. Reinvestments of these principal payments began in January 2018. This meant that the Riksbank's holdings of government bonds increased temporarily in 2018.

## The Executive Board's discussions and monetary policy considerations

### Important to have firmly anchored inflation expectations

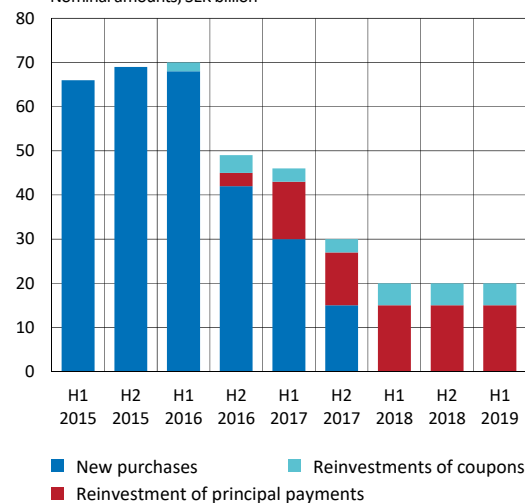
An issue that was the subject of many of the Executive Board's discussions in 2018 was at what point inflation and inflation expectations could be considered sufficiently well-anchored to the target – that is to say there was enough confidence in the inflation target – in order for it to be appropriate for the Riksbank to start increasing the interest rate. The Executive Board was in agreement that the repo rate needed to be increased at some point but did not agree on exactly when this should happen.

The issue of how well inflation is anchored to the target is closely linked to the question of the extent to which a certain level of inflation reflects persistent or temporary factors. For this reason, the analysis of measures of underlying inflation was afforded considerable scope during the year (see the article "The CPIF and measures of underlying inflation").

One of the risks noted by the Executive Board was that if repo rate increases were initiated too early, inflation could fall below target again. After the global financial crisis, inflation in Sweden was below target for about six years and at times was less than 1 per cent measured in terms of the CPIF (see Figure 2:2). It has required an expansionary policy with a very low repo rate for a long time to attain the target again. If inflation were once again to fall below target, it would risk the credibility of the target being once again called into question and economic agents expecting an inflation rate of below 2 per cent even in the long term.

If inflation and inflation expectations are very low, it may be more difficult to achieve adjustments in relative wages between professions, firms and branches that are beneficial to the economy. This worsens the conditions for wage formation to distribute resources in the economy efficiently. Another problem is that low average inflation could make it more difficult for monetary policy to counteract future recessions, as it would be difficult to achieve a sufficiently low real interest rate.<sup>4</sup> This has given rise to an international debate on whether 2 per cent is

Figure 2:8. The Riksbank's purchases of government bonds  
Nominal amounts, SEK billion



Note. The development for reinvestments from 2019 onwards is a forecast and refers to nominal amounts. The final amounts will depend on current market prices.

Source: The Riksbank

<sup>4</sup> This is described in more detail in the section "The purpose of the inflation target" in Chapter 4.

actually too low a target. With even lower average inflation than this, the problems would be even greater.

The point at which confidence in the inflation target is high enough to not constitute an obstacle to increasing the repo rate is ultimately a question of judgement. Executive Board members had slightly different views on this during the year, as well as on how strong inflationary pressures were expected to be in the period ahead. As previously mentioned in the chapter, a majority of the Executive Board considered it appropriate to implement a first repo rate increase in December.

## Monetary policy decisions in 2018

13 February	<p>The repo rate was held unchanged at <math>-0.50</math> per cent. The forecast for the repo rate was also left unchanged with slow increases from the second half of 2018. Henry Ohlsson entered a reservation against the repo rate decision and the rate path. He advocated raising the repo rate to <math>-0.25</math> per cent with reference to the strong economic growth in Sweden and abroad.</p>
25 April	<p>The repo rate was held unchanged at <math>-0.50</math> per cent. The forecast for the repo rate was revised down and indicated slow rate rises not until after the end of the year. Henry Ohlsson entered a reservation against the repo rate decision and the rate path. He advocated a repo rate rise to <math>-0.25</math> per cent for the same reasons as before.</p>
2 July	<p>The repo rate was held unchanged at <math>-0.50</math> per cent. The forecast for the repo rate was also held unchanged. Martin Flodén entered a reservation against the rate path and advocated one with an increase of <math>0.25</math> percentage points in September or October 2018 and that coincided with the repo-rate path as from the third quarter of 2019. Henry Ohlsson entered a reservation against the repo rate decision and the rate path. He advocated a repo rate rise to <math>-0.25</math> per cent for the same reasons as before.</p> <p>The Executive Board also decided to extend the mandate for foreign exchange interventions until the 12 February 2019. Martin Flodén and Henry Ohlsson entered reservations against this. Martin Flodén stated the same reasons as he did with respect to previous decisions on the foreign exchange intervention mandate, i.e. that foreign exchange interventions are not an appropriate tool for making monetary policy more expansionary in the current situation. Mr</p>

5 September	<p>Ohlsson considered that in a situation with inflation and inflation expectations close to the target level, potential interventions on the foreign exchange market can be managed without a special mandate.</p> <p>The repo rate was held unchanged at –0.50 per cent. The forecast for the repo rate was revised down slightly and indicated a rate rise of 0.25 percentage points, either in December or in February 2019. Martin Flodén entered a reservation against the rate path and advocated one with a high probability of an increase of 0.25 percentage points in October and that coincided with the repo-rate path as from the third quarter of 2019. He felt that the communication of such a repo rate path would entail sufficient tightening of monetary policy. Henry Ohlsson entered a reservation against the rate decision and the rate path and advocated a rise to –0.25 per cent for the same reasons as before.</p>
23 October	<p>The repo rate was held unchanged at –0.50 per cent. The forecast for the repo rate was also held unchanged. Martin Flodén and Henry Ohlsson entered reservations and advocated a repo rate rise to –0.25 per cent. Martin Flodén referred to the upturn in inflation and the strengthened confidence in the inflation target and advocated a repo-rate path that coincided with the report's rate path as from the third quarter of 2019. Henry Ohlsson referred to the same arguments as before and advocated bringing forward the repo-rate path with the same gradient as the repo-rate path in the Monetary Policy Report.</p>
19 December	<p>The repo rate was increased to –0.25 per cent. The forecast for the repo rate was revised down and indicated that the next rate rise will probably occur during the second half of 2019. After that, the forecast indicated approximately two rate rises per year by 0.25 percentage points each time. Per Jansson entered a reservation against the repo rate decision and the rate path. He referred to the continued major uncertainty regarding the strength of the more persistent rate of inflation. In his opinion, it was better to await further information and proceed cautiously with an unchanged rate for a further period of time.</p>

## ARTICLE – The CPIF and measures of underlying inflation

The Riksbank's target variable for monetary policy is inflation according to the CPIF, which means that monetary policy is adjusted so that CPIF inflation is around 2 per cent two to three years ahead. CPIF inflation can sometimes fluctuate up or down due to individual price movements. For example, rapidly rising energy prices contributed relatively substantially to CPIF inflation in 2018. On condition that the effect on the CPIF is temporary, such a change is not something to which monetary policy needs to react. The Riksbank calculates different measures of underlying inflation to obtain a picture of how much of the development in CPIF inflation is temporary and how much is persistent. Underlying inflation can be measured in many different ways, the common denominator being that all the measures exclude or reduce the significance of temporary price movements. According to the measures calculated by the Riksbank, the persistent component of inflation was slightly below 2 per cent in 2018.

### Inflation in terms of the CPIF is the Riksbank's target variable

The Riksbank's goal is low and stable inflation. More specifically, the target is that the annual change in the consumer price index with a fixed interest rate (CPIF) shall be 2 per cent. When the Riksbank introduced the inflation target in 1993, the target was expressed in terms of the annual rate of change in the CPI, but in September 2017, the target variable for monetary policy was changed to the CPIF. The main reason for the change was to clarify the role played by the CPIF in recent years, as this price index had in practice been more important for the design of monetary policy than the CPI.<sup>5</sup>

When the Riksbank makes monetary policy more or less expansionary, it affects the economy and inflation via different channels. Some channels have a relatively rapid impact on inflation, but many of them take longer and most monetary policy effects on inflation occur with a time lag. Monetary policy is therefore based on forecasts of future developments. To achieve the inflation target, the Riksbank normally adjusts monetary policy so that CPIF inflation, according to the forecast, will be close to the target of 2 per cent a few years ahead.

### The forecasts two to three years ahead show the persistent change in CPIF inflation

Inflation is normally defined as an increase in the general price level in the economy. A substantial change in an individual price is thus not the same as inflation when other prices increase at a normal rate. However, the *measures* used to estimate inflation, such as the CPIF, can be affected quite considerably by movements in individual prices. If, for

example, the prices of fruit and vegetables increases substantially due to poor harvests, it may affect and temporarily push up inflation measured in terms of the CPIF. On condition that the effect of the price increase is not permanent and does not have knock-on effects on other prices, the upturn in CPIF inflation is nothing that the Riksbank needs to offset with monetary policy.

For this reason, it is important that the Riksbank analyses inflation outcomes carefully in order to understand what is presently driving inflation and what it might mean for inflation going forward. If the assessment is that temporary factors are affecting CPIF inflation, this will be reflected in the forecasts that stretch a few years ahead. If the effects on CPIF inflation are temporary, they will normally not affect inflation in two to three years.

### Measures of underlying inflation complement the forecasts for CPIF inflation

To create a general picture of how much of the development in the CPIF is temporary and how much is persistent, the Riksbank also calculates various measures of 'underlying' inflation. There is no clear-cut definition of the term underlying inflation and it can be measured in many different ways. The measures can roughly be divided into two groups.<sup>6</sup>

Certain measures of underlying inflation identify specific prices that have historically been driven by more temporary factors and remove these prices from the CPIF. Such measures are given particularly sharp focus when it is obvious that inflation outcomes have been affected by these individual prices, for example food or energy prices, and the intention is to illustrate what effect this has had on CPIF inflation.

<sup>5</sup> See further the article "CPIF as target variable for monetary policy" in Monetary Policy Report September 2017.

<sup>6</sup> More details on how the Riksbank calculates measures of core inflation can be found in the article "Why measures of core inflation?" in Monetary Policy Report October 2018 and in Johansson, M. Löf, O. Sigrist and O. Tysklind (2018), "Measures of core inflation in Sweden", *Economic Commentaries* No. 11. Sveriges Riksbank.



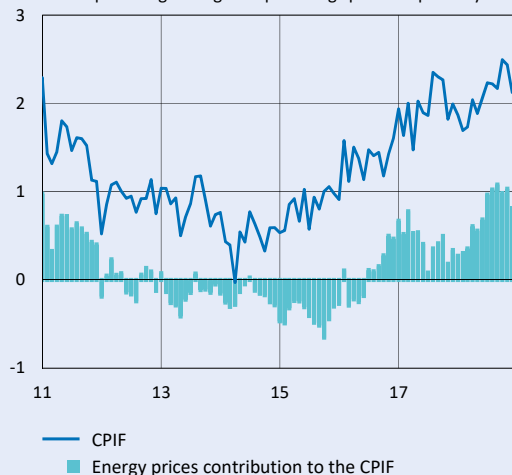
For other measures of underlying inflation, the basis is more neutral in that it is not determined in advance which prices are to be removed. Instead, statistical methods are used to identify prices in the CPIF that historically have varied quite considerably. These are then either removed from the CPIF or their significance is reduced when all prices are added together into an aggregate measure.

The intention is therefore that measures of underlying inflation should capture the persistent component of inflation at present, which can give a better picture of future inflation if current CPIF inflation is being affected by temporary factors. But it is important to point out that measures of underlying inflation are a complement to forecasts for CPIF inflation a few years ahead. It is the forecasts for CPIF inflation that the Executive Board of the Riksbank bases its monetary policy decisions on.

### Energy prices made a major contribution to CPIF inflation in 2018

As mentioned previously, CPIF inflation in 2018 was affected quite considerably by developments in energy prices during the year. Over the course of the summer and autumn, the increase in electricity and fuel prices contributed in total about 1 percentage point to the outcome for CPIF inflation (see Figure 2:9). This situation differs considerably from the period 2012–2015, when energy prices contributed to holding back CPIF inflation for an unusually long period of time.

**Figure 2:9. CPIF and contribution from energy prices**  
Annual percentage change and percentage points respectively



Note. The group 'energy prices' consists of fuel and electricity prices. The contribution of energy prices to the CPIF in the forecast is approximately equal to the annual percentage change in energy prices multiplied by their current weight in the CPIF.

Sources: Statistics Sweden and the Riksbank

Another way of illustrating the effect of energy prices on the CPIF is to study the underlying inflation measure 'CPIF excluding energy'. This gives a clearer picture of what CPIF inflation would have been without the contribution from

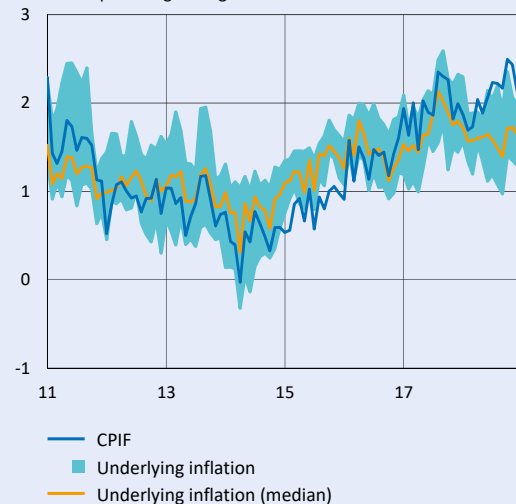
energy prices. On average for 2018, inflation in terms of the CPIF excluding energy was 1.4 per cent, compared with 2.1 per cent in terms of the CPIF.

The assessment made by the Riksbank in 2018 was that the most of increase in energy prices was temporary and that the contribution from energy prices to CPIF inflation would decrease in the period ahead. The oil price fell quite significantly towards the end of the year. The electricity price, which had been pushed up by the extremely hot and dry summer, remained on a high level but was expected to fall towards a more normal level in the spring of 2019 as the demand for electricity decreases and the supply of hydroelectric power increases.

### Measures of underlying inflation indicate persistent inflation slightly below 2 per cent in 2018

Even though the contribution from energy prices to CPIF inflation was considerable in 2018, CPIF inflation was naturally also affected by other price components (see Chapter 1). As previously mentioned, the CPIF excluding energy prices is just one of several feasible measures of underlying inflation. Even though the contribution from energy prices was temporary, it is not obvious how much of the outcome for inflation in 2018 reflected temporary factors and how much reflected a more persistent development.

**Figure 2:10. CPIF and measures of underlying inflation**  
Annual percentage change



Note. The field shows the highest and lowest outcomes among different measures of underlying inflation. The measures included are: CPIF excluding energy, CPIF excluding energy and perishables, CPIFPC, CPIFPV, Trim1, Trim85 and UND24. For an explanation of the measures, see the references in footnote 6.

Sources: Statistics Sweden and the Riksbank

Figure 2:10 shows CPIF inflation together with a field stretching from the lowest to the highest estimate of underlying inflation each month according to seven measures regularly calculated by the Riksbank.<sup>7</sup> The figure illustrates that there can be a relatively large variation in the different

<sup>7</sup> These measures are described in more detail in the references in footnote 6.

measures from one month to the next, but it is also clear that the persistent component of inflation in 2018 is generally estimated to be lower than CPIF inflation. The median of the measures fluctuated between 1.4 and 1.7 per cent during the year.

The different ways of calculating underlying inflation have various strengths and weaknesses and can work more or less effectively depending on various circumstances. But an evaluation of the measures has shown that two of them in particular fulfil a number of desirable criteria over time. One of these measures gives weights to CPIF components depending on how much they vary over time. The other calculates the common trend among CPIF components. In 2018, the average for these measures was 1.7 per cent and 1.6 per cent respectively.<sup>8</sup> This is hence a slightly higher estimate of the persistent component of inflation than indicated by inflation in terms of the CPIF excluding energy, but also clearly lower than CPIF inflation for the year.

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<sup>8</sup> The two measures are called UND24 and CPIFFC.

## CHAPTER 3 – The Riksbank’s forecasts and monetary policy in recent years

During 2016 and 2017 the Riksbank’s very expansionary monetary policy was continued to ensure confidence in the inflation target and to stabilise inflation around 2 per cent. The policy contributed to continued strong economic activity that also had an impact on price developments. Inflation was back on target in 2017 and remained there during 2018. The forecasts made by the Riksbank in these years and which guided monetary policy captured the development of inflation and economic activity in a relatively good way and the repo rate has followed the Riksbank’s forecasts relatively closely since the end of 2016.

To achieve the inflation target of 2 per cent, the Riksbank normally adapts monetary policy so that the forecast for CPIF inflation is close to target a few years ahead. The decisions are based on forecasts because monetary policy affects inflation with a time lag. However, it is not obvious how quickly inflation is affected. Some effects become visible fairly quickly, for instance those achieved when changes in the exchange rate affect prices of imported goods. To a certain extent, therefore, the monetary policy conducted in 2018 and described in Chapter 2 may have affected inflation during the year. Other effects that go via changes in aggregate demand only become visible after a longer period of time. This means that the monetary policy the Riksbank conducted in 2016 and 2017 has great significance for inflation and the real economy in 2018.

### The forecasts made in 2016 and 2017 reflect the monetary policy conducted at that time

So did the Riksbank conduct a monetary policy in 2016–2017 that contributed to good target attainment in 2018? One way of approaching this question is to study the forecasts made by the Riksbank for inflation and the rest of the economy during those years. This provides a picture of the monetary policy conducted and the assessments upon which it was based.

Figures 3:1-3:9 show the actual developments and the Riksbank’s forecasts during the years 2016 and 2017 for a number of central variables.<sup>9</sup> The purpose of the figures is to illustrate in a general manner how the Riksbank’s view of the future during these years compared with the subsequent outcome. It is therefore not necessary to distinguish individual forecasts.

### The repo rate has followed the Riksbank’s forecasts relatively closely since the end of 2016

During 2016, global interest rates were low and there was considerable uncertainty over economic activity abroad. In Sweden, however, economic activity strengthened and resource

#### Even well-founded forecasts can be wrong

Target attainment, as discussed in Chapter 1, is a natural starting point for an assessment of monetary policy. But the extent to which inflation deviates from the target does not necessarily give the full picture of how well monetary policy has been conducted.

Monetary policy is based on forecasts as it affects economic activity and inflation with a certain time lag. The objective is obviously that the Riksbank’s forecasts shall be correct so that monetary policy decisions are based on an accurate picture of economic developments going forward. However, unforeseen events occur all the time in the economy, which means that deviations from the inflation target are more the rule than the exception. Some statistics are also revised, leading to outcomes that were taken for granted when the forecasts were made and may subsequently be changed. All these factors together mean that even well-founded and carefully prepared forecasts often turn out to be wrong.

<sup>9</sup> The fact that the starting point for the forecasts is in certain cases relatively far from the line showing the outcome may in part be due to the outcome having subsequently been revised, to weights used to compile the outcome series having been changed or to the effects of any seasonal adjustment to the outcome series having been altered over time.

utilisation was close to normal. Inflation increased, but the upturn was uneven. In 2016, therefore, the Riksbank reduced the repo rate and increased purchases of government bonds to support the upturn and maintain confidence in the target. At the start of the year, the assessment was that it would be possible to increase the repo rate in 2017, on condition that the economy largely developed in line with expectations (see Figure 3:1). However, uncertainty over the strength of the inflation upturn caused the Riksbank in the autumn of 2016 to delay an initial increase until 2018.<sup>10</sup>

Thereafter, the repo rate has followed the Riksbank's forecasts made towards the end of 2016 and in 2017 relatively closely. According to these forecasts, the Riksbank's assessment is that repo rate rises could start to happen at a slow pace from mid-2018. The fact that the repo rate was then increased in December 2018, i.e. slightly later than in the forecasts, was partly a result of continued uncertainty about the strength of underlying inflation (see Chapter 2).

**CPIF inflation as expected, but unexpectedly weak underlying inflation in 2018**

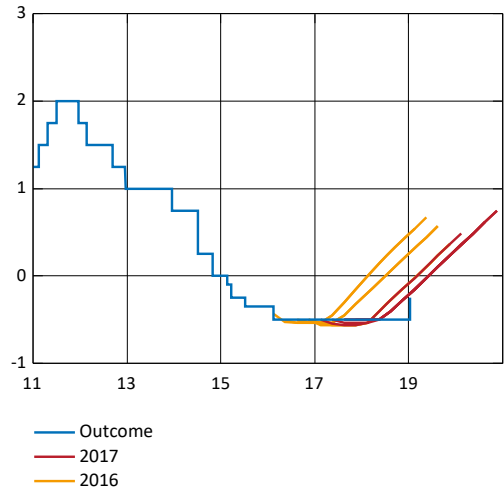
With the monetary policy conducted in 2016–2017, the Riksbank's assessment was that inflation would continue to rise and stabilise around the inflation target. This is also what happened. The forecasts for CPIF inflation made by the Riksbank in 2016 captured the rise in inflation in 2017 in a good way (see Figure 3:2). The fact that CPIF inflation then remained close to the inflation target during 2018 was captured by the forecasts made by the Riksbank in 2016 and 2017.

CPIF can at times be much affected by movements in individual prices.<sup>11</sup> During the period 2016–2018, energy prices periodically made an unusually large contribution to CPIF inflation, which is reflected in the forecasts made by the Riksbank for inflation in terms of the CPIF excluding energy (see Figure 3:3). The Riksbank's assessment at the start of 2016 was that price increases excluding energy prices would be higher going forward than turned out to be the case. The forecasts made in 2017 were also higher than the outcome for inflation in 2018. As the forecasts for CPIF inflation itself were nevertheless in line with the outcome for the entire period, as Figure 3:2 illustrates, this indicates that energy prices rose unexpectedly sharply.

**Strong growth and inflation upturn abroad**

A contributory factor to the inflation upturn in Sweden is that international economic activity has grown gradually stronger in recent years. In the countries that are most important for Sweden's economy, GDP rose more rapidly than expected in both 2017 and 2018 (see Figure 3:4). To a certain extent, the forecast errors can be explained by a subsequent upward

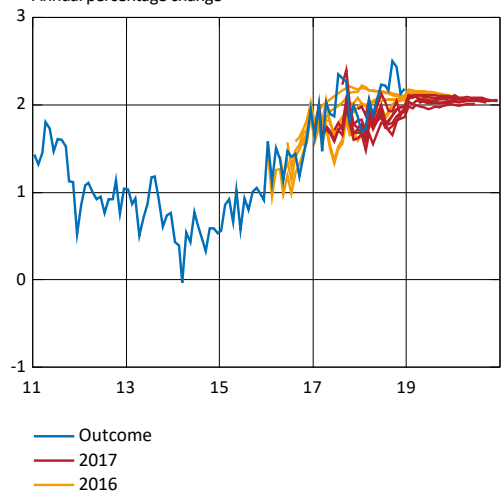
**Figure 3:1. Repo rate, outcome and forecasts**  
Per cent



Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017. Several of the forecasts made in 2016 largely coincide with each other. The same is true of forecasts made in 2017. Outcomes are daily data and forecasts refer to quarterly averages.

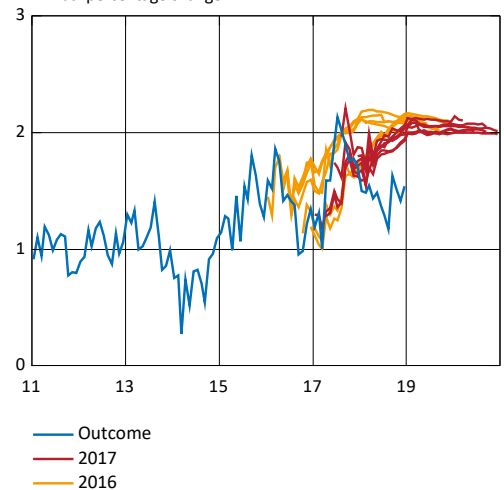
Source: The Riksbank

**Figure 3:2. CPIF, outcome and forecasts**  
Annual percentage change



Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017. Sources: Statistics Sweden and the Riksbank

**Figure 3:3. CPIF excluding energy, outcome and forecasts**  
Annual percentage change



Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017. Sources: Statistics Sweden and the Riksbank

<sup>10</sup> This revision is not visible in Figure 3:1, however. After the revision, the repo rate forecast remained largely unchanged until April 2017. In the figure, therefore, the last forecasts made in 2016 coincide with the first forecasts made in 2017.

<sup>11</sup> See further the article "The CPIF and measures of underlying inflation".

revisions of the statistics, which means that the Riksbank's forecasts started from levels that were too low.

At the same time, the economic upturn has contributed to an increase in inflation abroad and the increase in 2016 was well captured in the Riksbank's forecasts (see Figure 3:5). International inflation in 2017 was higher than in previous years, but was nevertheless surprisingly low. Bearing in mind that GDP growth was simultaneously stronger than expected, the Riksbank, like other analysts, expected a higher inflation outcome that year. In 2018, however, inflation abroad was in line with the Riksbank's forecasts.

### The krona exchange rate has been weaker than expected

In 2016, the krona depreciated in a way that was unexpected for the Riksbank (see Figure 3:6). It is often difficult to identify what drives changes in the krona exchange rate and how it will move in the short term. In the longer term, it is reasonable to assume that the exchange rate is affected by more structural factors that depend on economic developments in Sweden in relation to other countries. The Riksbank's assessment has been that the krona should appreciate in the long run and from the end of 2016 and up to autumn 2017, the exchange rate strengthened in line with the Riksbank's assessment. But since then the krona has once again become unexpectedly weak.

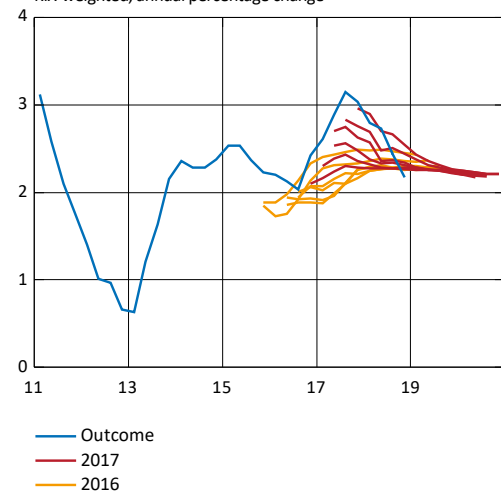
Monetary policy is not aimed at meeting a particular target for the krona. However, the exchange rate affects how prices in krona for imported goods and services fluctuate. The important thing for monetary policy is therefore how the exchange rate affects inflation. However, it is difficult to know how large the impact on inflation will be and how quickly it will occur. But it is clear that the weakening in 2016 and since the end of 2017 has contributed to the upturn in inflation in recent years. The development of the exchange rate in 2018 and the effects on inflation are discussed further in the article "The significance of the krona for inflation".

### Domestic economic developments approximately as expected

In Sweden, economic activity has been strong for a long period of time. This has been reflected in strong growth, rising employment and an increasingly high level of resource utilisation. The strong economic activity both in Sweden and abroad has made it easier for companies to raise their prices. In recent years, economic activity has remained relatively strong and in 2017 and also 2018 GDP growth was in line with the historical average. The Riksbank had expected GDP growth to slow down, but the forecasts overestimated developments somewhat (see Figure 3:7). This is explained partly by historical downward revisions to GDP outcomes for 2016 and 2017.

The relatively strong economic activity is also reflected in unemployment, which fell in line with the Riksbank's assessment in 2016 and 2017. For 2018 the Riksbank had forecast that activity in the economy would slow down somewhat and that unemployment would in principle remain unchanged over the

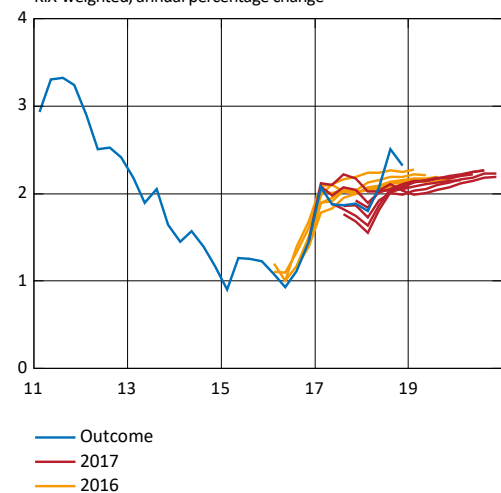
**Figure 3:4. GDP abroad, outcome and forecasts**  
KIX-weighted, annual percentage change



Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017. The outcome for 2018 Q4 refers to the Riksbank's forecast in February 2019. KIX refers to an aggregate of countries that are important for Sweden's international transactions.

Sources: National sources and the Riksbank

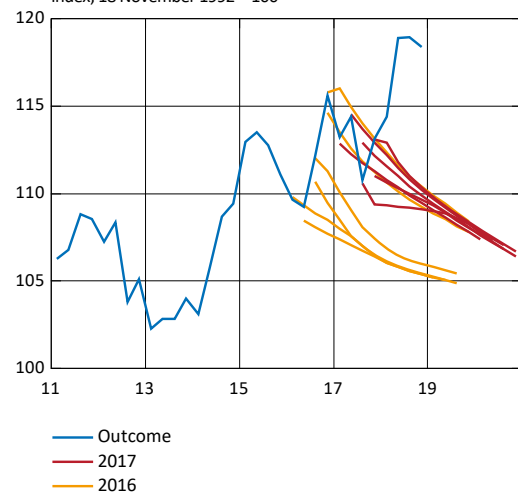
**Figure 3:5. Inflation abroad, outcome and forecasts**  
KIX-weighted, annual percentage change



Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017. KIX refers to an aggregate of countries that are important for Sweden's international transactions.

Sources: National sources and the Riksbank

**Figure 3:6. KIX-weighted nominal exchange rate, outcome and forecasts**  
Index, 18 November 1992 = 100



Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017. The KIX (krona index) is a weighted average of the krona exchange rate against currencies in countries that are important for Sweden's international transactions. A higher value indicates a weaker exchange rate.

Source: National sources and The Riksbank

year. But at the beginning of 2018 employment increased much more than expected, which was a factor in unemployment falling further (see Figure 3:8). Although the number of people in the labour force also increased more than expected in 2018, the strong employment meant that unemployment as a whole was lower than expected over the year.

#### Moderate wage increases but unexpectedly high cost pressures

When resource utilisation increases, this is normally reflected in rising costs for companies. The costs for labour have also increased, but it is not primarily wage increases that have driven developments. In comparison with earlier periods of corresponding economic activity, wage increases have been unexpectedly moderate.

The rising costs are explained to a greater extent by the poor development in productivity, that is, output per hour worked. This development was weak in both 2017 and 2018 and also weaker than the Riksbank had assessed. Despite the relatively moderate wage increases, the costs for the work put into production in companies have nevertheless increased. The rate of increase in unit labour costs, the difference between the increase in total wage costs and the increase in productivity, has been higher than the Riksbank had estimated (see Figure 3:9).<sup>12</sup>

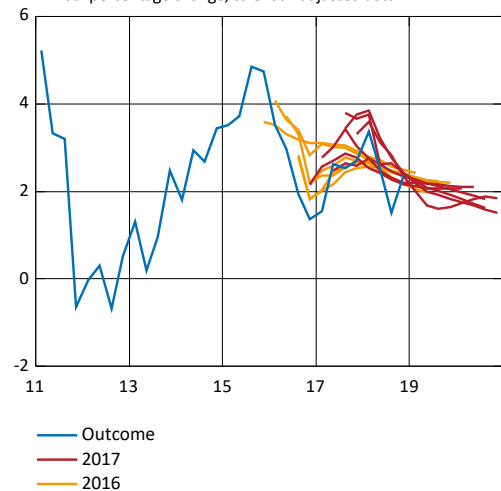
#### No major differences between the Riksbank's and other analysts' forecasts in recent years

In an evaluation of monetary policy, there is reason to compare the Riksbank's forecasts with those of other analysts, as this can give an indication of how reasonable the Riksbank's forecasts were at the time they were made. Did the Riksbank's forecasts differ significantly from those of other analysts, and if so why? Or did all of the analysts reason in the same way? The Riksbank publishes every year a detailed evaluation of the Riksbank's forecasts in comparison with those of other analysts. With regard to the forecasts made in 2016 and 2017, the conclusions are in brief that the Riksbank succeeded relatively well in its forecasts of inflation in 2018. In general, however, the differences between the different analysts were relatively small. This is described in greater detail in "A review of the Riksbank's forecasts", Riksbank Studies, March 2019 and the corresponding report from March 2018.

#### The expansionary monetary policy 2016–2017 had the intended effect

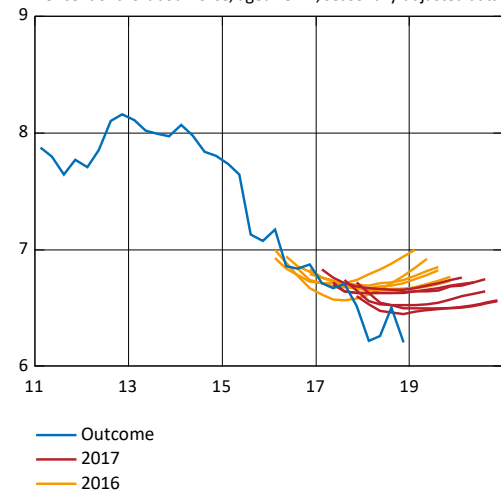
During 2016 and 2017 the Riksbank's very expansionary monetary policy was continued to ensure confidence in the inflation target and to stabilise inflation around 2 per cent. The policy had the intended effect, in the sense that it contributed to continued strong economic activity that also had an impact on price developments. Inflation was back on target in 2017 and remained there in 2018, although there were question marks

**Figure 3:7. GDP, outcome and forecasts**  
Annual percentage change, calendar-adjusted data



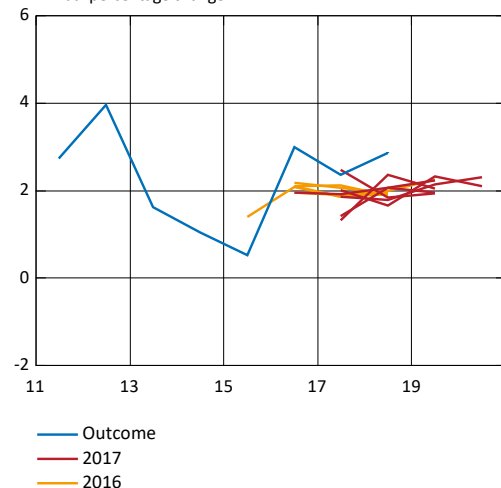
Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017.  
Sources: Statistics Sweden and the Riksbank

**Figure 3:8. Unemployment, outcome and forecasts**  
Per cent of the labour force, aged 15-74, seasonally-adjusted data



Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017.  
Sources: Statistics Sweden and the Riksbank

**Figure 3:9. Unit labour cost, outcome and forecasts**  
Annual percentage change



Note. The yellow and red lines represent the Riksbank's forecasts 2016 and 2017.  
Source: Statistics Sweden and the Riksbank

<sup>12</sup> In this case as well, however, some of the forecast errors are due to later revisions to the National Accounts.

regarding the strength of the underlying inflation. Long-term inflation expectations were also around 2 per cent.

From 2016, both economic activity in general and inflation have developed in line with the Riksbank's forecasts and the repo rate has followed the Riksbank's forecasts relatively closely since the end of 2016.

## ARTICLE – The significance of the krona for inflation

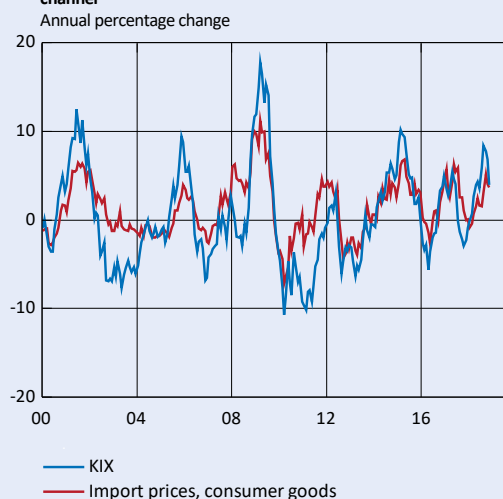
Changes in the krona exchange rate can affect both inflation and the real economy. For a central bank with an inflation target, like the Riksbank, the effects on inflation are particularly important to follow. This article describes how changes in the krona exchange rate affect inflation in Sweden. The link between the exchange rate and inflation is more complicated than it may appear at first glance. In 2018, the krona was considered to have been weaker than what is normal in the long term. Analysis by the Riksbank suggests that this has helped keep inflation in Sweden around the target of 2 per cent. As the inflation target is combined with a floating exchange rate, the Riksbank has no target for the development of the Swedish krona exchange rate. But monetary policy can help push inflation towards the target, partly as a result of its effects on the exchange rate. It is therefore important for the Riksbank to follow and analyse the development of the Swedish krona.

### The krona exchange rate has a clear correlation with import prices for Swedish companies...

The most *direct* way that movements in the krona exchange rate affect Swedish inflation is via the price of imported products for Swedish companies *in the producer channel* or “at the border”.

Prices do not generally change continuously but are sluggish. How strong the immediate correlation between the exchange rate and import prices in Swedish companies depend in part on whether the importing company has a contract price in foreign currency or in Swedish krona. If the price is contracted in foreign currency, a movement in the krona exchange rate leads to an immediate change in the import price in krona.<sup>13</sup> There is a lot to suggest that exports from large countries and currency areas are largely priced in the exporter’s currency.<sup>14</sup> The fact that much of Sweden’s foreign trade is with the euro area and the United States could therefore indicate that a significant proportion of imports to Swedish companies are priced in foreign currency. Figure 3:10 shows the movement in the krona exchange rate together with the change in import prices of Swedish consumer goods at the producer level.<sup>15</sup> We see that there is a very strong correlation.

Figure 3:10. Nominal exchange rate and import prices in the producer channel



Note. The KIX (krona index) is a weighted average of the krona exchange rate against currencies in countries that are important for Sweden’s international transactions. A higher value indicates a weaker exchange rate.

Source: National sources, Statistics Sweden and the Riksbank

### ... but a weaker correlation with aggregate consumer prices

There are several reasons why the exchange rate has a weaker correlation with aggregate consumer prices than with import prices “at the border”.

Companies that import products and sell them on to Swedish consumers face a choice when the purchase price of the import changes: change the price to the consumer to compensate for the new purchase price, adjust the margins and keep the price to the consumer unchanged or a

<sup>13</sup> The price of export products being priced in the exporting country’s currency is normally referred to as Producer Currency Pricing, PCP. When the exporter instead sets the price in the recipient country’s currency, it is normally referred to as local currency pricing, LCP. For research studies of how the choice of pricing currency influences the effect of the exchange rate on import prices, see, for instance, M. Flodén and F. Wilander, “State dependent pricing, invoicing currency, and exchange rate pass-through”, *Journal of International Economics*, 70, pp. 178–196, 2006 and G. Gopinath, O. Itskhoki, and R. Rigobon, “Currency choice and exchange rate pass-through”, *American Economic Review*, 100, pp. 304–336, 2010.

<sup>14</sup> For example, one study indicates that 97 per cent of exports from the United States are priced in US dollars. See G. Gopinath, O. Itskhoki, and R. Rigobon, “Currency choice and exchange rate pass-through”, *American Economic Review*, 100, pp. 304–336, 2010. A study of Swedish companies shows on the contrary that Swedish exports are mostly priced in foreign currency, see R. Friberg and F. Wilander, “The currency denomination of exports – A questionnaire study”, *Journal of International Economics*, 75, pp. 54–69, 2008.

<sup>15</sup> In total, about 60 per cent of import price data is submitted to Statistics Sweden in foreign currency. These prices are then converted into Swedish krona at the current exchange rate.



combination of these. As mentioned earlier, prices are generally sluggish, and this is also true of prices to Swedish consumers.<sup>16</sup> This has to do with different costs associated with changing prices, which can reflect the risk of losing long-term customer relations or work on distributing new information about the price changes. If movements in the exchange rate can be assumed to be *temporary*, companies are probably less inclined to pass on the price change to the consumer than if the exchange rate movement is deemed to be *permanent*.

The propensity of companies to pass on cost changes for imported goods to consumer prices is affected by a number of *domestic factors*. The Swedish *economic situation* is one such factor. In an economic boom when demand is strong, it is generally easier to increase prices to consumers. *Competitive conditions* also play a role. Greater competition on the Swedish market could reduce the willingness of companies to pass on cost increases to consumer prices. For example a company may see a price that exceeds that of its competitors as the precursor to losing market share.<sup>17</sup> One often talks of companies' *price mark-ups*, which show prices in relation to costs. Higher competition tends to reduce price mark-ups, while a strong economic situation tends to increase them. Another example of domestic factors that can affect the prices of import goods to the consumer are costs for transport in Sweden.

So far, we have discussed the effects on imported goods between the producer and the consumer channel. One obvious circumstance that weakens the correlation between import prices at the border and aggregate consumer prices is that imported products only constitute part of the total CPI basket. Even though it is difficult to distinguish imported products from domestically produced ones, we can think of the CPI basket in terms of goods and services. *Goods* are mostly made up of *imported products* while *services* to a larger extent reflect *domestic conditions*.<sup>18</sup> Goods including food and services respectively make up about 45 per cent of the CPI basket.<sup>19</sup>

### The exchange rate also influences inflation via indirect effects

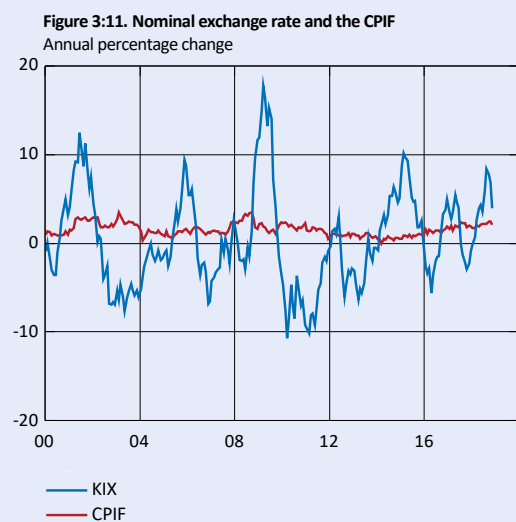
Movements in the exchange rate not only influence inflation via the effects on import prices, but may also influence inflation in more *indirect* ways. For example, a weakening of the exchange rate may also increase demand for Swedish exports abroad and boost output in Sweden. Via higher resource utilisation, this may, in turn, lead to developments

such as rising wages and ultimately higher consumer prices in Sweden.<sup>20</sup>

The effect on Swedish exports of a changed krona exchange rate may, however, have been weakened by an increased occurrence of *global value chains*. An example is a Swedish export company that uses imported input goods from other countries. If the krona depreciates, not only does it help to make the company's exports cheaper abroad, but it also makes the imports of input goods more expensive.<sup>21</sup>

### Difficult to observe the correlation between the exchange rate and inflation

As aggregate inflation in Sweden is affected by many factors in addition to the exchange rate, it is difficult to observe the correlation between the exchange rate and inflation in the data (see Figure 3:11).



Note. The KIX (krona index) is a weighted average of the krona exchange rate against currencies in countries that are important for Sweden's international transactions. A higher value indicates a weaker exchange rate.

Source: National sources, Statistics Sweden and the Riksbank

Another reason for the difficulties in observing the correlation has to do with the *causes* of exchange rate movements.<sup>22</sup> A weakening krona can, for example, indicate that investors are turning to other currencies because of *poorer prospects for the economy and inflation in Sweden*. We could then observe a weakening krona at the same time as falling inflation. This is due to the increased import costs "at the border" being offset by several domestic factors reflecting a deteriorating economic situation and making it less likely that companies will pass on cost increases for imported products to the consumer.

<sup>16</sup> See M. Apel, R. Friberg and K. Hallsten, (2004): "Price-setting behaviour in Swedish firms", *Economic Review* 2004: 4, Sveriges Riksbank.

<sup>17</sup> See M. Jonsson, "Increased competition and inflation", *Economic Review* 2007:2, Sveriges Riksbank.

<sup>18</sup> Service prices are also affected to a certain extent by the exchange rate. One reason for this is that imported input goods, which are affected by exchange rate movements, are used in service production.

<sup>19</sup> Remaining items are made up of energy and capital costs for housing.

<sup>20</sup> See the article "The impact of the exchange rate on inflation" in Monetary Policy Report December 2016, Sveriges Riksbank.

<sup>21</sup> See E. Frohm, "How do global value chains influence the effects of the krona exchange rate on exports?", *Economic Commentaries* No. 9, 2018, Sveriges Riksbank.

<sup>22</sup> See the article "The exchange rate and inflation" in Monetary Policy Report, April 2018, Sveriges Riksbank and V. Corbo and P. Di Casola, "Conditional exchange rate pass-through: evidence from Sweden", Sveriges Riksbank Working Paper Series No. 352, 2018.

But if the exchange rate deteriorates due to *factors abroad*, the likelihood may be greater that a depreciation of the exchange rate is linked to rising inflation in Sweden, as the depreciation of the krona is not being offset by domestic factors.

A more expansionary monetary policy in Sweden contributes to a weaker krona exchange rate, as it becomes less attractive to invest in Swedish interest-bearing assets compared with similar assets abroad. But it also contributes to stronger economic activity by, for example, stimulating household consumption. The stronger domestic economic activity in turn makes it easier for companies to pass on cost increases from higher import prices and also contributes to rising wages and more rapidly increasing service prices. We should therefore expect a depreciation of the krona as a result of a more expansionary monetary policy to be linked to rising inflation, as the effects on inflation of such a depreciation are reinforced by domestic factors. But a more expansionary monetary policy can in turn be a reaction to poorer prospects for the economy and inflation in Sweden, which illustrates the difficulties in drawing conclusions from observed data alone.

It is clear from Figures 3:10 and 3:11 that the krona exchange rate, seen over a longer period, has *intermittently weakened and strengthened* and hence *temporarily contributed to both higher and lower inflation*.

### Weak krona during 2018...

In 2018, the krona has been on a weak level compared with the previous years (see Figure 3:12).

The Riksbank's assessment is that, in 2018, the krona has also been weaker than its long-term level.<sup>23</sup> This is explained by temporary factors having weakened the krona for a period. The depreciation of the krona at the start of 2018 was mainly due to a combination of expectations for a more expansionary monetary policy in Sweden and greater unease on international financial markets.<sup>24</sup>

For the rest of the year, the krona exchange rate remained on approximately the same level although it did vary somewhat. As at the beginning of the year, the two main factors affecting the krona were: the degree of unease on international financial markets and expectations regarding Swedish monetary policy.

Figure 3:12. KIX-weighted nominal exchange rate Index, 18 November 1992 = 100



Note. The KIX (krona index) is a weighted average of the krona exchange rate against currencies in countries that are important for Sweden's international transactions. A higher value indicates a weaker exchange rate.

Sources: National sources and the Riksbank

### ... which has contributed to higher inflation in Sweden

As we saw earlier, it is difficult to draw conclusions about the effect of the exchange rate on inflation only by observing data. In some way, we must therefore try to isolate the effects of the exchange rate on inflation from the other significant factors. This can be done with the help of an analysis in the Riksbank's macroeconomic model, Ramses. Such model estimates indicate that the weak krona has helped to keep inflation around 2 per cent during 2018.<sup>25</sup>

But such an analysis also shows that low price mark-ups may have helped to prevent even higher inflation in 2018. This may reflect a lower propensity than normal to pass cost increases from, for example, imported products on to the consumer. But this dampening effect on inflation is significantly less than during 2014–2015, which can be a reflection of the improved economic situation since then. The fact that economic developments have a significant impact on the scope for companies to pass on cost increases to the consumer is also very much in line with the Riksbank's earlier analyses.<sup>26</sup>

### The Riksbank has no target for the exchange rate, but it is an important component in the inflation assessment

Since 1993, Sweden has had a floating exchange rate in combination with an inflation target.<sup>27</sup> In other words, the Riksbank has no target for the Swedish krona exchange rate, regarding neither its level nor its development. As we have seen, the development of the krona is significant for the development of inflation. It is therefore important to make an assessment of the future krona exchange rate when

<sup>23</sup> This assessment is based on the real exchange rate, which shows the nominal exchange rate adjusted for differences in price levels between Sweden and abroad. There is evidence that real exchange rates over time have a tendency to move towards an equilibrium level. If the current level of the real exchange rate is weaker than the equilibrium level, the krona is expected to appreciate, and vice versa. See "Development of the Swedish krona in the longer term", article in Monetary Policy Report, October 2018.

<sup>24</sup> See the article "The exchange rate and inflation" in Monetary Policy Report, April 2018.

<sup>25</sup> See "Evaluation of the Riksbank's forecasts", Riksbank Studies, March 2019, Sveriges Riksbank.

<sup>26</sup> See, for example, the article "the development of costs and inflation" in Account of Monetary Policy 2013, Sveriges Riksbank, M. Apel, E. Frohm, J. Hokkanen, C. Nyman and S. Palmqvist, "Results from a survey on company pricing", *Economic Commentaries* No. 4, 2014, Sveriges Riksbank and the article "Why inflation has risen" in Account of Monetary Policy 2017, Sveriges Riksbank.

<sup>27</sup> The fixed exchange rate was abandoned on 19 November 1992. The inflation target was introduced on 15 January 1993, with the intention of being brought into force at the beginning of 1995.

making the forecasts for inflation. The Riksbank also needs to have an idea of the monetary policy required to push inflation towards the target at an appropriate pace. Monetary policy can help push inflation towards the target, partly as a result its effects on the exchange rate. It is therefore important for the Riksbank to follow and analyse the development of the Swedish krona.

## CHAPTER 4 – Important monetary policy issues: perspective on the expansionary monetary policy

In recent years, the Riksbank's monetary policy has been focused on stabilising inflation around 2 per cent and safeguarding confidence in the inflation target. In a historical perspective, the policy has seen unique measures: the repo rate has been lowered to below zero and the Riksbank has purchased large amounts of government bonds. A review of the policy conducted in recent years indicates that the new and untried measures have contributed to inflation rising and returning to the target in 2017. The negative side-effects of the policy appear at the same time to have been limited. As the policy was unusual, it is natural that it has been the subject of debate. There have been arguments in favour of a less expansionary monetary policy and a higher repo rate. However, the Riksbank's assessment is that the policy conducted has been necessary in order to maintain confidence in the inflation target, which is a prerequisite for favourable economic developments.

### Expansionary monetary policy over a long period of time

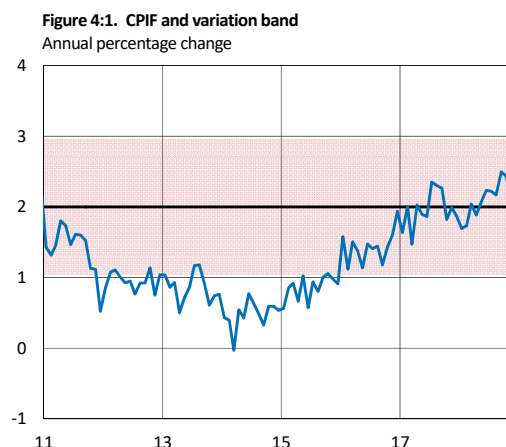
The Riksbank has conducted a very expansionary monetary policy over a number of years, with measures that have been unique from an historical perspective. The repo rate has been cut below zero and the Riksbank has made large-scale purchases of government bonds to create further downward pressure on market rates and thereby stimulate the economy and stabilise inflation and inflation expectations around the target level.

In this chapter, we sum up the policy and study the current state of knowledge as regards the effects of the negative repo rate and the bond purchases. We also discuss what side-effects the policy has, that is, the effects that have arisen as a result of the policy conducted but not reflected in the Riksbank's target variables – inflation and output/employment. Since the monetary policy stance itself has been the focus of discussions in different contexts, there is also reason to address the debate on monetary policy.

#### An expansionary monetary policy to safeguard confidence in the inflation target

To put the expansionary monetary policy into perspective, it may be useful to begin with a retrospective.

During 2011, CPIF inflation fell to a level around 1 per cent and then remained at this low level until it fell further at the beginning of 2014 (see Figure 4:1). At that time, there were signs that economic agents were beginning to question whether the Riksbank would attain an inflation rate of 2 per cent. For instance, the mean value of the long-term inflation expectations among economic agents fell further and further below the target (see Figure 1:3). The rapid fall in the median of the money market participants' inflation expectations, which have long been exactly



Note. The pink area shows the Riksbank's variation band and covers about three-quarters of the outcomes since January 1995. The variation band is a way of showing whether the deviation from the inflation target is unusually large.

Sources: Statistics Sweden and the Riksbank

on target, illustrates clearly the change and the seriousness of the situation in 2014 (see Figure 4:2). Inflation had then been lower than 2 per cent for a long time and in the general debate people had begun to question the Riksbank's capacity to bring inflation back to target. Monetary policy in 2014 and 2015 therefore focused increasingly on bringing inflation and inflation expectations back to 2 per cent.

The Riksbank has also had to consider the fact that many other central banks have conducted a very expansionary monetary policy during the period. This applies not least to the policy conducted by the ECB, with negative policy rates and extensive asset purchases. If the Riksbank had maintained a too high repo rate, or refrained from asset purchases, there would have been a risk of the krona appreciating rapidly and substantially. This in turn would have resulted in the already low Swedish inflation falling further and it would thereby have been even more difficult to bring up inflation and anchor expectations.

To describe what problems might arise then, there is reason to draw attention to the basic purpose of an inflation target.

## The purpose of the inflation target

### A credible inflation target constitutes an anchor in the economy...

The purpose of an inflation target is to act as a benchmark for price setting and wage formation in the economy – it becomes what is usually called a nominal anchor. When inflation varies less and economic agents have a collective picture of how prices will increase in the future, it becomes easier to plan for the long term. This in turn improves the possibility of favourable economic development. One condition for this to work is that there is confidence in the target.

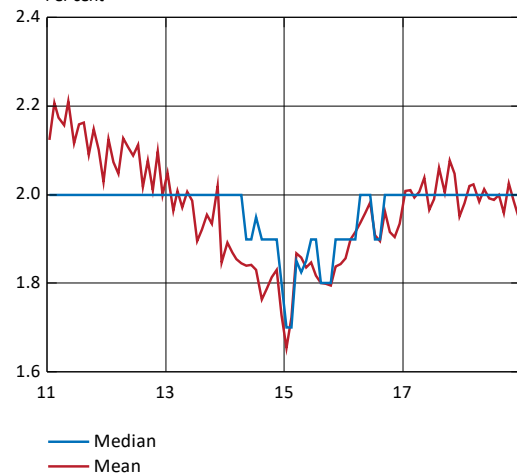
### ... and reduces economic fluctuations

A credible inflation target can also mean not only that inflation varies less, but that output and employment also vary less.

Let us assume that for some reason we have a fall in demand. If there is no confidence in the inflation target, inflation expectations may also fall in the slightly longer run, that is, the economic agents do not expect inflation to be back on target even in a number of years' time. This will cause a rise in the real interest rate, i.e. the interest rate corrected for inflation expectations, if the nominal interest rate remains unchanged. The higher real interest rate reinforces the effect of the original fall in demand and weakens the economy further. The central bank then needs to lower the policy rate sharply to prevent the real interest rate from being too high. With poorly anchored expectations, monetary policy will therefore be more volatile, and probably not as effective.

In a corresponding way, a positive shock to demand can make inflation and inflation expectations rise. It lowers the real

Figure 4:2. Inflation expectations among money market participants, 5 years ahead  
Per cent



Note. Refers to inflation measured with the CPI. The median shows the inflation value that has as many measurement values above as below it. Unlike the average, the median value is not sensitive to extreme values.

Source: Kantar Sifo Prospera

interest rate and contributes towards further increasing demand. The economy then runs the risk of overheating.

When confidence in the inflation target is weak and inflation expectations are not well anchored, the result thus becomes larger fluctuations in the economy. We went through such a development in Sweden in the 1970s and 1980s, when the fixed exchange rate did not act as a sufficiently strong nominal anchor. Wage formation did not function well and prices and wages increased systematically faster in Sweden than abroad, which resulted in repeated cost crises and devaluations.

#### **A target of 2 per cent facilitates an adaptation of relative wages...**

There are also good reasons why the target is 2 per cent and not lower. One reason is that the conditions for wage formation to effectively distribute resources in the economy can deteriorate when average inflation is too low. The reason is that it has proved difficult in practice to lower nominal wages. If inflation is low and nominal wages cannot be lowered, it becomes difficult to adjust real wages between different professions, companies and sectors. This can ultimately bring about both higher unemployment and poorer productivity growth in the economy. These problems can be mitigated if there is some underlying inflation.

#### **... and make it easier for monetary policy to counteract economic downturns**

Another advantage of a target of 2 per cent, which has been particularly clear in recent years, is that a very low average rate of inflation would make it more difficult for monetary policy to counteract recessions. If average inflation is very low, the nominal average interest rate will also be low. The lower the interest rate is in normal conditions, the less scope there is to lower it before it reaches its lower bound. It will thus become more difficult to counteract future economic downturns with the aid of interest rate cuts. An average inflation rate lower than 2 per cent will also make it more difficult to attain a sufficiently low *real* interest rate.

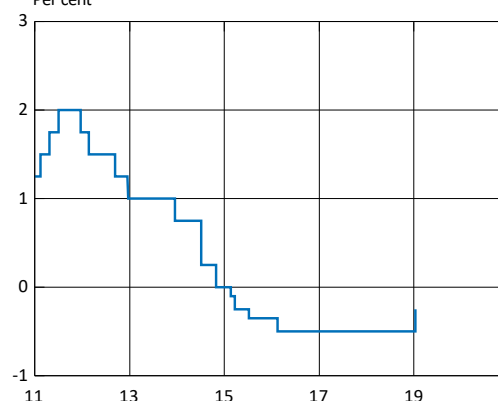
There is an international discussion on whether a target of 2 per cent, which most developed countries have now, provides sufficient scope to conduct a monetary policy that is as expansionary as may sometimes be needed. A lower target would mean that there was even less scope here.

## Effects of the negative interest rate and bond purchases

### **A new and untried monetary policy environment**

Figure 4:3 shows the Riksbank's repo rate during the period, how it was cut to just below zero in February 2015 and immediately thereafter to  $-0.25$  per cent at an extraordinary meeting in March. With regard to the purchases of government bonds,

**Figure 4:3. The Repo rate**  
Per cent



Source: The Riksbank

Figure 4:4 illustrates the Riksbank's holdings from 2015 and onwards. As for the zero interest rate, there was a cautious start, with two preliminary purchases of SEK 10 and 30 billion in February and March 2015.<sup>28</sup> This was a deliberate strategy by the Riksbank, which reflected the fact that this was a new and untested monetary policy environment. The Riksbank wanted to proceed cautiously and evaluate the effects before continuing.

When the negative interest rate was introduced, the Riksbank expected the impact on the economy via certain channels to be the same in principle as an interest rate cut would normally have, for instance, effects on the economy via the exchange rate. On the other hand, the effect via bank rates could be less than normal. If banks did not want to introduce a negative interest rate on deposits, they would probably not cut their lending rates as much. There were thus reasons to expect a somewhat weaker impact than normal from monetary policy.<sup>29</sup>

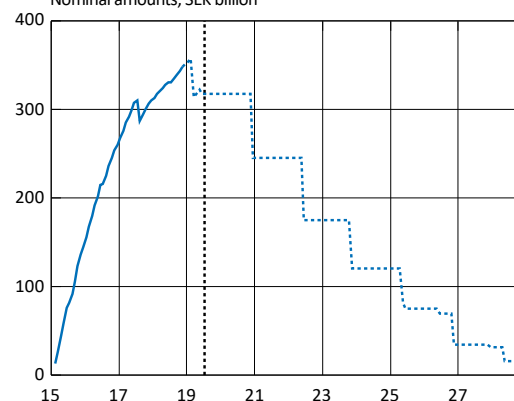
The effects of the bond purchases on the economy were more uncertain. There were older experiences to learn from, but during the decades prior to the financial crisis bond purchases had rarely been used as a monetary policy tool. After the financial crisis, however, some central banks had successfully used bond purchases as a complement to cutting their policy rates. The purpose of the purchases was to lower interest rates in the economy further, partly by investors re-balancing their portfolios as access to government bonds declined. As a result, demand for other assets then increases, which in turn means that prices of these assets rise at the same time as yields fall.<sup>30</sup>

#### Repo rate cuts have had an impact on market rates and the exchange rate

Studying how market rates have developed in recent years with a negative interest rate, it is clear that they have followed the repo rate.<sup>31</sup> Both short interbank rates and government bond yields have followed the repo rate downwards as it has been cut and they are now at roughly the same level as the repo rate (see Figure 4:5).

The fact that the repo rate has been cut below zero means in practice that banks pay interest to deposit money with the Riksbank. Banks' loans to one another have also been at negative interest rates for a couple of years now and as the short- and long-term government bond yields are below zero, the state can borrow at a negative interest rate – in other words, the state is paid to borrow. Banks and some larger companies and municipalities can also obtain short-term funding at negative

Figure 4:4. The Riksbank's holdings of government bonds  
Nominal amounts, SEK billion



Note. Refers to the Riksbank forecast from December 2018. Forecast up until June 2019, after that a technical projection with the assumption that no further reinvestments are made. The development of the holdings is also affected to a certain extent by the bonds' market prices and by which bonds the Riksbank chooses to reinvest in. The vertical line marks the shift between the forecast and technical projection.

Source: The Riksbank

Figure 4:5. Interest rates in Sweden with up to 2-year maturity  
Per cent



Note. The rate for government bonds and mortgage bonds refers to the implied zero coupon rate.

Source: The Riksbank

<sup>28</sup> Details of the Riksbank's bond purchases from 2015 onwards can be found, for instance, in the article "The negative repo rate and complementary monetary policy measures" in the Account of Monetary Policy 2017. See also the article "The Riksbank's strategy for a gradual normalisation of monetary policy" in Monetary Policy Report, December 2017.

<sup>29</sup> See the article "The Riksbank's complementary monetary policy measures" in Monetary Policy Report, February 2015.

<sup>30</sup> For a more detailed discussion of how the bond purchases affect interest rates in the economy, see J. Alsterlind, H. Erikson, M. Sandström and D. Vestin, "How can government bond purchases make monetary policy more expansionary?", *Economic Commentaries*, No. 12, 2015, Sveriges Riksbank.

<sup>31</sup> The Riksbank has regularly reported on the impact of monetary policy. See the articles "Perspectives on the negative repo rate", Monetary Policy Report July 2016, "The effects of monetary policy on financial variables", Monetary Policy Report, April 2017, "The effects of the Riksbank's monetary policy, 2015–2016", Account of Monetary Policy 2016 and "The negative repo rate and complementary monetary policy measures", Account of Monetary Policy 2017.

interest rates. In general, the falling interest rates on the capital markets have meant that non-financial corporations' funding costs via bonds and certificates have become cheaper (bank loans still make up the majority of funding, however).

A more expansionary monetary policy in Sweden contributes to a weaker krona exchange rate in that it becomes less attractive to invest in Swedish interest-bearing assets compared with similar assets abroad. As market rates have followed the repo rate since it was cut below zero, the impact of monetary policy on the exchange rate has functioned roughly as normal.

### Banks have held deposit rates close to zero

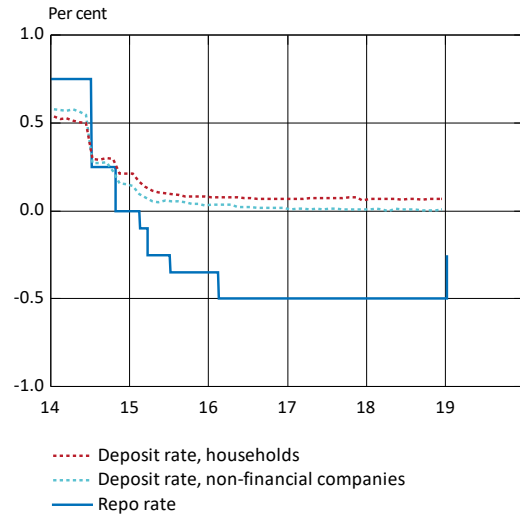
The impact of the repo rate on deposit rates at banks has been less than normal. But this was something the Riksbank had expected to happen. Banks have chosen not to introduce a negative interest rate on deposits for most of their customers. Instead, the average deposit rates for households and companies have remained largely unchanged since mid-2015 and have been close to zero (see Figure 4:6).<sup>32</sup>

### Lending rates have followed the repo rate, but with some time lag

Banks' costs for funding via deposits have thus not fallen to the same extent as costs for market funding. On the whole, there has nevertheless been scope to cut interest rates on lending. To analyse whether banks have made use of this scope, one needs to study the interest rates on the loans actually granted by banks rather than their so-called listed interest rates. The reason for this is that the listed rates refer to hypothetical loans where the interest rate need not necessarily coincide with the loans actually granted.

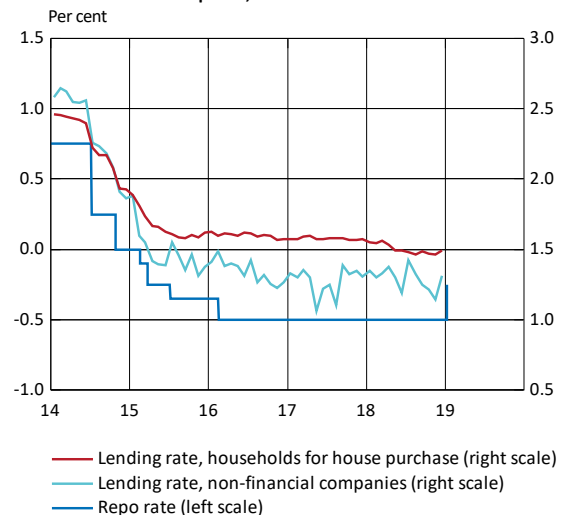
A closer look reveals that banks' lending rates for a three-month fixation period – variable mortgage rates – have followed the cuts in the repo rate, albeit with a less clear impact than on market rates.<sup>33</sup> Lending rates thus did not fall directly in connection with the cut in the repo rate, most noticeably so with the cuts in the middle of 2015 and early 2016. But in time lending rates have fallen by more or less the same extent as the repo rate even after these cuts (see Figure 4:7). It is difficult to say exactly what this time lag was due to. One hypothesis is that the interest rates were initially held up, but that they have since been pushed down as new players have entered the mortgage market and the competition has become tougher. But there may also be other explanations that are linked more to changes in regulations, for instance, the amortisation requirements, than to the actual repo rate cuts.

Figure 4:6. Repo rate together with the average deposit rate to households and companies, new contracts



Note. Deposit rates are a weighted average of all interest rates for different maturities. Sources: Statistics Sweden and the Riksbank

Figure 4:7. Repo rate together with the average lending rate to households and companies, new contracts



Note. Lending rates are a weighted average of all interest rates for different maturities. Sources: Statistics Sweden and the Riksbank

<sup>32</sup> Deposit rates for financial corporations, large non-financial corporations and some municipalities and county councils have fallen, however, as the repo rate has decreased. Fees have also increased, reducing the total return on bank balances.

<sup>33</sup> It is natural to focus on these interest rates as the majority of new mortgages are taken at variable interest rates. It is also these interest rates that should largely be affected by changes in the repo rate. Interest rates at longer fixation periods are affected by many other factors and should to a greater extent reflect expectations of the future repo rate. For further details, see H. Erikson and D. Vestin, "Pass-through at Mildly Negative Policy Rates: The Swedish Case", Staff Memo January 2019, Sveriges Riksbank.



### **The Riksbank's government bond purchases have also had an impact on interest rates**

In addition to the cuts in the repo rate, the Riksbank's purchases of government bonds have been an important part of the expansionary monetary policy. The purchases began in 2015 and have since then been gradually extended to a holding of just over SEK 350 billion in nominal figures (see Figure 4:4). No new net purchases of government bonds have been made since 2017, but the holdings have not declined as the Riksbank has regularly reinvested principal payments and coupons in the bond portfolio so that monetary policy would not gradually become less expansionary.

An important approach in the studies attempting to estimate the impact of the bond purchases is to analyse the effects on financial assets that arise directly when the central bank announces a new decision to purchase government bonds. If the decision comes totally or partially unexpected for market participants, the new information is taken into account in the prices of financial assets directly after the decision has been made public. A common conclusion in the studies analysing the effects of the bond purchases by the major central banks is that they have functioned more or less as expected.<sup>34</sup>

Studies show that this type of announcement effect has also existed for the Riksbank's bond purchases and that the magnitude of the effects is in line with the effects observed in other countries.<sup>35</sup> The bond purchases have contributed to Swedish interest rates being lower than they would otherwise have been, which has also reduced the differences between Swedish rates and rates abroad. Although it is generally difficult to separate the effects, the results indicate that the bond purchases have supplemented the cuts in the repo rate.

One factor behind the Riksbank's decision to begin purchasing government bonds in 2015 was to avoid letting the krona strengthen too quickly in a situation where inflation had already been low for a long time. The government bond purchases have reduced this risk by pushing down Swedish rates in approximately the same way as foreign central banks have pushed down rates abroad.

## **Side-effects of the expansionary monetary policy**

The long period with a low repo rate – and in recent years a negative repo rate – supplemented with large purchases of government bonds has led to a very expansionary and in many ways untried monetary policy environment. The Riksbank is

<sup>34</sup> See, for instance, M. Weale and T. Wieladek, "What are the macroeconomic effects of asset purchases?", *Journal of Monetary Economics*, 79, pp. 81–93, 2016.

<sup>35</sup> See for instance R. B. De Rezende, D. Kjellberg and O. Tysklind, "Effects of the Riksbank's government bond purchases on financial prices", *Economic Commentaries* no. 13, 2015 and R. B. De Rezende, "The interest rate effects of government bond purchases away from the lower bound", *Journal of International Money and Finance*, 74, pp.165–186, 2017 and the article "The effects of monetary policy on financial variables" in Monetary Policy Report April 2017.

therefore constantly analysing the potential side-effects of the monetary policy on the economy.

However, it is not entirely clear what should be regarded as a side-effect. Although monetary policy affects other quantities than the primary target variables of monetary policy, that is inflation and also output and employment, these effects may be a natural and unavoidable part of monetary policy. It is therefore largely a matter of judgement as to what comprises a side-effect.

This section does not discuss, for instance, the effects of the expansionary monetary policy on the exchange rate. The fact that the exchange rate is weak when monetary policy is expansionary is one of the channels through which monetary policy has an effect. However, the krona depreciation has been much debated over the year and is therefore taken up in the section “The monetary policy debate” below.

### High level of household indebtedness a cause for concern

Despite a certain slowdown in 2017–2018, many asset prices, including equity and housing prices, have shown a rising trend over a long period of time (see Figures 4:8 and 4:9). Even though the period of rising prices started before the Riksbank took the repo rate into negative territory and started purchasing government bonds, the monetary policy conducted has probably contributed to the price growth. There is a risk that a long period of very expansionary monetary policy can create incentives for excessive risk taking in the economy, where assets become overvalued and risks are wrongly priced. As a result, various agents’ indebtedness may increase in a way that is not sustainable.

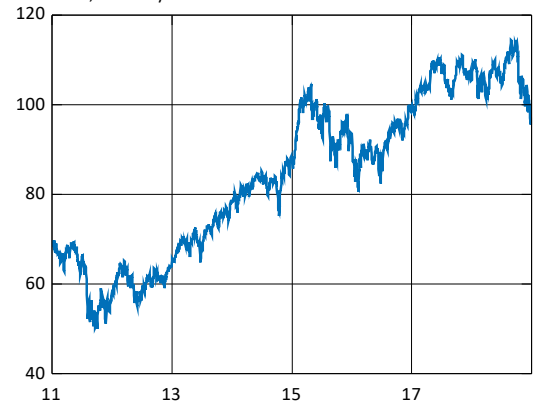
The increase in Swedish household indebtedness has long been a cause for concern (see Figure 4:10). Together with rapidly rising housing prices, it has made households sensitive to both price falls on the housing market and rising interest rate costs. There are several factors behind the increasing indebtedness, including structural problems on the housing market and the trend decline in real interest rates abroad, which also affect a small open economy like Sweden. The expansionary monetary policy conducted in recent years has also contributed to the upturn.

It is the Riksbank’s assessment that the high household indebtedness continues to pose the greatest risk to the Swedish economy.<sup>36</sup> It is therefore important to increase households’ resilience in different ways and to limit the risks, primarily with measures in housing and taxation policy.

### Opinion is divided on how well the fixed-income market is functioning

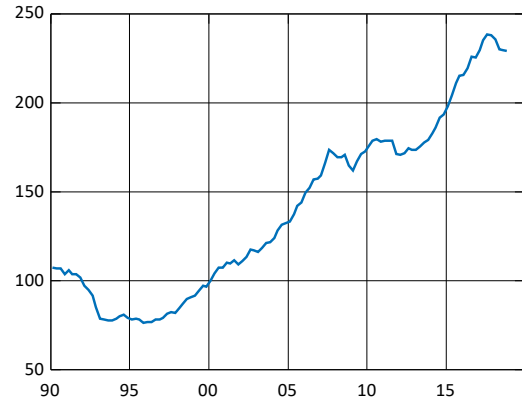
One possible side-effect of the negative interest rate and the Riksbank’s large purchases of bonds is a negative impact on how the financial markets are functioning. Since autumn 2018, the Riksbank has carried out a survey among those active on the Swedish fixed-income and foreign exchange markets to gain an

Figure 4:8. Stock market movement, OMXS Index, 3 January 2017 = 100



Source: Macrobond

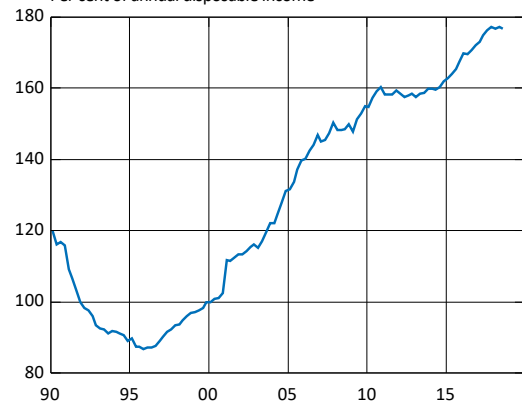
Figure 4:9. Real housing prices Index 2000 Q1 = 100



Note. Real housing prices refer to the price index (single-family houses) converted from nominal to real terms by using the CPIF.

Sources: Statistics Sweden and the Riksbank

Figure 4:10. Household debt Per cent of annual disposable income



Note. Households’ total debts as a share of their disposable income totalled over the past four quarters.

Sources: Statistics Sweden and the Riksbank

<sup>36</sup> See Financial Stability Report 2018:2, Sveriges Riksbank.

overall picture of how they view market functioning. So far, the markets have been able to manage negative interest rates relatively smoothly. The Riksbank's survey showed that there was an equal number of participants who considered the fixed-income market to be functioning well in general as considered that it was functioning poorly (see Figure 4:11).<sup>37</sup>

### The demand for cash has not increased and banks have good profitability

As deposit rates below zero entail a cost for bank savings, it is possible that negative interest rates will prompt households and companies to convert their bank savings into cash instead. But as was illustrated earlier, households and most companies have yet to encounter negative deposit rates. Furthermore, the use of cash in Sweden is low compared with other countries and demand for it has decreased in general (see Figure 4:12).

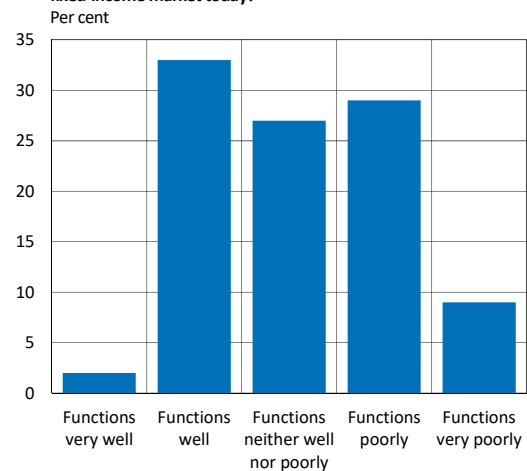
A development that can be linked to the low interest rate, however, is the substantial increase in deposits into tax accounts at the Swedish Tax Agency in 2016. At this point, the interest rate on tax accounts was positive while interest rates on bank deposit accounts had fallen to zero, or just below zero for some companies. In January 2017, the Swedish Government decided to reduce the interest rate on tax accounts to zero as well. According to the Swedish National Debt Office's assessment, however, deposits into tax accounts that can be seen as pure capital investments have continued to increase, albeit not as rapidly, and in 2018 totalled a good SEK 80 billion.<sup>38</sup> One consequence of large capital investments in tax accounts is that they make government borrowing unnecessarily expensive.

One risk with negative interest rates that has also been highlighted is that they can reduce banks' profitability, which could ultimately lead to higher rather than lower lending rates and a smaller supply of credit.<sup>39</sup> Even if the profitability of Swedish banks has declined somewhat recently, their profitability during the period with a negative interest rate has been high and stable in general, and their results and lending capacity have not been tangibly affected (see Figure 4:13).

### Distributional effects of the expansionary monetary policy via rising employment and higher asset prices

The unusually long period of expansionary monetary policy, combined with the extraordinary measures taken by central banks, has brought up the question of the distributional effects of monetary policy both in Sweden and abroad.

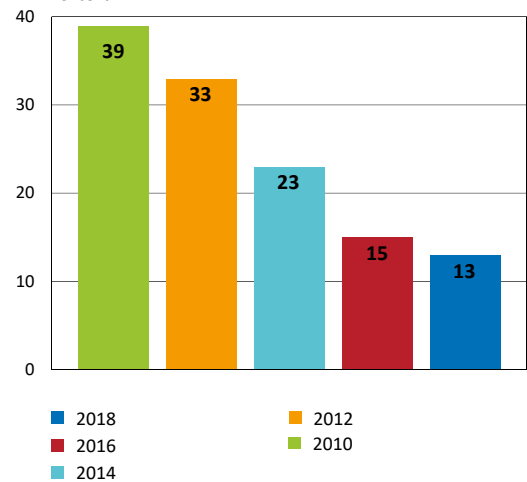
Figure 4:11. What is your assessment of the functioning of the Swedish fixed-income market today?



Note. Percentage of 45 responses in total. From Financial markets survey autumn 2018.

Source: The Riksbank

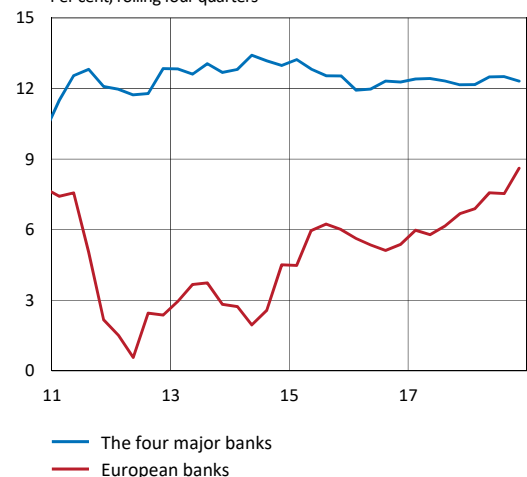
Figure 4:12. Demand for cash



Note. Percentage of the respondents in the survey "Payments patterns in Sweden" saying that they paid for their most recent purchase in cash.

Source: The Riksbank

Figure 4:13. Return on equity



Note. Unweighted average adjusted for nonrecurring items. The red line refers to a sample of major European banks – see Financial Stability Report 2018:2, the Riksbank

Sources: SNL Financial and the Riksbank

<sup>37</sup> See Financial markets survey autumn 2018, Sveriges Riksbank.

<sup>38</sup> See the report Central Government Debt Management. Proposed guidelines 2019–2022, Swedish National Debt Office.

<sup>39</sup> The fact that deposit rates have not been cut below zero, which reduces the incentive of banks to cut lending rates, makes some people sceptical about the impact of the Riksbank's monetary policy with a negative interest rate, see for instance G. Eggertson and L.H. Summers, "Negative interest rate policy and the bank lending channel", contribution on vox.eu.org, 24 January 2019. For a comment on this, see H. Erikson and D. Vestin, "Pass-through at Mildly Negative Policy Rates: The Swedish Case", Staff Memo January 2019, Sveriges Riksbank. That the negative interest rate should have given banks an incentive to raise the lending rate is also contradicted by the results in R. B. De Rezende and S. Laséen, "Monetary Policy Transmission and Spillovers in an Open Economy During Normal and Negative Interest Rate Periods", unpublished essay, June 2018, Sveriges Riksbank.

There are several aspects to this. The purpose of an inflation target is that it shall be a benchmark for price setting and wage formation. If inflation is kept low and stable, it will counteract the arbitrary redistribution of income and wealth that arises when inflation is high and varies substantially from one year to the next. A monetary policy that is aimed at maintaining an inflation target thus counteracts undesired distribution effects.

At the same time, changes in the monetary policy conducted to attain the inflation target will unavoidably also affect household's incomes and wealth. An expansionary monetary policy will contribute to increased activity and stronger growth and thus to higher employment and lower unemployment. As the access to jobs has a decisive significance for household's incomes and economic prospects in general, a monetary policy that contributes to higher employment will also contribute to a more even distribution of income and wealth. At the same time, an expansionary monetary policy contributes to a rise in the prices of equity and other assets, which means that income and wealth become less evenly divided between households. The net effect is not self-evident, but studies made indicate that the effect via employment could be more significant than that via asset prices.<sup>40</sup>

Even though the last ten-year period has been quite unique, it should be remembered that monetary policy is normally both expansionary and contractionary over economic cycles. To the extent that monetary policy affects the prices of equity and other assets, these consequently sometimes go up and sometimes go down. Even if assets are not evenly distributed in the population, the distributional effects should also therefore more or less cancel each other out over the course of the economic cycle.

It is also worth noting that the development of asset prices in the longer term is affected by the long-term development of the real interest rate, which is determined by factors other than monetary policy.

#### **Positive side-effects on a divided labour market?**

In addition to the often discussed negative side-effects of the very expansionary monetary policy, there may also be positive side-effects that are not discussed as often. This concerns in particular the fact that expansionary monetary policy contributing to a long-lasting high level of resource utilisation can contribute to a *lastingly* higher level of employment. The reason for this is that it may then be easier for groups that under normal economic conditions experience difficulty entering the labour market to actually get jobs.<sup>41</sup>

The Swedish labour market is often described as divided, with unemployment in some groups, for instance, foreign-born

<sup>40</sup> See, for instance, M. Lenza and J. Slacalek, "How does monetary policy affect income and wealth inequality? Evidence from quantitative easing in the euro area", ECB Working Paper Series No 2190, October 2018. For a more detailed discussion of the potential effects of monetary policy on the distribution of income and wealth, see for instance H. Ohlsson, "The distributional effects of monetary policy", speech on 7 April 2017, Sveriges Riksbank.

<sup>41</sup> This was discussed, for instance, by Deputy Governor Martin Flodén in a contribution to the debate at the monetary policy meeting in February 2018, see Monetary policy minutes, February 2018, Sveriges Riksbank.

persons, being much higher than in other groups (see Figure 4:14).

However, in recent years there has been a very strong development on the labour market, something the expansionary monetary policy has probably contributed to, and employment has also increased significantly in groups that usually have more difficulty becoming established on the labour market (see Figure 4:15). Once people in these groups manage to gain a foothold on the labour market, their chances of remaining there probably increase. If they were instead to have remained unemployed, they would in time have lost skills and competence and probably found it even more difficult to get a job. But as many have now got a job, they will find it easier to become employed again in the future. Although this ‘persistence effect’ is not the primary objective of the expansionary monetary policy, it can be a result.

## The monetary policy debate

Given that the Riksbank has conducted a very expansionary monetary policy with new tools over a number of years, it is natural that a number of questions have arisen regarding monetary policy.

### Less expansionary monetary policy with a broader mandate?

One argument put forward is that the Riksbank has focused far too much on the inflation target and that, with a broader mandate, the Riksbank would have been forced to consider other factors, such as the high level of household indebtedness.

Like most other central banks, the Riksbank’s inflation targeting policy is flexible in practice, and aspects other than inflation are also taken into account when this is deemed appropriate and possible.<sup>42</sup> Price stability – ensuring that there is a nominal anchor in the economy – is however the principal target for most central banks, including the Riksbank.

The Executive Board’s assessment has been that the scope for conducting a more flexible monetary policy has been limited after inflation expectations fell and confidence in the inflation target weakened in 2014. A less expansionary policy than the one conducted by the Riksbank would have caused inflation to remain below target and perhaps even to fall further, and hence risk undermining confidence in the target. Had this been the case, expectations in the economy may well have become fixed on lower inflation in the long run, which in turn would have caused various problems that are described in more detail in the section “The purpose of the inflation target”.

Consequently, a broader monetary policy mandate would hardly have changed the conditions for monetary policy. On the other hand, the Riksbank’s scope for conducting a flexible monetary policy has improved as inflation and inflation expectations have risen and confidence in the inflation target has strengthened.

Figure 4:14. Unemployment among Swedish born and foreign born persons

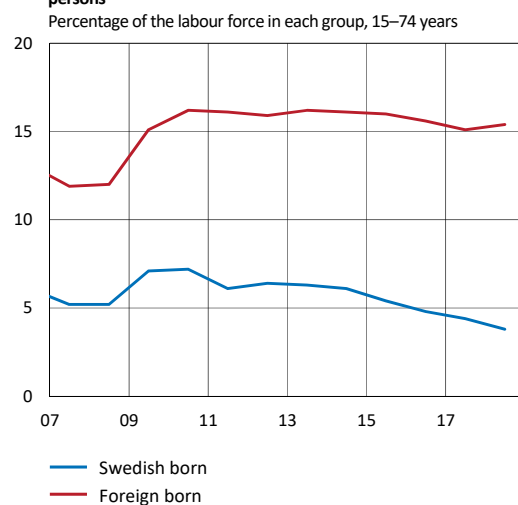
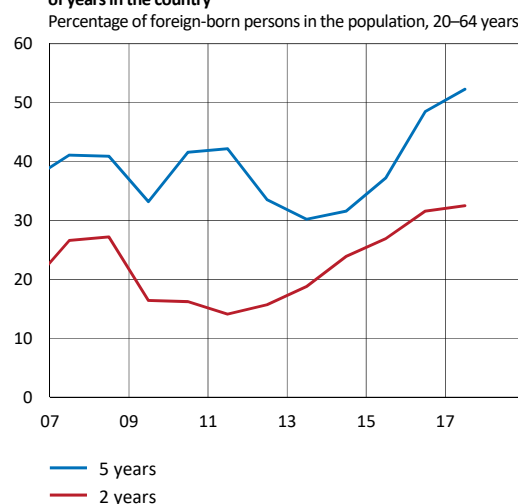


Figure 4:15. Employment rate among foreign born persons by number of years in the country



<sup>42</sup> The Riksbank Committee is currently investigating whether monetary policy targets other than price stability should be incorporated into the Sveriges Riksbank Act.

As regards housing prices and household debt, it can be noted that they have risen in parallel and basically uninterrupted for about twenty years up until very recently, when the housing market weakened (see Figures 4:9 and 4:10). During different phases of this period, monetary policy has been both expansionary and contractionary. Furthermore, in recent decades real interest rates both in Sweden and abroad have fallen and are currently very low. This development has to a great extent been prompted by international saving and investment patterns, which monetary policy is unable to influence. There is a great deal to suggest that interest rates will remain low for some time to come. This means that the interest rate will be relatively low in a historical perspective, even during periods when monetary policy is more contractionary.

The expansionary monetary policy of recent years has indeed contributed to the increase in housing prices and household debt. But the problems are basically structural and monetary policy is not particularly well suited to managing them. Macroprudential policy and tax and housing policies are better tools for this.

#### **Less expansionary policy to create more monetary policy scope?**

A partially related argument in the external debate has been that the Riksbank should have increased the repo rate earlier and thereby created more scope for reducing it to tackle the next economic downturn.

It is often unclear from this argument exactly how much higher the repo rate should have been, but presumably substantially higher given that the argument is to create scope to then cut the rate. But with a higher interest rate, both growth and inflation would have been lower. A less expansionary monetary policy than the one conducted by the Riksbank would probably have led to inflation undershooting the target, and the higher the interest rate was, the larger the deviation would have been.

As has been noted above, a key assessment of the Executive Board was that a less expansionary monetary policy would probably have led to the credibility of the inflation target being once again called into question and to economic agents expecting an inflation rate significantly below 2 per cent even in the long run. As described in the section “The purpose of the inflation target”, this would have made it more difficult for monetary policy to counteract future economic downturns.

Consequently, early rate rises could have ultimately resulted in *less* monetary policy scope in the future rather than provide greater scope. It is therefore important that increases in the repo rate do not happen in such a way that inflation will be significantly lower and confidence in the inflation target is put at risk.

#### **Monetary policy and the development of the krona**

At the beginning of 2018, the krona depreciated considerably (see Figure 4:16). This sparked a debate on the responsibility of

monetary policy for the development of the krona and whether the policy conducted has contributed to making Swedish people poorer.<sup>43</sup>

This can bring to mind changes in Sweden's prosperity in a wider sense. However, there is no simple and clear-cut correlation between a country's exchange rate and its prosperity, not as this concept is normally used. Using common measures of prosperity, such as GDP per capita, developments in Sweden over the last decade have been relatively good in an international perspective.<sup>44</sup>

In recent years, many countries have conducted increasingly expansionary monetary policy. This is particularly true of the ECB, which has basically had a negative policy rate since the summer of 2014 and which has made more extensive asset purchases than the Riksbank.<sup>45</sup> The Executive Board has identified a risk that the krona would strengthen rapidly in the wake of the ECB's expansionary monetary policy. In such a scenario, inflation would probably have remained below target and confidence in the inflation target would have been further weakened. The basic purpose of the expansionary monetary policy has hence been to maintain confidence in the inflation target, not to keep the exchange rate weak. Well-anchored confidence in the inflation target is crucial to a stable price-setting and wage formation process.

The fact that the krona weakened against the euro in 2018 despite the ECB's continued expansionary monetary policy is probably not only a result of the Riksbank's monetary policy. The currencies of several small countries have developed in approximately the same way as the Swedish krona despite quite substantial differences in the policy rates set by these countries (see Figure 4:17).

In the monetary policy regime introduced in Sweden in 1993, the inflation target replaced the fixed exchange rate as the nominal anchor in the economy. Now as discussions turn to the responsibility of monetary policy for the development of the krona, it is important to remember that monetary policy under a fixed exchange rate regime needs to focus entirely on defending the exchange rate and cannot take other factors into consideration.<sup>46</sup> This is illustrated by the devaluation policy that Sweden was forced to conduct during the 1970s and 1980s. As inflation at that time was too high in relation to other countries, international competitiveness needed to be adapted via repeated devaluations. These deviations from the fixed exchange

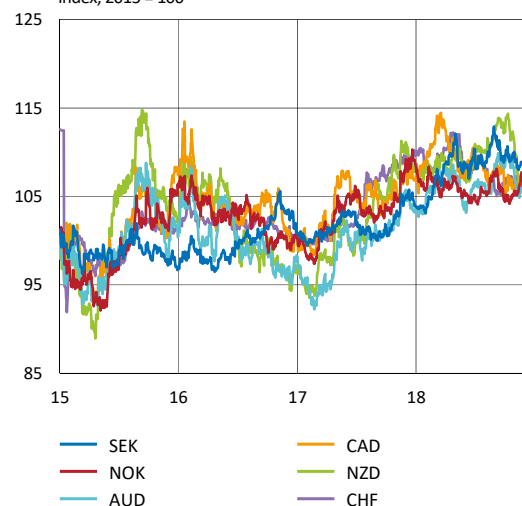
**Figure 4:16. KIX-weighted nominal exchange rate Index, 18 November 1992 = 100**



Note. The KIX (krona index) is a weighted average of the krona exchange rate against currencies in countries that are important for Sweden's international transactions. A higher value indicates a weaker exchange rate.

Sources: National sources and the Riksbank

**Figure 4:17. Exchange rates of small open economies against the euro Index, 2015 = 100**



Note. A higher value indicates a weaker exchange rate.

Source: ECB

<sup>43</sup> For a summary of this criticism and a response to it, see the article "Inflationsmålet har inte gjort svenskar fattigare" [The inflation target has not made Swedish people poorer] written in Swedish by Deputy Governor Per Jansson in *Dagens industri* on 23 March 2018.

<sup>44</sup> An example of a measure of prosperity that considers aspects other than GDP is the OECD "Better Life Index" ([www.oecdbetterlifeindex.org](http://www.oecdbetterlifeindex.org)). Sweden also performs well using this measure.

<sup>45</sup> Since the beginning of 2015, the ECB's purchases of securities for monetary policy purposes have grown to a magnitude corresponding to a good 20 per cent of the euro area's GDP.

<sup>46</sup> There are many examples of central banks who have been forced to tighten monetary policy during recessions in countries with fixed exchange rates. In Sweden, the Riksbank needed to increase the policy rate very sharply during the recession of 1992 in an attempt to defend the fixed exchange rate. In Denmark, the Danish Nationalbank increased its policy rate during the financial crisis of 2008 in order to defend the fixed exchange rate against the euro, while other central banks reduced their policy rates to stimulate their economies.

rate damaged its credibility and made it more difficult to conduct monetary policy in that regime.

With a floating exchange rate and an inflation target, monetary policy can take greater consideration of domestic economic developments, if there is sufficient confidence in the inflation target. But the value of the exchange rate is then freely determined by the market. In this regime, in other words, a fluctuating exchange rate is unavoidable. On the other hand, one should not expect the krona to constantly depreciate. Virtually all other countries have an inflation target set at or very close to 2 per cent. Swedish inflation relative to inflation abroad should not therefore cause a trend depreciation of the krona's nominal exchange rate. Neither have we in practice seen such a trend depreciation over a long period of time (see Figure 3:11). The krona has indeed weakened quite sharply at times, but strengthened at other times. The Riksbank's assessment is that the krona has been weaker in 2018 than its long-term level and that it will therefore strengthen in the longer run (see the article "The significance of the krona for inflation").

#### **The role of wage formation in the inflation process**

In 2018, the debate on the relationship between wage formation and inflation also intensified. Even though this debate has no direct link to the monetary policy conducted, it may have important implications for the conditions for inflation targeting.

For about 20 years, centrally agreed wage cost increases in the economy have been governed by the agreements concluded in the industrial sector, in accordance with the Industrial Agreement. The aim of the Industrial Agreement was to create more controlled wage formation that takes international competitiveness into account. Over the last two decades, the norm established by the industrial sector has contributed to restrained wage increases.

Gradually, however, a number of challenges with this system have increasingly been a subject of discussion.<sup>47</sup> One argument has been that the norm makes it more difficult to change relative wages. This has been highlighted based on justice and distribution aspects, for example as an obstacle to reducing wage gaps between women and men. But it has also been emphasised from a macroeconomic perspective. If relative wages are not flexible enough, it could counteract a socioeconomically effective distribution of the labour force among professions and sectors. This could in turn create imbalances on the labour market.<sup>48</sup>

One aspect that is highlighted, and is important for monetary policy, is the extent to which a norm for wage increases established by the industrial sector is always compatible with an inflation targeting regime. The reason for highlighting this issue is

<sup>47</sup> See a Swedish article by L. Calmfors, "Industrins lönenormering kan och bör reformeras" [Wage standardization in industry can and should be reformed], in Lönebildning för jämlikhet [Wage formation for equality] No. 4, the 6F trade union partnership, 2018.

<sup>48</sup> It should be pointed out that there are studies showing that there is a certain amount of wage flexibility with regard to changes in unemployment at a regional level, see M. Carlsson, I. Häkkinen Skans and O. Nordström Skans, "Wage Flexibility in a Unionized Economy with Stable Wage Dispersion", IZA Discussion Paper No. 12093, January 2019, Institute of Labor Economics.



the strikingly low overall nominal wage growth in the economy despite a healthy economic situation.

The restrained wage agreements in Swedish industry is largely due to the moderate wage growth in our European competitor countries. As the industrial sector's agreements also set the standard for wage agreements in other sectors that are only partly or not at all exposed to competition, these agreements will also be low.

From a theoretical perspective, this type of wage norm should not be incompatible with inflation targeting in the long term as the euro area's inflation target is very much in line with Sweden's.<sup>49</sup> But during periods of unusually low wage increases in the euro area, the norm established by the industrial sector may lead to such low wage growth in the whole Swedish economy that it may take longer to achieve the inflation target. During such periods, there is a risk of inflation expectations falling and of confidence in the inflation target being undermined.

The interaction between the monetary policy framework and the forms of wage formation is an important issue for future analysis. The smooth functioning of this interaction is central to favourable economic developments.

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<sup>49</sup> The European Central Bank's target is that inflation shall be "below but close to 2 per cent".

## ARTICLE – The Riksbank’s development work

The Riksbank works constantly on improving its monetary policy analysis. A key issue to analyse in 2018 was the relationship between developments on the labour market and wage and price developments. As the Riksbank’s forecasts indicated a forthcoming repo rate increase, analyses of the possible consequences of such an increase for the economy were also published. Another issue, which the Riksbank has reiterated on many occasions, is the assessment of the krona’s development and its effects on inflation. The work on enhancing the inflation analysis also continued during the year. An issue that was analysed in particular was how different measures of underlying inflation forecast inflation, given that energy prices have had such a major impact on the development of inflation in recent years. The analysis of a possible e-krona included various feasible consequences for monetary policy, depending on how such an e-krona is designed.

The Riksbank works constantly on improving its monetary policy analysis and the impact of monetary policy on the economy. This work includes both the analysis of developments in the real and financial economy and the design of models that capture how the economy functions in a changing world.<sup>50</sup>

### In-depth analysis of the correlation between the labour market and wage and price developments

Despite falling unemployment and rising resource utilisation, wage and price growth has been subdued in recent years both internationally and in Sweden. In 2016 and 2017, the Riksbank had analysed feasible explanations to this development, and this work continued in 2018. One of the correlations analysed was between resource utilisation and inflation, referred to as the Phillips curve.<sup>51</sup> This analysis found that the Riksbank’s forecasts should continue to be based on the fact that wage growth is affected by resource utilisation with a certain time lag, while taking into account the apparent weakening of the correlation. It was also pointed out that inflation is affected by several factors in addition to wage growth, including productivity growth, energy prices and the exchange rate. It is not possible therefore to automatically say in advance how monetary policy might change if wage increases turn out to be lower than forecast.

During the year, the Riksbank analysed the causes of the low wage growth in Sweden with the help of microdata on the individual level.<sup>52</sup> One study analysed how a changed

composition of the labour force, towards a higher proportion of foreign-born persons and higher proportion of persons with post-secondary education, may have affected wage growth in Sweden over the last ten years. A larger proportion of highly educated persons in the labour force boosts wage growth, while the opposite is true regarding a higher proportion of foreign-born persons. In other words, the effects go in opposite directions and it was noted that they by and large cancel each other out. The conclusion was that the composition of the labour force seems in total to have had little effect on wage growth in Sweden in recent years.

Another study analysed the development of wage differentials between people who have switched jobs and people who have obtained work by having entered the labour force or moved into it from unemployment. It was shown that wage development is as a rule stronger for those who have switched jobs. It was also noted that this wage premium has not decreased in recent years in relation to developments during previous economic booms in Sweden and is hence does not explain the modest wage growth either.

### How do future rate rises affect the economy?

An important issue to analyse during the year was how the economy might be affected by future repo rate rises.

An article in the Monetary Policy Report described how the cashflows and consumption of Swedish households might be affected by rising interest rates.<sup>53</sup> The fact that household debt has risen and that their mortgages have largely been

<sup>50</sup> Examples of this are “Reduced housing construction is subduing GDP growth”, article in Monetary Policy Report, February 2018 and L. Alexandersson “Liquidity premium in the Swedish inflation-indexed government bond market”, *Economic Review* No. 2, 2018:2.

<sup>51</sup> See “The Phillips curve and monetary policy”, article in Monetary Policy Report, July 2018.

<sup>52</sup> C. Flodberg “Has wage development been affected by changes in the composition of the group of employees?” No. *Economic Commentaries*, No. 1, 2018 and C. Flodberg, “Who switches jobs and is the wage premium for switching jobs cyclically normal?” *Economic Commentaries*, No. 10, 2018.

<sup>53</sup> “How are household cashflows and consumption affected by rising interest rates?” article in Monetary Policy Report, December 2018. This article was an update of the Riksbank’s more detailed analysis one year previously, see “How are households affected by rising interest rates?” article in Monetary Policy Report, December 2017 and P. Gustafsson, M. Hesselman and B. Lagerwall “How are household cashflows and consumption affected by higher interest rates?”, Staff Memo, December 2017.

taken out at a variable interest rate means that the effects of monetary policy on household consumption are greater than previously. The article notes that the increased interest-rate sensitivity of households has become a more important circumstance to consider in Swedish monetary policy. However, the Riksbank's repo rate path indicated that the rate would be increased at a slow pace, which suggested that the total effects on household cashflows would be limited. It was also noted that the Riksbank's monetary policy considerations are ultimately guided primarily by how the repo rate affects the entire macroeconomy and the prospects for inflation.

The Riksbank has investigated the legal options for collecting or accessing more detailed information about households' assets and debts as such statistics would make it possible to analyse the problems of household debt more effectively. However, the legal issues have yet to be settled.

One study analysed the effects of repo rate rises on financial variables.<sup>54</sup> It presented a general review of previous repo rate hike periods in Sweden, focusing on the effects on longer-term interest rates, the exchange rate and household mortgage rates. The differences between these periods and the current situation in Sweden was also discussed, in light of today's historically unique scenario with a negative repo rate. It was noted that the financial conditions have gradually become less expansionary and have been closely followed by both market rates and interest rates for households and companies during earlier periods of interest rate rises.

#### **Analysis of the krona's impact on inflation and a new assessment of the krona's long-term level**

Because of the relatively sharp depreciation in the krona at the beginning of the year, the Riksbank published analyses of the effects that movements in the krona exchange rate have on inflation.<sup>55</sup> A clear finding in these analyses was that the effects on inflation of a change in the krona exchange rate may depend on two factors: firstly the cause of the change, and secondly how permanent the change is expected to be. As the article shows, this makes it difficult overall to assess the effects.

The Riksbank's forecasts for the exchange rate is based on an assessment of the long-term level of the real exchange rate. The real krona exchange rate reflects the price level in Sweden in relation to abroad, measured in common currency, which is the same as the nominal exchange rate adjusted for the relationship between the price level in Sweden and abroad. An updated assessment of the interval for the long-term real trade-weighted krona exchange rate,

measured using the KIX krona index, was published in an article.<sup>56</sup> The assessment showed that the long-term real krona exchange rate was weaker than the assessment that had previously formed the basis of the Riksbank's forecasts and was published in 2013. The work on these issues, as on many others, will continue in the period ahead.

#### **Continued work on the analysis of inflation**

One issue that has been in focus in the Riksbank's work on analysing inflation in recent years is the difference in the development of the Riksbank's target variable of inflation in terms of the CPIF and different measures of underlying inflation.<sup>57</sup> For example, energy prices often vary sharply and therefore have a major impact on measured inflation. Over time, however, the variations have a tendency to cancel each other out. Once prices that vary in the short term are adjusted for, a time series is derived that hopefully better reflects underlying inflation. Even though certain measures are more useful than others, the conclusion is that no one measure satisfactorily fulfils all the criteria during all time periods, indicating that the Riksbank should use a broad set of measures of underlying inflation.

Inflation in the trade and service sector has also been analysed using questions from the National Institute of Economic Research's Economic Tendency Survey.<sup>58</sup> The Riksbank had ordered these questions aimed at systematically gathering information at company level on prices and how they are determined. The survey responses indicated that foreign and domestic cost pressures have contributed to price increases in the trade sector. Higher demand and higher domestic costs have contributed to price increases in service branches. At the same time, competition has held back price pressures in these sectors. These results largely confirm the results from the Riksbank's macroeconomic models.

#### **Monetary policy analysis of a possible e-krona**

The monetary policy effects of introducing an e-krona have also been studied during the year.<sup>59</sup> One aspect analysed is the Riksbank's operational framework as an e-krona involves the Riksbank increasing its circle of counterparties to also include households and companies that are not credit institutions. The e-krona can be a potentially large and volatile item on the balance sheet and the operational framework may need to be adapted to it.

If the general public were to be given the opportunity to hold an unlimited quantity of e-krona that is not interest-bearing, it would probably no longer be possible to set

<sup>54</sup> "What usually happens when the repo rate is raised?" article in Monetary Policy Report, October 2018.

<sup>55</sup> "The exchange rate and inflation" article in Monetary Policy Report, April 2018 and V. Corbo and P. Di Casola "Conditional exchange rate pass-through: evidence from Sweden", Working paper series No. 352, 2018.

<sup>56</sup> "Development of the Swedish krona in the longer term", article in Monetary Policy Report, October 2018.

<sup>57</sup> "Why measures of core inflation?" article in Monetary Policy Report, October 2018 and J. Johansson, M. Löf, O. Sigrist and O. Tysklind "Measures of core inflation in Sweden", *Economic Commentaries* No. 11, 2018.

<sup>58</sup> E. Frohm, M. Löf and M. Tibblin "New survey data highlights company pricing", *Economic Commentaries* No. 8, 2018.

<sup>59</sup> Special edition on the e-krona, *Economic Review* No. 3, 2018.

negative rates on monetary policy instruments, for example a negative policy rate. Even the effects of quantitative easing may also decrease. The purpose of such easing is to push down interest rates with longer maturities. These rates reflect expected future short-term rates. The introduction of a non-interest-bearing e-krona may prevent the expected future repo rate from being negative, which could mean that long-term interest rates cannot be pushed down to the same extent. On the other hand, if the e-krona were to be interest-bearing, no such limitations arise and the monetary policy impact may instead increase under certain circumstances. The Riksbank's balance sheet, the monetary policy operational framework and the impact of monetary policy are important, ever-present items on the Riksbank's agenda.

### Consequences of global warming

Global warming could also have consequences for monetary policy. An economic commentary published in 2018 discussed whether central banks should have a greater focus on understanding the effects of climate change.<sup>60</sup> The conclusion is that global warming and its consequences are relevant for central banks as these consequences may conceivably have an impact on monetary policy in the longer run. The financial risks for Sweden are uncertain as Sweden itself is less exposed to climate risks than many other countries, but at the same time is a small open economy that is heavily dependent on what happens in the rest of the world. In the conclusions, it is noted the primary contribution that central banks can make to sustainability is to help ensure a successful stabilisation policy.

**Table 4:1. Monetary policy-related studies published in 2018<sup>61</sup>**

#### Articles in Monetary Policy Reports

"Reduced housing construction is subduing GDP growth", February.

"The exchange rate and inflation", April.

"The Phillips curve and monetary policy", July.

"Small effects on production and inflation of the summer's drought and forest fires", September.

"Development of the Swedish krona in the longer term", October.

"What usually happens when the repo rate is raised?", October.

"Why measures of core inflation?" October.

"How are household cashflows and consumption affected by rising interest rates?", December.

#### Economic Commentaries

C. Flodberg "Has wage development has been affected by changes in the composition of the group of employees?", No. 1.

E. Frohm, M. Löf and M. Tibblin "New survey data highlights company pricing", No. 8.

E. Frohm "How do global value chains influence the effects of the krona exchange rate on exports?", No. 9.

C. Flodberg "Who switches jobs and is the wage premium for switching jobs cyclically normal?", No. 10.

J. Johansson, M. Löf, O. Sigrist and O. Tysklind "Measures of core inflation in Sweden", No. 11.

C. Olovsson "Is climate change relevant for central banks?", No. 13.

R. Emanuelsson, G. Katinic, and E. Spector "Developments in the housing market and their effect on household debt", No. 14.

#### Articles in Sveriges Riksbank Economic Review

L. Alexandersson "Liquidity premium in the Swedish inflation-indexed government bond market", No. 2.

M. Nessén, P. Sellin and P. Åsberg Sommar "The implications of an e-krona for the Riksbank's framework for implementing monetary policy", No. 3.

H. Armelius, P. Boel, C. A. Claussen and M. Nessén "The e-krona and the macroeconomy", No. 3.

C. Berg, P. Meyersson and J. Molin "Dramatic years in Sweden and globally – Economic developments 2006–2017", No. 4.

J. Hansson, M. Nessén and A. Vredin "The storm after the calm – lessons for monetary policy analysis", No. 4.

#### Working Paper series

M. Sandström "The impact of monetary policy on household borrowing – a high-frequency IV identification", No. 351.

V. Corbo and P. Di Casola "Conditional exchange rate pass-through: evidence from Sweden", No. 352.

K. Walentin and A. Westermark "Learning on the Job and the Cost of Business Cycles", No. 353.

R. De Rezende and A. Ristinieni "A shadow rate without a lower bound constraint", No. 355.

S. Franco and E. Frohm "Reduced "Border Effects", FTAs and International Trade", No. 356.

H. Armelius, C. Bertsch, I. Hull and X. Zhang "Spread the Word: International Spillovers from Central Bank Communication", No. 357.

P. Di Casola and S. Sichlimiris, "Towards Technology-News-Driven Business Cycles", No. 360.

#### Riksbank studies

Evaluation of the Riksbank's forecasts, March 2018.

<sup>60</sup> C. Olovsson "Is climate change relevant for central banks?" *Economic Commentaries* No. 13, 2018.

<sup>61</sup> The table also contains policy-related studies not mentioned in the text above.





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