

Monetary Policy Report

October 2018



Monetary Policy Report

The Riksbank's Monetary Policy Report is published six times a year. The report describes the deliberations made by the Riksbank when deciding what is an appropriate monetary policy to conduct.¹ The report includes a description of the future prospects for inflation and economic activity based on the monetary policy that the Riksbank currently considers to be well-balanced.

The purpose of the Monetary Policy Report is to summarise background material for monetary policy decisions, and to spread knowledge about the Riksbank's assessments. By publishing the reports, the Riksbank aims to make it easier for external parties to follow, understand and assess monetary policy.

The Riksbank must submit a written report on monetary policy to the Riksdag (Swedish Parliament) Committee on Finance at least twice a year (see Chapter 6, Article 4 of the Sveriges Riksbank Act (1988:1385). During the spring, special material is submitted as a basis for the evaluation of monetary policy. During the autumn, Monetary Policy Report is submitted as an account of monetary policy.

The Executive Board made a decision on the Monetary Policy Report on 23 October 2018. The report may be downloaded in PDF format from the Riksbank's website www.riksbank.se, where more information about the Riksbank can also be found.

¹ See "Monetary policy in Sweden" on the next page for a description of the monetary policy strategy and what can be regarded as an appropriate monetary policy.

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 (CPIF).
- At the same time as monetary policy is aimed at attaining the inflation target, it shall 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 publishes its own 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 which repo-rate path, and any potential supplementary measures are needed, for monetary policy to be well-balanced. The trade-off is 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 weaken 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 spans 1 to 3 per cent, which captures around three quarters of the historical monthly outcomes of CPIF inflation. The Riksbank always strives 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 unbalanced development of asset prices and indebtedness however, well-functioning regulation and effective supervision play a central role. 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.

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 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 – Monetary policy considerations

Since the Monetary Policy Report in September, economic developments have been largely as expected, both in Sweden and abroad. Uncertainty has increased slightly over global economic prospects but economic developments continue to be good. Activity in the Swedish economy is high, even if GDP growth is expected to slow down in the period ahead. The labour market situation is strong, with high demand for labour. Inflation increased to 2.5 per cent in September, partly as a result of rapidly rising energy prices. Other measures of underlying inflation are lower but there are signs that inflationary pressures are rising in the economy. All in all, inflation is expected to be close to the target of 2 per cent in the years ahead.

Overall, the economic outlook and inflation prospects remain largely unchanged since the September Monetary Policy Report. Consequently, in line with the previous forecast, the Executive Board has decided to maintain the repo rate unchanged at -0.50 per cent. If the economy develops in a way that continues to support the prospects for inflation, the Executive Board deems that it will soon be appropriate to start raising the repo rate at a slow pace. The forecast for the repo rate is unchanged since the monetary policy meeting in September and indicates that the repo rate will be raised by 0.25 percentage points either in December or in February. As with the first raise, monetary policy will also subsequently be adjusted according to the prospects for inflation. Reinvestments of principal payments and coupon payments in the government bond portfolio will continue until further notice. The expansionary monetary policy underlines the Riksbank's aim to safeguard the role of the inflation target as the nominal anchor for price setting and wage formation.

Swedish inflation at target

Positive developments internationally but increased uncertainty

Global economic developments continue to be positive, even though, for example, developments in Italy and the escalated trade conflict between the United States and China mean that uncertainty over the prospects for the global economy has increased slightly. Signs of weakness in several emerging economies that are particularly vulnerable to tighter financial conditions in the US economy are contributing to the increased uncertainty. Growth in world trade has slowed down in 2018. Together with a slight downturn in growth indicators, this suggests slightly weaker development abroad compared with last year. However, resource utilisation in developed economies is rising and, apace with this, wage growth and inflationary pressures are expected to rise gradually. Monetary policy abroad has therefore started to move in a less expansionary direction in a number of countries. Financial conditions have become somewhat tighter but continue to provide support to economic developments both in Sweden and abroad.

Table 1:1.

Important factors for monetary policy
Positive developments in the global economy even if uncertainty has increased slightly. Monetary policy abroad has started to move in a less expansionary direction in an increasing number of countries.
Continued strong economic activity in Sweden
CPIF inflation and inflation expectations above 2 per cent. Core inflation is lower than CPIF inflation but is rising in line with the forecast from September.
Slow appreciation of the exchange rate.
Conclusion: The repo rate is held unchanged at -0.50 per cent. If the economy develops in a way that continues to support the prospects for inflation, the repo rate is expected to be raised either in December or in February. Reinvestments of principal payments and coupon payments in the Riksbank's bond portfolio will continue until further notice.

Table 1:2.

Important forecast revisions since the Monetary Policy Report in September
Somewhat weaker labour market and GDP growth currently, therefore slightly lower resource utilisation in the economy.
Lower productivity growth, therefore higher rate of increase in unit labour costs.
Slightly slower appreciation of the exchange rate in the next few years.
All in all, largely unchanged forecast for CPIF inflation.

Activity in the Swedish economy remains high

The most recently published National Accounts paint a picture of slightly weaker GDP growth in recent years. Nevertheless, the Riksbank deems that economic activity in Sweden has been and continues to be strong. GDP growth is expected to slow in the period ahead (see Figure 1:2). This is a consequence of both foreign and domestic demand growing slightly more slowly, with the slowdown of domestic demand primarily being due to reduced housing investment.

Developments on the labour market have been very strong for several years and both the labour force participation rate and the employment rate have risen to historically high levels. The decline in unemployment has now slowed down, even though indicators suggest that demand for labour remains good. But, as the employment rate has risen and unemployment fallen, it has become more difficult for companies to find the staff they are looking for. This is reflected in higher degree of shortages and longer recruitment times. In the period ahead, a slower increase in recruitment and slightly higher unemployment is expected.

Even if GDP growth and the employment rate are somewhat lower than previously assumed, the current resource utilisation in the Swedish economy is still deemed to be higher than normal and is expected to remain relatively high in the years ahead.

Inflation remains close to 2 per cent

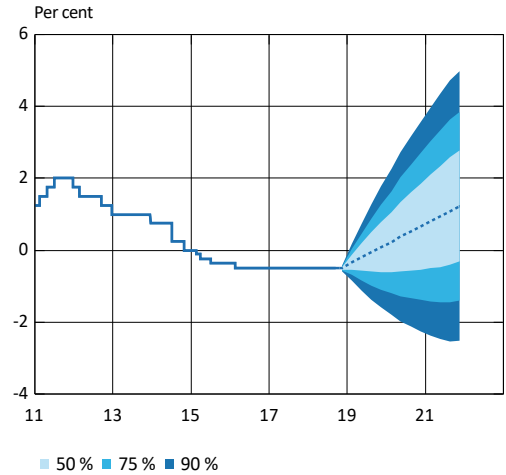
Since early 2017, inflation has been close to the inflation target of 2 per cent, and, in September, inflation amounted to 2.5 per cent (see Figure 1:3). An explanation for this has been rapidly rising energy prices. To gain an understanding of the more persistent component of the measured inflation rate, measures of core inflation can be studied (see the article “Why measures of core inflation?”). The median of various measures of core inflation increased in September to 1.7 per cent (see Figure 3:2). There are also other signs that inflationary pressures are rising in the economy, but these are still deemed to be relatively modest.

However, continued high energy prices and a higher rate of increase primarily in prices for goods, as a result of the earlier krona depreciation, mean that inflation is expected to continue to be around 2.5 per cent until mid-2019. In 2019, the rate of increase in energy prices will slow down, and will then contribute to CPIF inflation falling back to just below 2 per cent (see Figure 1:4). The strong economic activity, rising cost pressures in the business sector and gradually higher inflationary pressures abroad mean that the conditions for inflation to remain close to 2 per cent are good. Various surveys also indicate that inflation expectations are at 2 per cent. Overall, it is the Riksbank’s assessment that inflation will be close to 2 per cent in the years ahead.

Current monetary policy

The Riksbank’s monetary policy with a negative policy rate and extensive purchases of government bonds has had a clear impact

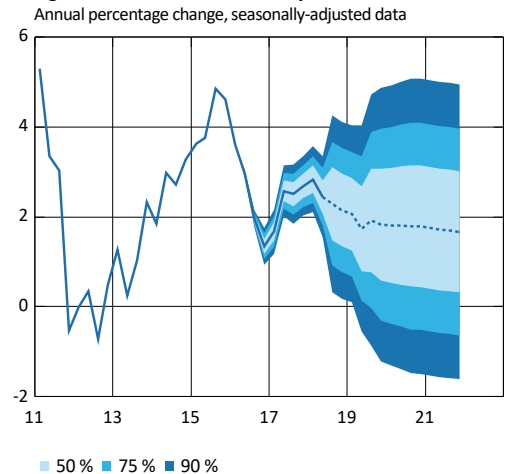
Figure 1:1. Repo rate with uncertainty bands



Note. The uncertainty bands for the repo rate are based on the Riksbank’s historical forecasting errors and the ability of risk-premium adjusted forward rates to forecast the future repo rate for the period 1999 up to the point when the Riksbank started to publish forecasts for the repo rate during 2007. The uncertainty bands do not take into account the fact that there may be a lower bound for the repo rate. Outcomes are daily rates and forecasts refer to quarterly averages.

Source: The Riksbank

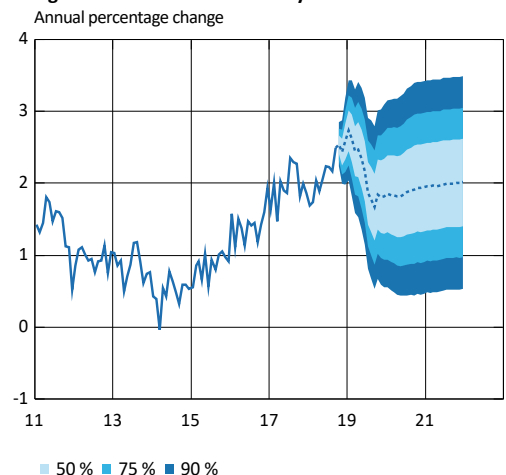
Figure 1:2. GDP with uncertainty bands



Note. The uncertainty bands are based on the Riksbank’s historical forecasting errors. There is also uncertainty for the outcomes for GDP, as the figures in the National Accounts are revised several years after the preliminary publication.

Sources: Statistics Sweden and the Riksbank

Figure 1:3. CPIF with uncertainty bands



Note. The uncertainty bands are based on the Riksbank’s historical forecasting errors.

Sources: Statistics Sweden and the Riksbank

on short-term and long-term market rates and on the krona exchange rate in recent years. Monetary policy has contributed to inflation now being over 2 per cent, to inflation expectations being close to 2 per cent, to economic activity being strong and to unemployment falling back.

Economic developments as expected

International developments have so far been good and in line with the Riksbank's forecasts, even if there exist a number of circumstances that have increased the uncertainty around the global economic outlook. So far, the increased uncertainty is only expected to have marginal effects on the economic development. The risks may, if they materialise, have a major impact on the global economy in the period ahead, but they are difficult to quantify in a forecast.

As far as the Swedish economy is concerned, new information has not changed the view that economic activity has developed strongly for a long time and that resource utilisation is higher than normal. The situation on the labour market also continues to be tight. Demand for labour is high and companies are noting difficulties in finding the skills they require.

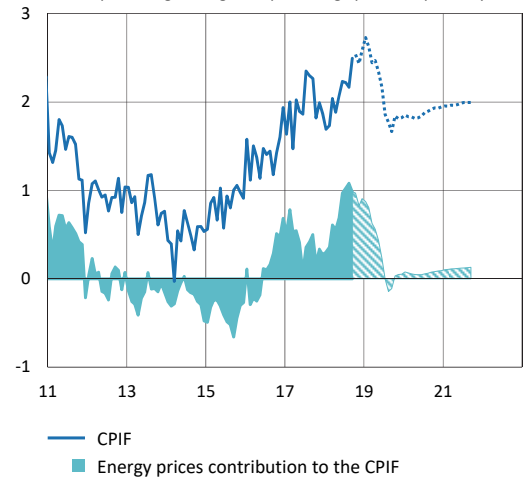
In the period ahead, resource utilisation is expected to be a little lower compared with the forecast in September. At the same time, growth in productivity has been unexpectedly weak, which, all in all, means that the outcome and forecast for unit labour costs have been revised up somewhat. The overall picture of inflation prospects in the years ahead is largely unchanged (see Figure 1:5). CPIF inflation amounted to 2.5 per cent in September, which is in line with the Riksbank's forecast. During the second half of 2019, inflation is expected to fall back, but it will still continue to be close to the target of 2 per cent after that.

If inflation prospects hold up, it will soon be appropriate to start raising the repo rate

Economic developments have largely been as expected and the overall economic outlook and inflation prospects are almost unchanged since the Monetary Policy Report in September. Consequently, in line with the previous forecast, the Executive Board has decided to hold the repo rate unchanged at -0.50 per cent (see Figure 1:6). If the economy develops in a way that continues to support the prospects for inflation, the Executive Board deems that it will soon be appropriate to start raising the repo rate. The inflation forecast is based on the repo rate being raised by 0.25 percentage points at the monetary policy meeting in either December or February. That is the same assessment as was made in September.

For inflation to remain close to target in the period ahead, it is important that economic activity continues to be strong and has an impact on price increases. Monetary policy therefore needs to remain expansionary. The forecast for the repo rate is unchanged since September. According to this, the repo rate will be raised slowly in the period ahead, with about two raises per year of about 0.25 percentage points each time. As with the first

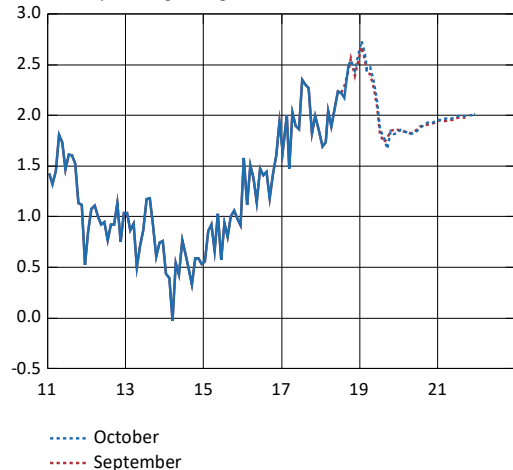
Figure 1:4. The CPIF and contributions from energy prices
Annual percentage change and percentage points respectively



Note. The contribution of energy prices to the CPIF in the forecast is calculated as the annual percentage change in energy prices multiplied by their current weight in the CPIF.

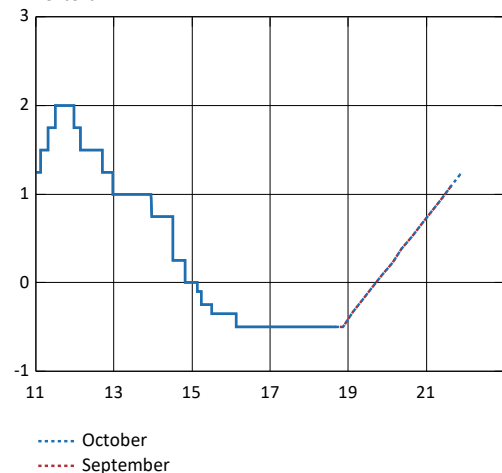
Sources: Statistics Sweden and the Riksbank

Figure 1:5. CPIF
Annual percentage change



Sources: Statistics Sweden and the Riksbank

Figure 1:6. Repo rate
Per cent



Note. Outcomes are daily data and the forecasts refer to quarterly averages.

Source: The Riksbank

raise, monetary policy will also subsequently be adjusted according to the prospects for inflation.

The Riksbank continues to be vigilant as regards the development of inflationary pressures in the economy. In this context, it is also important that the krona exchange rate develops in a manner compatible with inflation remaining close to target. All in all, the assessment has been made that monetary policy will have to proceed cautiously and continue to be expansionary for a long time to come. The real repo rate is expected to be negative over the entire forecast period (see Figure 1:9).

Government bond purchases contribute to monetary policy expansiveness

At the end of September, the Riksbank’s government bond holdings amounted to just under SEK 340 billion, expressed as a nominal amount (see Figure 1:7). Net purchases of government bonds were concluded in December 2017, but principal payments and coupon payments will be reinvested in the government bond portfolio until further notice. In December 2017, the Executive Board decided that reinvestments of the large redemptions due in the first six months of 2019 should be allocated evenly across the period from January 2018 to June 2019 (see Figure 1:8). This means that the Riksbank’s holdings of government bonds will increase temporarily during 2018 and the beginning of 2019.

Uncertainty and risks

Forecasts of future economic developments are always uncertain, as illustrated by the uncertainty bands in Figures 1:1–1:3. In the Riksbank’s forecasts, the risks of both stronger and weaker development shall, in principle, be balanced. It is difficult, however, to assess the likelihood of future events and the consequences they might have should they occur.

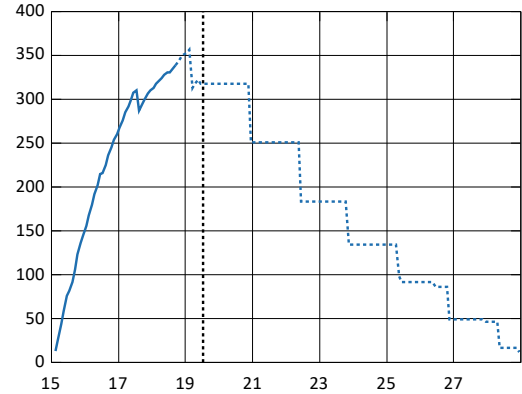
Neither is it obvious how monetary policy should relate to uncertainty and risks. There are occasions on which monetary policy deliberations may wish to pay particular attention to certain risks, the consequences of which may have a severe impact on economic development. But, on other occasions, it may be necessary to await more information before adjusting monetary policy.

Uncertainty about developments abroad

Sweden is a small economy with substantial international trade. How the global economy develops is therefore of considerable significance for developments in Sweden, when it comes to both growth and inflation.

Uncertainty around international economic activity has increased slightly recently, which is reflected in increased uncertainty on the world’s stock exchanges, among other things. One risk is that growth in the global economy can be weaker than in the Riksbank’s forecasts. This might be the case, for

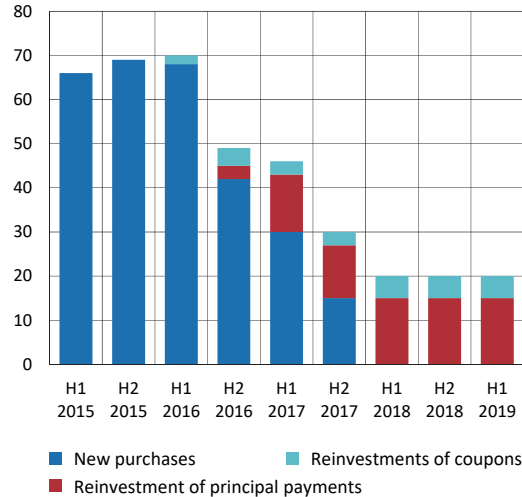
Figure 1:7. The Riksbank’s holdings of government bonds
Nominal amounts, SEK billion



Note. Forecast up until June 2019, after that a technical projection under the assumption that no further reinvestments are made. Holdings are also affected to a certain extent by bonds market prices and by which bonds the Riksbank chooses to reinvest in. The vertical line marks the shift between the forecast and the technical projection.

Source: The Riksbank

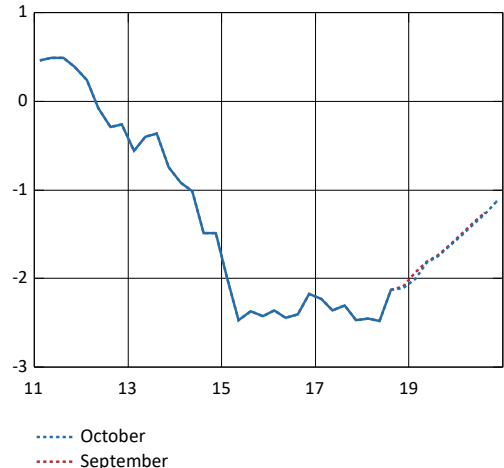
Figure 1:8. The Riksbank’s purchases and reinvestments
Nominal amounts, SEK billion



Note. The development of reinvestments from mid-2018 onwards is a forecast and refers to nominal amounts. The final amounts will depend on current market prices.

Source: The Riksbank

Figure 1:9. Real repo rate
Per cent, quarterly averages



Note. The real repo rate is the Riksbank’s expected real interest rate, calculated as a mean value of the Riksbank’s repo rate forecast for the year ahead minus the inflation forecast (CPIF) for the corresponding period. Outcomes are based on the latest forecasts at that time.

Source: The Riksbank

example, in a scenario where the ongoing trade conflicts escalate further and lead to greater pessimism among households, companies and on financial markets (see the box “Increased protectionism in world trade” in Chapter 4 for a description of the protectionist measures taken so far). Continued uncertainty surrounding economic developments in countries such as Argentina and Turkey could also impair sentiment and contribute to weaker growth in the global economy, particularly if this impacts the financial markets.

There is also uncertainty over whether the Italian government’s draft budget will be adjusted to make it compatible with the country’s commitments towards the European Union. In a very unfavourable scenario, there may arise uncertainty over the cohesion of the EU, with major consequences for the economic outlook.

Uncertainty also persists over the economic and financial effects of the United Kingdom’s exit from the EU. This applies in particular in the event that the United Kingdom were to leave the EU without a withdrawal agreement. The long-term effects on growth of such a scenario are certainly deemed to be relatively limited for the EU as a whole. But the effects would vary from country to country and, in the short term, significant disruption cannot be ruled out, particularly on the financial markets.

In a scenario with weaker global growth, international inflation will probably also be lower than in the Riksbank’s forecast. There is also uncertainty around how the relationship between resource utilisation and inflation looks after the financial crisis. In several countries, core inflation has remained low despite the economic recovery and a relatively healthy economic situation. Wage growth, in particular, has been strikingly low in many countries. This has raised the issue of whether structural changes have occurred that have weakened the relationship between resource utilisation and inflation more permanently. In that case, one consequence could be that monetary policy needs to be more expansionary than previously to achieve a certain rate of inflation. It is also possible, however, that developments can be explained by the fact that the time lag between improvements in economic activity and price and wage increases has been unusually long after the financial crisis. A sign that this might be the case is that wage growth now seems to have begun to pick up in several countries, for example in Germany.

In the United States, economic development is particularly strong: unemployment is at its lowest level for almost 50 years and the expansionary fiscal policy is helping to push up growth in an economy that is already strong. If inflation in the United States becomes higher than expected or if questions arise over public finances, US interest rates may rise sharply, which could further exacerbate problems for the emerging market economies that have already been negatively affected by higher interest rates abroad and a stronger dollar. The direct economic consequences for Sweden of such a development would probably be limited but

Side-effects of monetary policy

There are concerns that the historically unusual monetary policy conducted in recent years may lead to undesirable side-effects. The Riksbank continuously analyses the effects of the negative repo rate and the extensive bond purchases.

One possible side-effect of low interest rates is that they can create incentives for substantial risk-taking in the economy. Assets may become overvalued, risk may be incorrectly priced and the indebtedness of various agents may increase in an unsustainable manner. The increase in Swedish household indebtedness has long been a cause for concern. Among other factors, the increase is due to structural problems on the housing market and the falling trend in the level of real interest rates in Sweden and abroad, while the expansionary monetary policy has also contributed. Several years of rapidly rising housing prices and heavily increased indebtedness have made households sensitive to both price falls on the housing market and rising interest costs. It is therefore important to increase households’ resilience in different ways and limit the risks of their high indebtedness.

Another possible side-effect is that the functioning of the financial markets could be impaired by a negative repo rate and government bond purchases. So far, however, the markets have been able to manage negative interest rates relatively smoothly. As regards government bond purchases, the Riksbank’s purchases have meant that a relatively large share of the stock is not available for trading on the market and there are signs that this is contributing to a slight delay in performing transactions. However, Swedish National Debt Office dealers are contributing positively to liquidity in the market.

Neither do the negative interest rates seem to have led to increased demand for cash; the value of outstanding banknotes and coins is much lower now than when the repo rate first became negative. It is still only a small portion of borrowing that takes place at negative interest rates and then only from certain larger companies and parts of the public sector. Moreover, banks’ profitability could decrease as a result of low and negative rates, something which could ultimately counteract the intended effect of monetary policy if lending rates were to go higher and credit supply was to diminish. The profitability of Swedish banks has recently been high and stable, however. Their profits and lending capacity have not been significantly affected either.

The Riksbank’s overall assessment is that the side-effects of a negative policy rate and government bond purchases have so far been manageable.

it cannot be ruled out that contagion effects via the financial markets could have greater consequences for Sweden too.

Uncertainty surrounding developments in Sweden

Sweden's considerable international dependence means that weaker developments internationally, for example as a result of an escalation in trade conflicts, could also impact Swedish growth and inflation. In this scenario, the slow deceleration of growth now forecast could be more marked.

How the krona will develop, especially in the slightly shorter-term perspective, is another source of uncertainty for inflation. In the long term, the real exchange rate, that is the exchange rate adjusted for relative price levels, does indeed tend to move towards a more sluggish equilibrium level, but this is not easy to estimate either (see the article "Development of the Swedish krona in the longer term").

One scenario may be that the Riksbank has underestimated by how much and how quickly the krona will appreciate when the repo rate starts to be increased. With an unexpectedly strong appreciation of the krona, import prices would slow more than forecast and inflation would be lower than expected. This would be particularly trouble-some in a situation where wage growth is still subdued and energy prices start to fall. This could cause confidence in the inflation target once again to weaken and inflation expectations to fall. The problems with such a development are described in the box "Risks of excessively low inflation".

Of course, there is also a chance that the forecasts underestimate inflation in the period ahead. This could be the case, for example, if economic activity in Sweden and internationally becomes stronger than expected or if the relationship between resource utilisation and inflation returns to being more like it was before the financial crisis. However, the risks of excessively low inflation merit particular attention, as at the prevailing interest rate levels, excessively low inflation is more difficult to manage than excessively high inflation.

Continued uncertainty about developments on the housing market

For some time now, the Swedish housing market has been in a cooler phase (see Figure 1:10). Developments in the period ahead are uncertain. It cannot be ruled out that housing prices going forward will fall further and that the slowdown in housing investment will be sharper than is assumed in the forecast. This in turn could lead to weaker development in household consumption as well as lower growth and inflation.

According to the Riksbank's forecast, household debt as a percentage of disposable income is expected to continue to rise in the years ahead (see Figure 1:11). To mitigate the risks inherent in household indebtedness, it is important that all

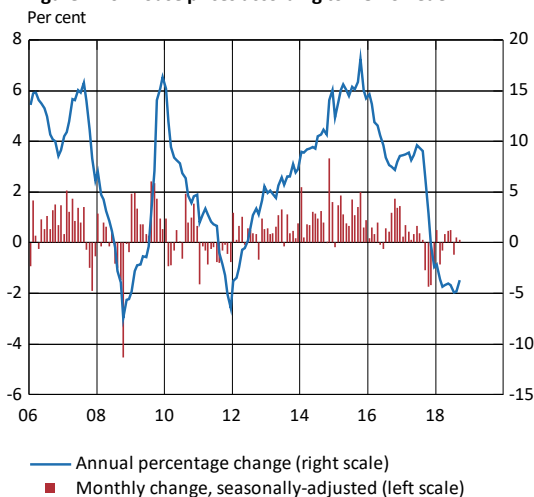
Risks of excessively low inflation

Monetary policy has a clear focus: to stabilise inflation around the inflation target of 2 per cent. The inflation target has been an important condition for the, in many ways, favourable developments in the Swedish economy since the mid-1990s. With a shared perception of how prices will develop in the future, it will be easier for economic agents to plan for the long term and the coordination of expectations lays the foundation for efficient price-setting and wage formation.

Persistently below-target inflation increases the risk of economic agents adjusting their expectations and starting to assume that inflation will not return to target even in the longer term. This would have an adverse effect on wage formation, for instance.

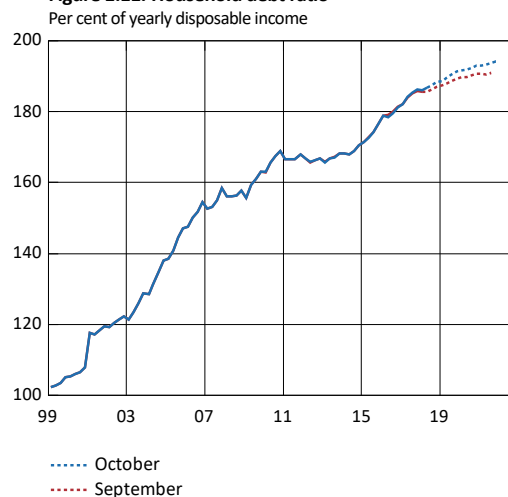
With an inflation rate and inflation expectations that are more permanently below target, the nominal interest rate will also be lower on average. This will increase the risk of the repo rate reaching its lower bound, in the same way as if the target were to be lowered. This reduces the Riksbank's scope for cutting the repo rate in the future if inflation becomes low or economic activity wavers. Moreover, too low inflation can make it difficult to adapt real wages between individuals in a company and between different industries, as nominal wages usually rise and are rarely lowered. This can impair the functioning of the labour market and lead to higher unemployment.

Figure 1:10. House prices according to HOX Sweden



Sources: Valueguard and the Riksbank

Figure 1:11. Household debt ratio



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

Sources: Statistics Sweden and the Riksbank

mortgages are subject to thorough credit assessment and that macroprudential policy is designed appropriately. To come to grips with the more fundamental problems associated with household indebtedness, it is, above all, important that measures are taken within housing and tax policy. Examples of feasible measures include a review of the rent-setting system, the taxation of capital gains from housing property sales as well as property tax and tax relief on interest expenditure.

ARTICLE – Why measures of core inflation?

The measured rate of inflation is often affected by temporary price movements which have no significance for the development of inflation in the longer term. Like other central banks, the Riksbank therefore calculates and publishes various different measures of core inflation. The aim of analysing such measures is to provide an indication of how high the more persistent component of the inflation rate is by removing temporary price movements. CPIF inflation is currently at 2.5 per cent, while the measure of core inflation is lower. For inflation to remain close to the target in a lasting manner, measures of core inflation also need to be close to 2 per cent.

Monetary policy is based on forecasts

Monetary policy normally focuses on bringing inflation close to the target of 2 per cent a couple of years ahead. This is why monetary policy is based on forecasts for inflation. From the beginning, the inflation target was expressed in terms of the CPI but, since September 2017, it has been expressed in terms of the CPI with a fixed interest rate, the CPIF.²

The measured inflation rate is often affected by price changes of a temporary nature. For example, this could be temporarily high electricity prices up or a change to tax deductions that temporarily affects the rate of increase in housing costs for households. One important part of the analysis of inflation is the attempt to assess how large a part of the measured inflation is temporary and how much is more persistent. In addition to CPIF inflation, the Riksbank therefore also regularly analyses measures of what is known as core inflation. The main aim of analysing such measures is to provide an indication of the level of the more persistent or persistent component of the measured inflation rate.

Even if many central banks use measures of core inflation in their communication, there is no uniform definition of what core inflation is and there are different ways of calculating it. One way is to exclude certain predetermined components of the CPIF whose prices are considered to reflect more temporary and short-term variations than those of the other components. The CPIF excluding energy is an example of such a measure. Another way of calculating core inflation is to use statistical methods to systematically exclude or lessen the significance of components in the CPIF whose prices fluctuate sharply. Examples of such measures calculated by the Riksbank include TRIM85, UND24, CPIFPV and CPIFPC.

Measures of core inflation supplement the forecasts

As monetary policy affects inflation with a time lag, the inflation forecast is a basic part of the background material

for monetary policy decisions. The forecasts show how the Riksbank views the durability of the rate of inflation measured. Measures of core inflation supplement the forecast by illustrating in a non-judgemental way how much of the rate of inflation can be expected to be more persistent and how much may be temporary.

Energy prices have recently shown a rapid increase and contributed almost one percentage point to the measured rate of inflation of 2.5 per cent in September. As energy prices are not expected to continue to increase as rapidly in the period ahead, this is not deemed to be a persistent level but instead CPIF inflation can be expected to fall over the next year. The most recent outcomes in the measures of core inflation also indicate that the more persistent part of CPIF inflation is lower than 2.5 per cent.

When the Riksbank makes inflation forecasts, it uses different types of information. Measures of core inflation are used as a part of the analysis of the present level of the more persistent rate of inflation. In addition to this, detailed analyses and assessments of the economic situation, the exchange rate and company costs in the form of developments in wages and productivity are central factors behind the final inflation forecast.

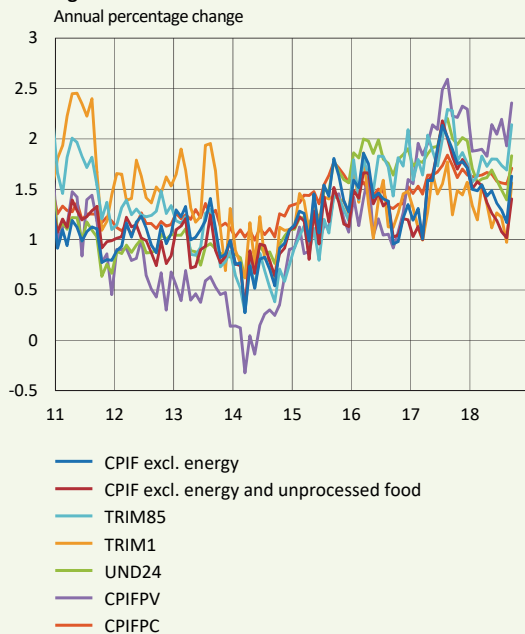
Different ways of calculating core inflation

The Riksbank's Monetary Policy Reports often show the measures of core inflation as a band in which the measure showing the highest and lowest rate of increase respectively for each month constitutes the band's upper and lower limit (see Figure 3:2). The band includes both measures where components are excluded and measures that have been calculated using statistical methods. The measures included in the band are shown in Figure 1:12.³

² See "The CPIF as target variable for monetary policy", article in Monetary Policy Report September 2017.

³ See Appendix 2 in Johansson, J. Löf, M. Sigrist, O. and Tysklind, O., "Measures of core inflation in Sweden", Economic Commentaries no. 11, 2018, for a technical description of the measures.

Figure 1:12. Measures of core inflation



Sources: Statistics Sweden and the Riksbank

Two of these measures exclude some predetermined components from CPIF inflation that has historically proved to be particularly volatile. The **CPIF excluding energy** excludes electricity and fuel from the CPIF. In the **CPIF excluding energy and unprocessed food**, meat, fish, fruit and vegetables have also been excluded in addition to energy.

The other measures are calculated with different statistical methods to systematically exclude or reduce the significance of those parts of the CPIF whose prices vary substantially. The idea behind these measures, which are also used in various forms by other central banks, is that unusually large (or small) price movements are temporary to a great degree. Different methods are used to make this adjustment, but the common factor is that they are based on the CPIF, divided into 70 components. In **Trim85** and **Trim1**, the components with the highest and lowest annual rates of price change are removed each month. In **UND24**, no components are excluded, but they are weighed together with other weights than in the CPIF. Components whose annual percentage price change varies to a relatively large degree are given a lower weighting and vice versa. All components are also kept in **KPIFPV**. The measure is calculated by giving the components weightings on the basis of how persistent their annual percentage rates of price change tend to be. The more persistent a component's price change is, the higher the weighting. **KPIFPC** is calculated by using statistical methods to estimate common trends among the components in the CPIF. The aim of the measure is thus to tone down major price movements in individual

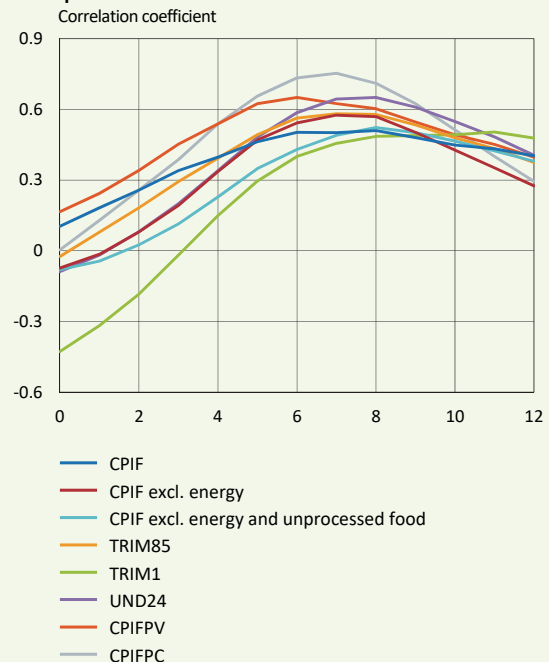
components and better identify the shared development of the majority of the components.

An evaluation of the measures of core inflation

A common approach is to formulate assessable characteristics that measures of core inflation should have.⁴ As the measure should ideally measure the more persistent parts of the measured rate of inflation, it should, for example, covary with macroeconomic variables that explain the development of inflation, for examples indicators of the level of economic activity. As the measure should ideally capture more persistent inflation, which tends to change relatively slowly, the measure should also be able to say more about the future development of inflation than current CPIF inflation does. It is also desirable that the measure has a mean value that is the same as the mean value of the target variable. In addition, given that temporary factors contribute towards increased variation in CPIF inflation, the measure of core inflation should also vary less than CPIF inflation.

One measure of economic activity is the Riksbank's indicator for resource utilisation (the RU indicator). Figure 1:13 shows the covariation (correlation) between the respective measure of inflation and the RU indicator with differing degrees of time lag.

Figure 1:13. Correlation between various inflation measures and the RU indicator with delay of a varying number of quarters



Note. The estimation period is Q1 1996 to Q2 2018. The figure shows the estimated correlation coefficient between respective inflation measures and the RU indicator with delays of a different number of quarters. The CPIFPC is revised every time a new observation is added. Measures of inflation calculated using real-time data are used in the estimations.

Source: The Riksbank

⁴ See Johansson, J. Löf, M. Sigrist, O. and Tysklind, O. "Measures of core inflation in Sweden", Economic Commentaries No. 11, 2018, for a discussion of the desirable characteristics of measures.

All measures show the highest correlation with the RU indicator with a delay of 5–8 quarters, meaning that there is relatively high correlation between the RU indicator in one quarter and measures of core inflation 5–8 quarters later. Most measures of core inflation are more correlated with the RU indicator than the rate of increase in the CPIF. The highest correlation is found between the RU indicator and CPIFPC with a 7 quarter delay.

Table 1:3 describes one way of measuring predictive power. The figures show how well outcomes in the various measures tally with CPIF inflation 12 to 24 months ahead. The tables thus illustrate how well the various measures are already reflecting the development of CPIF inflation up to two years ahead. The figures show the so-called root-mean-squared errors (RMSE) when the current outcome of each inflation measure is used as a forecast for future CPIF inflation 12–24 months ahead. RMSE is a common measure of forecasting ability. The lower the value of the RMSE, the more accurate the forecast. The RMSE values that fall below the RMSE of the CPIF are marked in bold in the table. Most measures of core inflation have better predictive power for future CPIF inflation than the CPIF itself has, both one and two years ahead. The best forecasting ability among these measures is that of the CPIFPC, where the current level of the CPIFPC implies a better prediction of CPIF inflation in, for example, two years than the current level of CPIF inflation does. In practice, like other forecasters, the Riksbank uses more sophisticated methods and more information in its forecasting work than only the current level of core inflation. However, the figures in Table 1:3 can give an indication of how well the measures of core inflation capture the more persistent parts of the current rate of inflation.

Table 1:3. Predictive power for respective measure of inflation for different forecast horizons

RMSE, percentage points

	12	24
CPIF	0.95	1.05
CPIF excl. energy	0.92	0.98
CPIF excl. energy and unprocessed food	0.91	1.02
TRIM85	0.86	1.01
TRIM1	0.95	1.12
UND24	0.80	0.86
CPIFPV	1.02	0.98
CPIFPC	0.74	0.81

Note. The CPIFPC measure is revised every time a new observation is added. Measures calculated using real-time data are used in the estimations. However, the first 5 years (1995–1999) the CPIFPC is calculated with data within the sample. Forecasts for the period January 1995 to July 2018 are included in the evaluation. Sources: Statistics Sweden and the Riksbank

Table 1:4 presents mean values and standard deviations for the various measures of core inflation and the CPIF. The average annual percentage change in the CPIF has been 1.56 per cent since 1995. The average rate of inflation according to the different measures is relatively close to CPIF inflation and most measures vary less than CPIF inflation. During this period, UND24 and CPIFPC deviate the least from the average rate of increase in the CPIF. The CPIFPC also has the lowest standard deviation.

Table 1:4. Mean value, bias in relation to the rate of increase in the CPIF and standard deviation 1995–2018

Annual percentage change and percentage points respectively

	Mean value	Bias	Standard deviation
CPIF	1.56	–	0.72
CPIF excl. energy	1.38	–0.18	0.65
CPIF excl. energy and unprocessed food	1.39	–0.17	0.62
TRIM85	1.66	0.10	0.68
TRIM1	1.70	0.14	0.70
UND24	1.50	–0.06	0.64
CPIFPV	1.48	–0.08	0.90
CPIFPC	1.62	0.06	0.36

Note. The CPIFPC measure is revised every time a new observation is added. Measures calculated using real-time data are used in the estimations. However, the first 5 years (1995–1999) the CPIFPC is calculated with data within the sample. The standard deviation is calculated for the annual percentage change in each inflation measure respectively (percentage points).

Sources: Statistics Sweden and the Riksbank

Other measures relevant at different points in time

When the properties of various measures of core inflation are compared over time, the measures CPIFPC and UND24 appear to be the most useful. These measures are, for instance, best at explaining future CPIF inflation at the same time as they covary the most with resource utilisation.

However, no individual measure of core inflation is assessed to provide the most correct picture of inflationary pressures in all situations, and various measures of core inflation can be useful at different times or over different periods. To obtain as good an indication as possible of current inflationary pressures, and where inflation is heading in the slightly longer term, the Riksbank will continue to analyse several different measures of core inflation. This is also common practice among other central banks.

CPIF inflation is currently at 2.5 per cent, while the measure of core inflation is lower. For inflation to remain close to the target in a lasting manner, measures of core inflation also need to be close to 2 per cent.

CHAPTER 2 – Financial conditions

The financial conditions in Sweden are expansionary and are providing continued support to economic development. The interest rates on loans to households and companies in Sweden are still low while credit growth remains on a high level. The krona has developed approximately in line with the forecast in September. The Federal Reserve is continuing to direct monetary policy in a tighter direction and the financial conditions in the United States have become less expansionary in 2018. Rising interest rates and falling equity prices have fuelled this development recently. The European Central Bank has begun tapering its bond purchasing programme and is expected to increase the policy rate after the summer of 2019. Uncertainty over developments in Italy remain but contagion effects to the rest of Europe have been limited so far. The financial conditions remain tight in a number of emerging market economies, compared with the start of 2018.

International developments

Rising policy rate expectations abroad

In connection with its monetary policy meeting in September, the Federal Reserve noted that the labour market has continued to strengthen and that economic activity has been rising at a strong rate. Unemployment is on a low level from a historical perspective and fiscal policy is expected to contribute to higher economic growth in the years ahead. At the same time, financial conditions remain expansionary. In light of this, the interval for the policy rate was raised to 2.00–2.25 per cent. The median forecast from the members of the monetary policy committee of the Federal Reserve indicates a further rate raise this year of 0.25 percentage points, three raises next year and one more in 2020. Expectations about the level of the future policy rate have increased according to market pricing (see Figure 2:1), but still indicate somewhat fewer rate rises than the members' median forecast for the period after the end of this year.

In the euro area, the European Central Bank (ECB) made the assessment in September that growth is still broad and that inflation will increase gradually. However, a sustainable rise in inflation still needs the support of an expansionary monetary policy. The ECB therefore decided at its monetary policy in September to maintain the monetary policy direction that was

Table 2:1.

Developments on financial markets since the Monetary Policy Report in September
Market participants' expectations of future policy rates have risen both in Sweden and abroad.
Government bond yields have risen both in Sweden and abroad.
The krona exchange rate is in line with the forecast made in September.
The share index has risen both in Sweden and abroad.
Lending rates to companies and households have fallen slightly.
The annual growth rate for lending to households decreased somewhat while it increased for non-financial corporations.

The transmission mechanism - from the repo rate to interest rates for households and companies

The repo rate has a direct effect on short-term interbank rates and government bond yields via the overnight rate. Expectations regarding the future repo rate and government bond purchases affect the development of longer-term government bond yields, which are also influenced by foreign yields. Government bond yields act as an anchor for other types of bond yields, which in turn affect banks' funding costs. This ultimately affects the lending rates for households and companies.



communicated in conjunction with the monetary policy meeting in June this year. This means that policy rates are unchanged and that the ECB deems that they will remain around their current levels at least until the end of summer next year. At the same time, net purchases of assets have been halved to EUR 15 billion per month since the beginning of October. The net purchases are expected to be concluded at the end of the year. Expectations regarding the ECB policy rate have shifted upwards slightly. According to market pricing, the policy rate is expected to be held unchanged for approximately one year ahead (see Figure 2:1).

In the United Kingdom, the Bank of England kept the policy rate unchanged in September after having increased it in August. Market expectations of future policy rate rises have shifted upwards somewhat since then (see Figure 2:1).

Long-term government bond yields have risen

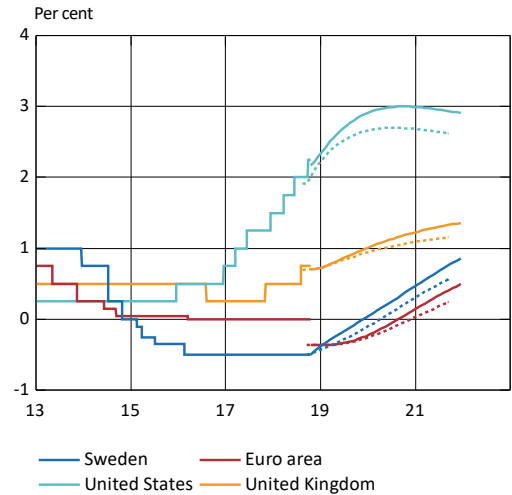
At the beginning of October, US long-term government bond yields rose rapidly. The communication from the Federal Reserve on the need for continued rate rises and macro statistics indicating that inflation may be higher than expected by the market have contributed to this development. Government bond yields with longer maturities have also risen in other parts of the world since the Monetary Policy Report in September (see Figure 2:2 and Figure 2:3). Expectations of rising future policy rates have contributed to this development but some of the increase can also probably be attributed to interest rate movements in the United States.

In a number of European countries, developments on the government bond markets since the summer have also been marked by the political uncertainty in Italy. According to market participants, a budget proposal that further impairs public finances in Italy may have negative effects on financial stability and long-term macroeconomic developments in the country with possible spillover effects to the rest of Europe. In a very unfavourable scenario, there may arise unease over the entire European Union. The budget proposal announced by the Italian government has caused Italian government bond yields to rise strongly and the gap between yields for Italian and German government bond yields to widen. The financial conditions have thereby become less expansionary in Italy but contagion to other countries in Europe has so far been limited (see Figure 2:4).

Continued expansionary financial conditions in the US

In 2018, the financial conditions in the United States have become less expansionary due to the Federal Reserve’s rate rises and the stronger dollar. Rising interest rates and falling equity prices have fuelled this development recently. However, the financial conditions in the United States are still expansionary. For example, the interest rate differentials between corporate and government bond yields are low from a historical perspective, and valuations on the stock markets are high in comparison with companies’ profits. Since the start of the year, stock market indices in the United States, unlike those in Europe, have risen.

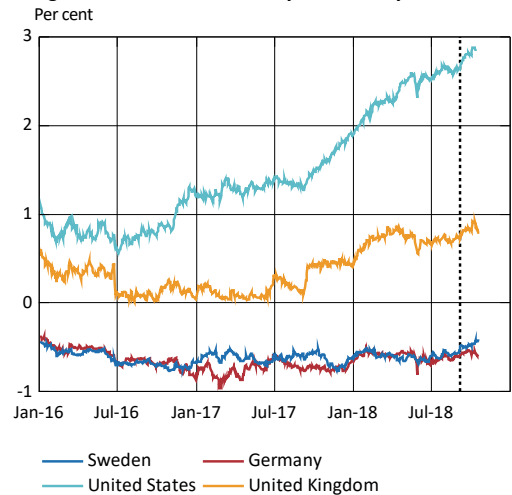
Figure 2:1. Policy rates and rate expectations according to forward rates



Note. Forward rates describe the expected overnight rate, which does not always correspond to the policy rate (the main refinancing rate for the euro area). Unbroken lines refers to 19 October 2018, broken lines refers to 3 September 2018.

Sources: The national central banks, Macrobond and the Riksbank

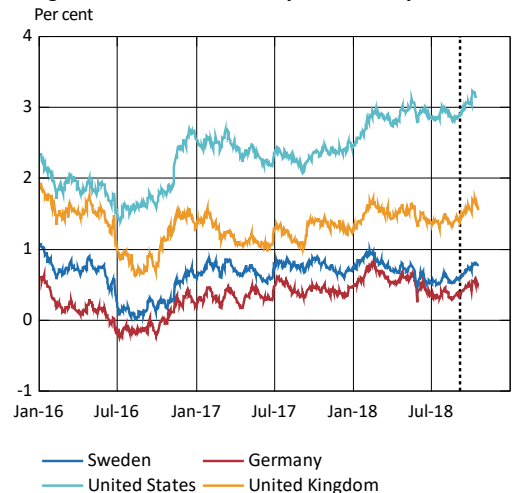
Figure 2:2. Government bond yields with 2 years to maturity



Note. Implied zero-coupon yields from government bonds. The vertical line indicates the Monetary Policy Meeting in September.

Sources: The national central banks and the Riksbank

Figure 2:3. Government bond yields with 10 years to maturity



Note. Implied zero-coupon yields from government bonds. The vertical line indicates the Monetary Policy Meeting in September.

Sources: The national central banks and the Riksbank

This is primarily due to both US macro statistics and company reports having largely exceeded the forecasts of analysts. US equity markets have also benefited from reduced corporation taxes.

Since the start of October, unease has increased on the financial markets due to the rapid interest rate rises in the United States, developments in Italy and an escalating trade war. This has led to broad downturns on the stock markets (see Figure 2:5).

Problems in emerging market economies

Developments in emerging market economies have been characterised by unease over the year. One important reason for this is the rising interest rates in the United States and the stronger dollar. A further contributory factor is unease over an expanded trade war. A number of emerging market economies with weak macroeconomic situations, characterised by high inflation, major current account deficits and significant foreign currency indebtedness, have encountered particularly large problems. The financial conditions have deteriorated strongly in these countries due to higher borrowing costs caused by higher interest rates and weaker exchange rates, as well as negative developments on the stock markets (see Figures 2:5 and 2:6).

Financial conditions in Sweden

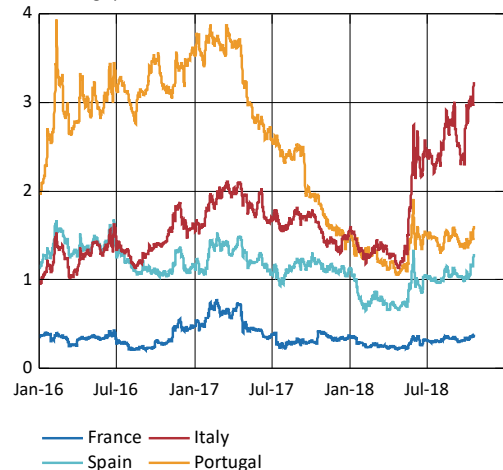
Rising interest rate expectations in Sweden

Ahead of the monetary policy decision in September, expectations with regard to both the timing and size of the first repo rate rise varied relatively significantly among different market participants. The spread among forecasts closed significantly after the monetary policy decision in September and the publication of the minutes. Both market pricing and the forecasts of market participants now indicate that the repo rate will be raised in either December this year or in February next year.

Expectations of the future repo rate have also risen. Among other things, this occurred in conjunction with the monetary policy decision and minutes in September. The fact that inflation outcomes for September were higher than many expected has also contributed towards expectations shifting upwards. The upward revision of interest rate expectations corresponds approximately with international developments (see Figure 2.1). Market expectations according to market pricing are still somewhat lower than the Riksbank’s repo rate forecast, however, especially in the longer term, while expectations according to surveys are in line with the Riksbank’s repo rate path (see Figure 2:7).

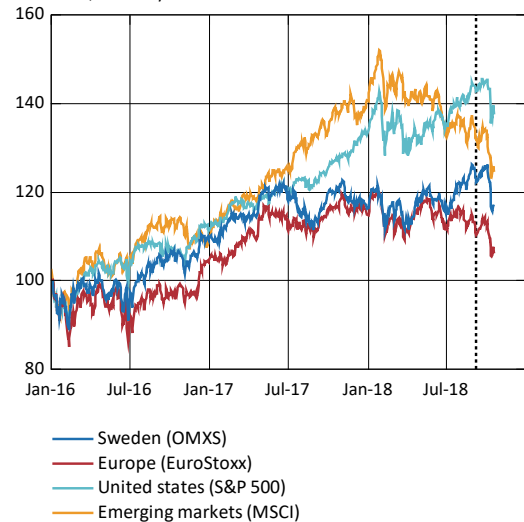
Government bond yields in Sweden has more or less followed the same pattern as in other countries. Above all, yields on longer-term government bonds have risen somewhat (see Figure 2:3). On the credit markets, yields on housing bonds and

Figure 2:4. Yield differential in relation to Germany, 10-year
Percentage points



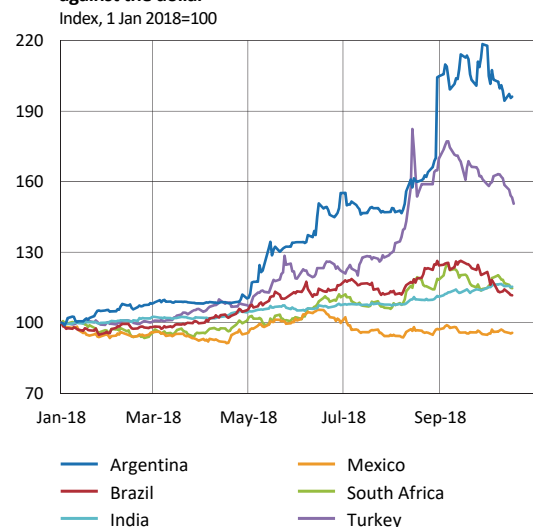
Note. Yield differentials refer to 10-year benchmark bonds.
Source: Macrobond

Figure 2:5. Stock market movements in local currency
Index, 4 January 2016 = 100



Note. The vertical line indicates the Monetary Policy Meeting in September.
Source: Macrobond

Figure 2:6. Emerging market economies’ exchange rates against the dollar
Index, 1 Jan 2018=100



Note. A higher value indicates a weaker exchange rate.
Source: Macrobond

corporate bonds have developed more or less as government bond yields have, meaning unchanged yield differentials.

The Riksbank’s bond purchases contribute to expansionary monetary policy

The Riksbank’s purchases of government bonds are aimed at pushing down interest rates in the economy in general. The bond purchases contribute to lower yields on government bonds but also to lower yields on other bonds, such as bank and corporate bonds. The purchases have thus supported the expansionary monetary policy and have contributed towards rising inflation and falling unemployment.

In 2018, the Riksbank has decided to buy government bonds for around SEK 40 billion. The Swedish National Debt Office is maintaining the issue volumes in Swedish government bonds, despite the continued surplus in public finances. According to the Swedish National Debt Office’s most recent forecast, the issue volumes in Swedish government bonds will amount to SEK 41 billion in 2018.⁵

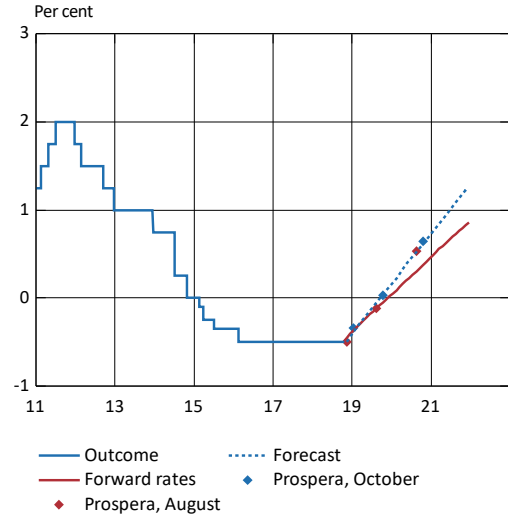
In recent years, turnover has decreased in the Swedish government bond market. Despite a somewhat lower turnover, the Riksbank assesses that Swedish investors in government bonds can buy and sell the bonds they need. This is because the Swedish National Debt Office’s dealers are constantly offering to buy and sell bonds and thus contribute liquidity. The dealers are continuing to help investors, such as fixed-income funds and pension companies, to carry out purchases and sales of government bonds.

However, the lower turnover on the market for these bonds means that the dealers themselves are finding it more difficult to manage their own bond positions and thereby their risk exposure. The Riksbank therefore carefully tracks how the government bond market and adjacent markets are functioning, both by analysing data and through regular contact with market participants.

The krona is in line with the forecast made in September

Since the September Monetary Policy Report, the krona has strengthened slightly, approximately in line with the Riksbank’s forecast. However, the krona’s development has not been one-sided. According to the trade-weighted krona index, KIX, the krona appreciated when expectations of the repo rate’s future level rose in conjunction with the monetary policy decision and the minutes in September, as well as after the inflation outcome for September was published. However, during trading days with increased unease or volatility in the wake of the rapid rise in interest rates in the United States in October, uncertainty over budget proposals in Italy and unease over an escalating trade war, the krona has mostly depreciated (see Figure 2:8).

Figure 2:7. Repo rate and market expectations



Note. The forward rate refers to 2018-10-19 and is a measure of the expected repo rate. The Prospera survey responses show the average for money market participants 2018-08-08 respectively 2018-10-10.

Sources: Macrobond, TNS Sifo Prospera and the Riksbank

Figure 2:8. Competition-weighted nominal exchange rate, KIX Index, 1992-11-18 = 100



Note. KIX refers to an aggregate of countries that are important for Sweden’s international transactions. The vertical line indicates the Monetary Policy Meeting in September.

Source: The Riksbank

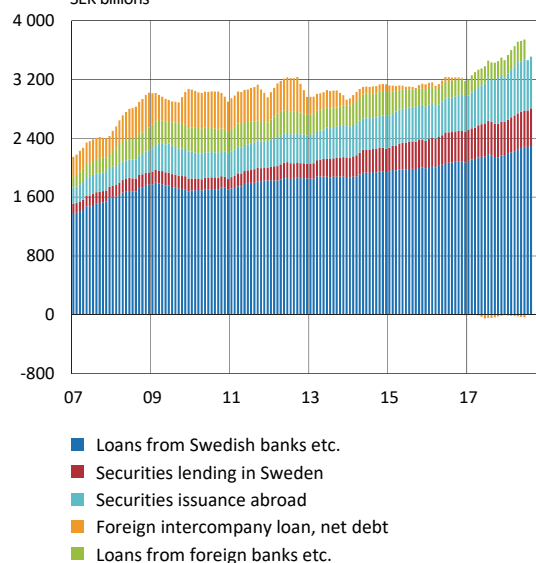
⁵ These SEK 41 billion are comprised of SEK 32 billion nominal bonds and SEK 9 billion real bonds.

Lower lending rates and increased indebtedness in household and corporate sectors

The banks are reporting high profitability and have good opportunities for obtaining funding both in Sweden and abroad. Their funding costs have been relatively unchanged in 2018. The conditions for households and companies to obtain credit thereby continue to be favourable. Bank lending rates to households have fallen slightly in 2018 and the average actual mortgage rate for new agreements was 1.5 per cent in August. This development can partly be explained by increased competition on the mortgage market. New players on the mortgage market have offered competitive mortgage rates, an approach that established banks have also adopted. The rate of increase in households' bank loans has also gradually levelled off slightly this year. This development is probably a consequence of the restrained price growth on the housing market. However, the debt-to-income ratio is continuing to rise as households' debts are still increasing faster than their incomes (see Figure 4:11).

The non-financial corporations' debts are also continuing to rise. Bank loans, which continue to form the primary source of funding for Swedish companies, increased by 7.2 per cent in August at an annual rate, compared with just under 5 per cent on average in recent years. Securities borrowing has also increased rapidly and now corresponds to around one-third of total corporate debt. The most recent outcome in September, which shows growth of about 12 per cent at an annual rate, also includes value and exchange rate fluctuations (see Figure 2:9). The average interest rate for new bank loans to non-financial corporations has also fallen slightly recently and was 1.3 per cent in August. Average deposit rates for households and companies have remained largely unchanged in recent years and are close to zero (see Figure 2:10).⁶ Access to credit is still good for both companies and households, at the same time as interest rates are low.

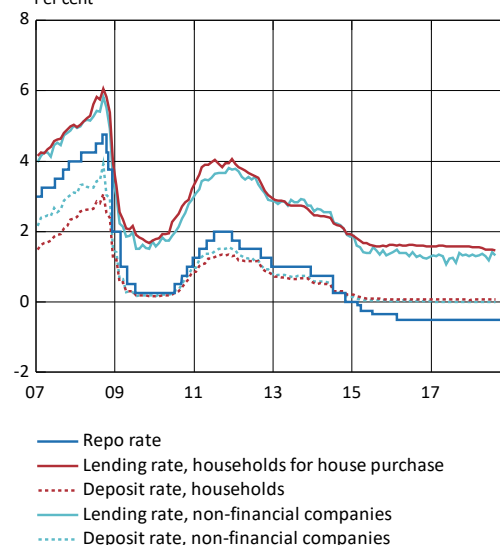
Figure 2:9. Swedish companies' interest-bearing loan debt SEK billions



Note. Outcomes for loans from foreign banks and intercompany loans extend to June. Outcomes for other statistics extend to August.

Sources: Statistics Sweden and the Riksbank

Figure 2:10. Repo rate together with the average deposit and lending rate to households and companies, new contracts Per cent



Note. MFIs' average deposit and lending rates are a weighted average of all interest rates for different maturities.

Sources: Statistics Sweden and the Riksbank

⁶ Most financial undertaking corporations and some non-financial corporations and municipalities are experiencing negative deposit rates. For technical reasons, however, the negative deposit rate is usually reported as a charge and is therefore not always visible in the figures from Statistics Sweden. Despite this, deposits at negative rates form a small portion of total deposits from non-financial corporations. See the article "Perspectives on the negative repo rate" in the Monetary Policy Report, July 2016.

ARTICLE – What usually happens when the repo rate is raised?

Monetary policy in Sweden and abroad has been expansionary for a long time. Assuming that the economy develops in a way that continues to support the prospects for inflation, the Executive Board deems that it will soon be appropriate to start raising the repo rate at a slow pace. Both market pricing and surveys among participants on the financial markets and households indicate expectations of rising interest rates. Consequently, financial conditions in Sweden are expected to successively become less expansionary. This article describes how the financial conditions have been affected in previous episodes when the repo rate has been raised. In earlier periods of interest rate rises in Sweden, the financial conditions have gradually become less expansionary and the rate raises have been closely followed by both market rates and interest rates for households and companies.

Monetary policy affects the financial conditions in Sweden

The financial conditions are a summary of the state of the financial markets and the interest rates and conditions met by households and companies when they need to borrow or invest capital. The Riksbank's monetary policy has a direct impact on the financial conditions in Sweden. Using the repo rate, the Riksbank steers the risk-free short-term rate that forms the basis of interest rate formation in Sweden. The general level of interest rates therefore follows changes in the repo rate. The Riksbank also influences financial conditions in a broader sense, as market rates with longer maturities, equity prices and the exchange rate are sensitive, to varying degrees, to the level of the repo rate. As the financial markets are international to a great degree, international events also affect the financial conditions in Sweden.

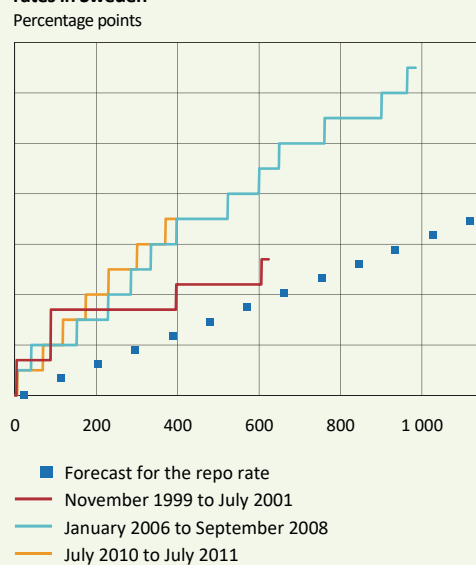
This article describes how the financial conditions in Sweden have been affected in previous episodes when the repo rate has been raised.

Previous periods of rising rates in Sweden

Over the past 20 years, the repo rate has been raised on 26 occasions. In all cases except two, the repo rate has been raised in steps of 0.25 percentage points, with one increase normally being followed by further increases.⁷ During this 20-year period, there have only been three longer periods of rising rates plus one very brief period in 2002.⁸ Figure 2:11 shows how the repo rate has been raised in the three longer episodes of rising rates, together with the raises shown in the present forecast for the repo rate. Compared with the previous periods, the repo rate is expected to be raised at a

slower rate in the period ahead, by about 0.25 percentage points twice per year over the coming three years.

Figure 2:11. Repo rate changes in periods of rising interest rates in Sweden



Note. The horizontal axis specifies the number of weekdays after the first rise of the repo rate. The repo rate forecast refers to quarterly averages and the points are placed in the middle of each quarter. The first point is placed after 22 days, corresponding to the middle of the fourth quarter of 2018.

Source: The Riksbank

The rate-rise period from November 1999 to July 2001

From November 1999 to July 2001, the repo rate was raised from 2.9 per cent to 4.25 per cent. This corresponds to a total raise of 1.35 percentage points (see Figure 2:11). During this rate-rise period, the Swedish two-year government bond yield initially rose but fell back as international monetary policy, particularly in the United States, was made more

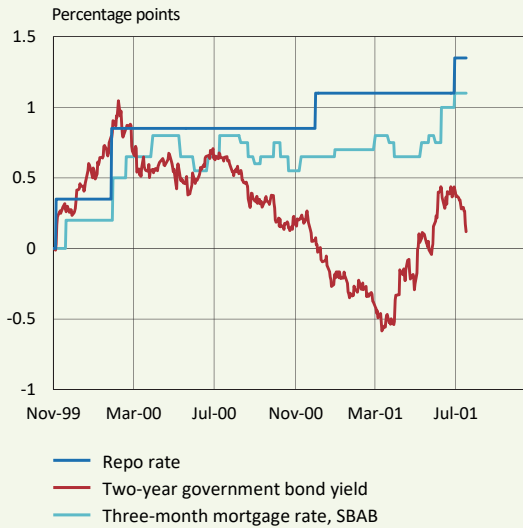
lower level of the repo rate since 1999 is thus due to the average level of each cut having been greater than the level of each raise.

⁷ The exceptions were the raise in November 1999, which was 0.35 percentage points, and the raise in February 2000, which was 0.5 percentage points.

⁸ Also when the repo rate is cut, the first cut tends to be followed by further ones. In addition, the number of raises and cuts is approximately the same. The successively

expansionary in early 2001. Over the entire rate-rise period, mortgage rates for households rose slightly less than the repo rate (see Figure 2:12). The effective exchange rate strengthened slightly at the start but weakened over the period as a whole.

Figure 2:12. Change of repo rate, two-year government bond yield and short mortgage rate over the rate-rise period 1999–2001

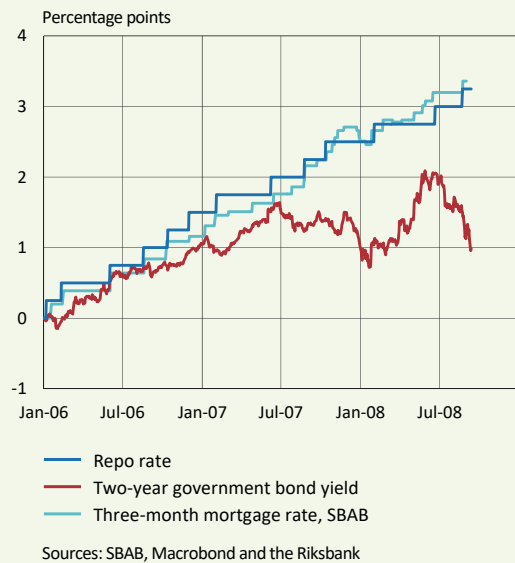


Sources: SBAB, Macrobond and the Riksbank

The rate-rise period from January 2006 to September 2008

From January 2006 to September 2008, the repo rate was raised from 1.5 per cent to 4.75 per cent. This corresponds to a total raise of 3.25 percentage points (see Figure 2:11). The two-year bond yield followed this development for nearly two years. As with the previous rate-rise period, monetary policies in Sweden and abroad were out of step to some extent. The Riksbank raised its repo rate by more than the ECB raised its policy rate. The Federal Reserve started to cut its policy rate in September 2007, a little over a year and a half after the Riksbank started its rate rises. During this period, lending rates to both households and companies corresponded well with the repo rate and the mortgage rate increased in line with the repo rate (see Figure 2:13). The increase of lending rates in line with the repo rate indicates that banks and mortgage institutions held their lending margins relatively unchanged. The exchange rate strengthened at the start of the period in particular.

Figure 2:13. Change of repo rate, two-year government bond yield and short mortgage rate over the rate-rise period 2006–2008

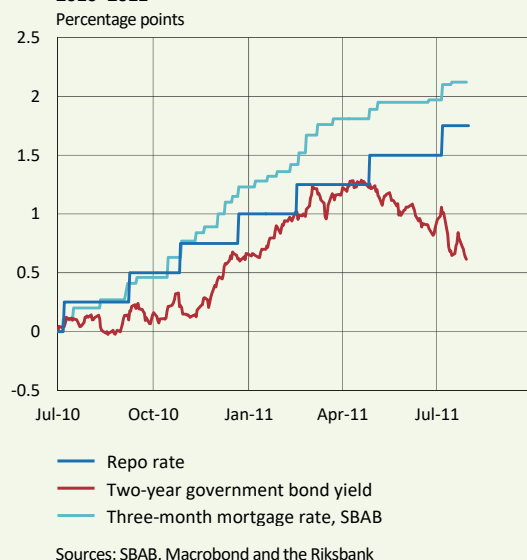


Sources: SBAB, Macrobond and the Riksbank

The rate-rise period from July 2010 to July 2011

Between July 2010 and July 2011, the repo rate was raised from 0.25 per cent to 2.0 per cent, a total of 1.75 percentage points (see Figure 2:11). During this period, mortgage rates to households rose faster than the repo rate was raised (see Figure 2:14). This indicates that the banks were raising their lending margins.⁹ Over this period, the major foreign central banks also held their policy rates relatively unchanged. The ECB certainly raised its policy rate by 0.5 percentage points, but this increase was reversed as the European sovereign debt crisis developed. Over the period, the krona appreciated against both the US dollar and the euro.

Figure 2:14. Change of repo rate, two-year government bond yield and short mortgage rate over the rate-rise period 2010–2011



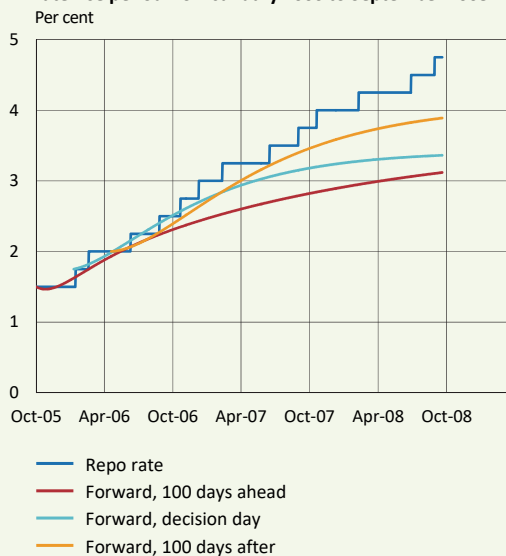
Sources: SBAB, Macrobond and the Riksbank

⁹ See Finansinspektionen’s quarterly review of the banks’ margins on mortgages at the link <https://www.fi.se/sv/publicerat/statistik/bankernas-marginal-pa-bolan2/>

Rate rises are usually expected

It is not unusual for market participants to adjust their expectations of the future repo rate as the repo rate continues to be raised. If expectations of the repo rate change, the financial conditions can also be expected to change. One common measure of the market's interest rate expectations is forward pricing.¹⁰ Figure 2:15 shows expectations of the future repo rate according to forward pricing 100 days ahead of the first raise, on the day of the decision and 100 days after the first rise during the rate-rise period from January 2006 to September 2008.

Figure 2:15. The repo rate and forward pricing during the rate-rise period from January 2006 to September 2008



Source: The Riksbank

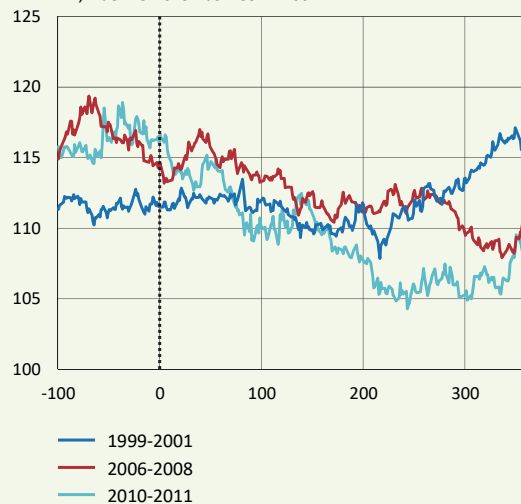
Over this period, the repo rate was raised more and over a longer time in comparison with the two other periods. However, the red line in Figure 2:15 indicates that the rises were already expected, to a significant extent, before the repo rate was raised for the first time. Over the period, the market participants also came to make successive upward revisions of their expectations of the future repo rate. However, these revisions did not lead to any dramatic changes of the financial conditions.

One important determinant for the Swedish krona is how expectations of Swedish monetary policy develop in relation to expectations of foreign central banks' monetary policies. The development of the exchange rate during the previous rate-rise periods indicates that the rate rises were expected. In Figure 2:16, it can be seen that the krona, in terms of the krona index KIX, was already strengthening before the first rate rise. Above all, this is clear in the two latest periods. Rate rises being wholly or partly expected is an important explanation for why the adjustment to less expansionary

financial conditions takes place gradually and in a predictable manner.

Figure 2:16. The development of the krona exchange rate in periods of repo rate rises

KIX, Index 18 November 1992 = 100



Note. The horizontal axis refers to the number of days from the first rate rise.

Source: The Riksbank

Gradually rising level of interest rates in the period ahead

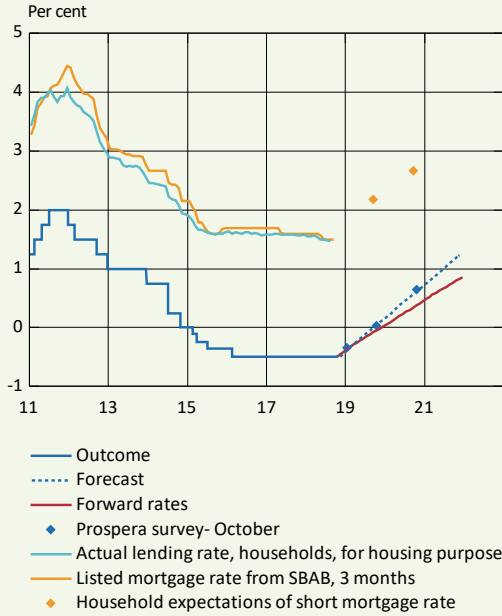
The Riksbank's repo rate path indicates an initial repo rate rise of 0.25 percentage points in the near term and then about two rises per year over the coming three-year period. The repo rate is expected to be about 0.7 per cent in two years, which is in line with surveys of market participants' expectations. Pricing on the Swedish fixed-income market indicates a repo rate level of around 0.4 per cent in two years' time (see Figure 2:17). Households also expect the level of interest rates to rise gradually over the coming years. According to a survey by the National Institute of Economic Research, households expect short-term mortgage rates to rise by just over 0.4 percentage points between autumn next year and autumn 2020. There is thus agreement that the level of interest rates will rise in the period ahead and that this will take place at a slower rate than in previous periods of interest rate rises.

Monetary policy has been highly expansionary for a long time, both in Sweden and abroad. In this sense, the current initial position differs from the initial position in the previous periods of rising rates. It therefore cannot be ruled out that rate rises will have a different effect on the financial conditions than previously. However, in several countries where the policy rate has been raised (the United States, United Kingdom, Canada, Czech Republic and Norway), developments have so far been in line with previous periods of rising rates. The Riksbank's forecast for the repo rate is also

¹⁰For a description of a method of calculating forward rates, see L.E.O. Svensson, "Estimating Forward Interest Rates with the Extended Nelson & Siegel Method" Sveriges Riksbank Quarterly Review no. 3, 1995, Sveriges Riksbank.

dependent on the economy and inflation developing as expected. If conditions for inflation change, monetary policy would also have to be adjusted.

Figure 2:17. Repo rate, household and market expectations and lending rate to households



Note. The forward rate refers to 19 October 2018 and is a measure of the expected repo rate. Survey responses show the mean value for money market participants on 10 October 2018. MFI's average lending rate is a volume-weighted average of rates for all maturities. Household expectations of the short mortgage rate are according to the Economic Tendency Survey for September.

Sources: Macrobond, TNS Sifo Prospera, Statistics Sweden, National Institute of Economic Research and the Riksbank

CHAPTER 3 – The current economic situation

The high GDP growth abroad last year has been followed by a somewhat weaker outcome so far this year. This development corresponds with the Riksbank's assessment that global growth will slow down in the period ahead. At the same time, international inflation has increased recently. The Swedish economy grew relatively quickly during the second quarter, even if the outcome was revised downwards compared to the previously published outcome from Statistics Sweden. Temporary factors are contributing to growth being expected to fall somewhat in the third quarter, but indicators point overall to a relatively good outcome for the Swedish economy. Unemployment now appears to have bottomed out, although indicators linked to employment suggest that the demand for labour is high. Continued high annual growth in energy prices means that CPIF inflation is expected to exceed 2 per cent over the rest of the year. Various measures suggest that underlying inflation is lower.

Inflation in Sweden

Inflation 2.5 per cent in September

In September, CPIF inflation amounted to 2.5 per cent (see Figure 3:1). This was in line with the forecast in the September Monetary Policy Report. Inflation excluding energy prices, which has fallen back over the past year, amounted to 1.6 per cent, which was also in line with the forecast in September.

The strong economic situation in Sweden has contributed to inflation rising gradually since 2014 and now being over 2 per cent. A weaker krona, which has an effect on prices of food and other imported goods, has also contributed to the upturn in inflation, as have rapidly rising energy prices.

To gain the best possible understanding of the more persistent component of the measured inflation rate, measures of core inflation can be studied (see the article "Why measures of core inflation?"). These measures indicate that the persistent part of the measured rate of inflation is lower than CPIF inflation. Two of the measures that appear the most useful, according to the evaluation criteria presented in the article are UND24 and CPIFPC. They amounted to 1.8 and 1.7 per cent respectively, according to the most recent outcome. The median of the various measures discussed in the article amounted to 1.7 per cent in September (see Figure 3:2).

Inflation to exceed 2 per cent for the remainder of year

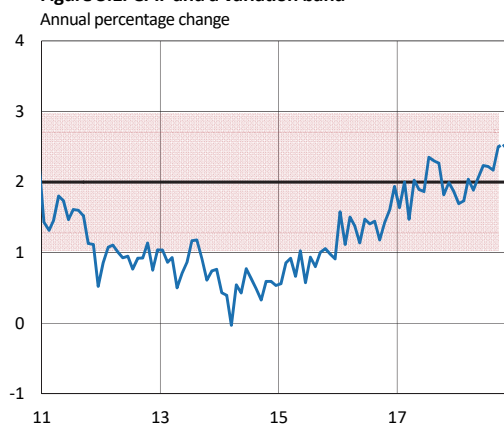
The warm and dry weather over the summer has meant that the level of water in hydroelectric reservoirs is unusually low, which has caused electricity prices to rise in Sweden. These are also affected by prices in other parts of Europe. There, electricity prices have risen mainly as a result of higher prices for coal and emission allowances. All in all, this has meant that the electricity price is still at a high level. Fuel prices are also much higher than they were last year. The Riksbank does not foresee any major

Table 3:1.

Expected development in MPR September	Actual development
CPIF inflation 2.4 per cent and CPIF excluding energy 1.6 per cent in September.	CPIF inflation was 2.5 per cent and CPIF excluding energy was 1.6 per cent.
GDP growth 4.2 per cent in second quarter.	GDP growth was 3.1 per cent.
Unemployment was 6.3 per cent in the third quarter.	Unemployment was 6.5 per cent.

Note. MPR refers to the Monetary Policy Report. Inflation refers to the annual percentage change. GDP growth refers to the seasonally-adjusted quarterly change in per cent, calculated at an annual rate. Unemployment refers to percentage of the labour force.

Figure 3:1. CPIF and a variation band



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 means of showing whether the deviation from the inflation target is unusually large. The broken line represents the forecast.

Sources: Statistics Sweden and the Riksbank

fluctuations in inflation in the short term. The annual rate of increase in services prices has slowed down compared with last year (see Figure 3:3). Only a moderate increase is expected in the growth rate in prices of both services and goods in the next few months. At the same time, the rate of increase in energy and food prices is falling. All in all this means that CPIF inflation is expected to remain around 2.5 per cent for the remainder of the year.

The Riksbank’s model forecast, which summarises the information from a large number of models and indicators, implies that the CPIF excluding energy will rise at a somewhat faster pace towards the end of the year (see Figure 3:4). According to the Economic Tendency Survey, more companies than normal are expecting prices to increase in the coming three months, particularly in the trade sector (see Figure 3:5). The rate of price increase on imported goods in the producer stage has risen as the krona has depreciated, but the rate of increase for domestic market prices has also risen somewhat in recent months.

CPIF inflation excluding energy is expected to rise in line with the model forecasts. The rate of increase will reach 1.8 per cent towards the end of the year, which is marginally higher than the forecast in September. CPIF inflation has also been revised up somewhat in relation to the forecast in September.

Inflation expectations amount to 2 per cent

Inflation expectations are close to 2 per cent on all horizons. Expectations in the longer run have been close to 2 per cent in recent years. As inflation has become higher, expectations have also risen in the shorter term.

According to TNS Sifo Prospera’s survey in October, inflation expectations among money market participants increased marginally compared with the survey in September. Five years ahead, the respondents expect CPI inflation to be 2.0 per cent (see Figure 3:6). The long-term inflation expectations for the CPIF also amounted to 2.0 per cent.

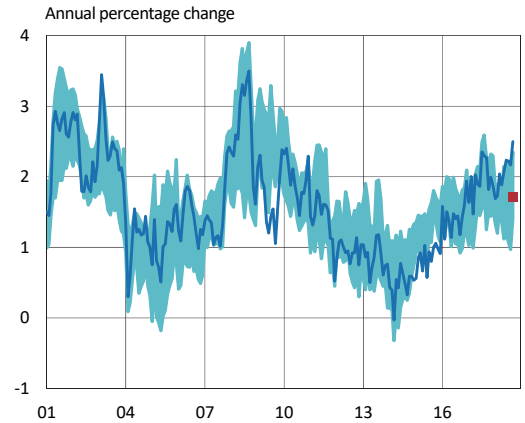
Global and Swedish economic activity

Weaker economic activity abroad so far this year

The high GDP growth abroad in 2017 has been followed by a somewhat weaker outcome in most regions so far this year. Growth in world trade has also slowed down since the start of the year. This information, together with lower levels of various world trade indicators, is compatible with the more normal growth that the Riksbank is expecting to see abroad in the period ahead.

Global growth is nevertheless expected to be relatively good during the second half of this year. Despite somewhat lower outcomes recently, confidence remains high in both the corporate and household sectors. Employment has risen and unemployment has fallen in most countries. Financial conditions,

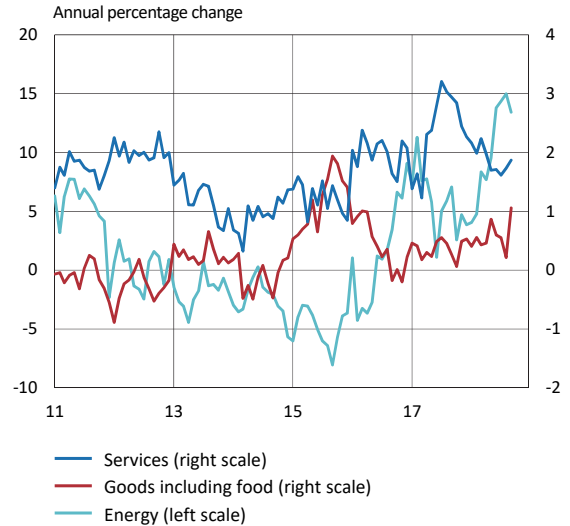
Figure 3:2. The CPIF and different measures of underlying inflation



Note. The line represents the CPIF. The field shows the highest and lowest outcomes among different measures of underlying inflation. The measures included are the CPIF excluding energy, UND24, Trim85, CPIF excluding energy and unprocessed food, persistence-weighted inflation (CPIFPV), factor from principal component analysis (CPIFPC) and weighted mean inflation (Trim1). The red dot represents the median value in September 2018 for all measures of underlying inflation.

Sources: Statistics Sweden and the Riksbank

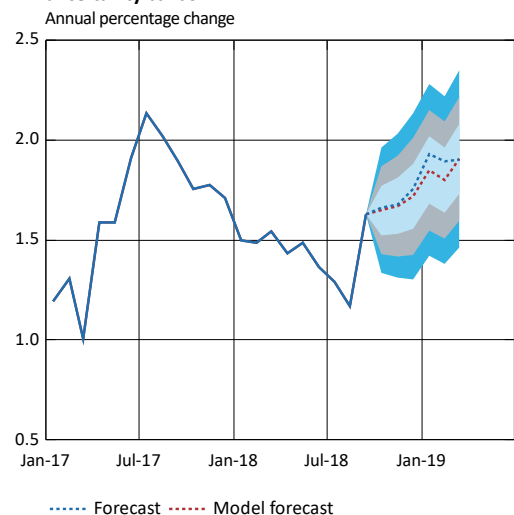
Figure 3:3. Prices for services, goods and energy in the CPIF



Note. Goods including food comprise together 45 per cent of the CPIF, services comprise 45 per cent and energy 7 per cent of the CPIF.

Sources: Statistics Sweden and the Riksbank

Figure 3:4. CPIF excluding energy, model forecast with uncertainty bands



Note. The uncertainty bands 50, 75 and 90 per cent are based on the models’ historical forecast errors.

Sources: Statistics Sweden and the Riksbank

such as interest rates and credit terms for households and companies, still provide support for economic growth.

The trade conflict between the United States and China has escalated in recent months. There is still considerable uncertainty regarding the United States' trade policy and its consequences, but the Riksbank's assessment of developments in the near term has so far only been marginally affected by this (see the box "Increased protectionism in world trade" in Chapter 4).

GDP increased by 1.8 per cent in the euro area in the second quarter, compared with the first quarter and calculated as an annual rate. Falling retail trade turnover in July and August, together with falling industrial production in July, indicate weaker GDP growth in the third quarter, even if industrial production saw renewed growth in August. Confidence in the corporate and household sectors has gradually declined, but remains higher than normal. Together with the continued strong development on the labour market, this indicates a return to a more normal growth rate towards the end of the year. Unemployment, which has declined significantly, is expected to continue to fall over the rest of the year. However, this will be at a slower pace now, as growth is more moderate than in recent years.

In the United States, GDP growth in the second quarter was over 4 per cent, calculated at an annual rate. This strong growth may be due to the expansionary fiscal policy having greater effects than expected. Since July, household confidence has strengthened and is now at one of the highest levels since the financial crisis. Even if export orders have slowed down over the start of the third quarter, confidence among companies continues to be very high. Growth is now expected to slow down somewhat during the second half of the year as resource utilisation becomes increasingly strained. Unemployment is at the lowest level since the end of the 1960s.

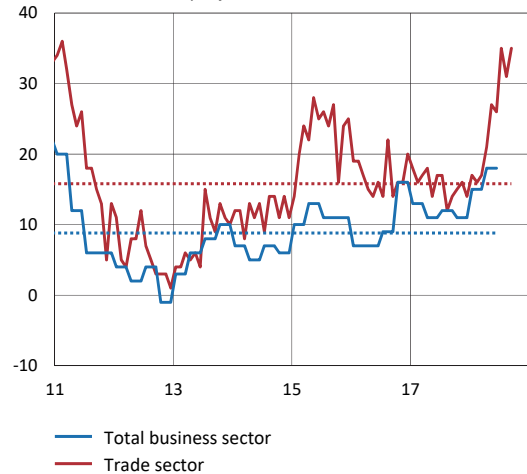
Low underlying inflation in the euro area

Commodity prices have on the whole fallen since the start of the year, partly due to concern that tougher trade barriers will subdue growth. After some decline over the summer, the oil price has risen again in September and October, partly due to decreased production in the United States and sanctions against Iran.

Inflation in the regions that are most important to Sweden has increased recently (see Figure 4:6). In the euro area, inflation is being kept up by rising energy prices. Inflation excluding energy and food prices fell to 0.9 per cent in September (see Figure 3:7). However, this inflation measure is expected to rise in the coming quarters due to the continued good development of the labour market and higher wage growth.

In the United States, inflation has risen gradually over the past year, but fell somewhat in August. Core inflation, measured in terms of the consumption deflator excluding energy and food, amounted to almost 2.0 per cent in August (see Figure 3:7).

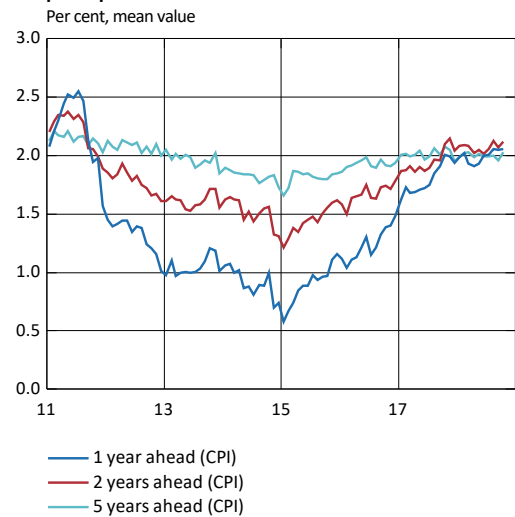
Figure 3:5. Price plans in the business sector and trade sector
Balances, seasonally-adjusted data



Note. Balances is the difference between the proportion of companies stating that they expect higher sales prices and those expecting lower sales prices over the next three months. Broken lines represent mean values since May 2003.

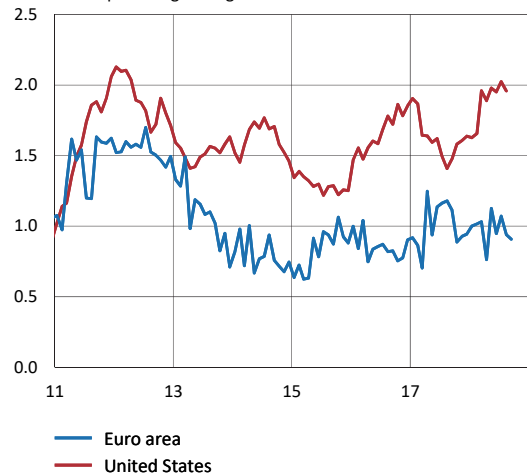
Source: National Institute of Economic Research

Figure 3:6. Inflation expectations among money market participants
Per cent, mean value



Source: TNS Sifo Prospera

Figure 3:7. Underlying inflation abroad
Annual percentage change



Note. The HICP excluding energy, food, alcohol and tobacco is shown for the euro area. The deflator for private consumption excluding energy and food is shown for the United States.

Sources: The Bureau of Economic Analysis and Eurostat

Swedish growth revised down

Newly published National Accounts figures paint a slightly weaker picture of recent years' economic development. GDP growth was adjusted down from 2016 and on. It is normal for historical growth to be revised as more information becomes available and it is not unusual for such corrections to be significant.

The new figures indicate that the level of GDP in the second quarter of 2018 was just over one per cent lower and that average growth in 2016 and 2017 was 0.4 percentage points lower per year compared with the previous publication (see Figure 3:8). The weaker GDP development is primarily due to imports now being higher and investment now being lower than had previously been published. The outcome for productivity has also been revised down. The Riksbank still, with the aid of a number of indicators, makes the assessment that economic activity in Sweden is and has been strong in recent years.

Although Statistics Sweden adjusted growth in the second quarter down, the Swedish economy grew rapidly and GDP growth amounted to just over 3 per cent at an annual rate. The relatively high growth is mainly explained by rapidly growing household consumption and a clear contribution from corporate sector investment in inventories. The high growth is probably partly due to temporary factors, however. For example, amendments to taxation regulations led to a substantial upturn in sales of private cars in June, which made a significant contribution to consumption growth.

Indicators point to weaker GDP development in the third quarter, largely due to heavily reduced sales of private cars. However, the Economic Tendency Survey shows continued optimism in the business sector, particularly in the manufacturing industry. The purchasing managers' index, which is a smaller survey and contains different questions, at the same time paints the picture of a more normal confidence among manufacturing companies.

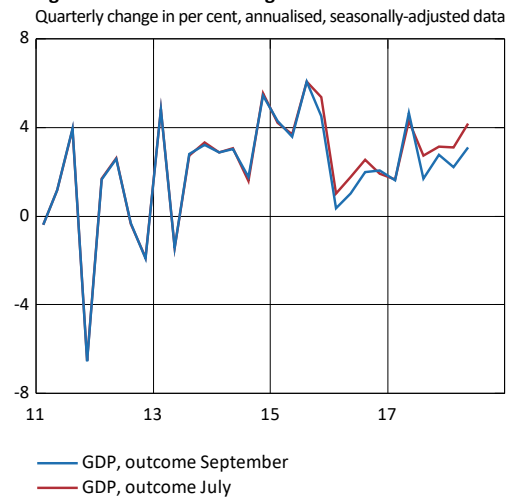
The Riksbank's model for short-term forecasts indicates that GDP was growing by a good 1.5 per cent during the third quarter, calculated at an annual rate (see Figure 3:9). The Riksbank's assessment is somewhat lower than the model forecast, as this is not deemed to completely capture the ongoing slowdown in housing construction. In the third quarter, GDP growth is expected to decline to just over 1 per cent, calculated at an annual rate, and then to increase again to just over 2 per cent during the fourth quarter. All in all, the Swedish economy is assessed to be close to the peak of the economic cycle.

Employment rate and labour force participation rate at record-high levels

The number of people in employment continued to increase in the third quarter. However, the labour force increased slightly more, meaning that unemployment rose compared to the first six months of the year, from 6.2 to 6.5 per cent.

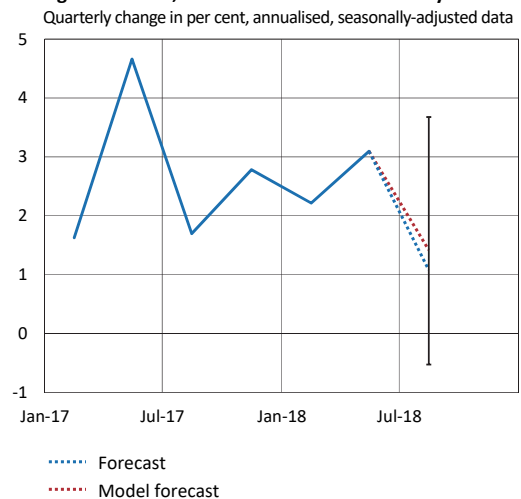
Demand for labour is high and short-term indicators suggest that developments will be strong over the remainder of the year.

Figure 3:8. Revision of GDP growth



Source: Statistics Sweden

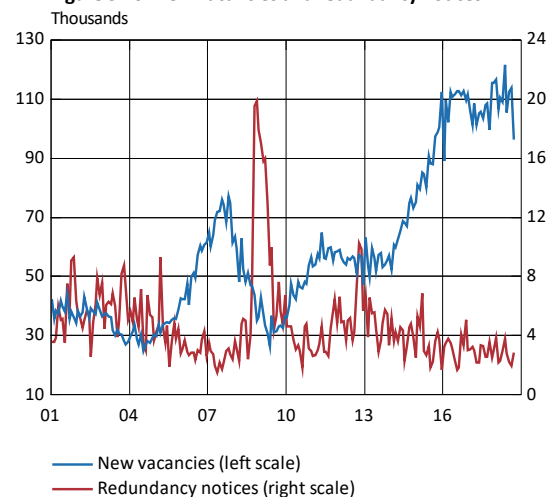
Figure 3:9. GDP, model forecast and uncertainty bands



Note. The model forecast is a mean value of forecasts conducted using different statistical models. The vertical line represents a 50-percent uncertainty band based on the models' historical forecasting errors.

Sources: Statistics Sweden and the Riksbank

Figure 3:10. New vacancies and redundancy notices



Note. Seasonally-adjusted data for new vacancies.

Sources: Employment Service and the Riksbank

Recruitment plans in the business sector are at a high level, according to the Economic Tendency Survey. Statistics from Arbetsförmedlingen (the Swedish public employment service) show that the number of new vacancies registered fell in September, but that the level remains high. At the same time, the number of redundancy notices is low (see Figure 3:10).

The number of people in employment and the number in the labour force are expected to continue to increase over the fourth quarter, while unemployment is expected to decrease slightly.

Resource utilisation in the economy higher than normal

The amount of spare capacity in the economy is affecting the development of wages and prices, albeit with a certain time lag. Resource utilisation in the economy is not directly observable, however. The Riksbank therefore follows a number of different indicators to be able to make an assessment.

According to the Economic Tendency Survey, a large proportion of companies report that they have a shortage of labour (see Figure 3:11). The shortage is severe in all sectors. The manufacturing industry is reporting a shortage of both technical white collar workers and blue collar workers. To a certain extent, the high level of shortages can be explained by employment increasing rapidly, but other indicators suggest that the amount of spare capacity on the labour market is small. Among other things, the vacancy rate, which measures the number of unstaffed positions that need to be filled immediately, is at a high level, at the same time as the average recruitment time in the business sector is relatively long.

Compared with the Riksbank’s assessment in September, resource utilisation is now slightly lower, but is still higher than normal. This view is also supported by the Riksbank’s resource utilisation indicator (see Figure 3:12).

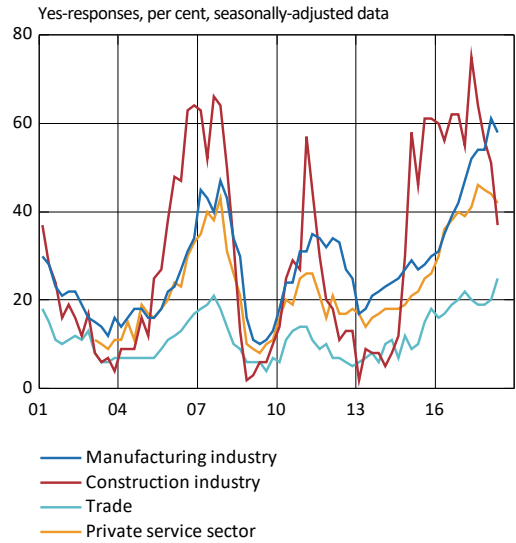
Weak productivity growth and slow rises in wages

Statistics on short-term wages have been published for the period up to the end of July. Preliminary outcomes imply that the annual percentage rate of wage growth was 2.6 per cent on average during the first seven months of the year. Wage increases in the business sector have been low in recent years but have risen slightly this year (see Figure 3:13).

The National Accounts’ ordinary outcome entailed revisions of recent years’ growth in labour costs and productivity. The percentage growth in productivity has been revised down by 0.5 percentage points since 2016, which has contributed to unit labour costs being revised up to a corresponding degree per year on average. Cost increases have thus been slightly higher than according to previous outcomes.

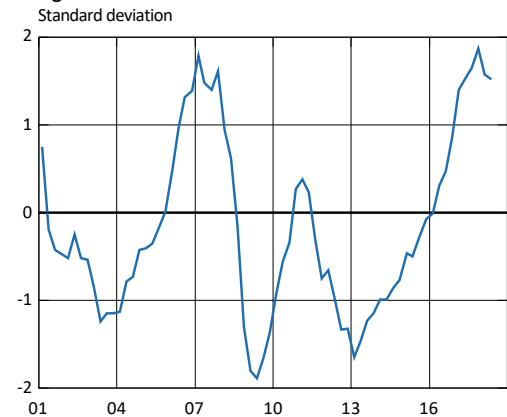
Wage growth has been low in Sweden in recent years, particularly in relation to the strong economic activity. Productivity, which has only increased by 0.5 per cent on average per year since the financial crisis, according to new calculations, may be able to explain the restrained wage development to a certain extent.

Figure 3:11. Labour shortage



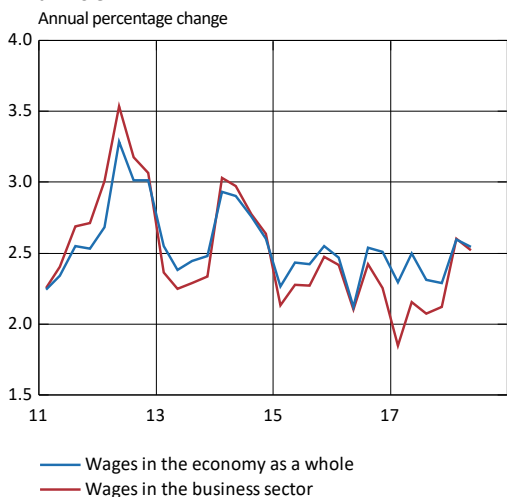
Note. Construction industry refers to the proportion of firms that have quoted a labour shortage as their main obstacle to increased construction. The other industries refers to the proportion of firms responding yes to the question of whether there is a labour shortage.
Source: National Institute of Economic Research

Figure 3:12. Resource utilisation indicator



Note. The RU indicator is a statistical measure of resource utilisation. It is normalised so that the mean value is 0 and the standard deviation is 1.
Source: The Riksbank

Figure 3:13. Wages in the business sector and the economy as a whole



Note. Wages according to short-term wage statistics. The National Mediation Office’s forecast of final outcome 2017Q3–2018Q2.
Source: National Mediation Office

CHAPTER 4 – The economic outlook and inflation prospects

The trade conflict between the United States and China has escalated, but international economic activity continues to be strong. As resource utilisation in developed economies rises in the period ahead, wage growth and underlying inflation are also expected to increase gradually. Growth abroad will, however, slow down in the years ahead as more and more economies reach full resource utilisation and monetary policy becomes less expansionary. Swedish economic activity has strengthened in recent years and is deemed to be stronger than normal. This is due to both the favourable global growth and the expansionary monetary policy that has stimulated domestic demand. Swedish growth is also expected to slow slightly in the years ahead, but economic activity will continue to be strong. The strong demand for labour is contributing to wage growth being expected to rise gradually in the period ahead, which, in turn, is contributing to rising inflation. On the other hand, a strengthening of the krona, together with a slower rate of increase in energy prices, will have a restraining effect on inflation in the period ahead. Overall, CPI inflation is expected to be around 2 per cent during the forecast period. This assessment is basically the same as in the Monetary Policy Report published in September.

International developments

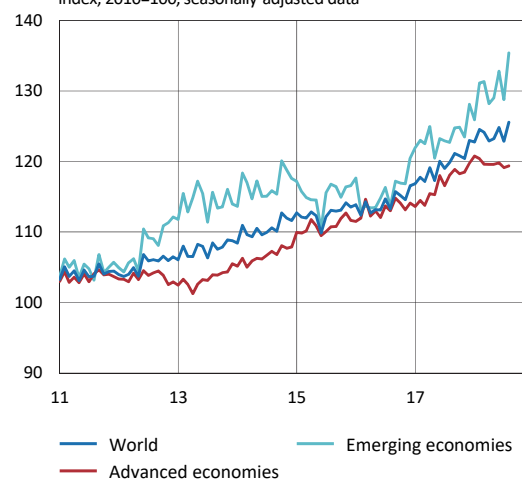
Continued favourable global economic activity

After strong GDP growth in 2017, overall growth during the first half of this year has been somewhat dampened in those countries that are most important for Swedish trade. The upward trend in imports for developed economies has levelled off (see Figure 4:1). In the period ahead, the recent increased trade conflicts are expected to have a marginal negative impact on the economies of some countries. So far, the introduced tariffs and the new threats of trade barriers have had minor effects on confidence among households, companies and financial markets worldwide.

Economic activity remains strong in many developed economies, which has led to unemployment continuing to decrease (see Figure 4:2). Both households and companies are optimistic, even if confidence has dampened in a number of countries. Resource utilisation is increasing internationally and is expected to contribute towards underlying inflation increasing in the period ahead. At the same time, monetary policy will gradually become less expansionary and GDP growth among Sweden's most important trading partners, measured in terms of KIX, will gradually slow, from 2.6 per cent this year to 2.1 per cent in 2021. Growth in demand for Swedish exports is therefore expected to slow down from about 4 per cent this year to 3.5 per cent in 2021. This demand is normally very well correlated with Swedish exports (see Figure 4:3). The volatile exports of services can periodically contribute to a less strong relationship. In 2015, exports of services increased unusually strongly in relation to international demand but recently this development has been reversed. Total Swedish exports have therefore increased slightly

Figure 4:1. Global imports of goods

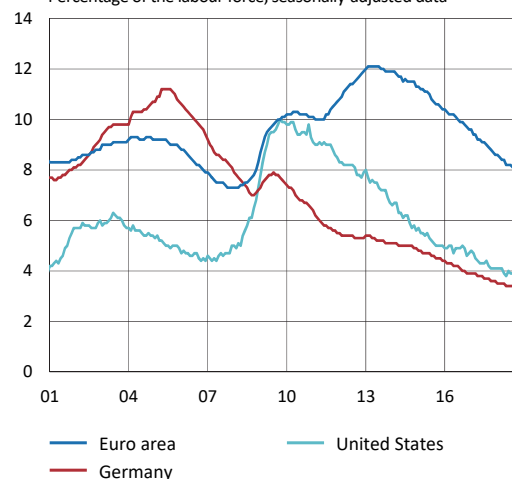
Index, 2010=100, seasonally-adjusted data



Source: CPB World Trade Monitor

Figure 4:2. Unemployment in various countries and regions

Percentage of the labour force, seasonally-adjusted data



Source: OECD

more slowly than international demand in recent years, but are expected to increase in line with international demand in the period ahead. In emerging market economies, continued high growth is expected and global growth is expected to amount to just under 4 per cent per year in 2018–2021.

Strong economic activity in the United States

GDP growth is good in the United States (see Figure 4:4). Unemployment is very low and confidence remains high among US companies and households. The expansionary fiscal policy with tax cuts and increased public expenditure is expected to contribute to higher GDP growth this year and next year. Financial conditions continue to be favourable for growth, even though the Federal Reserve has raised its policy rate and reduced its bond holdings. In light of decreased fiscal policy and monetary policy stimulation measures, GDP growth is expected to be just under 3 per cent this year, before gradually decreasing to just over 1.5 per cent in 2021.

The trade conflict between the US and China has intensified over the autumn (see the box “Increased protectionism in world trade”). The tariffs introduced so far have led to unease that has contributed to some companies in a number of districts in the United States reducing or postponing their investments.¹¹ However, the US economy as a whole remains strong and the negative effect is expected to be limited. If the trade conflict between the US and other countries escalates further, and particularly if confidence is clearly impacted and yields on corporate bonds rise, this effect could be significantly greater for both the US and other countries.¹²

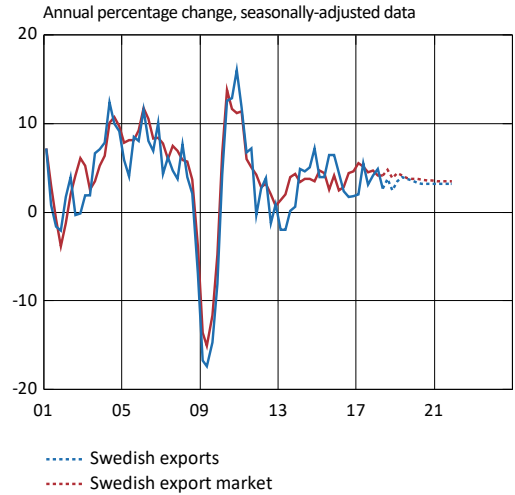
Lower GDP growth in the euro area

Growth in the euro area’s GDP decreased in the first six months of the year compared with 2017 which with recent macroeconomic outcomes indicate a continued slowdown in the third quarter. Confidence in the corporate and household sectors has declined, but remains high. Unemployment has decreased steadily in recent years and is expected to continue to fall in the period ahead. The high confidence and the strong labour market are expected to lead to GDP growth recovering in the period ahead and reaching a normal pace over the long term when suppressed requirements in consumption and investment have been satisfied.

Continued challenges for some emerging market economies

In the summer and autumn, a number of emerging market economies have been affected by rising oil prices, the stronger dollar and US trade restrictions. Oil exporting economies such as Russia have benefited from the rise in oil prices (see Figure 4:5), but, at the same time, the Russian economy has been burdened by the sanctions introduced by the United States. Rising US interest rates and a stronger dollar have increased concern in

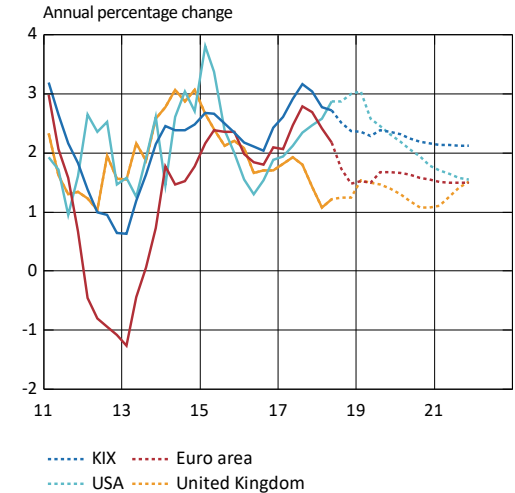
Figure 4:3. Exports and the Swedish export market



Note. The Swedish export market index measures import demand in the countries to which Sweden exports. This is calculated by aggregating imports in the countries included in KIX and covers around 85 per cent of the total Swedish export market.

Sources: Statistics Sweden and the Riksbank

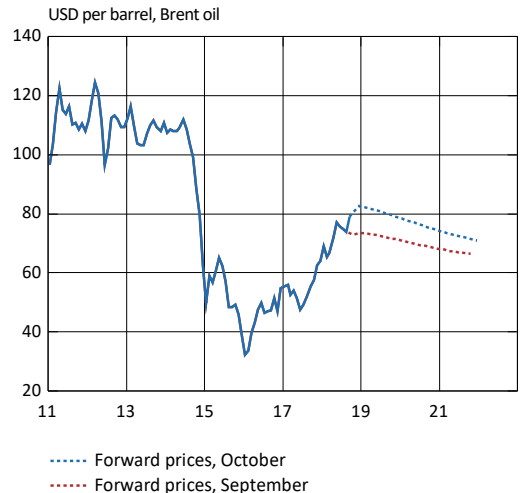
Figure 4:4. GDP in various countries and regions



Note. KIX is an aggregate of countries that are important to Sweden’s international transactions.

Sources: Bureau of Economic Analysis, Eurostat, national sources, Office for National Statistics and the Riksbank

Figure 4:5. Price of crude oil



Note. Forward prices are calculated as a 15-day average. The outcomes refer to monthly averages of spot prices.

Sources: Macrobond and the Riksbank

¹¹ See Federal Reserve, Beige Book, 12 September 2018.

¹² See box in IMF World Economic Outlook, Chapter 1, October 2018.

countries that are dependent on dollar funding, such as Argentina and Turkey. In both of these countries, the currency has weakened heavily due to low confidence in the economic policy being conducted.

In China, there are signs of lower growth in domestic demand. One contributory factor is that new regulations have led to a slowdown in credit growth and a fall in infrastructure investments. However, recent months' depreciation of the Chinese exchange rate against the dollar is counteracting the negative effects of greater trade barriers. The authorities have indicated their intention to conduct a more expansionary fiscal policy going forward due to the trade barriers and the slowed growth in demand. Monetary policy has also been made more expansionary by cutting the reserve requirement for the banks. All in all, this is expected to lead to Chinese GDP growth this year being in line with the government's growth target of around 6.5 per cent, after which it will gradually become lower. In 2021, growth is expected to be 6 per cent.

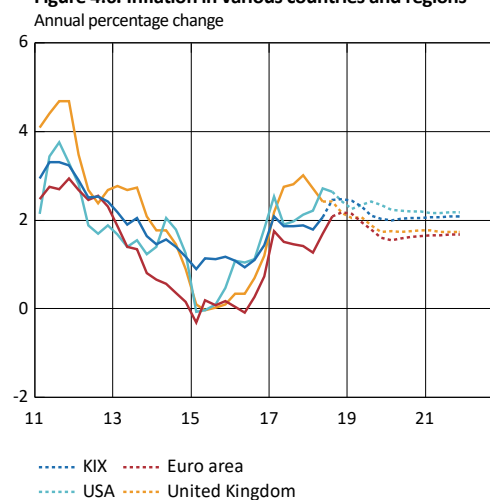
Slowly rising inflationary pressures abroad

A higher oil price has contributed to inflation rising faster abroad (see Figures 4:5 and 4:6). In the euro area, inflation is expected to be around 2 per cent towards the end of the year but then to fall successively when the contribution from energy prices declines over the course of 2019. Underlying inflation in the euro area is still low. However, the wage bargaining rounds have led to higher wage agreements for the sectors where agreements have been reached in Germany and, in the euro area too, the rate of wage increase has risen. More strained resource utilisation is expected to lead to a gradual rise of core inflation in the euro area, from about 1 per cent at present to just below 2 per cent at the end of the forecast period, which is in line with the ECB's inflation target. In the United States, underlying inflation is in line with the Federal Reserve's inflation target. The forecast is for it to remain so over the years ahead due to the continued high resource utilisation.

Weak krona to strengthen gradually

The prevailing uncertainty over international developments, with threats of increased protectionism and unease over developments in countries such as Turkey and Italy, have probably contributed towards weakening the krona over the year (see Figure 4:7). The Riksbank continues to deem that the krona is weak in real terms, compared with the levels justified by long-term factors, and a strengthening is predicted in the period ahead. However, the forecast implies a somewhat smaller appreciation over the longer term than was assumed in conjunction with the Monetary Policy Report from September (see the article "Development of the Swedish krona in the longer term", Chapter 4).

Figure 4:6. Inflation in various countries and regions



Note. KIX is an aggregate of the countries that are important to Sweden's international transactions.

Sources: The Bureau of Labor Statistics, Eurostat, national sources, Office for National Statistics and the Riksbank

Increased protectionism in world trade

On 30 March this year, the United States introduced import tariffs on steel and aluminium of 25 and 10 per cent respectively. On 22 June, the EU introduced counter-measures, which include increased tariffs on motorcycles and steel, aluminium and agricultural products. In July and August, the United States introduced 25 per cent tariffs for a selection of imported goods from China for a total of USD 50 billion. China responded with an equivalent tariff increase on goods from the United States. On 24 September, the United States expanded its measures against China by introducing tariffs of 10 per cent on imported goods from China in an amount of USD 200 billion. The tariff will be raised to 25 per cent at the end of the year. China has, in turn, responded with a countermeasure of 10 per cent tariffs on US exports to China, corresponding to USD 60 billion. The value of the goods now subjected to increased tariffs corresponds to about half of the United States' total imports of goods from China and about 85 per cent of the United States' exports to China. The United States has announced that it may raise tariffs on goods corresponding to a further USD 267 billion, which would mean tariffs being raised on all imports from China.

US authorities are also investigating the possibility of introducing tariffs on imports of vehicles and vehicle components, which would affect countries in which the production of vehicles forms a relatively large part of the economy, such as Sweden, Germany and Japan. However, these tariffs are not expected to be introduced as long as negotiations to reduce trade barriers between the EU and the United States are ongoing. Overall, the measures introduced so far are expected to have a limited effect on global growth. However, there is a risk that the effects could be significantly greater. This could happen if the trade conflict between the United States and other countries escalates or involves more countries, or if it has clear negative effects on confidence among households and companies and on the financial markets.

Sweden

Strong economic activity but waning growth

After recent years' high GDP growth, driven by strong foreign demand, high housing investment in Sweden and expansionary monetary policy, developments are expected to slow down slightly in the period ahead. The global economy is entering a calmer growth phase and housing investments are expected to grow more slowly in Sweden. All in all, Swedish GDP is expected to increase by 2.3 per cent this year, after which growth will slow down to an average of almost 2 per cent per year in 2019–2021 (see Figure 4:8).

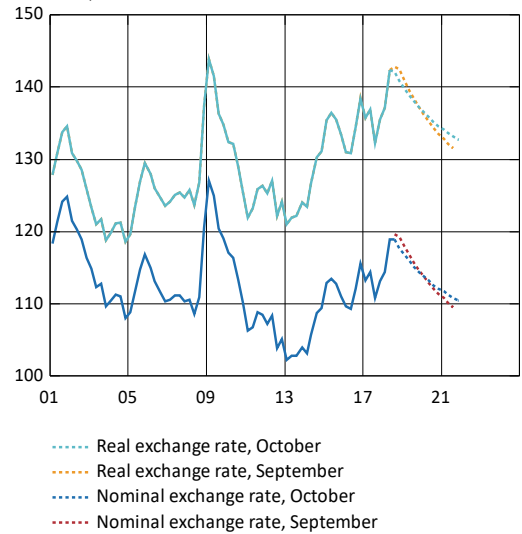
The decline in housing prices is restraining growth in domestic demand

The high level of capacity utilisation in the manufacturing sector and the high demand for Swedish goods and services is contributing towards an increased need for investment in the business sector. At the same time, the development of the Swedish housing market is in a weaker phase. Housing prices in August were about 5 per cent lower, measured with the HOX price index, than they were in the same month of the previous year. The weaker price growth is deemed to be due to the large supply of new housing in recent years, among other factors. It is also likely that the overall effect of the amortisation requirement introduced in 2016 and the tightened regulations this year has led to dampened effect on prices, particularly in Stockholm, where households' debt-to-income ratios are highest. Even if the decline in prices on the housing market was preceded by a very rapid price rise in the years before, it is expected to lead to a slight fall in the rate of new construction of housing in the years ahead.¹³ This, together with continued high demand, supported by low interest rates and continued employment growth, is contributing towards stabilising the development of housing prices this year and the rate of price increase in the period ahead is expected to be moderate.

The decline in housing investment is restraining domestic demand and GDP growth. This stands in strong contrast to the period 2013–2017, when housing investment contributed towards a growth in demand by an average over 0.5 per cent of GDP per year. By 2021, housing investment's share of GDP is expected to have fallen by about one percentage point to just under 5 per cent (see Figure 4:9). The share remains relatively high from a historical perspective (see Figure 4:9), but not by international standards.¹⁴

The house price fall is moderate and can be compared to the price rises in the preceding years. Even if the development of the housing market is deemed to have dampened household confidence somewhat, the overall effects on their consumption

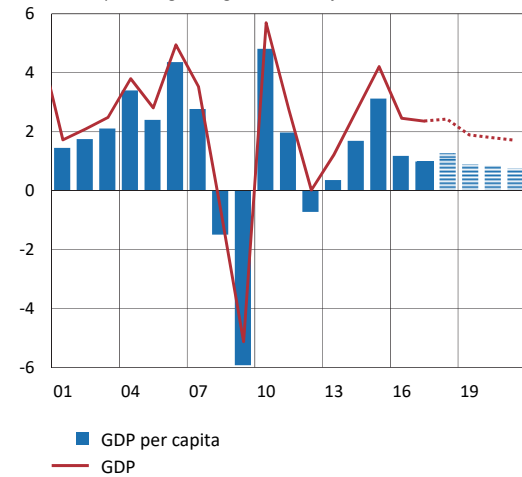
Figure 4.7. Real and nominal exchange rate, KIX
Index, 18 November 1992 = 100



Note. The real exchange rate is calculated using the CPIF for Sweden and the CPI for the rest of the world. The KIX is an aggregate of 32 countries that are important for Sweden's international transactions.

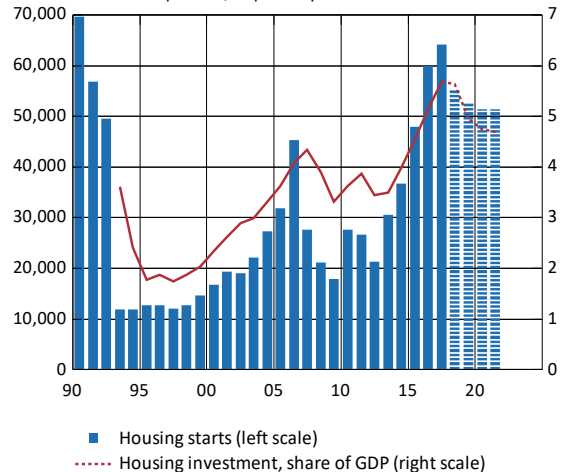
Sources: National sources, Statistics Sweden and the Riksbank

Figure 4.8. GDP and GDP per capita
Annual percentage change, calendar-adjusted data



Sources: Statistics Sweden and the Riksbank

Figure 4.9. Housing starts and housing investments
Number and per cent, respectively



Sources: Statistics Sweden and the Riksbank

¹³ See the article "Reduced housing construction is subduing GDP growth" in the February 2018 Monetary Policy Report.

¹⁴ See "Residential investment and economic activity: evidence from the past five decades, BIS Working Papers No. 726, June 2018.

are expected to be minor and it is expected to increase at an even pace in the years ahead. Over the last five years households have saved a historically high share of their disposable incomes. When their scope for consumption develops more weakly in the years ahead, among other reasons due to lower growth in employment and higher interest rates for mortgages, they are expected to reduce their savings (see Figure 4:10). In this context, high mortgage rates are therefore deemed to have a relatively limited effect on household consumption.¹⁵

Previous upswing in housing prices is contributing to increasingly high indebtedness

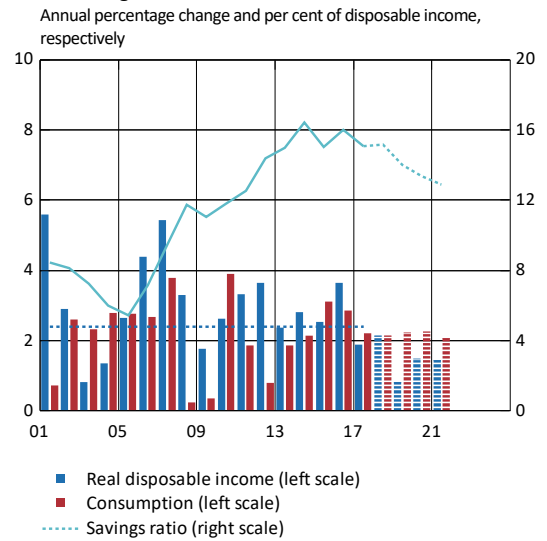
The lower housing prices and the measures adopted to increase household amortisation are contributing towards a slower rate of increase in household debt. At the same time, the previous long period of rising housing prices means that today's home buyers still pay a significantly higher price than the sellers did. The purchasers' average mortgage loan then becomes larger than that of the sellers, contributing to maintaining the growth of household debt. In the years ahead, Swedish household debt is expected to continue to increase more rapidly than households' disposable incomes. At the end of 2021, the debt-to-income ratio is expected to be just over 190 per cent (see Figure 4:11). This means an upward revision due to households' disposable incomes being expected to be lower than in the assessment made in the September Monetary Policy Report.

Continued favourable labour market

Developments on the labour market have been strong for several years with a rising employment rate and falling unemployment (see Figure 4:12). The labour supply has increased rapidly as a result of both high growth in the population and a rising labour force participation rate. However, the increase in the labour supply is expected to slow down slightly in the period ahead due to the demographic development of the current population and decreased immigration. Demand for labour has also been high for several years. As the employment rate has risen and unemployment fallen, it has become more difficult for companies to find the staff they are looking for. This is reflected in both higher shortages and longer recruitment times. All in all, resource utilisation is deemed to be higher than normal and is expected to continue to be relatively high in the years ahead (see Figure 4:13). Despite the positive economic activity, unemployment is predicted to rise in the period ahead. This is because the job-finding rate, i.e. the flow from unemployment into employment, continues to be relatively low. At present, a relatively large percentage of those unemployed are persons who, on average, have a lower job-finding rate, for example, persons born outside Europe. This proportion of the labour force is expected to increase in the near future.

¹⁵ See the article "How are households affected by rising interest rates?" in the December 2017 Monetary Policy Report.

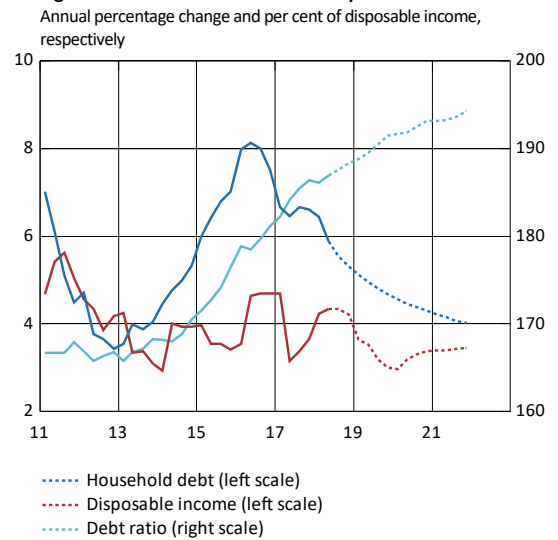
Figure 4:10. Households' real disposable income, consumption and savings ratio



Note. Disposable income has been deflated using the household consumption deflator. Broken line is the average of consumption growth 1994–2017.

Sources: Statistics Sweden and the Riksbank

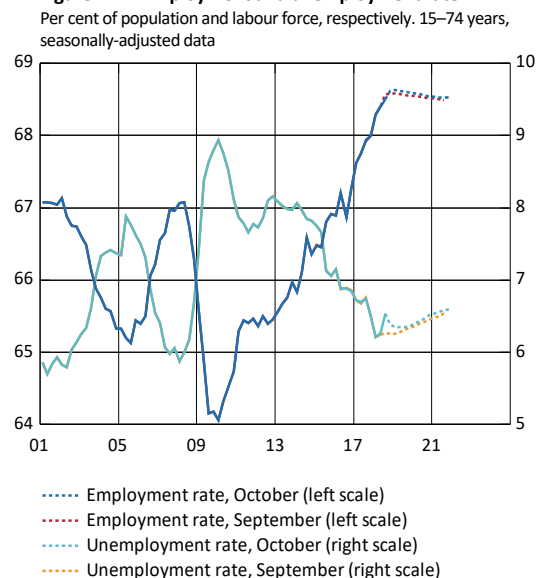
Figure 4:11. Household debts and disposable income



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

Sources: Statistics Sweden and the Riksbank

Figure 4:12. Employment and unemployment rate



Sources: Statistics Sweden and the Riksbank

Wages rising but at a moderate pace

In recent years, wage growth has been low in relation to the historical average, even if a certain upswing has been visible for the business sector over the last year. The weak productivity growth over the last ten years or so has held back the room for wage increases and, despite the low wage increases, profits in the business sector are relatively low from a historical perspective. At the same time, the relationship between the strong demand for labour and wages seems to be moderate. In addition, wage increases and growth in unit labour costs are low abroad.

However, wage growth is expected to be faster in the period ahead (see Figure 4:14). This is indicated by a number of factors. The labour market is strong. Inflation has risen and inflation expectations seem to be solidly anchored around the inflation target of two per cent. There are also certain signs of rising wage growth abroad (see Figure 4:15). In addition, productivity growth is expected to gradually rise and to approach a normal growth rate at the end of the forecast period. This will increase scope for employers to raise wages at a faster pace in the period ahead. All in all, however, the forecast for wages has been revised downwards slightly towards the end of the forecast period compared with the Monetary Policy Report from September due to the lower expected productivity growth. Unit labour costs are expected to increase by around 2 per cent a year during the forecast period, which is a relatively normal rate of increase (see Figure 4:16).

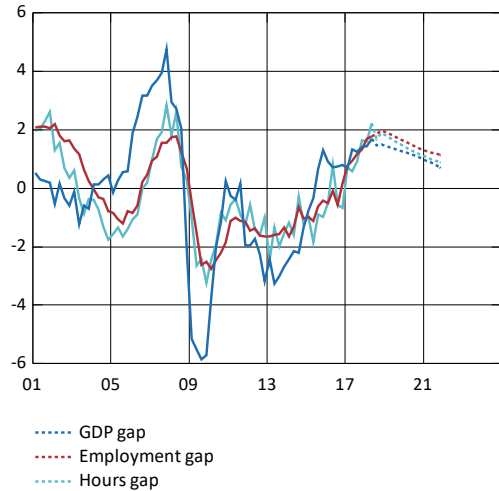
Inflation close to 2 per cent in the years ahead

In September, CPIF inflation amounted to 2.5 per cent. Various measures of core inflation are lower (see the article “Why measures of core inflation?”). The median of several such measures rose in September to 1.7 per cent. One of these measures, CPIF inflation excluding energy, amounted to 1.6 per cent in September. This was marginally higher than in the Riksbank’s forecast in September.

For a number of years, inflation was well below the Riksbank’s inflation target, but the increasingly strong economic situation in Sweden has contributed towards rising inflation in recent years. In addition, the weakening of the krona exchange rate, which, among other things, is pushing up the prices of food and other imported goods, has contributed to the rise in inflation. During 2017, the upturn in inflation was also due, to some extent, to temporarily high service prices. Rising energy prices have also contributed over recent years. All in all, this has meant that inflation has continued to rise to around 2.5 per cent.

Over the coming years, the continued favourable level of economic activity and the strong labour market, together with the consequent high resource utilisation in Sweden, will continue to act as a driving force for inflation. The rate of increase in unit labour costs has risen and the forecast for this has been revised upwards at the same time as inflation expectations seem to be anchored close to the inflation target of 2 per cent. In addition,

Figure 4:13. GDP gap, employment gap and hours gap
Per cent



Note. The gaps refer to the deviation in GDP, the number of those employed and the number of hours worked from the Riksbank’s assessed trends.

Sources: Statistics Sweden and the Riksbank

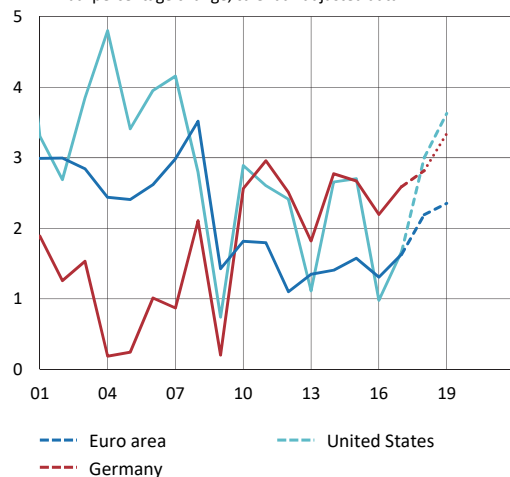
Figure 4:14. Real short-term wages
Annual percentage change



Note. Refers to short-term wages in the economy as a whole, deflated by the CPIF.

Sources: National Mediation Office, Statistics Sweden and the Riksbank

Figure 4:15. Wages abroad
Annual percentage change, calendar-adjusted data



Note. Refers to the OECD’s forecasts for payroll expenses per employee in the business sector from May 2018.

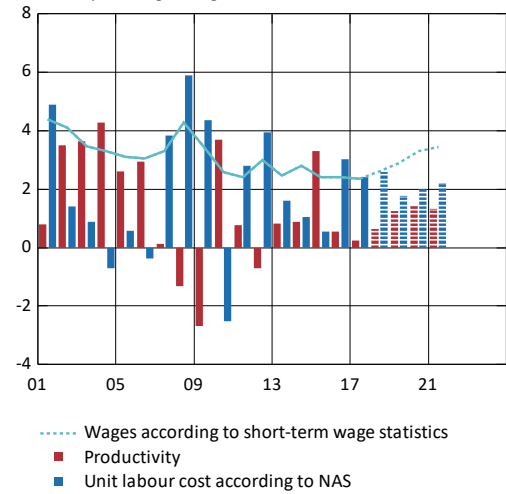
Source: OECD

underlying inflation abroad is rising. At the same time, the krona is expected to strengthen gradually, which has a dampening effect on the rate of inflation. Energy prices are not expected to contribute to inflation to the same extent as in recent years. Overall, it is the Riksbank’s assessment that CPIF inflation will be close to 2 per cent over the forecast period. When the repo rate, and thereby also mortgage rates, begins to rise towards the end of 2018, household interest expenditure will increase faster, which means that CPI inflation will become significantly higher than CPIF inflation (see Figure 4:17). In 2021, the CPI is expected to increase by over 3 per cent.

Minor revisions to the inflation forecast

The cyclical conditions for inflation are assessed to be largely unchanged since the previous Monetary Policy Report. The assessment of resource utilisation at present has been revised downwards slightly, but is expected to remain high in the years ahead. The rapidly rising unit labour costs and upward revision of these in the most recent National Accounts are a factor that also suggests rising inflation. Moreover, underlying CPIF inflation excluding energy prices rose in September (see Figure 4:18). All in all, the forecasts for inflation measured as the CPIF and as the CPIF excluding energy remain largely unchanged in relation to the previous ones.

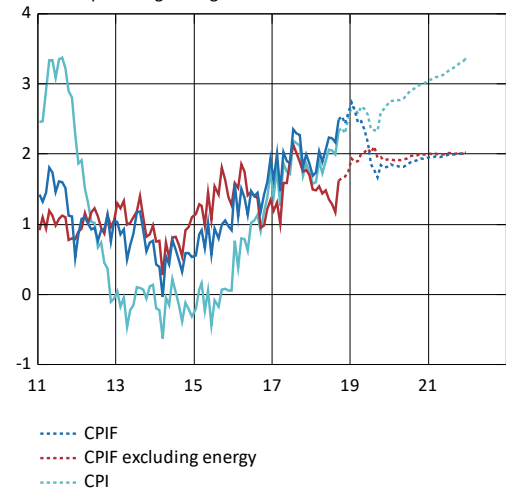
Figure 4:16. Wages and labour costs in the whole economy
Annual percentage change



Note. The National Mediation Office’s forecast of final outcome 2017Q3–2018Q2.

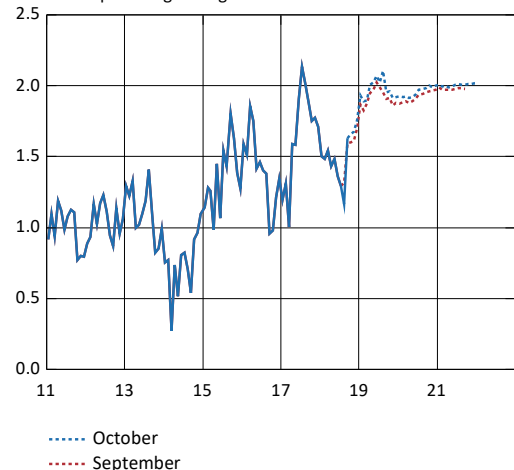
Sources: National Mediation Office, Statistics Sweden and the Riksbank

Figure 4:17. CPIF, CPIF excluding energy and CPI
Annual percentage change



Sources: Statistics Sweden and the Riksbank

Figure 4:18. CPIF excluding energy
Annual percentage change



Sources: Statistics Sweden and the Riksbank

ARTICLE – Development of the Swedish krona in the longer term

As the development of the krona affects inflation, it is important for the Riksbank to form an idea of the krona exchange rate going forward. Exchange rates vary substantially and the difficulty in making exchange rate forecasts is widely acknowledged, both over the short and long terms. But there is evidence that real exchange rates, which is to say nominal exchange rates adjusted for relative price levels, tend to move towards a more sluggish equilibrium level. The Riksbank therefore makes an assessment of this level, which functions as an anchor for forecasts of both the real and the nominal exchange rate. The current assessment is that the real exchange rate measured in terms of the krona index (KIX) will be within the interval of 120 to 135 five to ten years ahead, which is a weaker level compared with the previous assessment. This interval means that the krona can be expected to appreciate by about 5–15 per cent in real terms over the next five to ten years.

In an article in the Monetary Policy Report of July 2013, the Riksbank presented the assessment that the real krona exchange rate, measured in terms of the KIX index adjusted for the international consumer price level in relation to the Swedish price level measured in terms of the CPIF, could be expected to be in the interval 110–125 in the longer term.¹⁶ Since then, the real krona exchange rate has weakened at the same time as there have been changes both in fundamental factors and in the estimates made by the Riksbank and other analysts. There is therefore reason to provide an updated picture of the Riksbank's assessment of the real exchange rate in the longer term.

Exchange rates vary substantially and it is widely acknowledged that they are difficult to forecast. A well-known and previously common conclusion is that it is not possible to make a better forecast for the future exchange rate level than the one obtained by simply assuming that the current level will prevail.¹⁷ However, real exchange rates appear to be anchored at more sluggish levels

or trends.¹⁸ The Riksbank's forecast for the development of the krona exchange rate is therefore based on an assessment of an equilibrium real exchange rate.

Purchasing power parity as a starting point

A common basis for the assessment of the equilibrium exchange rate is purchasing power parity – that goods and services can be expected to cost the same in different countries after conversion to the same currency.¹⁹ At relative purchasing power parity, the price levels in different countries are not necessarily the same, measured in the same currency, but the relationship between them is constant. Over time, the prices rise or fall by the same percentage in the different countries. If relative purchasing power parity prevails, the real exchange rate will be constant – when inflation is higher than in other countries, the nominal exchange rate depreciates, and vice versa.²⁰

Figure 4:19 shows a few different measures of real exchange rates between the Swedish krona and the euro and the US dollar respectively.²¹ Eurostat and the OECD regularly

¹⁶ See the article "A long-term perspective on the krona" in the July 2013 Monetary Policy Report.

¹⁷ See Meese, R. A. and Rogoff, K. (1983), "Empirical Exchange Rate Models of the Seventies: Do they fit out of sample?", *Journal of International Economics*, vol. 14, pp. 3–24.

¹⁸ While nominal exchange rates can seemingly behave irrationally (see Bacchetta, P. and van Wincoop, E. (2018), "Puzzling Exchange Rate Dynamics and Delayed Portfolio Adjustment", Meeting Papers 675, Society for Economic Dynamics), there are now a number of studies indicating that the propensity of real exchange rates to gravitate towards the mean can be utilised to forecast both real and nominal exchange rates in the slightly longer term. See, for example, Engel, C., Mark, N. C., and West, K. D. (2008), "Exchange rate models are not as bad as you think", *NBER Macroeconomics Annual 2007*, vol. 22, pp. 381–441; Ca' Zorzi, M., Kolasa, M. and Rubaszeka, M. (2017): "Exchange rate forecasting with DSGE models", *Journal of International Economics*, vol. 107, pp. 127–146; Cheung, Y-W., Chinn, M. D., Pascual, A. G. and Zhang, Y. (2017), "Exchange Rate Prediction Redux: New Models, New Data, New Currencies", NBER Working Paper No. 23267; and Eichenbaum, M., Johannesen, B. K., and Rebelo, S. (2017), "Monetary Policy and the Predictability of Nominal Exchange Rates," Finance and Economics Discussion Series 2017–037, Board of Governors of the Federal Reserve System.

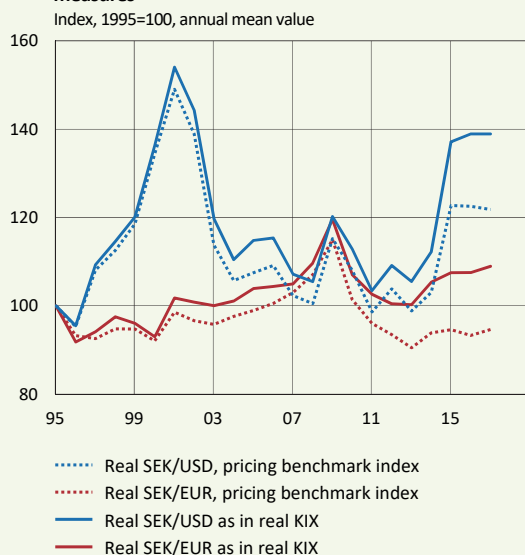
¹⁹ The Economist's Big Mac Index is calculated on the price of a single product which has the advantage of being basically identical the world over. If a Big Mac costs the same in two different countries calculated in the same currency, it is seen as an indication that there is absolute purchasing power parity between these two countries. Occasionally, differences in Big Mac prices are also taken as an indication of the under or overvaluation of the currencies of the countries in question. For examples of this and more discussion of the Big Mac index, see The Economist (2018), "The Big Mac index", <https://www.economist.com/news/2018/07/11/the-big-mac-index>.

²⁰ For a more detailed account of theories and empirical research into purchasing power parity, see Froot, K. A. and Rogoff, K. (1995), "Perspectives on PPP and Long-Run Real Exchange Rates" in Grossman, G.M. and Rogoff, K. (eds.), *Handbook of International Economics Vol. 3*, Elsevier.

²¹ The large fluctuations in the krona's real exchange rate against the dollar coincide with fluctuations in the nominal effective dollar exchange rate. The years around the turn of the millennium were characterised by several major phenomena and events that possibly had an impact on exchange rates, including the so-called IT bubble, the launch of the euro and the terror attack in the United States on 11 September 2001. A common explanation for the dollar appreciation in recent years is growing yield differentials between the US on the one hand and the euro area and Sweden on the other.

compile data on prices of carefully specified goods and services in different countries in order to obtain fully comparable measures of price levels. Bilateral real exchange rates calculated on the basis of these statistics (broken line) indicate that between 1995 and 2017, an appreciation of the krona's real exchange rate occurred in relation to the euro area and a depreciation occurred in relation to the United States. All in all, considering these countries' weights in KIX, this measure paints the picture of a reasonably constant level, over time, of the krona's real exchange rate until the end of 2017.²² One interpretation of this is that the valuation of the krona in 2017 was in line with relative purchasing power parity.

Figure 4:19. Bilateral real exchange rates according to different measures

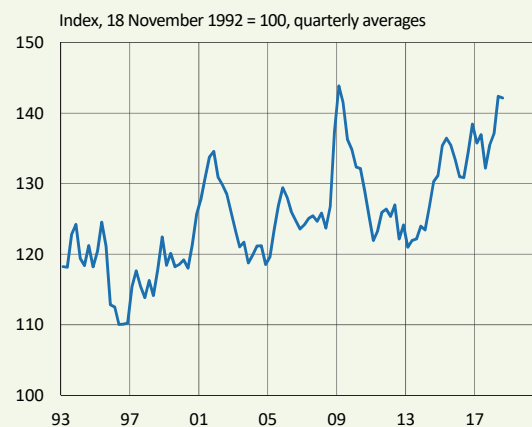


Sources: Eurostat, OECD and the Riksbank

Real exchange rates based on the countries' own consumer price indices (see the solid lines in Figure 4:20) paint a slightly different picture. This calculation method, which forms the basis of the real KIX index that the Riksbank uses in its analysis, gives the view that the real krona exchange rate over the period 1995–2017 weakened against both the euro and the dollar. It is not obvious what lies behind the differences between the two measures, but calculations of price levels are uncertain and methods of calculation can differ from country to country. It is therefore important to consider several different measures when assessing the long-term level. However, the Riksbank's exchange rate forecasts, and the measure we normally publish, concern the real KIX index. Diagram 4:20 shows that real KIX has varied greatly and has weakened since 1993. The average for real KIX since

the transition to a floating exchange rate regime at the end of 1992 is 125.

Figure 4:20. Real exchange rate, KIX



Sources: National sources, Statistics Sweden and the Riksbank

Driving forces behind trends in the real exchange rate

If the real exchange rate demonstrates long-term trends, which cannot be ruled out based on the development of real KIX, it may be misleading to use an average for a certain historical period when assessing the equilibrium rate. Instead, it is a matter of trying to understand what lies behind the long-term changes. Some of the possible driving forces behind trends in real exchange rates that play a prominent role in both the literature and the Riksbank's analytical tools are described below. But many things can influence the development of the exchange rate and it cannot be ruled out that other factors also play an important part.

One of the most common explanations for why price levels in a joint currency can develop differently in different countries assumes that productivity growth primarily occurs in production that is traded internationally.²³ Prices in this sector are determined internationally, but wages increase apace with productivity and push up wages, and ultimately prices, on goods and services not traded internationally. This, in turn, means that the price level rises more in countries with higher productivity growth and hence that the real exchange rate appreciates in countries that have higher productivity growth than their trading partners.

Productivity growth is roughly reflected in GDP growth per capita.²⁴ Figure 4:21 shows that Sweden's GDP per capita rose in relation to the KIX-weighted countries between 1993 and 2006. This would speak for an appreciation trend in the real krona exchange rate during that period, in contrast to the depreciation shown in Figure 4:20. A possible contributory reason could be that the increase in relative GDP per capita has been driven by relatively strong Swedish

²² The same view appears if these real exchange rates are instead calculated with the aid of unit labour costs.

²³ This is also sometimes called the Harrod-Balassa-Samuelson effect. See R. Harrod (1933), *International Economics*, Cambridge University Press, B. Balassa (1964), "The Purchasing Power Parity Doctrine: a Reappraisal", *Journal of Political Economy* 72 (6),

pp. 584-596, and P.A. Samuelson (1964), "Theoretical Notes on Trade Problems", *Review of Economics and Statistics* 46 (2), pp. 145-154.

²⁴ The level of GDP per capita can, alongside productivity, capture income effects on labour supply (lower labour supply with higher incomes) that can push up wages and hence price levels in the economy.

productivity growth in the services sector – the output of which is traded internationally to a lesser extent – which has restrained price development in this sector and hence weakened the real exchange rate.²⁵

Figure 4:21. GDP per capita in Sweden in relation to KIX-weighted countries abroad
Index, 1993=100, annual mean value



Sources: The IMF and the Riksbank

Another possible reason for why real KIX did not appreciate with a rising ratio between GDP per capita in Sweden and abroad is that other factors may simultaneously have affected the real exchange rate in the opposite direction. Factors close at hand include, in addition to productivity, those that are relevant to how rich Sweden is compared with other countries, such as the terms of trade, i.e. the relationship between export prices and import prices expressed in Swedish krona. The more advantageous the terms of trade are in relation to other countries, i.e. the more Sweden receives in exchange for its exports, the stronger the real exchange rate is expected to be. Sweden’s terms of trade showed a weakening trend until the global financial crisis (see Figure 4:22). This can therefore help to explain a real krona depreciation trend over the same period.

Figure 4:22. Sweden’s terms of trade
Index, 1993=100, quarterly values



Source: Statistics Sweden

In other words, the development of Sweden’s GDP per capita in relation to other countries and the terms of trade, respectively, seem to have affected the real exchange rate in opposite directions between 1993 and 2007. After this, these variables have fluctuated less and do not point to a clear weakening of the equilibrium real exchange rate in recent years.

The current account balance and the real exchange rate

Another perspective on the real exchange rate takes its starting point in the current account balance. This reflects how a country’s total saving relates to the total value of investments made there. During certain periods, a country’s saving can be relatively high and its investments relatively low. For saving to exceed investment, exports need to exceed imports and that requires a weak real exchange rate. If there is reason to believe that Sweden’s saving will decrease in the period ahead or that its investment demand will increase relative to other countries, there is also reason to expect a stronger future exchange rate.

Since the changeover to a floating exchange rate in late 1992, Sweden has had a current account surplus corresponding to an average of 5 per cent of GDP (see Figure 4:23). This is a comparatively large surplus in an international comparison and could be a sign that the krona will appreciate in the longer term. However, the current account surplus has declined considerably over the past ten years, down to around 3 per cent of GDP, which is an indication that there is now less scope for the krona to appreciate than before.

Figure 4:23. Current account balance
Percentage of GDP, four quarter moving average



Source: Statistics Sweden

The real exchange rate 5–10 years ahead

It is not possible to observe the equilibrium real exchange rate. It is therefore difficult to determine how correct various assessments of this level have been and which method functions best. Table 4:1 therefore shows estimates of the

²⁵ For example, statistics from the ECB indicate that productivity growth in the service sector (measured as output per hour worked) since 1995 has been approximately twice as high in Sweden as in the euro area.

equilibrium real exchange rate with different assumptions, which all form the basis of the Riksbank's total assessment of an interval for the real exchange rate five to ten years ahead.

The Riksbank's own estimates of the equilibrium real exchange rate are made using models that at the same time explain the equilibrium real exchange rate based on trends in relative GDP (or GDP per capita) and the terms of trade as well as the deviation in the actual real exchange rate from the equilibrium rate with the net external position, the current account and interest rate differentials in relation to other countries.

The IMF makes annual assessments of normal levels of individual member countries' current account balances based on factors deemed important for saving and investment. If the current account balance exceeds the normal level, the conclusion is that the exchange rate is undervalued. The most recent estimate from the IMF means that Sweden's current account surplus in 2017 was larger than can be justified by fundamental factors in the medium term and that the krona is therefore undervalued and can be expected to strengthen.²⁶

It cannot be ruled out that we are experiencing a trend towards an increasingly weak real KIX that is driven by something other than the development of the variables discussed above. Something indicating this is that real KIX weakened by over 10 per cent between 1995 and 2017, at the same time as other measures indicate that the real exchange rate has in principle remained unchanged over the same period. It may therefore be worth observing some measure of the trend development in the real KIX without taking account of any underlying driving forces. A so-called Hodrick-Prescott filter meets this criterion and, when applied to the annual average of the real KIX, including the Riksbank's forecast for the period until the end of 2021, it gives a current trend level of 135.

Table 4:1. Estimates of the equilibrium real exchange rate and the Riksbank's assessment of the real exchange rate 5–10 years ahead
KIX, index 18 November 1992 = 100

Estimate	Equilibrium real exchange rate
Purchasing power parity ²⁷	125
Estimates using Riksbank models	122 – 129
IMF	122 – 135
Trend level, based on Hodrick-Prescott filter ²⁸	135
The Riksbank's assessments	Real exchange rate 5–10 years ahead
Interval published in 2013	110 – 125
Current interval	120 – 135

The different estimates of an equilibrium real exchange rate form the basis of the Riksbank's assessment of an interval for

the real exchange rate five to ten years ahead. The interval published by the Riksbank in 2013 and the new revised update of this interval are shown at the bottom of the table.

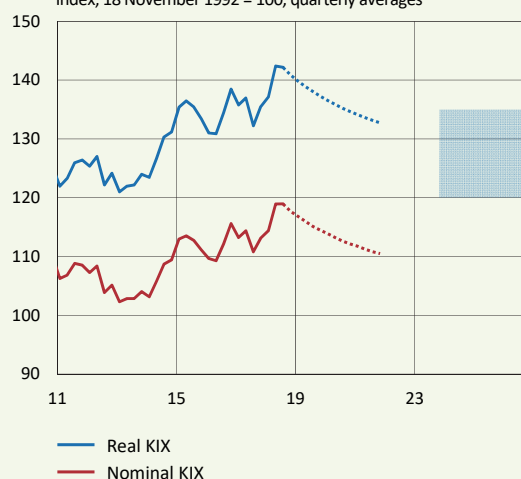
In the third quarter of this year, real KIX was at 142, which is weaker than the different estimates and assessments of the equilibrium real rate in Table 4:1. This indicates that it is likely that temporary factors are making the krona weak at present. One of these is interest-rate differentials in relation to other countries. The krona depreciation that took place since the start of 2014 coincided with Swedish interest rates falling in comparison with corresponding interest rates abroad. For example, the gap between Swedish two-year government bonds yields and their German equivalents decreased by just over half a percentage point, and the gap with the US equivalents decreased by just over three percentage points.

The future development of the krona

All in all, it is thus the Riksbank's assessment that a reasonable interval for the real exchange rate measured in terms of KIX, 5–10 years ahead, is between 120 and 135 (see Figure 4:24).

The krona is currently above this level, which means that it is expected to appreciate in the years immediately ahead. As

Figure 4:24. Real and nominal exchange rate, KIX
Index, 18 November 1992 = 100, quarterly averages



Note. The blue field shows the Riksbank's assessed interval for the real exchange rate 5–10 years ahead.

Sources: National sources, Statistics Sweden and the Riksbank

inflation during the same period is expected to be about as high in the KIX-weighted countries as in Sweden (measured in terms of the CPIF), the nominal exchange rate will strengthen at about the same rate as the real krona exchange rate (see Figure 4:24).

²⁶ International Monetary Fund (2018), *External Sector Report: Tackling Global Imbalances amid Rising Trade Tensions*.

²⁷ Average for the real KIX since 1993Q1.

²⁸ The filter has been applied to annual data for the real KIX, including the Riksbank's forecast for the period until the end of 2021. The adjustment parameter used is 100, which is normal in the filtering of annual data. The revised value applies to 2018.

Tables

The forecast in the previous Monetary Policy Report is shown in brackets unless otherwise stated.

Table 1. Repo rate forecast

Per cent, quarterly averages

	Q3 2018	Q4 2018	Q1 2019	Q4 2019	Q4 2020	Q4 2021
Repo rate	-0.50	-0.50 (-0.50)	-0.33 (-0.33)	0.09 (0.09)	0.66 (0.66)	1.23

Source: The Riksbank

Table 2. Inflation

Annual percentage change, annual average

	2017	2018	2019	2020	2021
CPIF	2.0 (2.0)	2.2 (2.2)	2.1 (2.1)	1.9 (1.9)	2.0
CPIF excl. energy	1.7 (1.7)	1.5 (1.5)	2.0 (1.9)	2.0 (1.9)	2.0
CPI	1.8 (1.8)	2.0 (2.0)	2.6 (2.7)	2.9 (2.9)	3.2
HICP	1.9 (1.9)	2.1 (2.1)	2.1 (2.1)	1.8 (1.8)	1.9

Note. HICP is an EU harmonised index of consumer prices.

Sources: Statistics Sweden and the Riksbank

Table 3. Summary of financial forecasts

Per cent, unless otherwise stated, annual average

	2017	2018	2019	2020	2021
Repo rate	-0.5 (-0.5)	-0.5 (-0.5)	-0.1 (-0.1)	0.4 (0.4)	1.0
10-year rate	0.7 (0.7)	0.7 (0.7)	1.4 (1.4)	2.1 (2.1)	2.7
Exchange rate, KIX, 18 November 1992 = 100	112.9 (112.9)	117.5 (118.0)	115.6 (116.3)	112.9 (112.6)	111.1
General government net lending*	1.6 (1.3)	0.9 (1.0)	0.9 (0.9)	0.7 (0.7)	0.7

* Per cent of GDP

Sources: Statistics Sweden and the Riksbank

Table 4. International conditions

Annual percentage change, unless otherwise stated

GDP	PPP-weights	KIX-weights	2017	2018	2019	2020	2021
Euro area	0.11	0.48	2.5 (2.5)	1.9 (2.0)	1.6 (1.7)	1.6 (1.6)	1.5
USA	0.15	0.09	2.2 (2.2)	2.8 (2.8)	2.6 (2.6)	2.0 (2.0)	1.6
Japan	0.04	0.02	1.7 (1.7)	1.1 (0.9)	1.1 (1.0)	0.4 (0.4)	0.9
China	0.19	0.09	6.9 (6.9)	6.6 (6.6)	6.0 (6.1)	6.1 (6.1)	6.0
KIX-weighted	0.75	1.00	2.9 (2.9)	2.6 (2.6)	2.3 (2.4)	2.2 (2.2)	2.1
World (PPP-weighted)	1.00	-	3.7 (3.7)	3.8 (3.8)	3.6 (3.8)	3.7 (3.7)	3.6

Note. Calendar-adjusted growth rates. The PPP weights refer to the global purchasing-power adjusted GDP weights for 2018, according to the IMF. KIX weights refer to weights in the Riksbank's krona index (KIX) for 2018. The forecast for GDP in the world is based on the IMF's forecasts for PPP weights. The forecast for KIX-weighted GDP is based on an assumption that the KIX weights will develop in line with the trend during the previous five years.

CPI	2017	2018	2019	2020	2021
Euro area (HICP)	1.5 (1.5)	1.8 (1.8)	1.9 (1.6)	1.6 (1.6)	1.7
USA	2.1 (2.1)	2.5 (2.5)	2.3 (2.3)	2.2 (2.2)	2.2
Japan	0.5 (0.5)	1.1 (0.9)	1.4 (1.2)	1.8 (1.8)	1.5
KIX-weighted	1.9 (1.9)	2.2 (2.1)	2.2 (2.1)	2.0 (2.0)	2.1
	2017	2018	2019	2020	2021
Policy rates in the rest of the world, per cent	-0.1 (-0.1)	0.1 (0.1)	0.2 (0.2)	0.5 (0.5)	0.8
Crude oil price, USD/barrel Brent	54.8 (54.8)	74.9 (72.3)	80.7 (72.4)	76.4 (69.6)	72.4
Swedish export market	5.0 (4.9)	4.2 (4.1)	4.0 (4.1)	3.6 (3.6)	3.5

Note. Policy rates in the rest of the world refer to a weighted average of USA, the euro area, Norway and the United Kingdom.

Sources: Eurostat, IMF, Intercontinental Exchange, national sources, OECD and the Riksbank

Table 5. GDP by expenditure

Annual percentage change, unless otherwise stated

	2017	2018	2019	2020	2021
Private consumption	2.2 (2.2)	2.1 (2.7)	2.2 (2.5)	2.3 (2.3)	2.1
Public consumption	0.0 (0.4)	0.9 (0.7)	1.0 (1.0)	1.1 (1.2)	1.0
Gross fixed capital formation	6.1 (5.9)	2.8 (3.7)	0.1 (0.5)	2.8 (2.8)	2.8
Inventory investment*	0.1 (0.1)	0.4 (0.3)	0.1 (0.2)	-0.2 (-0.1)	0.0
Exports	3.2 (3.6)	3.2 (3.2)	3.6 (3.8)	3.7 (3.7)	3.5
Imports	4.8 (4.8)	3.4 (2.7)	2.7 (3.3)	3.5 (3.5)	3.8
GDP	2.1 (2.3)	2.3 (2.9)	1.9 (2.0)	2.0 (2.1)	1.8
GDP, calendar-adjusted	2.4 (2.5)	2.4 (3.0)	1.9 (2.0)	1.8 (1.8)	1.7
Final domestic demand*	2.4 (2.5)	1.9 (2.3)	1.2 (1.5)	2.0 (2.0)	1.9
Net exports*	-0.5 (-0.3)	0.1 (0.3)	0.5 (0.4)	0.2 (0.2)	0.0
Current account (NA), per cent of GDP	3.6 (4.2)	3.0 (3.9)	3.2 (3.8)	3.3 (3.9)	3.1

*Contribution to GDP growth, percentage points

Note. The figures show actual growth rates that have not been calendar-adjusted, unless otherwise stated. NA is the National Accounts.

Sources: Statistics Sweden and the Riksbank

Table 6. Production and employment

Annual percentage change, unless otherwise stated

	2017	2018	2019	2020	2021
Population, aged 15–74	1.1 (1.1)	0.8 (0.8)	0.6 (0.6)	0.5 (0.5)	0.5
Potential hours worked	0.9 (0.8)	0.9 (0.8)	0.8 (0.8)	0.8 (0.8)	0.7
Potential GDP	2.0 (2.2)	2.1 (2.2)	2.1 (2.2)	2.0 (2.1)	2.0
GDP, calendar-adjusted	2.4 (2.5)	2.4 (3.0)	1.9 (2.0)	1.8 (1.8)	1.7
Number of hours worked, calendar-adjusted	2.1 (1.8)	1.8 (1.7)	0.6 (0.7)	0.4 (0.4)	0.4
Employed, aged 15–74	2.3 (2.3)	1.7 (1.7)	0.8 (0.8)	0.5 (0.5)	0.5
Labour force, aged 15–74	2.0 (2.0)	1.4 (1.3)	0.8 (0.8)	0.6 (0.6)	0.6
Unemployment, aged 15–74 *	6.7 (6.7)	6.3 (6.2)	6.4 (6.3)	6.5 (6.4)	6.6
GDP gap**	1.2 (1.1)	1.5 (1.9)	1.3 (1.7)	1.1 (1.4)	0.8
Hours gap**	1.0 (1.0)	1.8 (2.0)	1.6 (1.9)	1.3 (1.5)	1.0

* Per cent of labour force **Deviation from the Riksbank's assessed potential level, per cent

Note. Potential hours worked and potential GDP refer to the long-term sustainable level according to the Riksbank's assessment.

Sources: Statistics Sweden and the Riksbank

Table 7. Wages and labour costs for the economy as a whole

Annual percentage change, calendar-adjusted data unless otherwise stated

	2017	2018	2019	2020	2021
Hourly wage, NMO	2.3 (2.4)	2.6 (2.6)	2.9 (2.9)	3.3 (3.4)	3.4
Hourly wage, NA	2.5 (2.7)	2.8 (2.8)	2.9 (3.0)	3.3 (3.4)	3.5
Employers' contribution*	0.0 (-0.1)	0.3 (0.1)	0.1 (0.1)	0.1 (0.1)	0.1
Hourly labour cost, NA	2.5 (2.6)	3.1 (2.9)	3.0 (3.1)	3.4 (3.5)	3.5
Productivity	0.2 (0.7)	0.6 (1.2)	1.2 (1.3)	1.4 (1.4)	1.3
Unit labour cost	2.4 (2.1)	2.6 (1.8)	1.8 (1.7)	2.0 (2.0)	2.2

* Contribution to the increase in labour costs, percentage points

Note. NMO is the National Mediation Office's short-term wage statistics and NA is the National Accounts. Labour cost per hour is defined as the sum of actual wages, social-security charges and wage taxes (labour cost sum) divided by the number of hours worked by employees. Unit labour cost is defined as labour cost sum divided by GDP in fixed prices.

Sources: National Mediation Office, Statistics Sweden and the Riksbank



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