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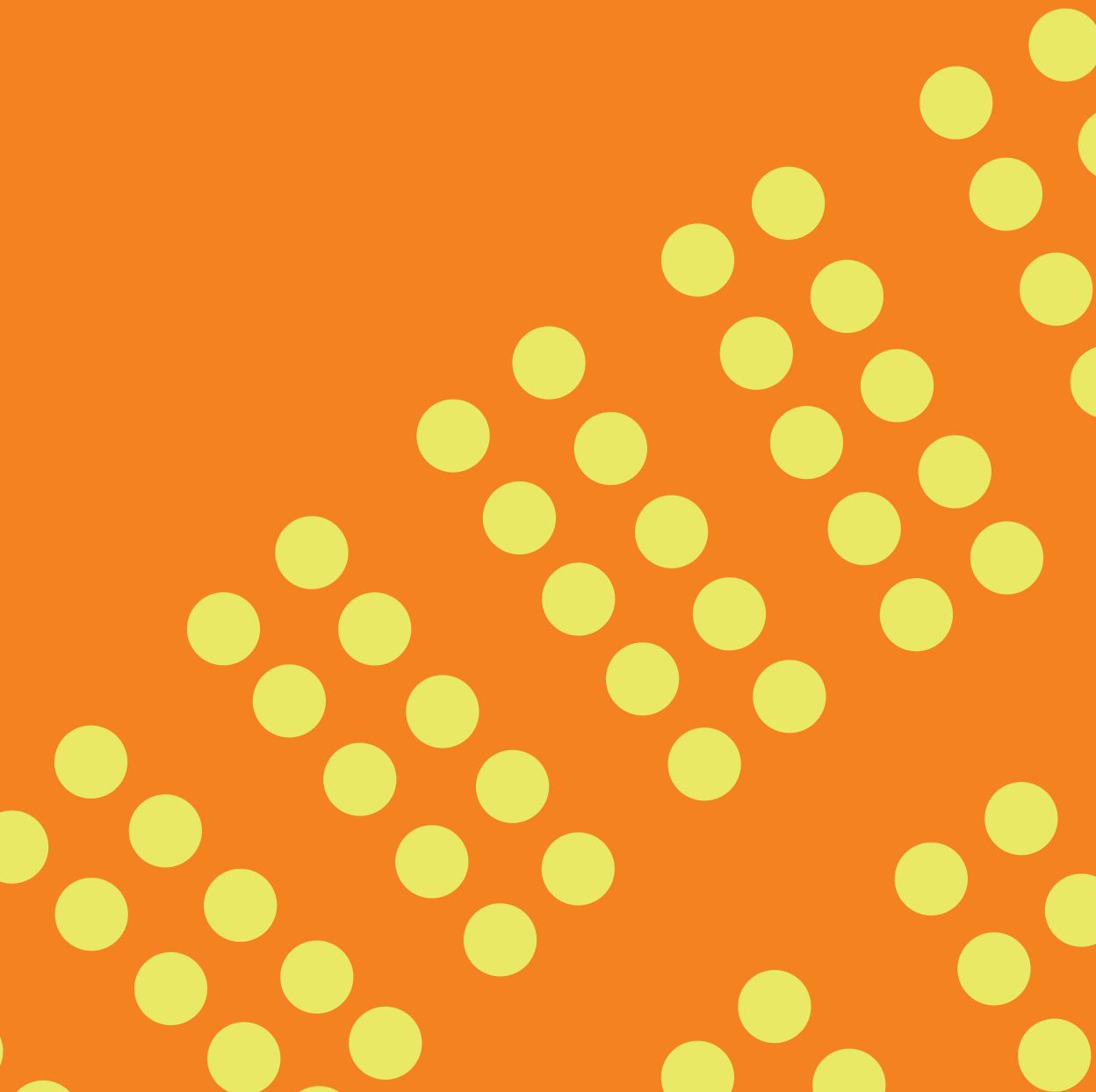
The Committee on Finance

Evaluation of monetary policy 2022

John Hassler, Per Krusell and Anna Seim



Evaluation of monetary policy 2022

John Hassler
Institute for International Economic Studies

Per Krusell
Institute for International Economic Studies

Anna Seim
Department of Economics

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Center for Monetary Policy and Financial Stability
(CeMoF)

Stockholm University

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Foreword by the Committee on Finance

The Committee on Finance has tasked the Center for Monetary Policy and Financial Stability (CeMoF) at Stockholm University with evaluating monetary policy 2022. CeMoF has in turn nominated Professor John Hassler, Professor Per Krusell and Associate Professor Anna Seim to perform the evaluation on behalf of the Committee on Finance. The researchers' report is the first of its kind and will serve as the basis for the Committee's forthcoming evaluation of the Riksbank's fulfilment of its objectives as regards monetary policy 2022.

The Riksbank's strongly independent status is laid down in the Constitution and it has been strengthened further with new Riksbank legislation which has been in force since January 2023. This places great demands on ensuring that democratic scrutiny of the Riksbank is carried out, and the Committee on Finance has an important role to play here. In accordance with the Riksdag Act, the Committee on Finance shall follow up and evaluate the activities of the Riksbank regarding the fulfilment of its objectives and its efficiency. This applies particularly to monetary policy, as the objective of price stability is the overall objective for the Riksbank. The assignment of the Committee on Finance to CeMoF to draw up this report on monetary policy is part of the Committee's work on developing the follow-up and evaluation of the Riksbank's activities.

Since the middle of the 00s, the Committee on Finance has carried out external evaluations of monetary policy approximately every five years. In these evaluations, the Committee on Finance has consulted international researchers and previous governors of central banks who look at monetary policy in a longer perspective. So far, four such external evaluations of monetary policy have been carried out.[1]

It is the hope of the Committee on Finance that the current report focusing on monetary policy last year will further stimulate public debate on Swedish monetary policy. The authors themselves are responsible for the content of the conclusions of the report.

Stockholm, May 2023

Edward Riedl (Moderate Party) Chair of the Committee on Finance	Mikael Damberg (Social Democrats) Deputy Chair of the Committee on Finance

[1] The first external evaluation was for the period 1995–2005 and was carried out by Francesco Giavazzi and Frederic Mishkin (2006/07:RFR1, report 2006/07:FiU27). The second was for the period 2005–2010 and was carried out by Charles Goodhart and Jean-Charles Rochet (2010/11:RFR5, report 2012/13:FiU12). The third was for the period 2010–2015 and was carried out by Francesco Giavazzi and Frederic Mishkin (2015/16: RFR6, report 2015/16:FiU41). The fourth and final report was for the period 2015–2020 and was carried out by Patrick Honohan and Karnit Flug (2021/22: RFR4, report 2021/22:FiU24).

Mikael Åsell
Head of Secretariat

Foreword by the authors

During the late autumn of 2022, the Center for Monetary Policy and Financial Stability (CeMoF) at Stockholm University was tasked by the Riksdag Committee on Finance to evaluate monetary Policy 2022.[2] CeMoF has therefore appointed a group of researchers who have been working with this evaluation during the spring.

The report has been written by Professor John Hassler, the Institute for International Economic Studies (IIES), Associate Professor Anna Seim, Department of Economics, and myself.

I would like to thank all those at the Riksbank who have provided data and other material which was used in the evaluation. We have also benefited from discussions with Kurt Mitman and doctoral students on the postgraduate programme in economics at Stockholm University.

We are responsible ourselves for the content of the report, and the conclusions drawn do not necessarily represent the views of other researchers connected to the Center.

Stockholm, May 2023.

Per Krusell

Professor, IIES, Stockholm University

Head of CeMoF

[2] For more information on CeMoF, please see https://www.su.se/center-for-monetary-policy-and-financial-stability/.

1 Introduction

This evaluation of monetary policy has been carried out by the Center for Monetary Policy and Financial Stability (CeMoF), at the request of the Riksdag Committee on Finance. The evaluation is the first of its kind. The overall objective is to evaluate "the Riksbank's monetary policy 2022 and how well the bank has achieved the objective of price stability". Our report is based on the Riksbank's account of the policy it has pursued in terms of reports on monetary policy and records from monetary policy meetings held in 2022, as well as other information and data.

An evaluation of monetary policy for a given year is made more difficult due to the fact that it takes time before the policy has any impact on the economy. The inflation and employment levels the we observe in 2022 are, to a certain extent, the result of the monetary policy pursued the years before, and we cannot yet evaluate the results of the measures taken during 2022. We have therefore chosen to place monetary policy in a broader context and discuss the policy of 2022 in the light of the macroeconomic development in recent years and the policy pursued during the same period.

This would appear particularly important as this year's report is the first external report the Committee on Finance has ordered as a basis for its annual evaluation of monetary policy, but it is also naturally more general in nature precisely because the effects of monetary policy are not immediate and an analysis of a particular year would risk missing important aspects.

Our primary conclusions are as follows. There is no doubt that the annual inflation according to the consumer price index with a fixed interest rate (CPIF) at 7.7 per cent exceeded the 2 per cent inflation target in 2022. The high level of inflation was above all a result of a number of unexpected disturbances in the economy and a very strong recovery after the pandemic, but, as implied above, to a certain extent also a result of earlier measures (or a lack of them). Our assessment is that even if the Riksbank had pursued an optimal policy in the years before and during 2022, it would not have been possible to limit inflation to 2 per cent during the year. Nor would it have been desirable to arrive at a 2-per-cent inflation level by pressing down prices which were not directly affected by for example low supply levels or high energy prices. We also note that long-term inflation expectations, for 2 or 5 years ahead, also converged towards 2 per cent in 2022. This indicates that the Riksbank has succeeded in establishing credibility for the inflation target and that this credibility does not seem to have been impaired by the high rate of price increases during the year. As the Riksbank's most important task is to provide the economy with a nominal anchor that households, companies and the parties to the labour market can base their decisions on, we believe that the Riksbank, in spite of the high level of inflation, largely achieved the price stability objective in 2022.

As regards the specific decisions that have been made, what they are based on and the communication that has been conveyed externally, we do however have a number of objections. Firstly, the Riksbank's inflation forecasts have been seriously misleading. The way in which the forecasts have been updated over time show that the Riksbank underestimated the inflationary pressure that arose in Sweden and in other countries at the end of 2021. In this regard, our assessment is that a greater prevalence of economic theory would have been of value, specifically an analysis of how the supply shocks that were still in evidence after the pandemic, together with an accumulated demand which increased in strength when restrictions were lifted, worked together to create a powerful inflation impulse.

We believe that the Riksbank ought to have raised its preparedness when inflation began to rise very rapidly in December 2020 in the USA and when the *Bank of England*, for example, began to raise its policy rate in December 2021. Our second objection applies therefore to the chosen interest rate path. The higher interest rate path which introduced with a rise of 25 points in April 2022 should have come earlier, that is back at the February meeting (alternatively at an extraordinary meeting in March when inflationary pressure had become even more evident). This would have made it possible to curb part of the rise in inflation, even though we do not believe that the difference would have been that great.

A third, and related, objection applies to external communication that has taken place. In general, it would be valuable if the Riksbank in future could base its forecasts more clearly on macroeconomic developments, in other words identified specific circumstances which may come to be significant. It could present several different scenarios, and state under which macroeconomic conditions it intends to carry out various measures. We believe that this would have been particularly valuable at the February meeting. It would have been possible, even though the general conviction was that inflation most probably would recede shortly, to explain that another inflationary development, like the one observed abroad, was in fact possible also in Sweden, and that policy rate setting would therefore have to be changed radically. When this actually did occur, quite unnecessarily it came as a surprise.

Our fourth and final major objection concerns the fact that the Riksbank continued to buy securities in 2022, that is, it pushed through *quantitative easing (QE).* Balance sheet operations are, in principle, expansionary measures that ought to have been phased out quickly when rate setting became restrictive. However, our general evaluation of quantitative easing is that it is not especially effective during normal conditions, that is in the absence of unrest in the finance market. It thereby follows that a sale of securities in 2022 would not have been of any significant help, as the economic situation had been, and remained, strong. The Riksbank could above all once again use the more effective policy interest instrument, as opposed to previous years when interest rates were close to the lower interest restriction. The Riksbank has made great losses caused by the fall in value of the assets purchased within the

framework of QE. This entails a significant cost for central government finances, but a more rapid phasing-out of QE during 2022 would not have reduced losses significantly, if at all. Our overall assessment is thus that the Riksbank should have started to reverse its purchases of securities early on in 2022, but that this alternative policy would not have led to more than a marginally positive outcome, not even in terms of the Riksbank's earnings.

The report is organised as follows. In section 2, we give an account of the objectives of monetary policy and provide a summary of what research says about central macroeconomic relationships and the effects of monetary policy measures. In section 3, we give an account of macroeconomic developments up until 2022. Sections 2 and 3 serve as important background, especially as this is the first report of its kind. In section 4, we describe monetary policy in 2022, focusing on those parts we see as having central importance, Section 5 contains our evaluation of the policies pursued. Our conclusions are summarised in section 6.

2 Background –objectives, theory and empirical data

The section provides a background to the analysis in the report. We interpret the Riksbank's tasks and objectives and give a short account of what research says about central mechanisms which are discussed later in the report. These parts should not be seen as an exhaustive description of the subject of monetary policy. They have been selected as they provide the basis for our analysis. We have not included more than a few references to the research literature, both to maintain focus in our presentation and to signal that we make assessments that must be based on our interpretation of the research situation, and that therefore can be difficult to link to specific studies.

2.1 The Riksbank's objectives and our interpretation

Under Chapter 1, Section 2 of the Sveriges Riksbank Act (1988:1385), which applied in 2022, the objective for the activities of the Riksbank shall be to "maintain price stability". Furthermore, the Riksbank should "promote a safe and efficient system of payments". The Riksbank endeavours to maintain price stability with the help of an inflation target of 2 per cent on an annual basis. Since 2017, the consumer price index with a fixed interest rate (CPIF) has been the Riksbank's formal target variable.

The Riksbank has a flexible inflation target which means that the real economy must be taken into consideration when monetary policy decisions are made. In the new Riksbank Act, which came into force on 1 January 2023, this is even more pronounced, but since our assignment is to evaluate monetary policy in 2022, we will examine monetary policy in the light of the Act that was applicable then.[3] However, it is important to point out that in our assessment in section 5 we interpret a significant temporary deviation from the target – and more tangibly, a deviation towards high inflation during 2022 – as in itself at least being potentially compliant with the Act. Inflation has been affected strongly by external price shocks for specific goods, and in this situation, inflation must be allowed to rise for these reasons. The alternative to allowing these relative price shocks to take place would be for the Riksbank to attempt to lower other prices and salaries thus holding back average price levels. This could have led the economy into a considerable recession. In other words, as stated in section 5, we do not interpret inflation targets literally but instead in terms of a more general rise in prices. Our interpretation naturally leaves some

[3] Chapter 2, Section 1 of the Sveriges Riksbank Act (2022:1568) (the new Riksbank Act) states as follows: "The overriding objective of the Riksbank is to maintain low and stable inflation (the price stability objective). Without neglecting the price stability objective, the Riksbank shall contribute to a balanced development of production and employment (consideration for the real economy)."

scope for the assessment that inflation has still been allowed to increase too much (since there has also been an excessively high increase in prices).

2.2 Conventional monetary policy

We will now provide a brief overview of how the research world sees pricing and inflation, exchange rate determinants and effects of outcomes such as inflation, employment and exchange rates and changes in policy rates. We describe the monetary policy transmission mechanisms and comment very briefly on relevant empirical studies.

Price and wage setting – rigidities

The effects of monetary policy are largely a result of the fact that prices and salaries demonstrate *rigidity:* They do not change continuously as a result of changes around the world. Many companies do not immediately change the price of their products if the cost for producing the products rises and, when they change the price, nor do they necessarily do so to compensate exactly for the rise in cost. In the same way, companies do not raise their prices if demand suddenly rises. Salaries are adjusted relatively rarely. Historically, in monetary theory, the volume of money was seen as a key monetary policy instrument. In the absence of rigidities, doubling the volume of money would not affect its real value (*neutrality* as regards monetary policy) but would just mean that all nominal variables would see their values double: Prices and salaries are multiplied by two, which would also mean that real salaries would be unaffected. If, on the other hand, prices and salaries are sluggish, an increased nominal monetary volume in households would also mean a real increase in purchasing power which this could be influenced by monetary policy. Modern central banks primarily control the policy rate, but the same kind of restrictions still apply: The real effects of changes in the policy rate mainly depend on rigidity in prices and salaries. Rigidities in price and wage setting, which can be said to constitute failings in the functioning of the market, are at the same time a precondition for the effectiveness of monetary policy.

The degree of price and wage rigidity is also of course of central importance when it comes to understanding how prices and wages develop, and these questions have recently become highly topical. When the prices of energy and certain input goods rise dramatically, and relatively unexpectedly, a crucial factor is how price and wage setters react and can be expected to react in future. These rigidities are thus not only of central importance when it comes to understanding the effects of monetary policy, but also for inflation forecasts (regardless of monetary policy).

Systematic and comprehensive empirical reviews of the frequency of price changes at companies were not presented until the beginning of the 2000s for the USA and a little later in Europe. We know today that considerable price rigidity exists. The likelihood of a typical item of goods changing its price

from one month to the next is 20 per cent or lower, but there are of course large differences in price rigidity between different groups of goods. The reason this research is relatively new is limited availability of historic microdata. But this also means that what we know about price rigidity originates from a period without significant inflation, as inflation has been historically low since at least since the 1990s. How companies behave today, and have been expected to react to the relatively great and generally visible rises in cost in 2021 and 2022 is somewhat of an open question. Our picture of current research is however that the following aspects are particularly important when assessing the behaviour of price-setting. Firstly, it is more likely that companies rapidly adjust their prices upward in the case of great changes in cost. Secondly, households are more susceptible to higher prices when cost increases are also visible to them. The first aspect applies directly to theories based on a reasonable assumption of fixed costs in the case of changes of price, also known as *"menu" costs*. The second aspect is based on an observation from behavioural economics.[4] It is therefore reasonable that the dramatic cost increases which started the increase in inflation in Sweden and in the world at large had a more rapid and fuller impact on prices than under more normal circumstances. It is too early to say whether many companies took the chance to exaggerate claims about cost increases and therefore raised their prices and extended their profit margins without losing customers. But it is reasonable to expect that price increases of this type are temporary and should disappear when competition between companies in the long term forces price levels down again.

Price level and determinants for the value of the SEK

In 1963, Milton Friedman established in his *Presidential Address* for *the American Economic Association* that "*inflation is always and everywhere a monetary phenomenon".* His statement was based on a stable relation between the money volumes and the GDP. Money is needed as a means of payment, and the amount of money that is needed is, as an approximative law of nature, proportional to total revenue, that is the GDP. This hypothesis is often called the *quantity theory*. Transactional patterns were regarded as not affecting real GDP, which was decided by completely different factors, at least in the long term, and therefore a doubling of price levels meant that twice as much money was required, as price levels that are twice as high lead to high nominal incomes. This relation must always be met and the connection would therefore also apply the opposite way round. According to Friedman, inflation can only arise as a result of changes in money volume and is therefore a *monetary phenomenon.*

Friedman's view is still part of our understanding of the value of money. Nonetheless, it can be noted that the volume of money in relation to the GDP varies greatly over time and displays changes that are sensitive to trends. The

[4] Price increases motivated by visible increases in demand can, however, irritate customers. A classic example is marked increases in the price of umbrellas on days when it is raining.

extent of the use of money (and which definition of money that is relevant) in transactions has varied over time. The value of money is also related to its role as a store of value, something we are reminded of particularly in times of crisis, when saving in liquid assets rises. During the period with low interest rates before and during the pandemic, various types of crypto currencies emerged as alternative stores of value and also as a means of payment. In other words, the quota between money volumes and the GDP is far from being such a fundamental factor as Friedman claimed was the case.

Economic theory has also helped us to understand that Friedman, to a certain extent, can be said to have been completely wrong. Since banknotes and coins are not convertible (in exchange for gold and other goods), but only have a value because of the fact that the recipient of a payment in SEK also expects that others in turn will exchange goods or services for SEK; in this way, the value of money is instead a form of a bubble. Money has value for us only because we have a strong belief that others think the same way. Hyperinflation is in fact theoretically possible if everyone were suddenly to lose confidence in the value of money. Such a situation feels unlikely, but it is clear that the extent to which money is used as a store of value and as a means of payment definitely affects its value. Changes of this type take place continuously, but are also difficult to predict, which is why the lasting value of money is difficult to predict in the long term.

The line of reasoning above may seem very theoretical, but let us now consider the relative value of different currencies, for example the exchange rate between the US dollar and the Swedish krona. We will begin by defining the term *purchasing power parity*, which means that a certain item of goods which can be purchased in two countries should cost approximately the same when expressed in the same currency. It is reasonable that purchasing power parity will be maintained more or less, since trading is possible. If a Big Mac, which is often taken as an illustration of this principle, is cheap in Sweden if expressed in US dollars, it is usually claimed that the Swedish krona is undervalued. For all goods that are traded across borders, it is reasonable to assume that there are relative prices which create a balance between supply and demand.

Generally speaking, this line of reasoning would indicate that there is a relative price between the goods of various countries which arises at least in the medium term. This relative price is called the *real exchange rate*.[5] If it deviates from what we believe to be its equilibrium level, it should be expected to return to its equilibrium level in the long term. Now it is claimed for example that generally speaking things are cheaper in Sweden than in Denmark than what we believe to be reasonable in the longer term. In economic terms,

[5] If we express the nominal exchange rate, E, in the number of units of domestic currency per unit of foreign currency, the real exchange rate is defined as $Q=EP^*/P$, where P is the domestic price level and P^* the foreign price level. An increase in the real exchange rate with this definition would mean a real depreciation. In the report, we consistently express the nominal exchange rate as the number of units of domestic currency per unit of foreign currency, see for example figure 3.7, in section 3.

we say that the Swedish real exchange rate in relation to Denmark is thus undervalued and that it reasonable to assume that it will be strengthened in the long term. Here, it is important to note that a real reinforcement of this type can occur in two ways, either by means of the nominal exchange rate being strengthened or by means of Swedish price levels rising in relation to those in Denmark. The latter would indicate that inflation is higher in Sweden than in Denmark. The fact that the real exchange rate is undervalued does therefore not automatically lead us to the conclusion that the value of the Swedish krona should rise. In order to be in a position to say something about this, we need to make an assessment of what will happen to inflation in the two countries.

One way to decide the relative price level between two countries is to use Friedman's theories. If the quota between money volume and nominal GDP is constant, the differences in inflation are decided by differences in the growth rate of money volume corrected for possible differences in the growth rate of real GDP. In that case, a restrictive monetary policy, that is weaker growth in money volume, would result in the price level increasing more slowly, which means that the exchange rate instead would appreciate. As we mentioned earlier, however, the quota between money volume and GDP is hardly constant. Nor is monetary policy any longer pursued as a result of the central bank deciding on money volume, but rather by setting a policy rate. There is empirical support for the fact that restrictive monetary policy, that is a rise in interest rates, results in a nominal reinforcement of the exchange rate (an *appreciation*). A reasonable interpretation is that such a policy will lead to lower price levels in future. Given the future real exchange rate, the future nominal exchange rate will be strengthened, which would have immediate impact on today's nominal exchange rate.

An appreciation of the Swedish nominal exchange rate could be beneficial today as import goods would then be cheaper in Swedish kronor. According to theory and empirical data, a rise in interest rates could contribute to this. The problem is that rises in exchange rates are relatively weak and blunt tools for influencing the exchange rate. Bacchetta och Chikhani (2021) focus on the development of the Swedish krona and find that the relationship is approximately one to one. A rise in interest of one percentage point leads to an appreciation of the Swedish krona of only one or a few per cent.

Monetary policy is also ineffective in the sense that many other factors influence the value of different currencies. When it is a question of whether international investors choose dollars or Swedish kronor in their portfolios, it depends on how the currencies are regarded as stores of value. The Swiss franc is generally regarded as a strong store of value, particularly in times of international crisis, and it has now appreciated in value for some time. Why two countries such as Sweden and Switzerland, which resemble each other in many respects, have currencies that have developed so differently is, however, not obvious. In any case, the differences in the development of the currencies do not depend on differences in policy rates. We will return to the development of exchange rates in section 3.

The conclusion is that exchange rates are difficult to understand, both in the short and in the long term. They also fluctuate markedly over time, apparently inexplicably, like a *random walk* where the changes over time are quite random.[6] The only way to be sure of controlling an exchange rate is to introduce the euro as a currency or possibly do as Denmark and introduce a fixed exchange rate. An analysis of this question lies outside our assignment and is not something we will discuss further.

Monetary policy transmission mechanisms

When there is price and wage rigidity, central banks can, by influencing nominal interest rates, also affect the *real interest rate*, that is the nominal interest rate minus estimated inflation, and thus economic activity. When there is a variable exchange rate, the central bank's most important instrument is normally the policy rate.[7] The policy rate determines interest rates on loans between the central bank and the commercial banks, as well as the overnight rate, that is the interest rate the banks pay for short-term loans from each other. Since the policy rate affects banks' costs, it also affects the rates of interest households and companies have to deal with. Changes in the policy rate affect aggregated demand by means of *monetary policy transmission mechanisms*. These can be classified in different ways, but usually a distinction is made between an *interest rate channel*, a *cash flow channel*, a *present value channel* and an *exchange rate channel*. What all these channels have in common is that a rise in the policy rate reduces aggregate demand, while a reduction in the policy rate increases it.

According to the interest rate channel, changes to the interest rates that households and companies meet have a tendency to influence their decisions whether to consume or invest now or in the future. A rise in interest rates will lead to households having a greater incentive to save and therefore they will consume less.[8] Furthermore, a rise in interest rates reduces the demand for investment, which also leads to decreased demand in the economy. It is the *real interest rate* that has an impact on the interest rate channel, but as we noted above, sluggish prices result in changes in the nominal policy rate having an impact via this channel.

According to the cash flow channel, an increase in the interest rate means that household costs, particularly for mortgages, will rise. If households are restricted in terms of liquidity or have small margins, an increase in interest rates can thus lead to their having to cut down on other consumption. It is the nominal interest rate that has an impact on the cash flow channel and it is

[6] See also figure 3.7 in section 3.
[7] The Riksbank's policy rate was known as the repo rate up to June 2022. In the report, we consistently use the term policy rate, unless otherwise stated.
[8] According to the *Euler Equation* for consumption, an increase in the interest rate results in households redistributing their consumption over time, also known as *intertemporal substitution*. However, studies imply that intertemporal distribution is of limited significance, empirically speaking (Boivin et al. 2011, Kaplan et al. 2018). The cash flow channel is probably stronger.

probably particularly important in an interest-sensitive economy like the Swedish economy, in which a relatively large proportion of households have variable interest on their mortgages. The cash flow channel also affects households who have accumulated capital, but whose liquidity is limited as this capital is bound up in for example housing. Empirical studies indicate that the cash flow channel is important.[9]

Changes in interest rates can also affect private consumption by having an effect of the prices of assets, such as shares and homes, via what can be termed the *present value channel*. A higher interest rate reduces the value of assets such as shares and homes, which makes the capital assets of households fall. This has a direct effect on the total consumption of households, while also making the value of the securities that households use for their loans fall. This makes it more difficult to borrow and more households will have their liquidity reduced, which curbs consumption. This mechanism also works in the opposite direction. Low interest rates that force up house prices lead to increased consumption and higher demand. The present value channel plays its part in normal fluctuations in the economy, but can also make consumption take unwelcome turns. Rapidly rising prices can result in the consumption of households dramatically exceeding their disposable income, while falling prices can lead to a rapid drop in consumption. There are studies that imply that these mechanisms were important before and during the global financial crisis in 2007–2008, and that this was a contributory factor resulting in the fact that the recession was so deep.[10]

As we mentioned in the section above, changes in interest rates in a small open economy with free movement of capital also influence aggregated demand via what is usually called the *exchange rate channel*. If the Riksbank raises interest rates, the value of the Swedish krona tends to be strengthened. Given the fact that prices change slowly, the result of this is that our exports become more expensive and imports cheaper, which results in an aggregated demand and lower inflation via lower import prices. As we noted in the previous section, very dramatic changes in interest are required for the Swedish krona to appreciate to any great extent. We will return to exchange rates in section 3.

Distributional effects of monetary policy

The Riksbank's task is not to influence the distribution of resources in society, but there are still reasons for a central bank to understand and take account of the development of inequalities in income and wealth. In recent years, the distributional effects of monetary policy have been given increased attention not only in public debate but also in the research world. One reason for this is

[9] Almgren et al. (2021) show for example that the European Central Bank's changes in interest rates have had more marked effects on the GDP in euro countries with a higher proportion of households whose liquidity is restricted.
[10] See for example Mian et al. (2017), Mian and Sufi (2018) and Guren et al. (2019).

implied in the previous paragraph: Analyses of the effects of monetary policy must be based on the fact that different households and companies have different preconditions and are in different economic situations. In the case of households, it is of central importance to understand how a given household's revenues, expenses and capital are directly influenced by monetary policy and how its consumption is then affected (its *marginal propensity to consume*). An important insight here is that the marginal propensity to consume can also be high for rich households, since their capital to a great extent is bound up in their homes. Modern research based on microdata would imply that this heterogeneity is considerable and that it affects the ability of monetary policy to control demand.[11]

Empirical literature on the subject of distributional effects of monetary policy is limited, but had grown as microdata have become available in more and more countries. In a study on Swedish data, Amberg et al. (2021) find that an unexpected fall in the policy rate of 25 points increases revenues in everything that is distributed, but that the increase is four to five times larger in the tails than distribution in the middle. For low-income earners, earned income increases, probably because expansive policies keep employment at a high level, and at the other end of the distribution, the effect is fuelled by higher capital revenues.

In order for monetary policy to have lasting effects on income and capital distribution, it has to be asymmetrical, so that a certain group tends to benefit more than other groups. But here, we note that monetary policy by necessity is often restrictive, while it can sometimes be stimulating. Based on the prevailing research situation, it is too early to draw any conclusions on whether monetary policy has significant asymmetrical distribution policy effects over a longer period of time containing both incentives and restrictions.

In section 3, we discuss the global trend with falling interest rates which has been observed in the last few decades. Here, we will confine ourselves to noting that the low interest rate situation has led to drastically rising prices of real assets such as shares and homes. This has created a build-up of capital of historic proportions. Even though broad groups in society have benefited from this, the capital is without doubt unequally distributed. The fact that the trend for interest rates has been to fall for some time is something that primarily lies outside the Riksbank's and other central banks' control, but individual episodes, such as the rise in house prices during the pandemic, may partly have been the effect of the monetary policy pursued with the result that it had consequences as regards distribution policy. The case now in progress regarding house prices is partly, but not completely, reversing the redistribution that took place when interest rates were low and house prices rose.

[11] Finance policy should also be analysed in the light of this type of heterogeneity and it can generally be formulated in a more effective way via targeted instruments.

Empirical studies of the effects of monetary policy

When the effect of changes in monetary policy are to be estimated, one problem is that a change in the policy rate influences such outcomes as GDP and inflation, while at the same time changes in the economy influence which policy rate is to be set. These opposing causalities need to be separated in order to be able to estimate the effects of monetary policy statistically. There is no completely watertight way of doing this, and different studies therefore give different results. One way of identifying the effects of changes in the policy rate is to assume that they have a delayed impact on inflation and employment. This method, proposed by Christopher Sims in 1980, often leads, in its original form, in practice to the result that monetary policy has relatively small effects.

Another empirical strategy, launched by Christina and David Romer in the 1990s, is to use communication from the central bank to assess the extent of surprises in monetary policy. By studying records and communication, it is possible to, more informally, identify changes in interest rates which do not appear to have been caused by any disturbance in the economy. The effects of monetary policy that are gauged using this approach are often considerably greater.[12] However, it is not possible to exclude the fact that the effects of monetary policy depend on whether or not a change in interest rates reacts to a disturbance in the economy.

In recent years, it has become increasingly common to identify surprises in monetary policy with high-frequency data within an hour of the central bank presenting a policy rate decision. It is in fact possible to compare price movements of interest-bearing bonds directly before and after interest rate decisions are made and, in so doing, discern the extent of surprise in the central bank's policies. These surprises are then interpreted as "surprises purely as a result of monetary policy". When the method is applied, we find qualitative results in line with those that are based in the above-mentioned methods, with varying strengths depending on the time period and country.

A further opportunity for assessing the effects of monetary policy is to build mathematical models of the economy and choose the parameters for the model so that it can succeed in describing relevant data and empirical results, such as those discussed above. Such models are built and used by the Riksbank, and also, for example, by the National Institute of Economic Research. In the Riksbank's *dynamic stochastic general equilibrium (DSGE) model*, MAJA, an increase in policy rate by one percentage point results in a fall in GDP of around 0.7 per cent after one and a half years.[13] The fall in inflation is relatively small, at most 0.2 percentage points annually year after year.

These models provide significant input for decision-making and discussion on the opportunities of monetary policy. They can be used as a sort of laboratory to analyse the consequences of changes in policy and economic disturbances, including those that have not been observed historically and

[12] See Coibion (2012) for an overview.
[13] Corbo and Strid (2020).

therefore cannot be analysed in any other way. But we would like to emphasise that the quantitative predictions of the models must be used in the right way. It is particularly important to be aware of the limitations of the model. MAJA is a rich and complex model, but is of course based on specific assumptions that in spite of everything must be seen as quite a gross simplification of reality.

In most models of the type described above, the effects of monetary policy depend firstly on how long an increase in the policy rate, for example, can be expected to remain in force. The longer interest rates are expected to be at a high level, the greater the effects. The type of interest change that is normally studied is one that successively recedes by a half over a year. But not all interest rate increases follow this pattern. More generally speaking, both expectations and uncertainty as to the course that the policy rate will follow also have an important role to play. Secondly, the effects of monetary policy are assessed taking for granted the assumption that nothing else will happen that will influence how the economy functions. The effects of an expansive monetary policy are for example probably more powerful when the economy is entering a financial crisis. The models also assume that expectations as regards inflation are firmly based well into the future. If there is a risk that these firmly held expectations might erode, the dynamics might be completely different. We still lack models that can describe such dynamics in a credible and quantitative fashion.

The most important task for monetary policy, especially today, is to avoid a situation in which inflation becomes embedded in the economy. In such a development, long-term expectations regarding inflation increase, and these become a self-fulfilling prophecy. We lack models that can quantitatively describe how high inflation needs to be and how long it needs to be high for this to happen. The same applies to dynamic events which can give rise to financial crises. In any case, it is clear that models in which expectations regarding inflation always play an integral part and in which financial crises never arise provide insufficient guidance for the situation today. We would therefore like to advise against overinterpreting claims that would imply that a certain result has been identified in any quantitative model. Such predictions may be the best ones that can be made in normal times, but they must be interpreted with considerable caution in situations characterised by considerable insecurity. During a period with rapidly increasing inflation, our assessment is that increases in the policy rate can be especially important, precisely because they are an expression of the Riksbank giving priority to ensuring that inflation expectations continue to have widespread support. In this case, they can also lead to a moderation in price and salary increases, precisely because they have an impact on the formation of economic expectations.

2.3 Unconventional monetary policy

The neutral real interest rate is an interest rate that has an effect that is neither stimulating nor restrictive. In section 3, we note that the trend has been for it to fall over the last three decades. An interest rate that is restrictive today would thus have had a drastically stimulating effect 20 or 30 years ago. The 'new normal' is thus low interest rates. In this low-interest environment, central banks in many countries, among them the Riksbank, have had difficulties reaching up to their inflation targets, particularly after the great financial crisis of 2007–2008. Lowering interest rates to zero has quite simply not been enough to efficiently stimulate the economy. Many have therefore pursued what is known as *unconventional monetary policy*: A *negative interest rate policy*, has been pursued, *forward guidance*, has been employed and *quantitative easing* has been implemented.

Negative policy rates

Negative policy rates have been introduced in many countries and we have reassessed concepts such as the *zero lower bound*. Policy rates can evidently be negative, and we are now instead speaking of an *effective lower bound* which states at which (negative) interest level it is no longer deemed meaningful to reduce the policy rate further. The nominal interest rate on cash is zero. In principle, it would be possible for cash to take over the role of the banks' liquidity reserve if negative interest rates were to make having assets at the Riksbank excessively costly. However, the handling of cash is also costly, and considerably negative interest rates would probably be needed during a longer period of time for such a development to arise.

Negative policy rates have had a normal impact on interest rates on the interbank market and on banks' interest on deposits going down to zero. On the other hand, interest rates on deposits have typically not been negative, at least not for households. In certain countries, this has resulted in problems of profitability for the banks. Low earnings capacity of banks has however not been a problem in Sweden.

Our assessment is that the effects of monetary policy do not undergo any abrupt qualitative or quantitative changes when the policy rate passes zero. A slightly negative policy rate, for example -0.25 per cent, is somewhat more stimulating that a slightly positive one, but otherwise not vastly different from positive interest rates. The significant attention in public debate that has been paid to negative interest rates is presumably to a large extent caused by the fact that we have not experienced this phenomenon historically. Since our task is to evaluate monetary policy for 2022, when policy rates were non-negative, we will not go into further depth on these issues here.

Forward guidance

Monetary policy takes effect partially via financial markets and several of the transmission mechanisms of monetary policy that we discuss in section 2.2 are driven by expectations. The effect of this is that communication about the future policy rate or future assets purchases, known as *forward guidance*, has become an important tool for central banks. By publishing forecasts and presenting signals in publications and speeches, a central bank can influence expectations in the economy. A distinction is made between less binding *Delphic* guidance and more binding *Odyssean* guidance, where the central bank in the latter case promises that it will implement a given measure. Odyssean guidance can be formulated so that it is *time-contingent* or *state-contingent*. Forward guidance works well only if the policy signals are credible. In the best of worlds, a central bank should carry out what it has said it will do so that the market repeatedly takes signals seriously. But if the state of the economy changes, the central bank can be forced to choose between not living up to the expectations of the market or implementing an unsuitable measure.[14] There are therefore clear advantages of envisaging and presenting scenarios depending on future developments so that the central bank can retain a certain amount of flexibility. We believe that the Riksbank can communicate its policy better by means of state-contingent guidance. We will return to this below.

Quantitative easing

The most extensive unconventional monetary policy measure that central banks have taken during the last decade is quantitative easing (QE). Quantitative easing is an umbrella term for balance sheet operations, but has primarily entailed central banks purchasing government bonds with long maturities in the secondary market.[15]

Discussion on QE is and has been extensive and, in our opinion, there are a number of obvious misconceptions circulating. QE has often been presented as a process in which central banks have set the money presses in motion and, with methods similar to Milton Friedman's classic *helicopter drops*, have spread these newly printed banknotes to banks and households. Given this description, it is easy to draw the conclusion that QE both before and during the pandemic is an important reason for the inflationary problems we are seeing at the moment. This, in our opinion, is a completely incorrect analysis.

[14] Flug and Honohan (2022) believe that the Riksbank appears to have felt it was forced to implement certain measures that had been announced (but not promised), despite the fact that it was doubtful at the point they were implemented whether they were justified. Two examples they identify are the raising of the negative policy rate to zero in 2019 in spite of the fact that it was not clear at that point whether inflation had permanently passed the target of 2 per cent together with purchases of corporate bonds during the pandemic in 2020. These purchases were announced during the spring of 2020, but were not implemented until September, when according to Flug and Honohan they were no longer needed. Walentin (2022) also believes that the Riksbank pushed through asset purchases to a greater extent than was justified.

[15] See the Bank of England (2023) for a review of the effects of quantitative easing.

QE basically concerns the redistribution of financial assets. In the case of purchases of government bonds, which was exclusively what the Riksbank was doing up until the pandemic, QE involved the Riksbank buying part of the outstanding national debt from the private sector. As payment, the latter receives assets in the form of funds in an account at the Riksbank. The interest on these assets is directly linked to the policy rate. QE leads to an expansion of the Riksbank's balance sheet, but both liabilities and assets increase equally. No difference arises concerning the extent of wealth between the public and private sectors

On the other hand, QE leads to a reduction in the average term to maturity of the national debt.[16]

The longer the term to maturity a bond has, the more sensitive is its value to changes in interest. A person who owns a bond with a long period of maturity therefore takes a larger interest rate risk. If the interest falls, the value will fall. The fall is greater the longer the period of maturity and the longer the interest is expected to be high. The mechanism is the same for mortgages. A household is less sensitive to changes in interest the longer the interest is fixed. A household is most sensitive when the interest is variable and thus can be subject to continuous change. With a fixed interest rate, it is instead the person who owns the debt, that is the bank or whoever the bank has re-sold the debt to, who bears this risk. The person who takes this risk normally requires compensation for doing so. The interest rate is on average thus higher, the longer it is fixed; the *maturity premium* is positive.

If the state via the Riksbank lowers the average term of maturity of the national debt, the state assumes a greater part of the interest rate risk. This can lower the maturity premium in that the more long-term interest rates will fall, which stimulates the economy. During normal times, however, when the private sector has the will and ability to carry interest rate risk, these effects are probably slight. Empirical studies indicate that QE has a certain effect on interest rates in the economy. However, these studies focus on the short-term effects, as the long-term effects are more difficult to predict.[17] Even if QE rapidly increases the total assets of the central bank's balance sheet, something that critics often recognise, our assessment is that the effect on the economy is relatively limited as long as the interest rates are not greatly affected. There is also good reason to believe that the effects are symmetrical, that is that in a situation when the private sector has normal capacity to carry risk, the effects of reducing the central bank's holding of bonds are not especially great. It should however be pointed out that quantitative tightening (that is the opposite

[16] At the end of 2022, the Riksbank's holdings of government bonds amounted to SEK 338 billion. This was 41 per cent of the outstanding volume of government bonds. The remaining term to maturity of the Riksbank's holdings varied between a few months and up to 23 years. The value-weighted average for the remaining term to maturity was 5.8 years (our own calculations based on the Riksbank's statistics on their holdings).

[17] The literature that attempts to gauge effects of QE is rapidly increasing. For a study on data in Sweden, see Di Casola and Stockhammar (2021) who show that QE from the Riksbank stimulated the economy which led to an increase in GDP and a reduction in unemployment, but they also find that the effects on inflation are uncertain.

of easing) has not been studied empirically in principle at all, as we have not observed this historically.

As QE can have unintended effects, it is still valuable to reduce the Riksbank's holdings of securities. Blix Grimaldi et al. (2021) argue for example that the Riksbank's purchases of securities have caused a deterioration of liquidity in the Swedish bond market when the Bank's holdings as a proportion of the total volume of outstanding bonds have become sufficiently large. The Swedish National Debt Office (2018) notes that the Riksbank's purchases of bonds had also contributed to a smaller turnover in the bond market before the pandemic.

In normal times, our assessment is thus that the effects of QE are limited. However, in connection with great macroeconomic crises, the private sector's will to carry risk can decrease. At the same time, the perceived (and actual) risk of various financial assets can increase dramatically. Risk premiums on such assets can then rise rapidly and uncontrollably so that their value collapses. This applies particularly to financial assets other than bonds issued by states with good creditworthiness. For these assets, the risk does not so much have to do with interest rate risk, but more with suspicion of inability pay on the part of the issuer.

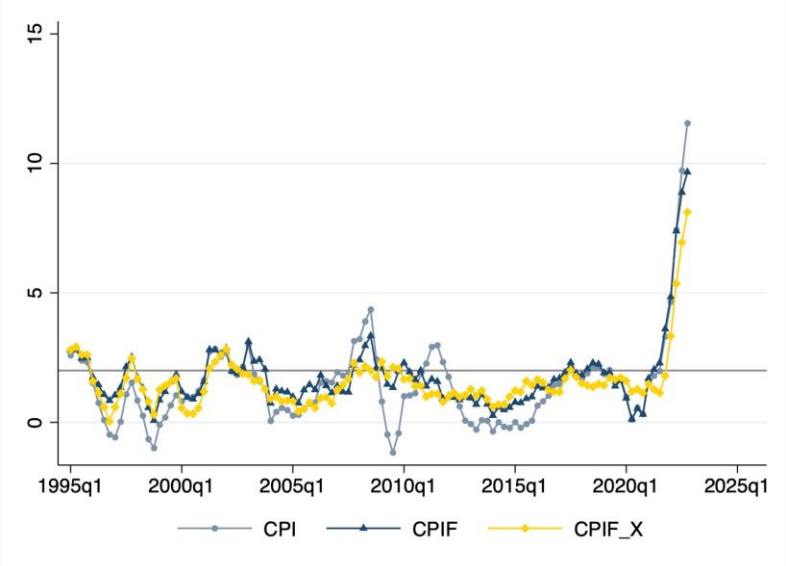
During the initial stages of the pandemic, the risk premiums on mortgage bonds rose quickly (covered bonds). These are issued by the banks to finance mortgages. When the Riksbank announced that it intended to assume a great part of the risk in these by purchasing large amounts of mortgage bonds, the risk premiums fell back.[18] Even though it is difficult or impossible to prove that purchases of financial assets in such situations are critical when it comes to avoiding financial crises, there are strong arguments for this being the case. Our assessment is therefore that it is of great importance that the Riksbank and other central banks have the tools and the mandate that allow them to act in this way in acute situations of crisis. Note, however, that quantitative easing, when it has a clear effect on the economy, has an impact by means of its effect on interest rates. It is thus not the quantity of securities in itself that is important, but how interest rates are steered. QE is similar in this way to traditional policies for dealing with policy rate, especially in situations where the policy rate is limited by the lower interest restriction.

Finally, we note that the Riksbank's holdings of securities, in the same way as for the portfolios of other actors, can lead to profits and losses. Profits result in the Riksbank's equity rising; losses result in it falling. The new Riksbank Act imposes both upper and lower limits for equity in relation to other items on the Riksbank's balance sheet. The Riksbank's balance sheet operations and the rises in interest rates that were introduced in 2022 have resulted in the Riksbank making considerable losses, which have used up its equity.

[18] Holdings of mortgage bonds amounted to SEK 368 billion at the end of 2022, approximately as much that of government bonds, but with a considerably smaller proportion of the outstanding stock. The average remaining term to maturity was also considerably shorter, only two years.

The new Riksbank Act has introduced an obligation for the Riksbank to request that the Riksdag restore the Bank's equity when reported equity falls below a certain level. A possible interpretation is that this dependency on funding from central government funds implies a weakening of the Riksbank's independence, but we are uncertain whether this is a problem. If this is assessed to be a problem, QE in general will be a type of monetary policy that entails cost.

Figure 3.1 Inflation according to various measures 1995–2022



Note: Annual inflation according to the consumer price index (CPI), consumer price index with a fixed interest rate (CPIF) and consumer price index with a fixed interest rate excluding energy prices (CPIF_X). Per cent. Quarterly data. The vertical line illustrates the inflation target. Source: The Riksbank.

3 Background – macroeconomic developments

In order to evaluate monetary policy for 2022, it is relevant to put the main macroeconomic variables into a somewhat longer perceptive. We will therefore make some observations below regarding how inflation, interest rates and real economic variables have developed. Our analysis is based on data we have received from the Riksbank and reflects significant trends. We also briefly comment on possible causes for the trends. The assessments we make in this discussion can be seen as our informal interpretation of the current research situation.

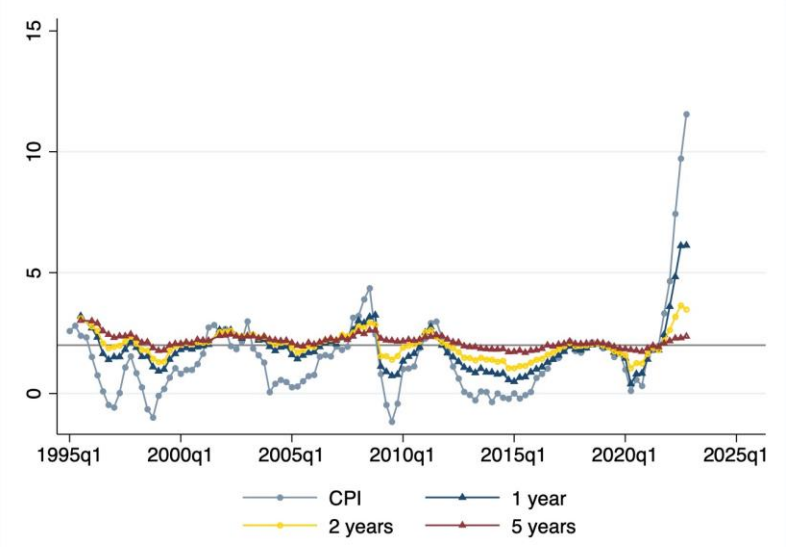
Since the inflation target was introduced in 1995, inflation has remained both above and below the target, but it is still striking how, on average, it fell below the target up until 2022. Figure 3.1 shows annual inflation in terms of the consumer price index (CPI), the CPI with a fixed interest rate (CPIF) and the CPIF excluding energy prices (CPIF_X). The horizontal line illustrates the inflation target of 2 per cent. One of the things that the figure shows is that energy prices can give rise to large fluctuations in inflation. If we focus on the development of the CPIF, the figure shows that inflation in its strict sense has remained under the target since the second quarter of 2010, with the exception of the third quarter of 2017 and the second to the fourth quarter of 2018. Inflation fell further during the pandemic and was at its lowest level – 0.1 per cent – during the second quarter of 2020. It is well-known that the Riksbank, like other central banks, has seen it as an important and difficult challenge to reach up to the inflation target. Low inflation of course reflects weak demand, but normally, this mechanism is quite short-lived. In order to understand long-term low inflation, further arguments are required, at least partially. During the relevant period here, unusually enough, a low demand during a longer period can be seen as an important reason for weak price developments.[19] The GDP gap we describe below (see figure 3.4) is also negative during a relatively long period. Globalisation has also meant increasingly tough competition, above all in goods markets, as well as continued strong technological developments for durable consumer and investment goods. Both of these factors have also held back a large number of relative prices. Inflation including energy prices finally starts to rise markedly during the first quarter of 2021, something we will return to in section 4.

Inflation expectations are of central importance for the way the economy functions. They are among the factors that form the basis for decisions regarding investments and savings and for the average round of wage negotiations, but they can also be used to provide an indication of whether market actors see

[19] This conclusion is also drawn by the Riksbank, see for example Andersson, Corbo and Löf (2015).

the Riksbank's inflation target as credible. Figure 3.2 shows actual inflation in terms of the CPI and inflation expectations in a 1-, 2- and 5-year perspective according to Prospera.[20] The figure shows that long-term inflation expectations (5 years) tend to be around 2 per cent, which implies that the Riksbank has succeeded in establishing credibility for the target, despite the fact that inflation has been markedly below the target on average. In the short term, inflation expectations may deviate more from the target, and the figure shows that inflation expectations in a one-year perspective differ more from the target than those in a two-year perspective.

Figure 3.2 Inflation according to the consumer price index and inflation expectations 1, 3 and 5 years ahead 1995–2022



Notes: Annual inflation according to the consumer price index (CPI). Inflation expectations according to Prospera refer to all actors. Per cent. Quarterly data. The vertical line illustrates the inflation target. Source: The Riksbank.

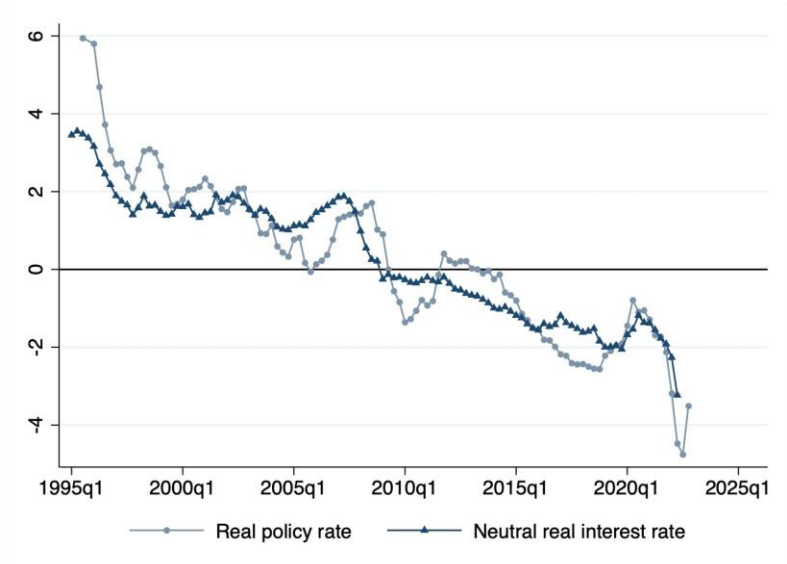
In order to be in a position to say something about monetary policy in relation to macroeconomic developments, we have to introduce a number of concepts. We will begin by defining potential GDP as production when there is "normal" capacity utilisation. Potential GDP must be estimated and involves assessments, since capacity utilisation can reflect long-term trends which are independent of the economic situation. In order to measure the economic situation, we define the GDP gap as the difference between actual and potential GDP, as a proportion of potential GDP, so that the gap is measured as a percentage. The GDP gap is our most common way of measuring resource utilisation and can vary as a result of the fact that actual GDP changes or potential GDP changes.

[20] We are focusing here on the CPI, as data regarding expectations for the CPIF are not available until 2017.

In order to study whether the pursued monetary policy has been restrictive or stimulating, we define the neutral real interest as the real interest which is neither one nor the other (see also section 2). A policy rate that is above the neutral rate of interest would therefore seem restrictive, while one that is below the neutral rate is stimulating. The level of the neutral real interest rate is controlled by structural factors in the economy that affect the range of savings opportunities and the demand for investments. These factors change over time but lie outside the Riksbank's control. This also changes the neutral real interest rate over time. Such changes must be taken into account to enable a correct assessment of whether a certain policy rate has in fact been restrictive or stimulating.

Figure 3.3 shows the development of the real policy rate, calculated as the nominal policy rate minus inflation expectations one year ahead, together with an estimation of the neutral real interest rate from Armelius et al. (2023). The graph shows a clear negative trend in the neutral real interest rate, which means that an increasingly lower real interest rate has been required to enable the GDP gap to be closed and therefore an even lower interest rate to stimulate the economy and force up inflation.[21]

Figure 3.3 Real policy rate and neutral real interest rate 1995–2022



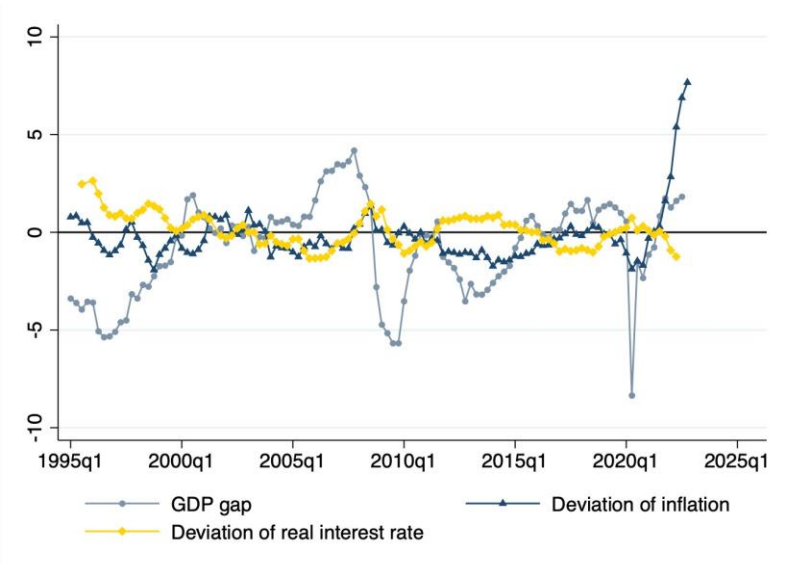
Notes: Real policy rate calculated as the nominal policy rate minus expected inflation according to CPI one year ahead. Inflation expectations from Prospera, concerning monetary market actors. Per cent. Quarterly data. Source: The Riksbank. Estimation of the neutral real interest rate from Armelius et al. (2023).

[21] Factors identified as important in research that tend to bring about a falling trend in the neutral real interest rate include demography, technology, the structure of finance markets and globalisation, see for example Rachel and Summers (2019) and Auclert et al. (2021).

If the real policy rate, that is the Riksbank's nominal policy rate minus expected inflation, is lower than the neutral real interest rate, this implies that monetary policy is expansionary, while the opposite would indicate a contractionary monetary policy. These definitions and measurements also involve informal assessment and should therefore be taken with a pinch of salt; most importantly, the gaps can subsequently be revised.

The Riksbank set the nominal policy rate to zero in October 2014, and then lowered it to -0.10 in February 2015. Figure 3.3 shows that the real policy rate was below the estimated neutral real interest rate from the second quarter of 2016 until the second quarter of 2019, which according to this measure, would indicate an expansionary monetary policy. Following a more neutral policy for a period of one-and-a-half years, monetary policy becomes expansionary again in the second quarter of 2021. There are no estimations of the neutral real interest rate after the second quarter of 2022, but we note that monetary policy, with the exception of the third quarter of 2021 (when the real interest rate was marginally higher than the estimated neutral rate), was expansionary in 2021 and the first quarter of 2022 despite the fact that inflation had started to rise during the spring of 2021 (see figure 3.1). CPIF inflation excluding energy prices was still just under the target of 1.8 per cent, but CPI inflation was over 2 per cent in the fourth quarter of 2021. Figure 3.2 also shows that inflation expectations in a 1-, 2- and 5-year perspective exceeded the inflation target in the fourth quarter of 2021 and beyond.

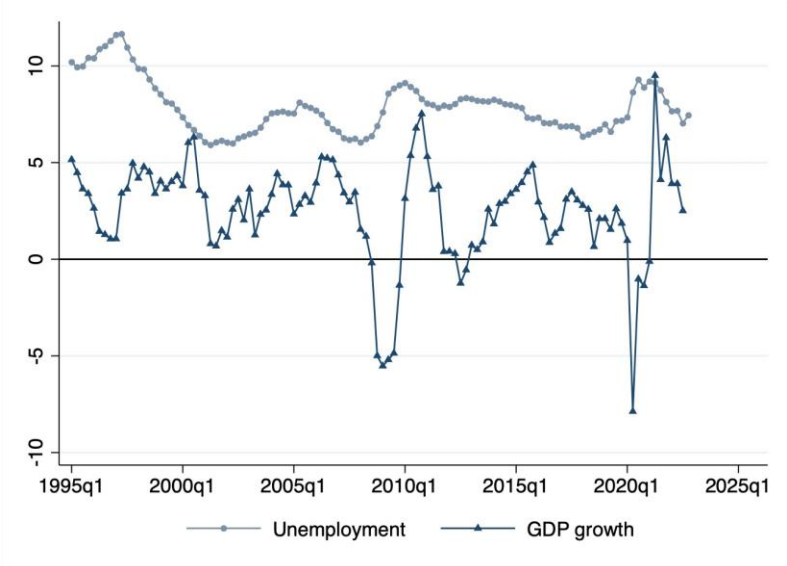
Figure 3.4 GDP gaps, deviation of inflation and deviation of real interest rate 1995–2022



Notes: Deviation of inflation measures CPIF inflation minus the inflation target. Deviation of real interest rate defined as the real policy rate based on inflation expectations one year ahead minus estimated neutral real interest rate. Inflation expectations from Prospera, concerning monetary market actors. Per cent. Quarterly data. Source: The Riksbank. Estimation of the neutral real interest rate from Armelius et al. (2023).

Figure 3.4 shows macroeconomic development based on estimated GDP gaps, the deviation of inflation from the target and the deviation of the real policy rate from the estimated neutral real interest rate in Armelius et al. (2023). If we focus on developments over the last few tears, we see that GDP gaps during the expansionary period in 2016 and beyond were consistently positive up until the pandemic. Following the most intensive phase of the pandemic, the GDP gaps become positive once more from the third quarter of 2021 onwards. The positive GDP gaps depend partially on a strong recovery in demand, and also on the fact that potential GDP was lower than normal after the pandemic, as a result of continued problems with input goods and deliveries on the supply side.

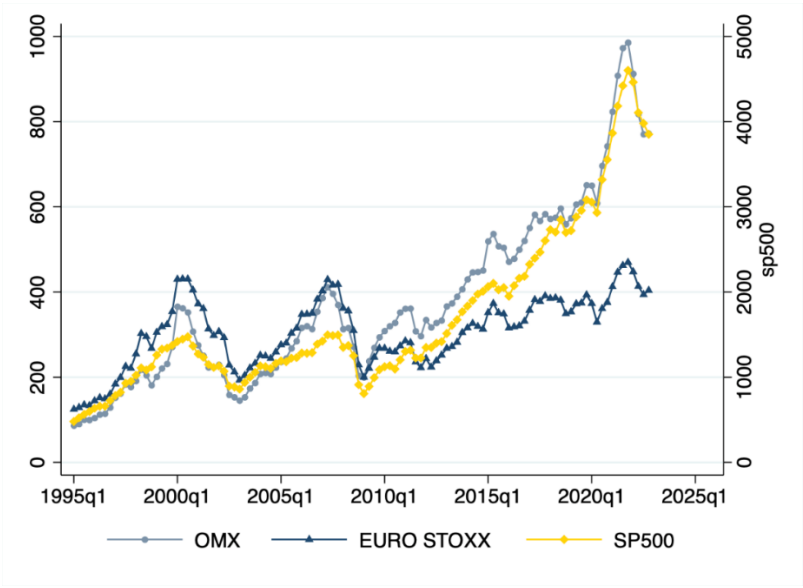
Figure 3.5 Unemployment and GDP growth in 1995–2022



Notes: Per cent. Quarterly data. Source: The Riksbank.

The image of an economy that recovered strongly after the pandemic is corroborated by figure 3.5 that shows the development of unemployment and the growth of GDP. Following slow economic development during the pandemic, we see signs of strong growth and a labour market characterised by falling unemployment.

Figure 3.6 Development of the stock market in Sweden, the euro area and the USA in 1995–2022



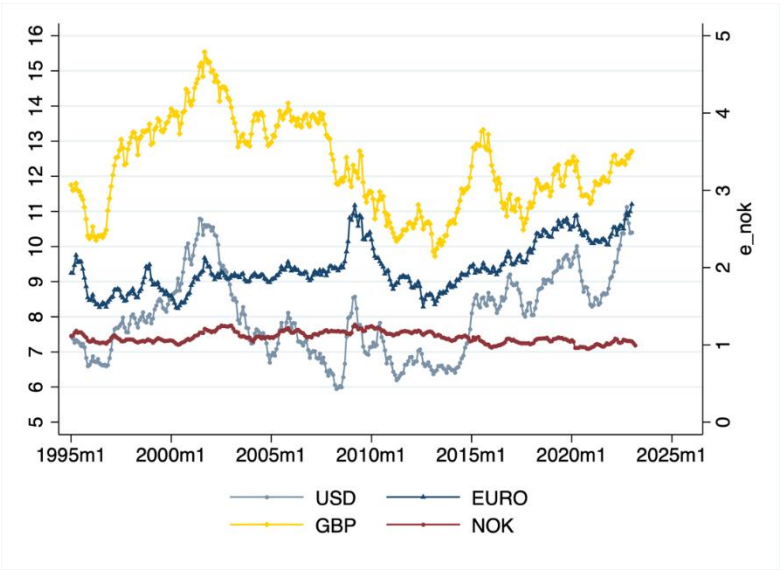
Notes: The scale for the development of the stock market in Sweden (OMX) and the euro area (EURO STOXX) is given on the left axis and the scale for the USA (SP500) on the right axis Index. Quarterly data. Source: The Riksbank.

Figure 3.6 shows the development of the stock exchange in Sweden (OMX), the euro area (STOXX EU) and the USA (SP500). We note that there are different scales on the axes, but that the development of the stock exchanges tends to be uniform and that great wealth has been built up especially in Sweden and the USA since the financial crisis of 2007–2008. In the euro area, average development has been more modest, partly because of factors related to the euro crisis. We note that all the indexes reach their peaks during the fourth quarter of 2021 and fall after this point.

In total, the real economic growth rate for Sweden was positive during 2022, which the Executive Board also noted, according to the minutes of their meetings. It should be added that the Executive Board also expressed cautious concern about the debt situation; however, we do not include any figures or data on this, since we see such metrics as difficult to interpret. There is clear concern for financial crises among researchers in this area, but our understanding of what triggers them is still very limited.[22]

[22] At CeMoF's first international virtual seminar on financial stability in the autumn of 2022, Hélène Rey gave a very interesting presentation on this subject. She presented a number of new findings based on a non-structural analysis of large volumes of data, and noted that a high level of debt is an important variable. But she primarily pointed out how little we know as yet.

Figure 3.7 The Swedish krona compared with the US dollar, the euro, the British pound and the Norwegian krone in 1995–2022



Notes: The scale of the exchange rate against the US dollar (USD), the euro (EURO) and the British pound (GBP) is given on the left axis and the scale for the Norwegian krone (NOK) is given on the right axis. Swedish kronor per unit of foreign currency. Monthly data. Source: The Riksbank.

Figure 3.7 shows the development of the Swedish krona against the US dollar (USD), the euro (EURO), the British pound (GBP) and the Norwegian krone (NOK) in 1995–2022. The exchange rate is measured here in Swedish kronor per unit of foreign currency so that an increase implies a weakening (depreciation) of the Swedish krona and a reduction implies a strengthening (appreciation) of the Swedish krona. As we discussed in section 2, the nominal exchange rate is a financial variable which can fluctuate dramatically over time. In the very long term (as in the figure here, which stretches over more than 25 years), it is not obvious that there is any trend in the development of the Swedish krona. But if we focus on the exchange rate during the last few years – let us begin straight after the Brexit referendum, which led to a dramatic weakening of the pound – the figure shows that the Swedish krona has depreciated markedly against the dollar, the pound and the euro. Why this has happened is in our opinion a lot less obvious that than what is often claimed in debates. It is often argued that the exchange rate has been weakened by the Riksbank's interest rate policy, by prospects for the Swedish economy in terms of developments in the housing market for example, or that the Swedish krona for various reasons has become an unstable currency which is avoided in international transactions. In our opinion, there is at least no systematic empirical support to corroborate that these factors have been important for the development of the Swedish krona, or that it could have been affected by a different policy.

Another factor that could have affected the development of the exchange rate over the last few years is the Riksbank's transition to a self-financed

foreign currency reserve. Previously, the Riksbank maintained a foreign currency reserve partly by instructing the Swedish National Debt Office to raise loans in foreign currency on behalf of the Riksbank, but the Riksbank has now proceeded to having a foreign currency reserve that is completely self-financed. This has resulted in the Riksbank during the period from 1 January 2021 – 31 December 2022 having bought in 14.5 billion USD and 5.5 billion euros.[23] Such purchases of other currencies mean that the Riksbank is selling Swedish kronor. It is not theoretically impossible that this can weaken the Swedish krona, but it is difficult to use any credible figures to describe the extent to which the Swedish krona is weakened.

As we discuss in section 2.2, the development of the exchange rate is genuinely difficult to understand. As we lack any convincing research to support stable correlations, we note that further research is needed to enable us to say what has caused the weakening of the Swedish krona. We would like to conclude instead by noting that figure 3.7 shows that the exchange rate against the Norwegian krone has been extremely stable over time, which is thought-provoking considering that Norway as an oil producer for many years has been ranked as one of the world's richest countries. We discuss the monetary policy pursued in other countries in section 4.4.

[23] https://www.riksbank.se/sv/statistik/riksbankens-balansrakning/valutavaxlingar-for-en-egenfinansierad-valutareserv/.

4 Monetary policy 2022

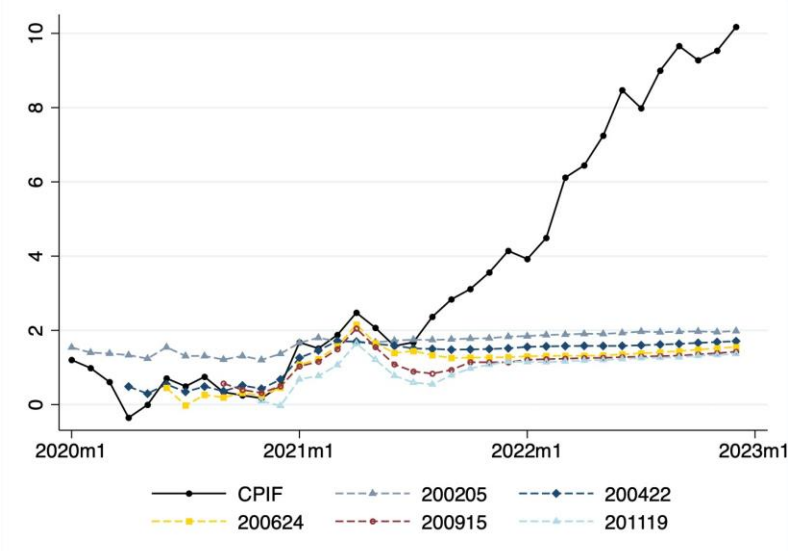
This section contains a description of Sweden's monetary policy in 2022. We give an account of the Riksbank's forecasts, monetary policy measures and communication, and place Sweden's monetary policy decisions in an international context. Our description is brief, and we especially highlight the aspects of the decisions that we later make assessments of.

4.1 The Riksbank's forecasts

Figures 4.1 and 4.2 show the Riksbank's forecasts for inflation according to the consumer price index with a fixed interest rate (CPIF) for the coming three years, at different times in 2020 and 2021. Although the focus of this section is monetary policy in 2022, an understanding of how the Riksbank has viewed the risks of both lower and higher inflation gives a valuable insight.

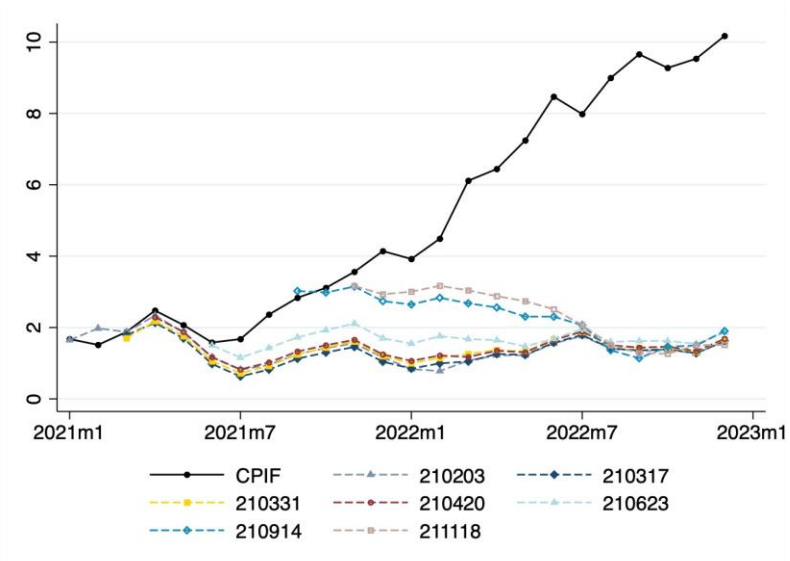
Figure 4.1 shows that there were no suspicions during the COVID-19 crisis in 2020 that inflation would rise in the long term. According to the forecast from February 2020 before the pandemic broke out, inflation was expected to rise in a long-term perspective to about 2 per cent, but this forecast was adjusted downwards later the same year.

Figure 4.1 Inflation according to consumer price index with a fixed interest rate (CPIF inflation) and the Riksbank's three-year inflation forecasts at different dates in 2020



Notes: A solid line shows annual inflation according to CPIF and the dotted lines show forecasts at different dates. Per cent. Monthly data. Source: The Riksbank.

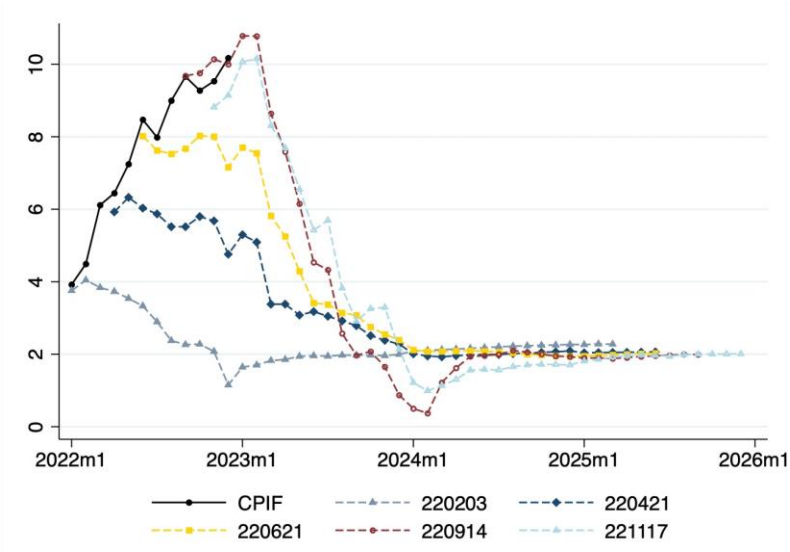
Figure 4.2 Inflation according to consumer price index with a fixed interest rate (CPIF inflation) and the Riksbank's three-year inflation forecasts at different dates in 2021



Notes: A solid line shows annual inflation according to CPIF and dotted lines show forecasts at different dates. Per cent. Monthly data. Source: The Riksbank.

Figure 4.2 shows that during the first six months of 2021, inflation in the coming three years was expected eventually to rise towards 2 per cent. The solid line shows actual CPIF inflation, and not until it reached just below 3 per cent in September 2021 were the forecasts revised upwards. Even then, inflation was predicted to fall relatively quickly to 2 per cent in the long term.

Figure 4.3 Inflation according to consumer price index with a fixed interest rate (CPIF inflation) and the Riksbank's three-year inflation forecasts at different dates in 2022

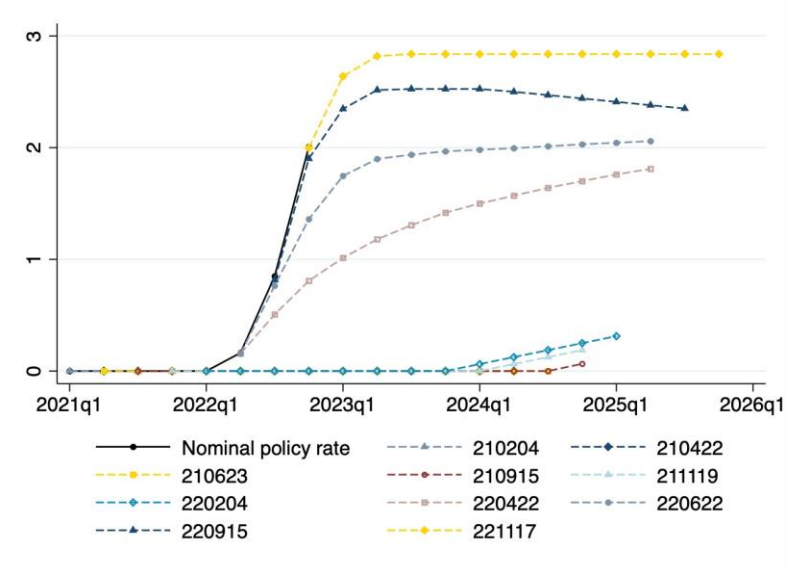


Notes: A solid line shows annual CPIF inflation and dotted lines show forecasts at different dates. Per cent. Monthly data. Source: The Riksbank.

Figure 4.3 shows the Riksbank's inflation forecasts in 2022. In February 2022, when actual CPIF inflation was just below 4.5 per cent, the graph shows that the Riksbank's assessment was that inflation would return to 2 per cent by the end of 2022. The figure then shows how the forecasts were updated during the year, and that the Rikbank's forecasts consistently underestimated the strength of inflationary pressures. Remarkably, the forecast trajectory falls very rapidly on the first three forecast occasions – the rise in inflation was clearly viewed as something highly temporary, despite the fact that inflation had risen significantly and over a longer period in several countries. Even at the September and November meetings, the forecasts indicate that further increases in inflation were only expected to be short term (see graphs for 14 September 2022 and 17 November 2022). In this respect, the Riksbank's assessments differ from those of other central banks. The *Bank of England*, for example, also adjusted its forecasts upwards in 2022, but each time it made its forecasts, it counted on there being continued price rises before inflation turned downwards again.[24]

[24] Bank of England (2022a, 2022b, 2022c and 2022d).

Figure 4.4 The Riksbank's policy rate and interest rate path for the three coming years at different dates in 2021–2022

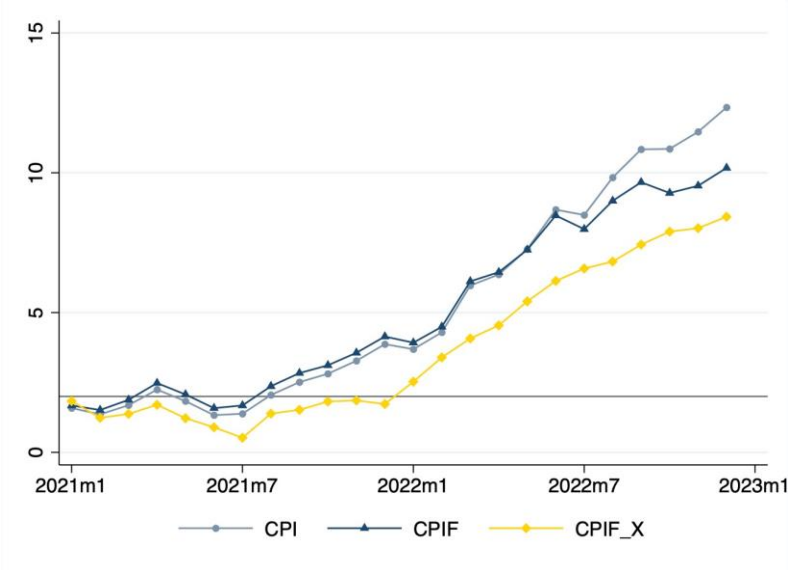


Notes: A solid line shows the policy rate and dotted lines show forecasts at different dates. Per cent. Quarterly data. Source: The Riksbank.

Figure 4.4 shows the Riksbank's policy rate and interest rate path at different times in 2021–2022. These clearly reflect its inflation outlook. In as late as February 2022, the Riksbank made the assessment that the policy rate would remain at zero until the fourth quarter of 2022, after which it would gradually be increased to 0.25–0.50 per cent in 2023–2024. A comparison with figure 4.3 reminds us that CPIF inflation at this time was almost 4.5 per cent, in other words 2.5 per cent above the inflation target. Since then, the Riksbank has continuously revised the interest rate path upwards. The most dramatic adjustment occurred between February and April 2022. When CPIF inflation was above 6 per cent in April (figure 4.3), the Riksbank assessed that the interest rate would be increased considerably faster than it had previously believed. Figure 4.4 shows that it then believed that the policy rate would be just below 2 per cent in the long term, rather than just below 0.50 per cent as it had signalled two months earlier.

The Riksbank's forecasts for the GDP gap and unemployment are illustrated in figures A.1 and A.2 in the appendix. These forecasts also indicate that the Riksbank underestimated the force of the economic downturn. Forecast GDP gaps tend to be below the actual gap. There are similar tendencies for unemployment, although the picture is less clear here.

Figure 4.5 Inflation according to different measures 2021–2022



Notes: Annual inflation according to the consumer price index (CPI), consumer price index with a fixed interest rate (CPIF) and consumer price index with a fixed interest rate excluding energy prices (CPIF_X). Per cent. Monthly data. The vertical line illustrates the inflation target. Source: The Riksbank.

4.2 The Riksbank's decisions for measures

In 2022, the Riksbank's Executive Board held five monetary policy meetings. Its policy rate decisions are presented in table A.2 in the appendix, together with summaries of the minutes of each meeting.[25]

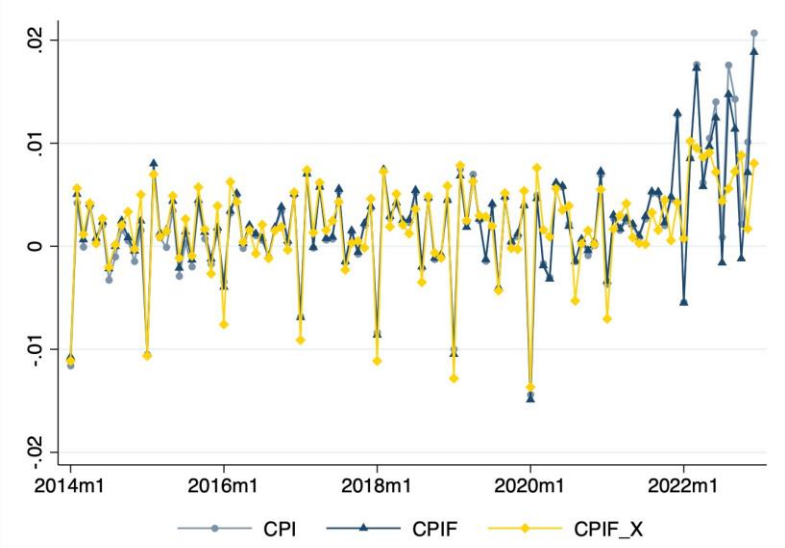
Policy rate decisions

Figure 4.5 shows the development of annual inflation according to CPI, CPIF and CPIF excluding energy prices (CPIF_X) in 2021–2022. The figure shows that CPIF inflation was 3.9 per cent in January 2022, but that inflation excluding energy prices was 2.5 per cent. At the monetary policy meeting on 9 February, the Executive Board made the following assessment (table A.2):

> Monetary policy needs to provide continued support for inflation to be close to target in the medium term. At the monetary policy meeting on 9 February, the Executive Board of the Riksbank therefore decided to keep the repo rate at zero per cent and that the Riksbank would purchase bonds for SEK 37 billion in the second quarter of 2022 to compensate for maturing assets. (The Riksbank 2022a)

[25] The decisions taken in 2021 are summarised in table A.1 in the appendix, but are not commented on in the report.

Figure 4.6 Monthly inflation according to different measures 2014–2022



Notes: Monthly inflation according to the consumer price index (CPI), consumer price index with a fixed interest rate (CPIF) and consumer price index with a fixed interest rate excluding energy prices (CPIF_X). Per cent. Monthly data. Source: The Riksbank and own calculations.

Figure 4.6 shows monthly inflation in 2014–2022. Statistics of this kind show, per definition, seasonal patterns which are not apparent in the previous figures; seasonal patterns are not interesting per se, but the numbers do reflect more directly price developments in the past month. We can see that all the monthly figures for 2022 send clear signals of a high price increase rate and a somewhat higher variance than previously when energy prices are included in the calculations.

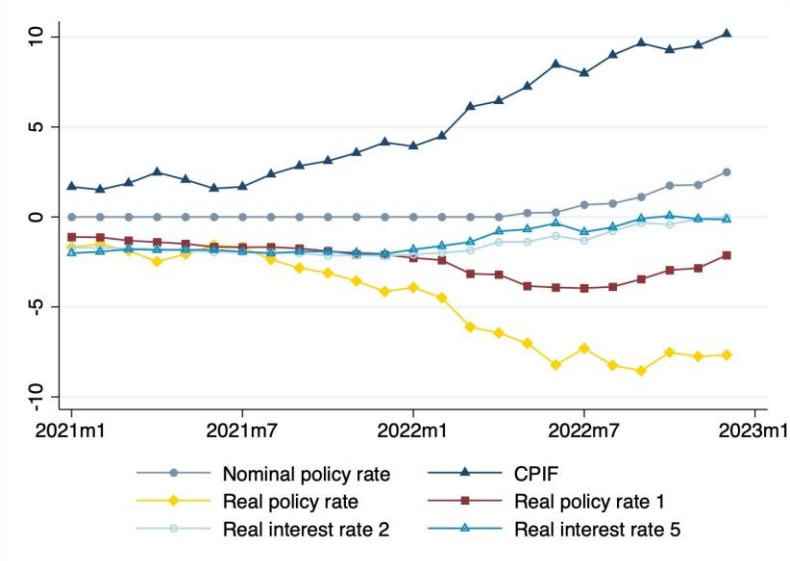
In April, CPIF inflation had risen to 6.4 per cent, and inflation excluding energy prices was 4.5 per cent. At the meeting of 27 April, the Riksbank revised its assessment from February and raised the policy rate by 25 points to 0.25 per cent. It also announced that it would admittedly continue to buy securities, but to a lesser extent than during the first half of 2022 (table A.2):

> In order to reduce the risk of a price-wage spiral and to ensure that inflation returns to target in due course, the Riksbank needs to take monetary policy measures. At the monetary policy meeting on 27 April, the Riksbank's Executive Board therefore decided to raise the repo rate from zero to 0.25 per cent and, during the second half of the year to reduce the rate of the Riksbank's purchase of securities in order to begin to reduce its holdings. (The Riksbank 2022b)

In June, CPIF inflation had risen to 8.5 per cent, and CPIF inflation excluding energy prices was 6.1 per cent. The Executive Board responded with a double increase of the policy rate to 0.75 per cent. It furthermore decided to reduce the Riksbank's security holdings at a faster rate than decided at the previous meeting:

> In order to reduce the price-wage spiral and to ensure that inflation returns to target, the Riksbank needs to take monetary policy measures. At the monetary policy meeting of 29 June, the Executive Board therefore decided to raise the policy rate by 0.5 percentage points to 0.75 per cent and to reduce the Riksbank's holdings of securities at a faster rate in the second half of 2022 than previously decided in April. (The Riksbank 2022c)

Figure 4.7 Nominal policy rate, inflation according to consumer price index with a fixed interest rate and real policy rate according to different measures 2021–2022



Notes: Annual inflation according to consumer price index with a fixed interest rate (CPIF). Real policy rate calculated as nominal policy rate minus actual inflation according to CPIF (real policy rate) and expected inflation according to CPIF in a 1-year perspective (real interest rate 1). Real interest rate in a 2- and 5-year perspective (real interest rate i, i = 2, 5) calculated as interest rate on bonds with maturities of 2 and 5 years minus inflation expectations for the corresponding term. Inflation expectations from Prospera, concern monetary market actors. Per cent. Monthly data. Source: The Riksbank.

In September, CPIF inflation was 9.7 per cent including energy, and 7.4 per cent excluding (figure 4.5). The Riksbank took forceful action and decided at its meeting on 19 September to raise the policy rate by one percentage point.

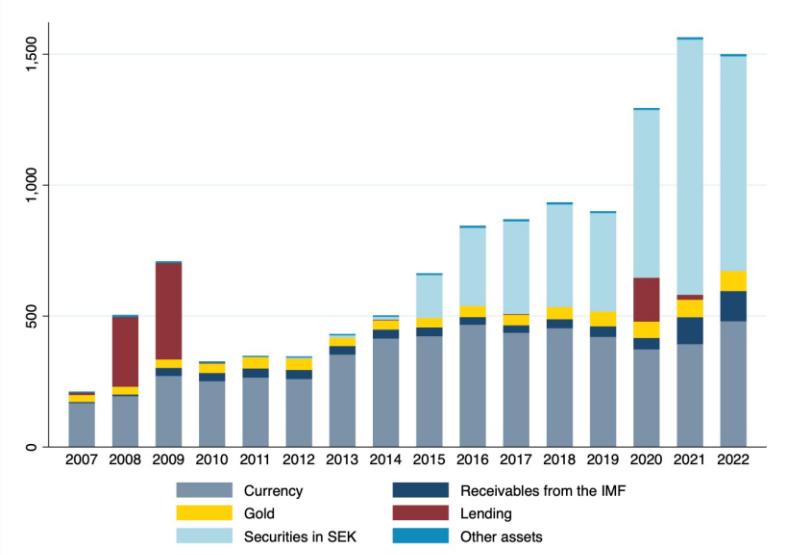
> Inflation is too high. It is undermining households' purchasing power and making it more difficult for both companies and households to plan their finances. It is crucial that monetary policy continues to react in order to ensure that inflation falls back and stabilises at the target of 2 per cent within a reasonable time. At its monetary policy meeting on 19 September, the Executive Board of the Riksbank decided to raise the policy rate by 1 percentage point to 1.75 per cent. (The Riksbank 2022d)

At the meeting of 23 November, inflation including energy prices was in principle unchanged at 9.5 per cent, but CPIF inflation excluding energy prices had increased to 8 per cent. The Executive Board therefore decided to raise the policy rate further by 75 points.

> To bring down inflation and safeguard the inflation target, the Executive Board decided to raise the policy rate by 0.75 percentage points to 2.50 per cent at the monetary policy meeting on 23 November. Inflation is still far too high and compared with September the Executive Board assesses that monetary policy needs to be tightened further to bring it back to the target within a reasonable time. (The Riksbank 2022e)

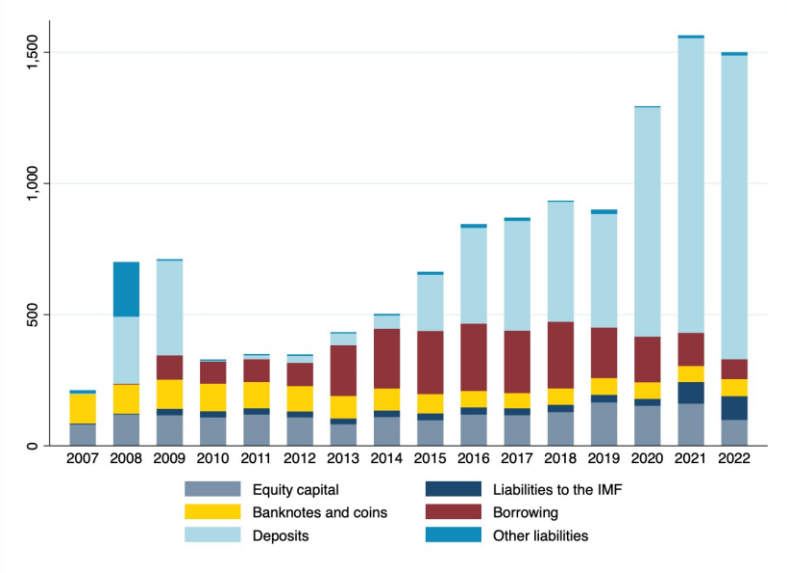
CPIF inflation, the nominal policy rate and the real policy rate are illustrated in figure 4.7. We note that between 27 April and 23 November, the Riksbank raised the policy rate by 2.5 percentage points. In the debate, it is sometimes claimed that the real interest rate has actually fallen as inflation has been high. This policy rate increase would not have had the desired tightening effect. This conclusion is based on the realised real interest rate, that is the interest rate minus actual inflation. However, this analysis is incorrect, as the realised real interest rate has no significance for economic decisions. The real interest rate that is important for household and business savings and investment decisions is based on expected inflation in a more long-term perspective. Figure 4.7 therefore shows the real interest rate based on actual inflation and the real interest rate based on inflation expectations in a 1-, 2- and 5-year perspective. The real interest rates that are based on long-term inflation expectations are at more normal levels, and in December 2022, were in principle, around zero (the real interest rate was -0.01 per cent when based on inflation expectations in a two-year perspective and -0.12 in a five-year perspective).

Figure 4.8 The Riksbank's assets 2007–2022



Notes: SEK billion. Observations from 31 December each year. Annual data. Source: The Riksbank.

Figure 4.9 The Riksbank's financial results, equity and liabilities 2007–2022



Notes: SEK billion. Observations from 31 December each year. Annual data. Source: The Riksbank.

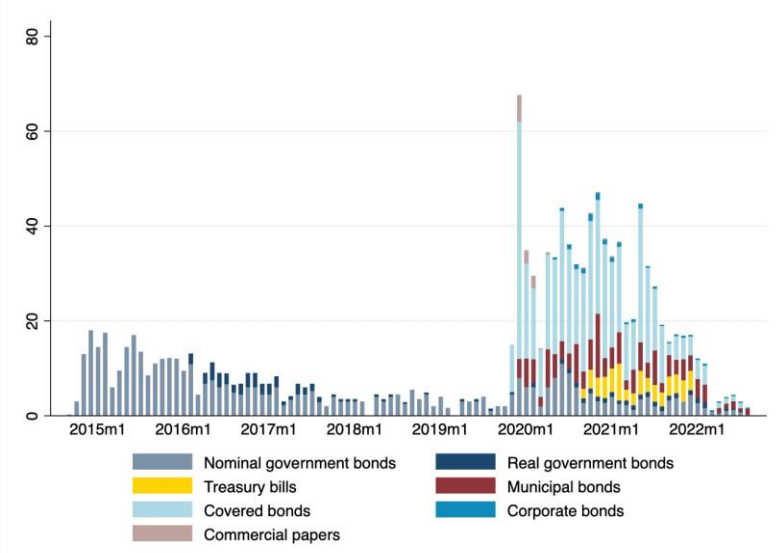
Decisions on balance sheet operations

In section 2, we noted that quantitative easing (QE) with the purpose of lowering long-term interest rates before the pandemic (resulting in an expected inflationary pressure), and to deal with rising risk premiums during the pandemic, have led to an expansion of the central banks' balance sheets. Figure 4.8 shows the Riksbank's assets at year-end 2007–2022. The figure shows that the Riksbank's security holdings grew rapidly when the Riksbank started to pursue QE in 2015. The holdings then increased dramatically during the pandemic years 2020 and 2021.

Figure 4.9 shows the liabilities side of the Riksbank's balance sheet. As discussed in section 2, purchases of assets have led to equivalent increases of the commercial banks' reserves in the Riksbank, the item referred to here as (monetary policy operations) deposits.

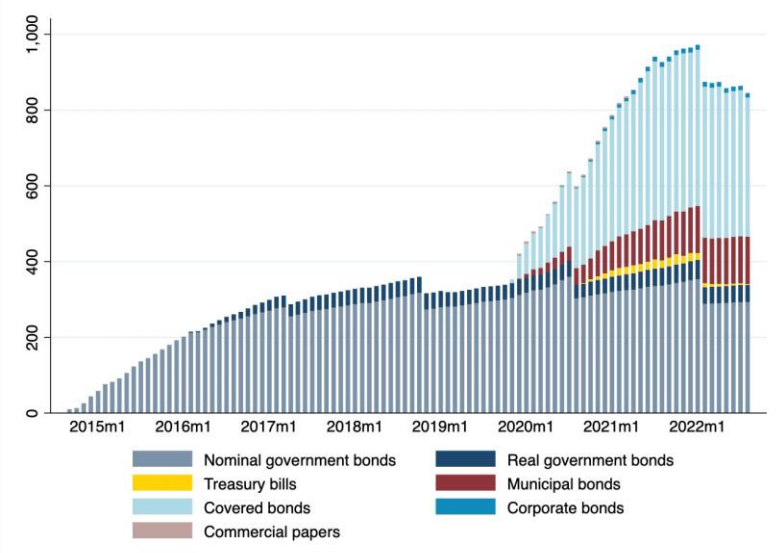
Figure 4.10 shows the Riksbank's purchases of different types of assets on a monthly basis in 2021–2022. The figure shows that the purchases up until the pandemic concern nominal, and to a lesser extent, real government bonds. During the pandemic, the Riksbank purchased large volumes of covered bonds, but also municipal bonds, and small volumes of corporate bonds.

Figure 4.10 The Riksbank's purchases of securities 2015–2022



Notes: Each column shows one month. SEK billion. Monthly data. Source: The Riksbank.

Figure 4.11 The Riksbank's holdings of securities 2015–2022



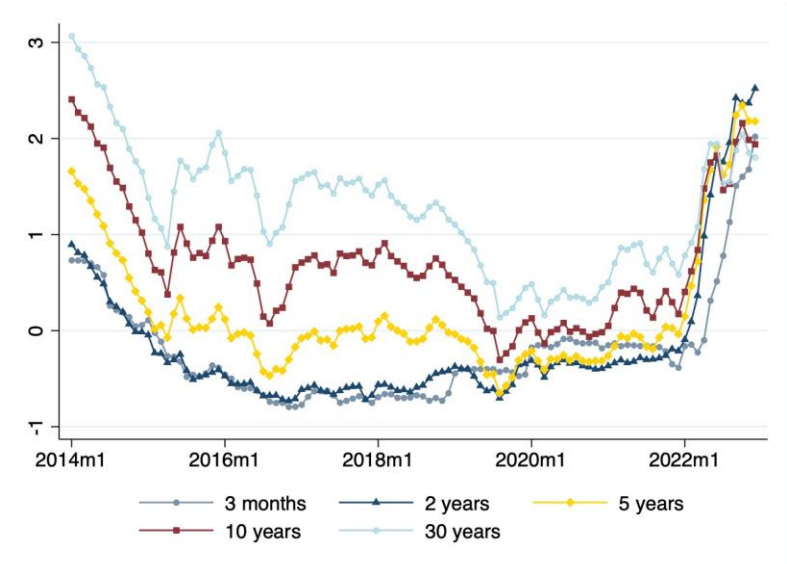
Notes: Each column shows one month. SEK billion. Monthly data. Source: The Riksbank.

The effects of these purchases on the Riksbank's accumulated assets can be seen in figure 4.11, which shows the Riksbank's holdings of securities in 2021–2022. The Riksbank has followed a strategy which has meant that it continued to purchase assets to compensate for maturing assets. It continued with this strategy during the spring of 2022 (see, for example, the explanation for

its decision of 9 February above). Figure 4.11 shows that the Riksbank's holdings of securities therefore did not start to decrease until the Executive Board decided that it would start to purchase securities at a slower rate in the second half of 2022 (see decision from 27 April above).

We note that, during the spring of 2022, when inflation according to several measures was above target at the same time as the policy rate was increased, continued action was taken to stimulate the economy by implementing the purchases of assets that had been planned in a fundamentally different macroeconomic climate. We will comment on the appropriateness of these decisions in section 5.

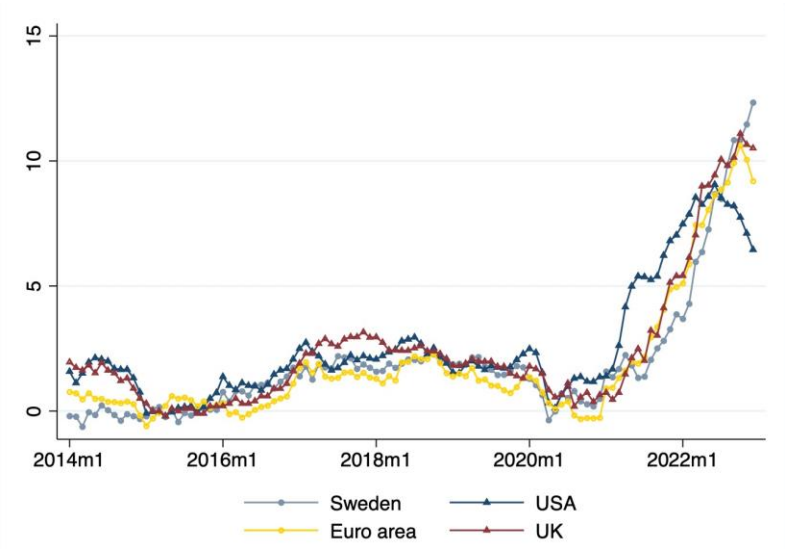
Figure 4.12 Yields on Swedish government bonds with a maturity of 3 months, 2, 5, 10 and 30 years 2014–2022



Notes: Per cent. Monthly data. Source: The Riksbank.

Figure 4.12 shows the yields on Swedish government bonds with different maturities. The long-term interest rates usually reflect the expected short-term interest rates. The figure shows that the longer the maturity of the bond, the higher the yield. The interest on treasury bills with a maturity of 3 months is, for example, significantly lower than for a bond with a maturity of 5 or 10 years. This is because of the maturity premium we discussed in section 2. We also see that QE appears to have pressed down the long-term interest rates, but that the interest rate increases in the last year have caused the long-term rates to rise significantly. The price fall on securities that the interest rate increases have involved have led to losses for central banks. In 2022, the Riksbank reported a (primarily unrealised) loss of SEK 81 billion (the Riksbank 2023a).

Figure 4.13 Inflation according to consumer price index in Sweden, the USA, the euro area and the UK 2014–2022

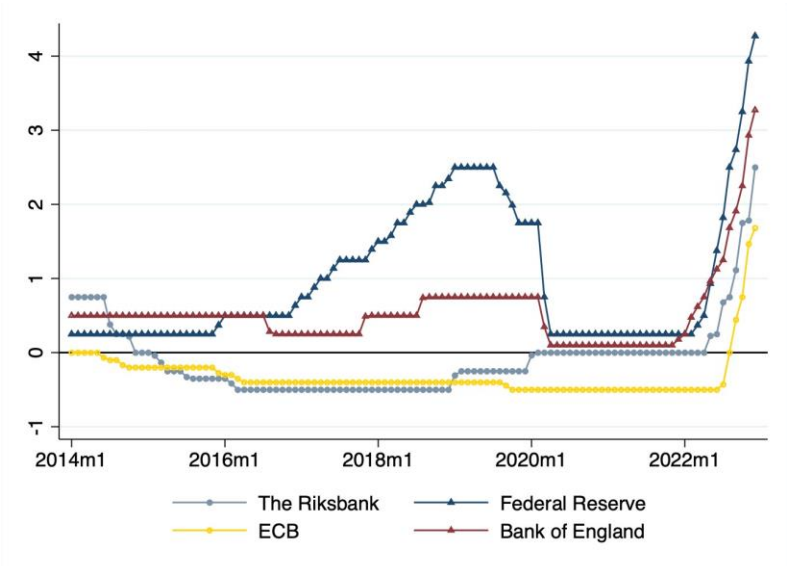


Notes: Annual inflation according to CPI in Sweden, the USA, euro area and UK. Per cent. Monthly data. Source: The Riksbank.

4.3 Comparison with other countries

Figure 4.13 shows inflation developments in Sweden, the USA, the euro area and the UK in 2014–2022. For the sake of comparison, all of the series measure the consumer price index (HICP in the euro area). The figure shows that inflation started to rise in the USA first in December 2020, with a very rapid increase. In the euro area, inflation (according to HICP) started to rise in January 2021, and in the UK at roughly the same time. In Sweden, inflation according to CPI started to rise in July 2021, that is, somewhat later than the other countries studied here, but in the spring of 2021, it was clear from data that there were inflationary pressures in the international community long before Russia's invasion of Ukraine. The figure also shows that inflation measured in this way fell slightly at the end of 2022 in all countries except Sweden.

Figure 4.14 Nominal policy rate in Sweden, the USA, the euro area and the UK 2014–2022



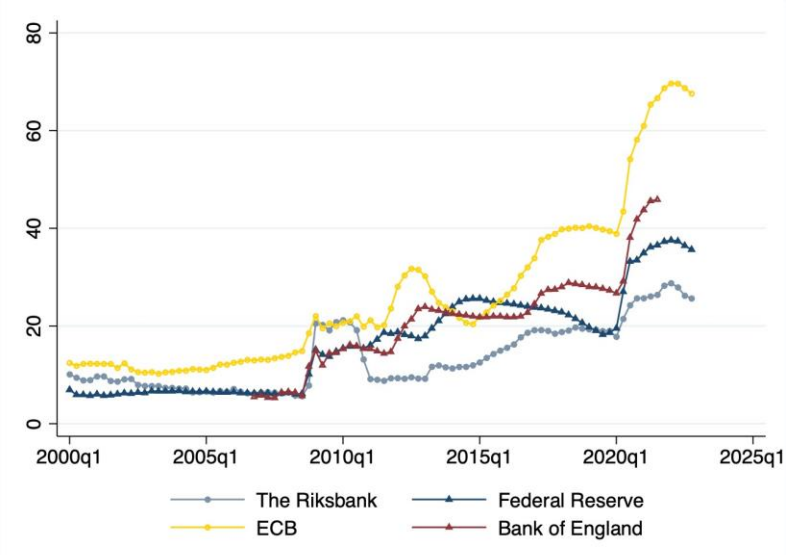
Notes: Nominal policy rate in Sweden (Riksbank), the USA (Federal Reserve), the euro area (ECB) and the UK (Bank of England). Per cent. Monthly data. Source: The Riksbank.

Figure 4.14 shows the development of the nominal policy rates in the same countries in 2014–2022. In a longer perspective, the figure shows that the *European Central Bank (ECB)* was the first of the four to introduce a negative policy rate in June 2014 and that the ECB also held on to the negative policy rate for the longest (until August 2022). The *Bank of England* started to raise its interest rate in December 2021, and was thus the first of the four central banks to do so. Inflation in the UK was then at 5.4 per cent (and had been above the 2 per cent target for eight months). The *Federal Reserve* lowered the interest rate to 0.25 per cent when the pandemic escalated in April 2020 and retained the same level until March 2022 when it started its increases. Inflation in the US was then at 8.5 per cent. Since then, the *Federal Reserve* has distinctly raised the policy rate a number of times so by the start of 2023 it was at 4.5 per cent.

In order to be able to assess how expansionary monetary policy has been during this period, it is also necessary to take into account the central banks' balance sheet operations. Figure 4.15 shows the four central banks' balance sheets relative to GDP. This measurement indicates that the Riksbank pursued a less extensive QE than the other central banks prior to the pandemic. The balance sheet operations have been an important measure in the euro area and their purpose there has, to a great extent, been to safeguard the euro and financial stability during the European debt crisis. The figure also shows that since the Riksbank started to purchase government bonds in 2015, the balance sheet relative to GDP has not reduced notably at any time. There have been marginal reductions during individual quarters, but this is in contrast with the *Federal*

Reserve's shrinking balance sheets before the pandemic, which meant that Sweden and the USA converged to the same level during the spring of 2019. During the pandemic, the balance sheets relative to GDP grew in all four countries, which is on account of the substantial purchases of assets that were made, but also to some extent mechanically of weak GDP growth during the crisis. The *Bank of England* was the first of the four central banks to actively start to sell off assets in November 2022, but the observations in these figures only continue to the end of 2021.

Figure 4.15 The central banks' balance sheets relative to GDP in Sweden, the USA, the euro area and the UK 2000–2022



Notes: The central banks' balance sheets relative to GDP in Sweden (Riksbank), the USA (Federal Reserve), the euro area (ECB) and the UK (Bank of England). Per cent. Quarterly data. Source: The Riksbank.

4.4 The Riksbank's communication

The Riksbank's external communication takes place in various ways. Minutes of the Executive Board meetings are an important source, interviews and articles in the media by and with members of the Executive Board are another. The Riksbank also publishes more in-depth reports on an ongoing basis and these may be assumed to form the basis of decisions and of the Executive Board's outlook on the future. The Riksbank's external communication is extremely important, partly specifically for the guidance it provides to market actors, and partly in order to build credibility at a more general level. In 2022, the Riksbank received an unusually great amount of media attention. During the first six months, rising inflation was in focus, while interest rate increases naturally received a great deal of attention during the second half of the year, especially as nominal policy rates had largely been negative for a long time. There was talk of dramatic increases. As a whole, the matters raised by the

media were of a negative nature, even if the Riksbank was not initially blamed for inflation. During the second half of the year, when many borrowers with variable interest rates were affected quite directly, the criticism became more noticeable.

We would like to make three observations, which we then refer to in our evaluation. Our first observation is that the Riksbank has admittedly expressed that there has been considerable uncertainly, in particular regarding future inflation, but that the forward guidance that has been given – in the form of interest rate paths – has been *unconditional*, that is it has not been based on different scenarios for inflation or other results. An alternative would have been – as described in section 2 – to make interest rate paths more conditional on future developments and to explain under which circumstances various changes could be expected. This is difficult to do with exactness, but could provide further, valuable information for market actors and could help, subsequently to explain why certain decisions, with hindsight, have been unfortunate (where this has been the case).

A second observation is that the Riksbank's assertions and forecasts serve as part of the basis upon which its *credibility* rests. Our general picture of the bank is that it is characterised by competence and, to a great extent, enjoys credibility. With considerable media attention, there will always be criticism – and in 2022, the attention received by the Riksbank had a notably more negative quality than earlier. This is natural in view of the difficult economic climate, but in such situations, it is especially important to maintain credibility. Forecasts are based on econometric models, and it is natural that they may be misleading. However, our examination in section 4 (see for example the inflation and policy rate forecasts in figures 4.3 and 4.4) shows that the Riksbank totally misjudged the situation. A comparison, for example, with the *Bank of England*, also shows that the Riksbank not only underestimated the level of inflation, it also counted on it turning downwards at a considerably faster rate than the UK's central bank did. When the errors in the forecasts are so great, it is important that the Riksbank is open about this, and we note that this has also been the case. It is possible that the Riksbank could have done more here, by publishing more in-depth information about how businesses' pricing behaviour and margins are determined. The overall knowledge in this area is not in any way complete, but important issues can nevertheless be highlighted. One possibility is to organise ad hoc conferences, in which both researchers and the media take part.

A third and final observation concerns the Riksbank's communication about the *exchange rate*. The weakened krona relative to several larger currencies has been discussed intensively in the media, and we have noted here, at least in connection with the Executive Board's decision meetings, that the Riksbank has not been as clear as it was in its communication about inflation and its determining factors. Actors in financial markets could certainly benefit from knowing how the Executive Board views the exchange rate channel (see section 2), how it interprets the depreciation of the exchange rate and whether

it has had any intention to influence the exchange rate of the krona. Our interpretation is that the Riksbank has not, in practice, had any objectives regarding the exchange rate or used the exchange rate channel (see section 2) in a systematic way. Further clarity on this matter would, however, have been preferable.

5 Evaluation

In this section with evaluate whether the Riksbank has achieved the price stability objective. We comment on whether the pursued policy has been well considered and reasonable. We conclude by commenting on common criticisms that have been voiced about the Riksbank.

5.1 Fulfilment of objectives

According to the Riksbank Act that applied in 2022, the objective of the Riksbank's activities is to "maintain price stability". This has been explained more precisely to mean that the Riksbank strives to keep CPIF inflation close to 2 per cent a year. During the period 2000–2021, inflation was on average 1.6 per cent per year. In 2021, it was 2.4 per cent, that is, relatively close to target. In 2022, on which this evaluation focuses, inflation was 7.7 per cent, and in December it reached 10.2 per cent. It is clear that this must be regarded as being in heavy excess of the inflation target.

However, there is reason to add greater nuance to the picture of this failure. An evaluation of the pursued policy should be conducted by means of a comparison with what the policy *otherwise* could have achieved.

With an optimal policy and perfect foresight, monetary policy could have been tightened back in 2021, perhaps six months or even earlier than it actually was. This would have reduced demand in the Swedish economy and limited opportunities for the economy's price-setters to pass on the cost increases caused by higher prices on energy and input goods to consumers. But not even if the Riksbank had known what was coming would it have been optimal to pursue a policy that kept the recorded inflation close to 2 per cent during 2022.

As mentioned in section 2, it is not easy for the Riksbank to control the natural relative price changes that occur as a result of wars and other disruptions to supply, and nor should it try to do so. The relative price of energy and other imported products must therefore be allowed to increase in such situations. An optimal policy in such situations does not involve forcing down all other prices, including nominal wages, so much that inflation is close to the target. The price and wage rigidities that characterise the economy would probably have made such a policy very expensive in real economy terms.

Even a perfect monetary policy, executed with full information about future price developments, would have led to considerable inflation in 2022: Even then, the 2 per cent target would have been exceeded by far, but for good reason. Naturally this conclusion also applies to the Riksbank, which in reality does not have perfect information but has to rely on uncertain forecasts that are available in real time. Exactly how high inflation would have been if the policy had been conducted on the basis of perfect information is difficult for us to determine, but our assessment is that it would nevertheless have been far

above the 2 per cent inflation target. A perfect policy would have led to inflation falling to target level more quickly, once the increase rate of energy and commodity prices had abated, but this would not have occurred immediately. The wage and price rigidities we referred to in the above sections mean that it takes time before both positive and negative cost disruptions spread through the economy and fully impact consumer prices. It is well documented that inflation during the current period depends on earlier inflation, that is, that there is a persistence in inflation dynamics. This means that inflation does not immediately return to 2 per cent when supply disruptions have eased. An evaluation of the Riksbank's policy cannot, therefore, stop with an assertion that inflation has been clearly above the target on account of such disruptions.

5.2 Has the policy been well considered?

Seen in the light of the information now available, it is clear that Sweden's monetary policy should have been tightened earlier than it was. This would have resulted in lower inflation and would have reduced the risk of weakening confidence in the inflation target. The necessary cooling of the economy could presumably have produced weaker real economic consequences, but they would not have been completely eliminated. Housing prices would still have fallen, as would activity in the property sector, but adaptations would probably have been less drastic.

Actual changes in the policy rate must be decided in real time, given the information available on each occasion. At the meeting in February 2022, according to our assessment, there were clear signs of a need for a tightening of monetary policy. Core inflation in Sweden had admittedly not started to increase markedly yet, but as noted in the minutes from February 2022, there were signs from the rest of the world of a more long-term period of high inflation, see sections 4.2 and 4.3. As discussed in section 4.3, the *Bank of England* had already decided to raise the interest rate, and increases had also been announced by the *Federal Reserve*. In Sweden, it was assessed that utilisation of resources would become higher than normal in the coming years. The long-term inflation expectations had also started to rise, but not to worrying levels.

Signals from the market also indicated a different development to the one signalled by the Executive Board. It is apparent from the minutes of the monetary policy meeting in February 2022 that the market expectations were that the policy rate would be increased twice during the year, by 0.25 percentage points each time, and a further three times in 2023. The decision at the February meeting was to keep the policy rate at zero and to issue an interest rate forecast indicating a rise not until the second half of 2024. The sizeable discrepancy between market expectations and what the Riksbank communicates is, in general, a problem. But in this case, the market expectations regarding earlier increases mean a much-needed tightening.

Various members of the Executive Board emphasised inflation risks both on the upside and the downside. Given the information available at the

meeting, a scenario with moderate inflation in 2022 followed by a return to low inflationary pressure was not completely unreasonable. In such a scenario, a policy with zero interest throughout 2022 and 2023 could have been well-balanced. However, we believe that given the existing information, a scenario roughly like the one that was then realised could not be ruled out. It is therefore somewhat surprising that a scenario with considerably higher inflation and a need for rapid and vigorous reforms was not developed in connection with the February meeting. A conditional forecast for the interest rate path in this scenario would have been an important supplement to the interest rate path that was actually published, and could have sent a clearer signal about the considerable uncertainty that existed. Such a strategy could also have highlighted the reason for the discrepancy between the market expectations and the interest rate forecast in the main scenario.

We also make the assessment that the Riksbank's inflation forecasts were deficient to the extent that they did not take into account that a greater tendency to adjust prices upwards was likely in the given circumstances. As discussed in section 2, it is reasonable to believe that major, clearly visible cost increases will lead to greater, more widespread price increases than in normal times, when the cost increases are smaller and not as obvious to the customers. A scenario with rapidly increasing prices had furthermore played out in other countries, where inflation had started to rise earlier, see sections 4.2 and 4.3.

In summary, our assessment is that the inflation forecasts were deficient and that the Riksbank should, at least, have clarified a possible scenario with more drastically rising prices on a broader front. It should otherwise be noted that the Governor of the Riksbank – in the minutes of the June meeting – also makes clear that "As a forecaster, the Riksbank has had a bad year so far." In the Riksbank's account of monetary policy during the year (The Riksbank 2023c), the inflation forecasts are given considerable scope, but it does not go as far here in its statements, but emphasises instead that it, during the year, has "learnt important lessons" about the forecasting tools.

At the monetary policy meeting in April, it was noted that a great deal had changed since the February meeting. The inflation increases in Sweden had now become widespread and the risks of a development where the long-term inflation expectations lose their basis in the inflation target had increased. It was decided to set Sweden's monetary policy on a new course with an increase of the policy rate by 25 points, forecasts for further increases during the year, and a halving of purchases of securities. This new course now appears relatively modest. This is also noted by the Governor of the Riksbank who notes in the minutes: "At the same time, I feel that the rate hikes included in the repo-rate path do not mean that monetary policy changes over to being contractionary." This may be a question of semantics, but our assessment is that monetary policy should have been revised at this meeting, to be more clearly contractionary, with a greater increase in the policy rate and by selling the securities more rapidly. As so much information had emerged since the February meeting, we believe that the Executive Board should have

considered an extraordinary monetary policy meeting between February and April as the information that surfaced was primarily connected with Russia's war of aggression in Ukraine and rapidly rising prices in the world around us. The rather moderate changes to monetary policy at the April meeting indicate that the Riksbank interpreted the new information as being less dramatic.

At the meeting of the Executive Board in June, there was, according to the minutes, full consensus regarding the fact that inflation had now risen far too much and that an increase of the policy rate by 50 points was appropriate. It is also clear that the Executive Board saw further significant rises ahead during the autumn. Our assessment is that an even greater increase would have been suitable, especially in view of the fact that the new increase became twice as great. At the meeting, it was noted that it seemed that the market's more long-term inflation expectations remained close to 2 per cent, but an interpretation of this is that this was due to the fact that the market expected the Riksbank to take much more forceful action against the markedly higher inflation. In the end, this is what the Riksbank did, but our assessment is that it should have taken more resolute action at the first three meetings of the year.

A separate question is why central banks choose a strategy where the policy rate is increased slightly, at the same as plans for future increases are clearly announced. An alternative could be to raise the policy rate more forcefully once, in order to send a stronger signal to the market. When the Federal Reserve changed the direction of its policy during the early Volcker period, this is exactly what it did. The gradual policy rate increases that the Riksbank and other central banks chose presumably depends on at least two factors. One of these is *uncertainty*. If it had been known exactly how inflation would develop, and how the economy would react to a dramatic and instant policy rate increase, it would reasonably have made it possible, instead of gradual increases, to take more resolute and immediate action. Above all the uncertainty about how heavily increased interest rates would affect our households, given a relatively high level of household debt for housing, is apparent from the minutes; a strong economy is highlighted, but also the risks to financial stability. Another reason for taking gradual action is that an explicit, gradual increase may also be regarded as resolute: it is possible to signal a strong focus on fighting inflation without introducing all the increases at once. The chock increase under Volcker was, according to our interpretation, intended to signal a completely new era for interest rate policy, and there are probably no such reasons today. However, there is reason for caution in this conclusion, as the final outcome of the round of wage negotiations had not yet been observed and inflation in Sweden had not yet started to fall (see figure 4.13 above).

Comments on the purchases of securities

We would also like to comment on the decisions that were taken concerning purchases of securities. A general observation is that the direction of this policy has not drastically changed in the same way as the decisions on the policy

rate did in 2022. More specifically, a clear reduction of holdings could have been expected, as a reduction means a tightening of monetary policy – which the (eventually) markedly increased policy rate meant. In other words, balance sheet operations were conducted which, to some extent, can be interpreted to have taken the opposite direction to the interest rate decisions. In our assessment of the balance sheet operations, we lean towards our evaluation of quantitative easing in section 2: (i) they can primarily be regarded to be of significance in times of crisis and when the policy rate has reached the lower interest restriction; and (ii) to the extent that they affect inflation and the economy, this is primarily through their impact on the long market rates.

If the Executive Board shares this assessment, it is possible that the role of quantitative easing in relation to inflation and the economy was regarded as secondary, and that the Executive Board focused on directly influencing market rates with its policy rate. Our assessment is, nevertheless, that the decisions to continue with asset purchases in 2022 were illogical, but that they probably had a marginal effect on inflation, and were therefore not problematic from a price stability perspective. However, there is reason to discuss whether or not the Executive Board should have placed greater emphasis on the impact of quantitative easing on the Riksbank's results. We will deal with this in a separate section below.

Interest rate risk and effects on overall central government finances of portfolio decisions

As discussed in section 2.3, holdings of bonds involve an interest rate risk. A rise in interest rates lowers the value of a bond which has promised lower interest rates. The Riksbank has reported substantial losses on its holdings of bonds for 2022. The market value of holdings of government bonds fell during 2022 by SEK 41 billion, municipal bonds by SEK 7 billion and mortgage bonds by SEK 23 billion. The fact that the value of the mortgage bonds fell less depends on a shorter maturity. Government bonds were mainly purchased before the pandemic, and generated ongoing surpluses as their yields were higher than the Riksbank's deposit rate. In total, the losses generated by the decisions to purchase securities during the period 2015–2019 were considerably lower (SEK 9 billion) than the losses generated during the period 2020–2022 (SEK 51 billion).[26]

Without the purchases of securities that were made in the period 2015–2022, the interest rate risk and thus the value losses that arose in 2022 would, instead, have affected the private sector. The losses are thus of a central government finance rather than socioeconomic nature. The risks to central government finances and the losses that later arose must be weighed against the potential socioeconomic gains of the pursued policy. Our assessment is that

[26] The Riksbank (2023b).

the risks to central government finances that the decisions led to were small in relation to the potential gains.[27]

The extensive securities purchases may, however, have other negative consequences, the costs of which are difficult to estimate and which depend on how monetary policy is pursued in the future. Here, we are especially thinking about the fact that the way the market functions can be affected if expectations are raised that the Riksbank will want to continue to steer risk premiums even where there is no imminent risk of financial collapse. Pricing of risk may then, in an unfortunate way, be guided by expectations regarding the Riksbank's actions, rather than by underlying risk factors.

As regards the monetary policy decisions in 2022, we believe that the purchases of securities could have been stopped earlier and that some sales could have been initiated. However, this would have had negligible effects, if any, on the holdings' value losses.

The losses to central government finances which arose as a result of the large holdings of securities are registered in the Riksbank's balance sheet and will lead to erased, or negative, equity. In our opinion, it is important that the central government finance transfers required to deal with this are done in such a way that it does not pose a risk to the independent status of the Riksbank. However, there are question marks here, in particular as we have not yet observed the process that needs to take place to restore the equity.

Overall assessment

Our assessment is that the Riksbank, despite high inflation, met the price stability objective during 2022, in the sense that long-term inflation expectations continue to be in line with the inflation target. We therefore consider that the pursued policy has on the whole been appropriate and in accordance with the Riksbank Act.

We are, however, critical to the Riksbank's forecasts and certain aspects relating to the shaping of the policy. The forecasts, which are naturally difficult to make in times of major, unexpected, changes, seriously underestimated the strong inflationary pressure.

Our assessment is, furthermore, that the policy rate increases should have started earlier and been more forceful. An extraordinary meeting to discuss a possible policy rate increase would have been justifiable in March.

However, we wish to stress that, even though we have tried to assess the Executive Board's decisions on the basis of the information that was available when they were taken, we may be influenced by the fact that we now see the outcome. We also see the "decision errors" as relatively marginal; it is unlikely that an earlier, more forceful policy rate increase could have curbed inflation to any great extent. In addition, there is a significant delay in how interest rates

[27] This particularly applies to the decisions regarding purchases of mortgage bonds in 2020. The value of the stimulating effects that were generated by the securities purchases prior to the pandemic were probably not that great.

affect inflation, so it will not be possible to make a fair assessment of the policy until in a couple of years. A very important task for the Riksbank is to keep inflation in check in the long term and to ensure that the inflation target continues to have broad support, in particular on the part of the parties to the labour market.

Regardless of the interest rate decisions that were actually taken, there should at least have been a preparedness for the fact that the high American core inflation that took off during 2021 could spread to the EU and Sweden. Even if this was not regarded as the most likely scenario, it would have been an advantage if a conditional plan for monetary policy according to this scenario had been drawn up and clearly communicated. It is obvious to us that an absolute forecast for the interest rate path and other monetary policy does not take into account important information which may drastically impact future policy. A description of the policy according to a few possible scenarios guides the actors in the economy and should be of use for efforts to gain support for long-term inflation expectations. This should be especially important when there are considerable discrepancies between the Riksbank's and the market's assessments of the probability of different scenarios. The Riksbank should have noted in February that many market actors assessed that the interest rate would need to be increased substantially during 2022, and communicated under which conditions such a forecast may play out.

During 2022, the Riksbank should also have stopped its purchases of securities and announced that an active sale was to commence given that such a *quantitative tightening* was not assessed to pose a risk to financial stability (which we assess to be unlikely). It is, however, important to point out two modifications to this conclusion. Firstly, we consider that the consequences of the deviation from what we assess would have been the best policy are relatively modest. Inflation would not have been much lower, and the impact on the real economy less. Nor do we consider that the pursued policy has seriously tarnished confidence in the inflation target.

Finally, we would like to point out, as discussed above, that the effect of quantitative easing on the Riksbank's equity will require the involvement of central government funds and that, in this process, it will be crucial to safeguard the Riksbank's independence and clarify that the Riksbank's results may not affect its monetary policy.

5.3 Common criticisms of the Riksbank

In the above section, we have discussed the advantages and disadvantages of the Riksbank's policy, and have taken into account alternative scenarios for the shaping of its monetary policy. In this final section we wish, on the basis of our discussions above, to comment briefly on some common comments and criticisms that the Riksbank received in the media in 2022 and, to some extent, before this. We make no claims to cover everything that has been said in the

debate, we just look at a few instances. Our comments are also very brief, as they are directly based on our arguments above.

(i) *The negative policy rate was a mistake.* Even though our analysis applies to 2022, it should be clear above that our assessment is that an interest rate slightly below zero was a suitable policy.

(ii) *The low interest rate policy ended up driving up inflation.* The low interest rate policy had the purpose of driving up inflation to the 2 per cent target, which has been a great challenge for many central banks. The considerable inflation increase that started in 2021 depends, however, primarily on completely other factors (specific prices rose rapidly and unexpectedly).

(iii) *QE ended up driving up inflation.* The same comment as under (ii).

(iv) *The Riksbank has "talked down" the Swedish krona in an attempt to drive up inflation*. We comment briefly above that the Riksbank could be somewhat clearer in its communication about the exchange rate. However, as we have stated, we do not interpret the Riksbank's communication in this way, and above all our interpretation is not that the Riksbank has a target for the exchange rate or actively tries to exploit the exchange rate channel. Furthermore, the theoretical and empirical support for "talk" being able to affect the exchange rate rests on fragile ground.

(v) *The Riksbank should have acted earlier and more forcefully as regards increases of the policy rate.* We consider this to be correct.

(vi) *The Riksbank should have phased out quantitative easing earlier.* We also consider this to be correct, even though we do not believe that phasing out earlier would have led to a markedly better situation today.

(vii) *Inflation is primarily the Riksbank's responsibility, and it is therefore the Riksbank's fault that it is so high.* Our view is that specific relative price changes that may lead to higher inflation are not the Riksbank's responsibility, and should furthermore be allowed to have an impact. On the other hand, general price increases are the Riksbank's responsibility. At the same time, we know that it sometimes takes time before the Riksbank's measures affect inflation. We cannot therefore expect general price increases to be close to 2 per cent every year. The market's inflation expectations indicate that the inflation target has broad support, that is, that the Riksbank actually meets its target in this regard. We noted that a high level of credibility for the inflation target creates scope for greater discrepancies, as in 2022, without credibility being lost.

(viii) *The interest rate increases were too drastic and affect the weakest in society.* Our view is that they were not too drastic, but rather that they came a little too late. We also consider that the monetary policy has given rise to negative distributional effects, but that these are difficult to avoid and do not belong to the Riksbank's primary responsibilities.

(ix) *The interest rate increases were risky on account of high levels of debt in society.* Firstly, the Riksbank did take this into account. Secondly, it is probable that high levels of debt make interest rate increases more effective when aiming to curb inflation. The risk would in this case be that we are close to a tipping point, which triggers a financial crisis. It is never possible to fully eliminate this risk, but our assessment is that it was low in 2022, and continues to be so.

(x) *Interest rate increases lead to increased costs for many companies and employees, and lead to higher prices and higher wage demands, and therefore cause higher inflation, not lower.* This reasoning is logical, but quantitatively the literature on the subject finds to the contrary, through the channels discussed above.

5.4 Concluding comments

A very compact summary of our assessment of the Riksbank's monetary policy in 2022 is, firstly, that the Riksbank primarily acted in order to meet the objectives laid down in the Riksbank Act, and that is has therefore fulfilled its task in a satisfactory manner. Secondly, we do nevertheless consider that a somewhat better policy could have been pursued. The inflation forecasts were substandard, even taking into account the great uncertainty that existed; the Riksbank should have increased the policy rate earlier, given the inflation information that existed; communication should have clarified various possible scenarios for inflation and future policy rates; and purchases of securities should have been reversed to sales early during the year. Our view is that such an alternative policy would have been more effective in curbing inflation and would have informed the market better, but at the same time we do not believe that the end result would have been markedly different to that under the policy that has been pursued.

Finally, we wish to point out some difficulties connected with the period we have been through and are still going through. Inflation and the policy rate have, until recently, been very low for a long time, not just in Sweden. Most of the research upon which we base our knowledge is based on studies – theoretical and empirical – of this particular period. We can lean on knowledge from more in-depth studies, in particular of relevant microdata, but once again, the conclusions of these studies are probably coloured by the absence of turbulent inflation and interest rates. During the 1970s, inflation and interest rates were also high, but this is half a century ago, and many factors in the economy have changed since then. So even if studies from this period are valuable, they are not as reliable. As regards, for example, the effect of securities purchases, we know quite a lot, but a basis of our analysis has to be that sales of securities – which are something that has not yet been studied to any greater extent – are similar to securities purchases, but in reverse. Certain theories about asymmetry have been suggested, but these theories have not been tested, and

theories about symmetrical effects should probably be used as the point of departure.

We would also like, more generally, to highlight the value of using both theory and empirical data, even though no individual theory captures everything, and no individual empirical study can be definitive. Our analysis is therefore necessarily an assessment based on what we know, and what we *do not* know. In addition to these relatively traditional questions, problems such as a negative equity in the Riksbank's balance sheet – if it even is a problem – may be even more difficult for us to deal with as researchers. It is about the risk of the Riksbank's independence being undermined and, once again, about credibility in new situations.

For research, new and different episodes are of course exciting, and we already see signs of a renewed interest in pricing and supply disruptions, especially among young researchers. We therefore expect a productive research period ahead, and a better basis for decision-making will be available as a result of this research. This gives us a certain feeling of confidence. As crises often emerge in new guises and bring new challenges, however, a realistic view of the opportunities of monetary policy must be characterised by a cautious optimism and by a humility for the future.

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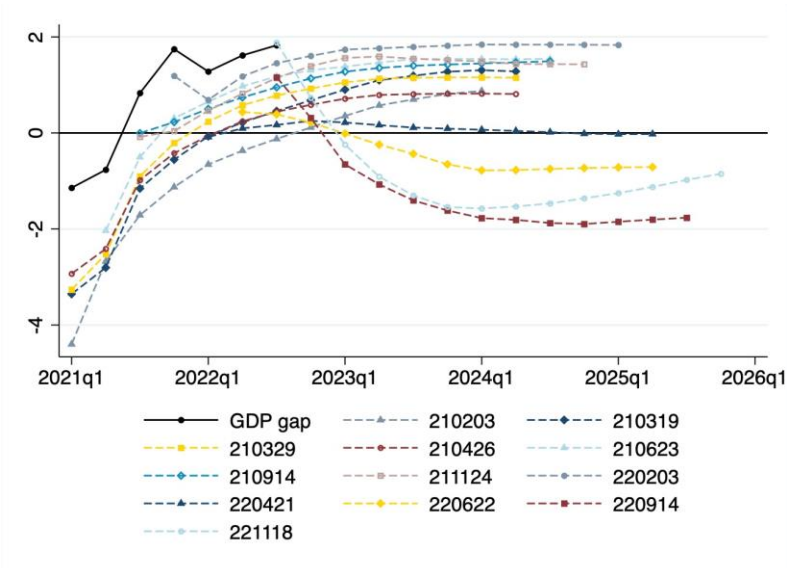
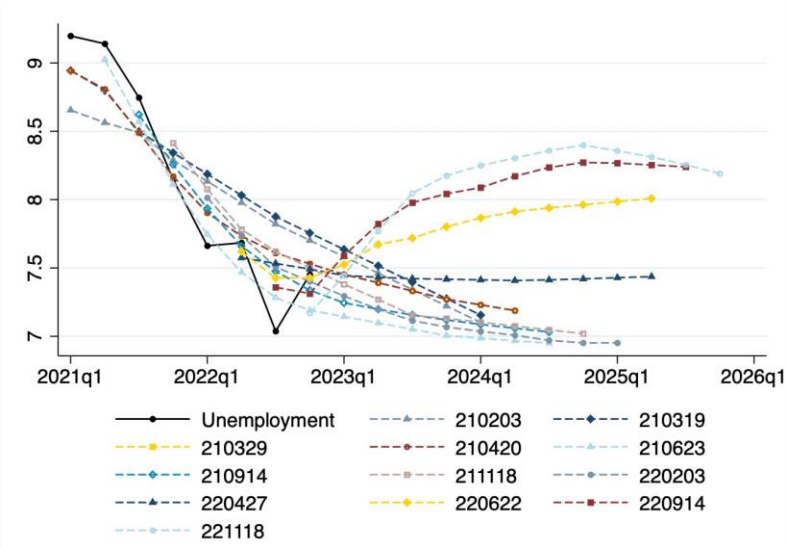
Appendix

Figure A.1 The GDP gap and the Riksbank's three-year forecasts at different dates 2021–2022



Notes: A solid line shows the GDP gap and dotted lines show forecasts at different dates. Per cent. Quarterly data. Source: The Riksbank.

Figure A.2 Unemployment and the Rikbank's three-year forecasts at different dates 2021–2022



Notes: A solid line shows unemployment and dotted lines show forecasts at different dates. Per cent. Quarterly data. Source: The Riksbank.

Table A1 Monetary policy decisions 2021

Date of meeting	Policy rate		Grounds for the decision*
	Change	New level	
9 February	0	0	*At the monetary policy meeting on 9 February, the Executive Board of the Riksbank decided to hold the repo rate unchanged at zero per cent. In order to support recovery and inflation, the Riksbank is also continuing to purchase assets within the envelope of SEK 700 billion and to offer liquidity within all the programmes launched in 2020.*
26 April	0	0	*Recovery is well under way, but it will take time before inflation is more permanently close to the target of 2 per cent. Continued expansionary monetary policy is therefore needed to support the economy and inflation. At the monetary policy meeting on 26 April, the Executive Board of the Riksbank decided to hold the repo rate unchanged at zero per cent and it is expected to remain at that level in the years to come. The Riksbank is also continuing to purchase assets within the envelope of SEK 700 billion and to offer liquidity within all the programmes launched in 2020.*
30 June	0	0	*At the monetary policy meeting on 30 June, the Executive Board of the Riksbank decided to hold the repo rate unchanged at zero per cent and it is expected to remain at that level during the coming three-year period. The Executive Board also decided that during the fourth quarter the Riksbank will buy bonds at an aggregate nominal amount of SEK 68.5 billion. This means that the pace of purchasing will continue to be tapered but that the envelope for asset purchases of SEK 700 billion will be fully utilised until the end of 2021.*
20 September	0	0	*At the monetary policy meeting on 20 September, the Executive Board of the Riksbank decided to hold the repo rate unchanged at zero per cent and it is expected to remain at this level over the coming three-year period. The Riksbank will continue to purchase securities during the remainder of 2021 in line with earlier decisions and the Executive Board's forecast is that the holdings will be more or less unchanged in 2022. The Executive Board also decided to now close certain lending facilities that were launched during the pandemic and to restore at the turn of the year the requirements for the collateral the banks have to provide when borrowing from the Riksbank.*
24 November	0	0	*Monetary policy needs to give continued support to the economy for inflation to be close to the inflation target in the slightly longer term. At its monetary policy meeting on 24 November, the Executive Board of the Riksbank therefore decided to hold the repo rate unchanged at zero per cent, and to purchase bonds during the first quarter of 2022 to compensate for forthcoming principal payments in the Riksbank's asset holdings.*

Please note: * Quotes from the summaries of the monetary policy minutes. (The Riksbank 2022a, 2022b, 2022c, 2022d and 2022e).

Table A2 Monetary policy decisions 2022

Date of meeting	Policy rate		Grounds for the decision*
	Change	New level	
9 February	0	0	*Monetary policy needs to give continued support for inflation to be close to the inflation target in the medium term. At its monetary policy meeting on 9 February, the Executive Board of the Riksbank therefore decided to keep the repo rate unchanged at zero per cent, and to purchase bonds for SEK 37 billion during the second quarter of 2022 to compensate for maturing assets in the Riksbank's holdings.*
27 April	+0.25	0.25	*The Riksbank needs to conduct monetary policy to counteract the high inflation becoming entrenched in price- and wage-setting, and ensure that inflation returns to the target after a time. At its monetary policy meeting on 27 April, the Executive Board of the Riksbank therefore decided to raise the repo rate from zero to 0.25 per cent and to reduce the pace of the Riksbank's asset purchases during the second half of this year so that the holdings decline.*
29 June	+0.5	0.75	*The Riksbank needs to prevent high inflation becoming entrenched in price- and wage-setting, and to ensure that inflation returns to the target. The Executive Board therefore decided at its monetary policy meeting on 29 June to increase the policy rate by 0.5 percentage points to 0.75 per cent and to reduce the Riksbank's asset holdings faster during the second half of the year than what was decided in April.*
19 September	+1.0	1.75	*Inflation is too high. It is undermining households' purchasing power and making it more difficult for households and companies to plan their finances. It is very important that monetary policy continues to act for inflation to fall back and stabilise at the target of 2 per cent within a reasonable time perspective. At its monetary policy meeting on 19 September, the Executive Board of the Riksbank decided to raise the policy rate by 1 percentage point to 1.75 per cent.*
23 November	+0.75	2.50	*To bring down inflation and safeguard the inflation target, the Executive Board decided to raise the policy rate by 0.75 percentage points to 2.50 per cent at the monetary policy meeting on 23 November. Inflation is still far too high and compared with September the Executive Board assesses that monetary policy needs to be tightened further to bring it back to the target within a reasonable time.*

Please note: * Quotes from the summaries of the monetary policy minutes. (The Riksbank 2022a, 2022b, 2022c, 2022d and 2022e).

SVERIGES RIKSDAG

Beställningar: Riksdagens tryckeriexpedition, 100 12 Stockholm
telefon: 08-786 58 10, e-post: order.riksdagstryck@riksdagen.se
Tidigare utgivna rapporter: www.riksdagen.se under Dokument & lagar