Sveriges Riksbank Economic Review

2026 no. 1

S V E R I G E S R I K S B A N K

Sveriges Riksbank Economic Review

Issued by Sveriges Riksbank

Editors: Marianne Nessén and Ulf Söderström

Advisory editorial committee: Mikael Apel, Anders Kärnä, David Kjellberg, Katja Rehnberg Taylor and the Communications Division
Sveriges Riksbank SE-103 37 Stockholm
Telephone +46 8 787 00 00

The Review is published on the Riksbank's website
www.riksbank.se

ISSN 2001-029X

Dear readers,

This issue of Sveriges Riksbank Economic Review contains four articles dealing with key issues in practical monetary policy – the internal preparations and predictability. The first article describes how monetary policy decisions are prepared at the Riksbank. The second article introduces a checklist, i.e. a set of criteria that can be checked during the monetary policy preparation process to ensure that the decisions are well balanced. The third article presents real-time estimates of the Riksbank's reaction function, and discusses how such estimates can be used to shed light on the predictability of monetary policy. The fourth article also analyses the Riksbank's reaction function, but then from the perspective of market participants' perceptions. The articles reflect the Riksbank's on-going work with transparency and predictability in monetary policy.

This issue also includes a fifth article summarising the lessons learned from a workshop held at the Riksbank on climate risks and commercial property.

- **The Riksbank's objectives, mandate and the process behind a monetary policy decision**

  Maria Sjödin, adviser in the Monetary Policy Department, describes how the Executive Board of the Riksbank reaches its monetary policy decisions. The article discusses, among other things, changes in the preparation of monetary policy in recent years, stemming from lessons learnt from the major macroeconomic shocks of the past few years, the transition to eight monetary policy meetings per year and the new Sveriges Riksbank Act.

- **A checklist for a well-balanced monetary policy – a proposal and an illustration**

  Jakob Almerud, *Carl Andreas Claussen* and *Matilda Kilström*, all at the Monetary Policy Department, propose a checklist for a well-balanced monetary policy. The checklist is based on seven overarching principles, such as stabilising inflation at the target and keeping monetary policy flexible, robust and predictable. The checklist aims to help ensure that monetary policy trade-offs are made in a systematic and transparent manner. The authors illustrate how the checklist can be used in practice through examples from a monetary policy drafting process at the Riksbank.

- **Has Riksbank monetary policy been predictable? Evidence from estimated reaction functions**

  Peter Gustafsson and *Marianne Nessén*, both at the Monetary Policy Department, report on new estimates of the Riksbank's reaction function based on real-time data. Using these estimates, they discuss how reaction functions can be used in the internal preparation of monetary policy decisions to help improve the predictability of monetary policy.

- **Estimating perceived monetary policy rules for Sweden**

  Max Brès, *Alexander Czarnota* and *Matilda Kilström*, all at the Monetary Policy Department, use expectations provided by professional forecasters in surveys, as well as expectations from the pricing of financial instruments, to estimate so-called ‘‘perceived’’ reaction functions. They use these to analyse how the Riksbank's monetary policy is perceived to respond to economic developments. *This article is published in English only.*

- **Climate risks and commercial property: lessons and challenges to strengthen financial stability**

  Kent Eriksson and *Mark Sanctuary* from the Royal Institute of Technology and the Sustainable Finance Lab and *Cristina Cella, Valentin Schubert* and *Ulf Söderström* from the Riksbank summarise a workshop that the Riksbank organised together with the Sustainable Finance Lab in November 2025. The theme of the workshop was how climate-related risks can be transferred to the financial system via the commercial property market. The article summarises the workshop's insights on how to improve the resilience of the financial system through better data, better coordination of governance and policy measures, including stress tests, regulation and proactive investment.

Read and enjoy!
Marianne Nessén and Ulf Söderström

Contents

The Riksbank's objectives, mandate and the process behind a monetary policy decision

Maria Sjödin*
The author is adviser at the Riksbank's Monetary Policy Department

In recent years, there have been some changes that have affected the Riksbank's work prior to monetary policy decisions. For example, a new Sveriges Riksbank Act entered into force in January 2023, more ordinary monetary policy decisions have been taken since 2024 and, not least, the period of major shocks to the economy has provided new experiences. This article is an update of a previously published description of the monetary policy decision-making framework.

The overall process ahead of a monetary policy decision is broadly the same and the need for flexibility remains. The Executive Board of the Riksbank now normally takes eight monetary policy decisions a year and, for every other decision, when a Monetary Policy Report is published, the process takes around five weeks. When a Monetary Policy Update is published it takes around three weeks. The drafting process can be roughly divided into four stages: (i) the phase before the Monetary Policy Department presents proposals for the main and alternative scenarios and monetary policy to the Executive Board; (ii) the actual preparatory meetings with the Executive Board; (iii) the phase after these meetings, when the Executive Board's feedback are incorporated, and finally; (iv) the monetary policy decision and the communication associated with it.

1 An independent central bank with high transparency

1.1 Statutory independence and price stability objective

The inflation target is one of Sweden's economic objectives because low and stable inflation creates good conditions for favourable economic growth. The Riksbank is responsible for the task of keeping inflation sustainably low and stable through monetary policy. The Riksbank is an independent central bank and an autonomous

* Thank you to Björn Andersson, Carl Andreas Claussen, Vesna Corbo, Mattias Erlandsson, Caroline Flodberg, Peter Gustafsson, Marianne Nessén, Anna Seim, Ingvar Strid and Ulf Söderström for their valuable comments. The opinions expressed in this article are the sole responsibility of the author and should not be interpreted as reflecting the views of Sveriges Riksbank.

authority under the Riksdag, and this independence has been a fundamental principle since 1 January 1999.[1]

The task of monetary policy to maintain price stability is defined in the Sveriges Riksbank Act. However, it is the Riksbank and its Executive Board that decide not only how the target is to be achieved, but also how the target is to be specified - that is, what the intended target variable is and what level it should be at. When the inflation target was introduced in 1993, it was specified as an annual change in the consumer price index (CPI) of 2 per cent. In 2017, the Riksbank decided the consumer price index with a fixed interest rate, the CPIF, to be the formal target variable but without changing the target level.[2] An amendment introduced in the new Sveriges Riksbank Act is that if the Riksbank wishes to change the specification of the inflation target, the Riksdag must now formally approve this.[3] The inflation target and its current specification have broad political support.[4]

While the overriding task of monetary policy is to fulfil the inflation target, the Riksbank shall also contribute to a balanced development of production and employment.[5] This is usually called "flexible inflation-targeting" (See Svensson 1999 and Svensson 2011). There is no general answer to the question of how quickly inflation should be brought back to 2 per cent if it deviates from the target. It depends, among other things, on how far from the target inflation is at the outset, the type of shock that has occurred and the trade-offs that monetary policy needs to make. Normally the trade-off is a question of finding a balance between how rapidly inflation shall be brought back and the effects on real economic developments. Monetary policy affects the real economy and inflation through different channels, which means that different mechanisms operate simultaneously. Some of these affect inflation relatively quickly while others take longer.

1.2 The Executive Board takes the monetary policy decisions

The Riksbank is led by an Executive Board which since 2023 consists of five full-time members, appointed by the General Council of the Riksbank. Their term of office is

[1] A key element of independence is what is known as the prohibition on instructions, which is enshrined in the Instrument of Government. This means that no public authority may determine how the Riksbank shall decide in matters for which it is responsible and that the Riksbank may not seek or take instructions from anyone.

[2] See Sveriges Riksbank (1993). The change in the formulation of the target did not change how monetary policy is conducted but it provided more clarity regarding how the Riksbank interprets its task of maintaining price stability. See Press release: CPIF the target variable for monetary policy

[3] The current Sveriges Riksbank Act (2022:1568) came into force on January 1 2023 and replaced the act from 1988 (1988:1365).

[4] An example of this is that the Government comments in the bill to the Sveriges Riksbank Act that (p.88): "The current specification of the price stability objective - two per cent inflation per year, measured by the consumer price index with a fixed interest rate (CPIF) - should be an appropriate specification of the objective for the time being." See Government of Sweden (2021).

[5] This wording was introduced in the new act. In practice, the meaning is the same as the one the Riksbank had in its previous strategy: that the Riksbank aims to stabilise output and employment around long-term sustainable development paths. The amendment therefore had no practical implications for the monetary policy strategy but was a formalisation of existing practice. See also the Sveriges Riksbank (2023).

five or six years.[6] One of the members is appointed Governor of the Riksbank and is Chair of the Executive Board. The other members are Deputy Governors, with one acting as First Deputy Governor. The Executive Board takes monetary policy decisions by majority vote, with each members vote carrying equal weight.[7]

The Riksbank normally holds eight meetings a year, at which the Executive Board decides on the policy rate and, if they deem it appropriate, other monetary policy measures.[8] However, if there is a need for more monetary policy decisions, the Executive Board may meet more frequently. The initial acute phase of the 2020 coronavirus pandemic is an example of this: Between 12 March and 21 April 2020, five extraordinary monetary policy meetings were held to decide on various measures.[9]

In connection with all monetary policy decisions, the Riksbank publishes a decision document in which the Executive Board justifies the decision.[10] At every other meeting, four times a year, the Riksbank's forecasts are published in a *Monetary Policy Report*, which summarises the data on which the current decision is based. The report reflects the Executive Board's views on economic developments and on what constitutes a well-balanced monetary policy. At the other four meetings, the Riksbank publishes a shorter document without new forecasts, a *Monetary Policy Update*. It contains a qualitative description of the impact of new information on the Executive Board's assessment of the outlook for economic activity, inflation and monetary policy, together with a justification for the monetary policy decision.

When the monetary policy decision is made public, the Riksbank also publishes a press release that briefly describes and justifies the decision. If any member of the Executive Board has entered a reservation to the decision, this is stated in both the decision document and the press release. The more detailed reasoning of the members is published in the monetary policy minutes approximately five working days after the decision meeting. The minutes also clarifies if and how members' views differ. Once the minutes are published, the members can also publicly express their own views on the decision.[11] The individual board members' protocol entries and

[6] Between 1999 and 2023, the Executive Board consisted of six members, and the Governor had a casting vote in decision-making. The Executive Board fulfils several roles that, in many other central banks, are performed by different groups of decision-makers. For example, at the ECB, the Bank of England and the Federal Reserve, different groups run operations in the organisation and make monetary policy decisions.

[7] At the same time, each member has an individual responsibility, which is reflected in the fact that the Executive Board is not expected to be unanimous in its decisions. The Executive Board is usually described as an individualistic monetary policy committee that, as opposed to a collegial committee, does not seek consensus and openly reports dissenting opinions once the decision has been taken. See for example Blinder (2007).

[8] The number of ordinary monetary policy meetings per year has varied over time. Between 2008 and 2020, there were normally six meetings per year. In 2020 the Riksbank moved to five meetings per year and in 2024 to eight meetings per year. The rationale for eight ordinary meetings was to be able to adjust monetary policy more quickly to the prevailing situation and to communicate more frequently a collective view of economic developments, while aligning with international practice.

[9] See the Riksbank's website for the minutes of monetary policy meetings Minutes of the Executive Board's monetary policy meetings | Sveriges Riksbank. The Executive Board also took six "per capsulam" decisions during this period. In total, decisions were taken on more than 20 different occasions in 2020.

[10] As of 2023, monetary policy decision documents are published in their current form as part of an adjustment to the new Sveriges Riksbank Act. Previously, decisions on the policy rate were included in the Monetary Policy Reports and the Monetary Policy Minutes, but not in separate decision documents.

[11] See also The Riksbank's communication policy | Sveriges Riksbank.

communication clarify their individual responsibilities, which also facilitates an evaluation of monetary policy.

1.3 Independence requires the Riksbank to be scrutinised and evaluated

As the Riksbank has an independent role in relation to the Riksdag, it is particularly important that it is possible to carefully scrutinise and evaluate the Riksbank's´ administration, not least to preserve trust and support for the Riksbank's´ independence and mandate. In order to hold the Executive Board accountable for its decisions, high transparency plays a central role.[12] Communicating monetary policy openly and clearly not only makes it easier for economic agents to make good economic decisions but also makes monetary policy easier to evaluate.

The Riksbank is scrutinised in several ways. The formal scrutiny of activities, decisions and the Executive Board is carried out by the Riksdag (the Swedish Parliament), the Swedish National Audit Office, the General Council and its audit function. The Riksbank's administration is audited by the Swedish National Audit Office every year, on the basis of the Annual Report. In the Riksdag, the Committee on Finance monitors and evaluates the Riksbank's activities, including through open hearings with the members of the Executive Board.

The Riksdag Committee on Finance evaluates monetary policy annually and, as a basis for this review, the Riksbank compiles the publication *Account of Monetary Policy*. Since 2023, the Committee on Finance has also commissioned an annual independent expert evaluation by Swedish researchers in economics. Every five years or so, the Committee on Finance also commissions two prominent foreign economists to review the monetary policy conducted by the Riksbank in a longer-term perspective. The first review was published in 1999 and the latest in 2026.[13]

The basis for monetary policy decisions is also evaluated internally. For example, the Riksbank continuously evaluates its forecasts to see how well they capture economic developments.[14]

1.4 The Riksbank's monetary policy tools

The policy rate is the main monetary policy tool used by the Riksbank to stabilise inflation at the target of 2 per cent. By raising or cutting the policy rate, the Riksbank affects other interest rates in Sweden. This in turn affects demand in the Swedish economy and thus inflation.[15]

[12] The Riksbank is often ranked highly in surveys of central bank transparency, see for example Dincer et al. (2022).

[13] See the Committee on Finance's website for all the evaluations, both the annual ones and those with a longer time perspective The Committee on Finance's evaluations of monetary policy | Sveriges Riksdag

[14] For the latest published evaluation of the forecasts, see Sveriges Riksbank (2026).

[15] This is usually referred to as the interest rate channel. Monetary policy also affects inflation and the real economy through other channels. These are usually referred to as the exchange rate channel, the asset price channel, and the expectations channel.

Under certain circumstances, the Riksbank may need to use other monetary policy measures, especially if the policy rate is already very low or even negative. If the Riksbank in such situation for example needs to lower interest rates further to stimulate the economy, this can be done by, for example, buying Swedish government bonds. Such securities purchases typically push down government bond yields, which then spread to other interest rates in the economy. There are other measures that the Riksbank could use, including purchases of other types of securities and interventions on the foreign exchange market. However, in accordance with the Sveriges Riksbank Act, there must be exceptional grounds for the Riksbank to buy and sell securities other than Swedish government securities for monetary policy purposes.[16]

Open and clear communication is also an important monetary policy tool for a central bank. When taking decisions about consumption and investment, households and companies are influenced by current interest rates, but also by how they expect interest rates to develop in the future. If they can anticipate the future monetary policy stance, it facilitates their economic planning. Monetary policy is therefore more effective if it is predictable. The Riksbank has chosen to be more open in its monetary policy communication than many other central banks. This includes the design of the monetary policy minutes but also publishing the forecast for the policy rate and alternative scenarios.[17]

1.5 The importance of monetary policy communication

The Riksbank tries to make monetary policy predictable in several ways. One way is to be clear about the objectives of monetary policy. Another way is to try to be clear about how monetary policy will be conducted to achieve these objectives.[18] The Riksbank has published forecasts for inflation and various real economic variables since the late 1990s. In 2007, the Riksbank began to also make its own forecast for the policy rate. The reason was, among other things, that the forecasts for inflation, the real economy and monetary policy would be more clearly linked, based on the principle that the other forecasts are conditioned on the forecast for the policy rate.[19] To increase transparency, the Riksbank decided to also publish its policy-rate forecast, together with the forecasts for economic developments that this monetary policy is expected to result in.[20]

[16] The previous Sveriges Riksbank Act was more general in terms of the tools that the Riksbank may use for monetary policy purposes.

[17] These three elements fulfil different functions, but they also create conditions for and interact with each other. See Breman and Seim (2025).

[18] One way to retrospectively discuss whether monetary policy has been predictable is to study deviations between the policy conducted and estimated so-called reaction functions, which aim to capture how the Riksbank historically set interest rates given developments in key economic conditions. Justifying the identified deviations in the Riksbank's communication when they occur can be expected to strengthen the predictability of monetary policy. This is discussed by Gustafsson and Nessén (2026).

[19] Working with policy rate forecasts also improves internal discussions, as the effects of different monetary policy options can be more easily analysed and illustrated. See Sveriges Riksbank (2017).

[20] It is still relatively unusual for central banks to publish forecasts for their policy rates.

The forecast provides information to actors in the economy on the behavioural pattern of the Executive Board: If the economy develops as the Riksbank expects, it shows what the Riksbank is likely to do and what impact it will have on economic activity and inflation. The policy-rate forecast thus reflects the monetary policy that in the end, in the Executive Board's view, is deemed consistent with good target attainment.

In 2024, the Riksbank began to communicate more clearly the difference between how the Executive Board views the forecast for the policy rate in the near term compared with the longer-term forecast. The aim was to signal that there is more information, and therefore somewhat more reliability, in the forecast for economic developments in the short term, while the outlook further ahead is increasingly uncertain, as new shocks continuously hit the economy.[21]

Since 2007 the Riksbank has also produced alternative scenarios. The scenarios are part of the internal analysis and have also become a supplementary tool for communicating how the policy rate might develop. With the scenarios the Riksbank can illustrate the uncertainty surrounding the economic outlook but also provide information on the risks that the Executive Board perceives as important and what the policy-rate forecast might look like if the scenarios materialise. Compared to uncertainty bands based on historical forecasting errors, scenarios provide a clearer view of the uncertainty surrounding the outlook at a given decision point. Alternative scenarios are also likely to be most valuable when the economic outlook is highly uncertain. Therefore, the Riksbank has seen a greater need to illustrate alternative development paths for the economy in recent years, as there have been several large shocks. That is why the scenarios have been highlighted more in the Riksbank's monetary policy communication.[22]

2 The monetary policy drafting process

2.1 Eight monetary policy decisions per year

It is mainly the Monetary Policy Department (APP) that prepares a basis for the monetary policy decision, with important participation also from the Markets Department (AFM), the Financial Stability Department (AFS) and the Legal Secretariat (RÄT). To provide a research perspective in the monetary policy analysis, the head of the research division and several researchers also participate in the drafting process.

Four times a year, ahead of the March, June, September and December decisions, APP produces a thorough baseline scenario with forecasts for economic activity, inflation and the policy rate, as well as detailed alternative scenarios. Based on the forecasts, a broader and more comprehensive basis is provided for the Executive Board to discuss

[21] See Sveriges Riksbank (2024) for more details on the change.

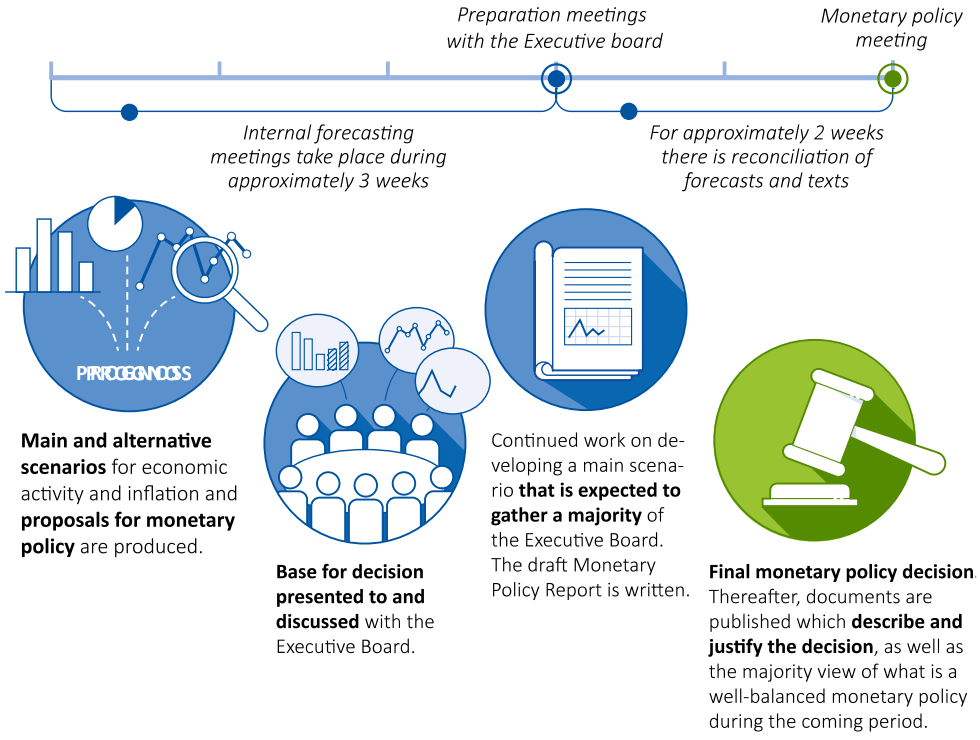
[22] Between 2007 and 2015, the alternative scenarios had their own chapter in the Monetary Policy Report. When the report was remodelled, the alternative scenarios were published less frequently but continued to be used in internal discussions. Since 2023, they have again been a regular feature of the Monetary Policy Report.

risks, uncertainties and different monetary policy options. Ahead of the other four decision occasions, APP does not produce forecasts but normally provides a more qualitative update on economic developments since the last forecast, an assessment of changes in the risk outlook and a basis for the Executive Boards' monetary policy considerations.

This means that the process leading up to a monetary policy decision is longer when a Monetary Policy Report is published than when a Monetary Policy Update is published. The longer process lasts around five weeks and can be roughly divided into four stages (see Figure 1): the phase before APP presents the basis for the decision to the Executive Board, the preparatory meetings with the Executive Board, the phase after these meetings and, finally, the monetary policy meeting and the related communication. These stages are summarised below.

The process ahead of a Monetary Policy Update lasts for around three weeks - about two weeks before the preparatory meeting with the Executive Board and then another week before the monetary policy meeting. Basically, the process is similar but more compressed since no forecasts are produced nor a monetary policy report is written.

Figure 1. Schematic image of the monetary policy process in March, June, September and December



2.2 The process before preparatory meetings with the Executive Board

2.2.1 The interplay between forecasting models and assessments in constant evolution

As it takes time before monetary policy has a full impact on inflation and the economy at large, forecasts of economic developments are an important basis for the decision. The forecasts are in turn affected by the assumptions made about monetary policy, that is, assessments about how the policy rate and the Riksbank's other monetary policy instruments will develop. Therefore, analyses of the impact of monetary policy - for example on the financial markets, the real economy and inflation - are also important in the decision-making basis.

The Riksbank uses several models to make the best possible analyses of the current economic situation and produce forecasts for economic developments beyond the next few quarters. These models are based on economic theory, empirical studies and different relationships in the economy. But there is no single tool that can fulfil all analytical needs, and both the needs and the tools change over time. The Riksbank is therefore continuously reviewing its models and working methods with the aim of improving the model support for forecasting and monetary policy analysis.[23]

To form an opinion about where the economy is at the outset, the Riksbank uses outcome data and a range of quantitative indicators related to actual activity, such as statistics on production, consumption and labour market conditions, as well as survey data that, for example, measures price plans and the confidence of households and businesses. When short-term forecasting (usually forecasts for the current quarter and one to two quarters ahead), more emphasis is typically placed on time series- and indicator models since they often have good short-term forecasting ability. Longer-term projections are to a greater extent based on bigger and more theoretically based macroeconomic models and trend assumptions, which, together with certain assumptions about how monetary policy react to economic developments, provide a coherent view on inflation and economic outlook. In addition, the Riksbank uses smaller, partial, models that are better suited to analyse certain specific relationships in the economy.

In addition to different time series models, such as Bayesian VAR models, the Riksbank uses the macroeconomic model Maja, a model for general equilibrium analysis, in its forecasting work.[24] Maja is a model that captures dependencies between different sectors and actors in the economy, but also between Sweden and the rest of the world. Maja can be used to explain both the events in the economy and how market mechanisms and economic policies can bring the economy back to its normal state (long-term equilibrium) after a shock. For example, the model can interpret the extent to which inflation is driven by productivity, the exchange rate and

[23] This includes further developing macro models, evaluating and improving current models, and developing new methods for short-term forecasting based on AI and machine learning.

[24] Maja is a New Keynesian DSGE model ("Dynamic Stochastic General Equilibrium model"), see Corbo and Strid (2020) and Ringqvist et al. (2020).

other factors. It is also an important tool for studying alternative economic scenarios and how monetary policy tends to respond to shocks over time.

Models are necessarily simplifications of the complex economy, but with their grounding in both theory and data, model forecasts provide a good starting point that helps to structure the monetary policy discussions. However, models assume, to varying degrees, that history repeats itself or that economic relationships are stable over time. Therefore, they need to be complemented by analyses and assessments by experts who have insights into mechanisms and events in the economy that the models have difficulty taking into account. The model forecasts are weighed together with this information and assumptions about monetary policy into final forecasts of economic developments. Expert assessments become particularly important when unusual events or structural changes that alter the functioning of the economy take place. Over the past years, major economic shocks have occurred, making it difficult for analytical methods based on historical relationships observed in more stable times to provide relevant support for decision-making. The pandemic, Russia's invasion of Ukraine and the period of high inflation are all examples of times when it has been particularly important to complement the models with different assessments.

An important lesson has been that inflation dynamics can be very different in an environment with many and large shocks, and that it is important to be able to identify such an environment as quickly as possible (see Durakovic et al. 2025). In order for the Riksbank to best assess the current situation and near-term developments, high-frequency are needed.[25] These are now an important tool in the assessment.[26] A greater need but also greater access to data has made the analysis of inflation, the real economy and the effects of monetary policy become more detailed. For example, the Riksbank continuously analyses detailed financial data and data on securities borrowing and lending. In the analysis of inflation, it has become important to study more high-frequency measures of inflation than the 12-month figures, data from the Food Price Index and data on the frequency of price-setting by firms. The Riksbank's business survey has long provided important information, but in recent years, these contacts with business actors have been closer. These discussions have provided the Riksbank with in-depth information on how companies perceive the current situation and how they intend to act.

2.2.2 Proposals for the baseline scenario and monetary policy are drafted

At the start of the monetary policy process, APP holds a meeting with the Executive Board to discuss specific questions and themes on which the drafting should focus. The aim is to obtain guidance from the Executive Board on whether the department's prioritisation proposal is appropriate and meets the needs of the Executive Board. The current and main sources of uncertainty and the risks surrounding economic

[25] In the Riksbank's overall strategic plan, one of the shifts is to harness the potential of data. This is about streamlining and improving the conditions for working with data, both in forecasting and policy analysis, and exploring how new data sources can help the Riksbank understand the economy in new ways. See the Riksbank's website, The Riksbank's Strategic Plan 2024-2027.

[26] Some examples used during the pandemic are indicators of community mobility measured from mobile phone data, hotel and restaurant booking status, and card transaction data. See Ewertzh et al. (2020).

developments and monetary policy are discussed. APP proposes preliminary alternative scenarios for publication in the forthcoming report. The Executive Board may also ask for further in-depth analyses prior to the decision. This work is sometimes published as analysis or fact boxes in the Monetary Policy Report or in other Riksbank publications. The discussions on the meeting mainly concern the work ahead of the upcoming monetary policy decision but can also include longer-term planning.

For about three weeks, APP then works internally to draft a baseline scenario for the development of economic activity and inflation in Sweden which include a well-balanced monetary policy. In the first stage, it is necessary to clarify the *conditions* for the forecast, i.e. what happens irrespective of how the Executive Board chooses to conduct monetary policy at the next monetary policy meeting. Overall, this concerns developments abroad, the financial conditions and the current state of the Swedish economy.

Sweden's strong external dependence means that analysing and discussing developments abroad is important, with a particular focus on Sweden's main trading partners such as Europe, the United States and China. In Maja, the external environment is later conditioned by APP's projected outlook for economic activity, inflation and monetary policy for the euro area and the United States. Current financial conditions are analysed, and exchange rate and interest rate developments are important elements in these discussions, not least to assess the pass-through of monetary policy. At a meeting on the current economic situation in the Swedish economy, new information since the previous monetary policy meeting is discussed in detail and its implications for the Riksbank's short-term forecasts for GDP, the labour market and inflation. As new information is published on a continuous basis, APP updates these assumptions about the external environment and the current situation throughout the drafting process.

In the next stage, APP uses macroeconomic models and assessments to produce a *proposed baseline scenario* for the entire forecast period, that is the next three years. By discussing the plausibility of the models' interpretation of the new information, conclusions can be drawn about the expected impact on forecasts beyond the next few quarters. When factors that the models cannot fully take into account are also considered, APP agrees on a consistent forecast for policy rate, inflation, GDP, unemployment and exchange rate. This forecast still relies on a monetary policy determined by an estimated monetary policy rule in the models. The Riksbank normally aims for the risks surrounding the inflation outlook to be balanced, i.e. it is equally probable that inflation will be too high as that it will be too low. The main scenario should therefore not be interpreted as the scenario that the Riksbank considers most likely. But it is challenging to make forecasts where the risks are fully balanced, especially when the conditions for monetary policy changes fast.

Thereafter, a monetary policy iteration takes place to arrive at a *proposal for monetary policy*. The monetary policy is calibrated to be well balanced, which may lead to further adjustments to the forecasts for real activity and inflation. The policy-rate forecast prepared is well balanced in the sense that it shows a development of

the policy rate that is judged to stabilise inflation at the target and contribute to a balanced development of output and employment. There may be several different forecasts for the policy rate that achieve this, while, for example, the timing of inflation stabilizing at the target differs. In choosing between these options, APP emphasizes monetary policy also being effective, robust, and predictable (see Almerud et al. 2026). To arrive at such monetary policy, scenario analysis is an important element. For example, APP produces monetary policy options to illustrate both the monetary policy trade-offs and the potential impact of different monetary policy strategies on the outlook for economic activity and inflation.

Among other things, the monetary policy proposal prepared by APP reflect the way in which the Executive Board has normally chosen to act on the basis of the outlook for economic activity and inflation. Of course, this becomes more complex when the economy is hit by unusual shocks, or if the Riksbank uses supplementary tools in parallel with the policy rate. In such situations, cooperation with other departments at the Riksbank is particularly important.

Building on the risk discussion with the Executive Board at the start of the process, APP also develops proposals for *alternative scenarios* to be published in the Monetary Policy Report. These scenarios are used to illustrate the uncertainty surrounding the economic outlook, provide information on the risks that the Executive Board deem to be particularly important at the time of decision-making, and convey how monetary policy might be conducted if the scenarios materialise.

2.3 Preparatory meetings with the Executive Board

Approximately two weeks before the decision is to be taken, the monetary policy decision basis is presented to the Executive Board at preparatory meetings lasting one or two days. The meetings aim to provide the Executive Board with the information it needs to start forming a view on future economic developments and monetary policy. To bring in new perspectives and avoid groupthink, time is also allocated for a researcher or other senior Riksbank staff member to discuss the decision basis and act as a kind of “devil’s advocate” at these meetings.

Initially, several staff members from APP, AFS, AFM and the Communication Division participate. APP presents different types of modelling results together with the forecasts, the rationale behind them and the monetary policy the forecasts rely on. Particular emphasis is placed on current issues and the assessment of the current state of the global and Swedish economy. The results of the in-depth analyses identified at the beginning of the process are also presented. Once APP has presented the baseline and alternative scenarios, the members of the Executive Board and the officials involved in the preparation discuss key assumptions and factors affecting the economic outlook. These may include, for example, developments abroad, financial conditions or specific domestic factors that affect the real economy or inflation. The Executive Board can ask detailed questions directly to experts and commission further analyses prior to the decision.

After that, the focus shifts to the monetary policy discussion, with a more limited number of participants. To achieve a structured discussion of the current monetary policy considerations, APP justifies the monetary policy assumption the presented forecasts are based on and discusses monetary policy options. Based on the material presented at the meetings, individual members then, in an even smaller group, give their views on the forecasts and monetary policy.

2.4 The process after the preparatory meetings with the Executive Board

After the preparatory meetings with the Executive Board, APP follows up on any further requests, continues to monitor new incoming information and develops a proposal for forecasts and monetary policy that is believed to gather a majority in the Executive Board. The Executive Board of the Riksbank consists of members with different backgrounds, experiences and knowledge so that decisions on monetary policy are based on several different perspectives. This also means that there may be different views on which monetary policy is most appropriate. Sometimes these are merely nuanced differences, but other times the members' views differ more significantly, for example on how inflation and the real economy will develop or whether the risk outlook is reflected in a fair manner. Even if there is a consensus on the economic outlook, there may be different views on what constitutes a well-balanced monetary policy. If there are different opinions within the Executive Board, it is the majority view that is expressed in the decision and in the Monetary Policy Report. The texts of the Monetary Policy Report prepared by APP thus reflect what the department judges a majority of the Executive Board will agree on regarding monetary policy, the outlook for economic activity and inflation and the main motives for the current monetary policy decision.

Less than a week after the preparatory meetings, the Executive Board receives a draft of the monetary policy report, and at an Executive Board meeting, the members then discuss how the forecasts and monetary policy should be presented. The draft report is tabled, and the editorial work continues after the meeting. In the run-up to the monetary policy meeting, officials will continue to monitor how new information affects the baseline scenario and how risks surrounding the forecasts develop. The text is only finalised at the monetary policy meeting, as this is when the forecasts and monetary policy are set.

2.5 The monetary policy decision

2.5.1 The decision meeting

In addition to the Executive Board, the monetary policy meetings are normally attended by the Chief of Staff, the General Counsel, the Director of Communication, the Chief Risk Officer, the Heads of APP, AFS and AFM, and some additional staff members from APP, AFM and the Communications Division. The Chairman and Vice Chairman of the General Council also regularly participate in the meetings of the Executive Board and thus have direct insight into the work of the Board. They have the right to express opinions, but not the right to put forward proposals or take any decisions.

During the drafting process, the members of the Executive Board have formed their own opinions, but it is at this meeting that they take the final decision on the policy rate and, if appropriate, other monetary policy measures. They shall also agree on a view of future monetary policy and economic developments by adopting the monetary policy report.

First, AFM presents a brief update on market developments since the previous monetary policy meeting. After that, AFS describes the situation in the financial system. APP then presents the forecast that the department judges will be supported by a majority of the Executive Board, and the monetary policy proposal on which it is based. APP also sets out the issues that were discussed in particular detail during the drafting process.

Each member of the Executive Board then gives their personal view on the economic situation, the outlook and various aspects on monetary policy conduct. Thereafter the Executive Board decides on the proposal for the policy rate that gathers a majority and also adopts the Monetary Policy Report, with any amendments necessary to reflect the discussions at the meeting fairly.

2.5.2 Communication after the decision

The monetary policy decision is normally made public the day after the Executive Board formally takes it. The press release is then published, including any reservations, and the Riksbank holds a press conference. The Governor of the Board and the head of the monetary policy department briefly outline the economic situation and the reasons behind the decision made based on the monetary policy report, after which journalists can ask the Governor questions. The Riksbank then undertakes a range of other communication activities to reach key target groups, such as several media interviews, meetings with market participants and chats on various media's websites, where the public can ask the Governor questions.

Immediately after the publication of a monetary policy decision, only the majority view is communicated by the Riksbank. Approximately five working days after a monetary policy meeting, the minutes are published, setting out the reasoning behind each member's decision. Thereafter, the members can present their own positions in the economic debate.

3 Concluding comment

The inflation target in its current form was introduced in 1993, making Sweden one of the first countries in the world to conduct monetary policy with a floating exchange rate and a numerical inflation target. Today, the Riksbank's independence is statutory, and therefore it is also particularly important to have high transparency. Being open and clear means that it is possible to carefully scrutinise and evaluate the Riksbank's activities. For the Riksbank, this is important to preserve support for its independence, build confidence in the inflation target, and create credibility for monetary policy.

This article aims to provide an understanding of the Riksbank's mandate, objectives, and the process of monetary policy decision-making. In recent years, certain changes have occurred that have affected the Riksbank's work ahead of monetary policy decisions. Overall, the process is largely the same, but today it takes into account experiences from the period of major economic shocks, a new Riksbank Act since January 2023, and the fact that eight monetary policy decisions are now normally made each year. In an ever-changing world, monetary policy constantly faces new challenges, and it will continue to be important with a flexible process preparing the monetary policy decision. It contributes to the Riksbank's ability to adapt in various ways to attain the inflation target and build confidence in the Riksbank's activities.

References

Blinder, Alan (2007), "Monetary policy by committee: Why and how?", *European Journal of Political Economy*, vol. 23, no. 1, pp. 106–123.

Almerud, Jakob, Carl Andreas Claussen and Matilda Kilström (2026), "A checklist for well-balanced monetary policy – a proposal and an illustration", *Sveriges Riksbank Economic Review*, no. 1, pp. 21–53.

Breman, Anna and Anna Seim (2025), "Openness and clarity – key ingredients in Riksbank communication", *Sveriges Riksbank Economic Review*, no. 2, pp. 5–22.

Corbo, Vesna and Ingvar Strid (2020), "MAJA: A two-region DSGE model for Sweden and its main trading partners", Working Paper no. 391, Sveriges Riksbank.

Dincer, Nergiz, Barry Eichengreen and Petra Geraats (2022), "Trends in monetary policy transparency: Further updates", *International Journal of Central Banking*, vol. 18, no. 1, pp. 331–348.

Durakovic, Selena, Jesper Johansson and Oskar Tysklind (2025), "Lessons from the high inflation period", *Sveriges Riksbank Economic Review*, no. 2, pp. 23–54.

Ewertzh, Jakob, Thomas Falk, Marie Hesselman, Isaiah Hull, Mårten Löf, Oskar Stigland and Markus Tibblin (2020), "Real-time indicators provide information support during rapid cyclical turnarounds", *Economic Commentaries* no. 2, Sveriges Riksbank.

Government of Sweden (2021), "En ny riksbankslag (A new Riksbank Act)", proposition from the Government 2021/22:41.

Gustafsson, Peter and Marianne Nessén (2026), "Has Riksbank monetary policy been predictable? Evidence from estimated reaction functions?" *Sveriges Riksbank Economic Review*, no. 1, s. 54–69.

Ringqvist, Mattias, Pär Stockhammar and Ingvar Strid (2020), "Assessing the foreign linkages in MAJA – a conditional forecast evaluation approach", Staff memo, Sveriges Riksbank.

SFS 2022:1568, The Sveriges Riksbank Act, Swedish Code of Statutes.

Svensson, Lars E.O. (1999), “Inflation targeting as a monetary policy tool”, *Journal of Monetary Economics*, vol. 43, no. 3, pp. 607–654.

Svensson, Lars E. O. (2011), “Inflation targeting”, chapter 22 in *Handbook of Monetary Economics*, vol. 3b, edited by Benjamin M. Friedman och Michael Woodford, Elsevier.

Sveriges Riksbank (1993), “Riksbanken anger målet för penningpolitiken (The Riksbank announces the target for monetary policy)”, press release 15 February.

Sveriges Riksbank (2017), ”The Riksbank’s experiences of publishing repo rate forecasts”, *Riksbank Studies,* June.

Sveriges Riksbank (2023), “The new Riksbank Act and the monetary policy framework”, article in the *Monetary Policy Report*.

Sveriges Riksbank (2024) “Changes in the Riksbank’s monetary policy communication”, article in *Account of monetary policy* 2024.

Sveriges Riksbank (2026), *Account of monetary policy,* 2025.

A checklist for well-balanced monetary policy – a proposal and an illustration

Jakob Almerud, Carl Andreas Claussen and Matilda Kilström*
Jakob Almerud is senior economist, Matilda Kilström is advisor, and Carl Andreas Claussen is Head of the Monetary Policy Strategy Division, all at the Monetary Policy Department

Central banks with inflation targets often face complex trade-offs. In this article, we present a checklist that can support navigating these. The checklist consists of seven general principles. These state, for instance, that monetary policy should stabilise inflation at the target while remaining flexible, robust and predictable. Each principle is supported by more specific checkpoints.

The checklist helps ensure that trade-offs are made in a systematic and transparent way, based on careful analysis. It sets clear requirements for logic and consistency and helps ensure that critical aspects are not overlooked. We demonstrate the practical application of the checklist by presenting an example of its use in a recent policy round at the Riksbank.

1 Introduction

Inflation-targeting central banks face complex trade-offs. While price stability remains their primary objective, they also have to balance additional considerations, such as the impact of policy on economic activity and risks. These challenges are compounded by intertemporal trade-offs, where meeting targets in one period may conflict with target attainment in another. Given these complexities, there is a need for tools that help policymakers navigate the trade-offs in a structured and transparent manner.

This article presents such a tool: a checklist designed to support central bank staff and policymakers in managing trade-offs and arriving at a well-balanced monetary policy. Beyond helping navigate trade-offs, the checklist also serves as a safeguard that supports transparent and systematic policymaking grounded in rigorous analysis. It places demands on logic and consistency and helps ensure that critical aspects are not overlooked.

The checklist consists of seven general principles with broad support in economic research, hereafter referred to as criteria. Essentially, they state that monetary policy should aim to stabilise inflation at its target while remaining efficient, flexible, robust,

* The authors would like to thank Irina Andone Rosén, Mattias Erlandsson, Peter Gustavsson, Göran Hjelm, Marianne Nessén, Anna Seim, Lars E.O. Svensson, Ulf Söderström and seminar participants at Sveriges Riksbank for valuable comments and suggestions. The opinions expressed in this article are the sole responsibility of the authors and should not be interpreted as reflecting the views of Sveriges Riksbank.

predictable and proportional. In addition, policy should be based on realistic forecasts. Each criterion is supported by one or more checkpoints.

The purpose of the checklist is to provide structure and promote transparency to the analysis, not to impose inflexible rules. In many cases, it will neither be possible nor desirable to meet all checkpoints. The important thing is that the checklist helps to highlight and address potential weaknesses in a monetary policy proposal.

In terms of previous work, this article expands on Norges Bank's criteria for an appropriate future interest rate path (Norges Bank, 2005, 2010, 2012; Qvigstad, 2006) by providing new criteria and more detailed checkpoints. We also illustrate how the criteria and the checklist can be applied in practice. For example, we extend Barnichon and Mester's (2023) framework to evaluate technical efficiency and to infer policymakers' preferences from past policy decisions. The latter makes it possible to check whether the preferences implicit in the decisions are stable over time.

The structure of the article is as follows. In Section 2 we outline the approach to monetary policy that underpins the checklist and introduces key terminology. In Section 3 we present the checklist itself. In Section 4 we describe how the checklist has been adapted and is applied at the Riksbank. Finally, we offer concluding remarks in Section 5.

Throughout the article, terms are highlighted in italics when defined.

2 Underlying approach and useful terms

2.1 Mature inflation targeting

The approach to inflation targeting that underlies the checklist is what we call ''mature inflation targeting''.

In theoretical models, identifying a well-balanced monetary policy is a well-defined optimisation problem. Given a known transmission mechanism (the ''model''), a projection for exogenous variables and specified preferences (the ''loss function''), well-balanced policy (''optimal policy'') can be derived by minimising the expected loss, see, for example, Woodford (2003) and Svensson (2011).

However, this kind of optimisation is not directly applicable in practical monetary policy. One reason is that it is impossible to specify a model and a loss function that fully capture the preferences, judgements and considerations that form actual decisions. A related reason is that decision-makers employ different heuristics. For example, they may use models and reasoning that resemble theoretical optimisation to varying degrees.

In practical inflation targeting, central banks rely on forecasts. This forecast-based approach has evolved over time. In the past, central banks would typically make inflation forecasts based on the assumption that the policy rate would remain unchanged over the forecast period and set policy according to a simple rule: if

forecasted inflation was sufficiently below the inflation target over a given horizon, monetary policy would be relaxed, and vice versa. Over time, it became clear that this method is flawed, (see, for example, Sveriges Riksbank, 2017, for a discussion and references). In more recent approaches, the forecasts are based on increasingly realistic monetary policy assumptions.

Our checklist builds on an approach where policy alternatives are evaluated based on the forecasts they give rise to, often referred to as forecast targeting (see Svensson 2005a and 2011). Below, we briefly outline this approach and explain where the checklist enters this process. We also define some terminology.

In a stylised and idealised rendering with only one decision-maker (the policymaker), mature inflation targeting can be described as a stepwise process: In the first step, the policymaker makes a judgement on everything relevant for the forecasts that monetary policy cannot affect. For a small open economy, this includes the current situation (nowcast), fiscal and macroprudential policy, and international economic developments. It may also include taking a stance on the transmission mechanism (‘‘the model’’).

In the second step, the policymaker takes this as given and looks for a policy alternative that gives forecasts for the target variables that balance the different considerations appropriately, that is, a well-balanced monetary policy. In a theoretical model, this would correspond to optimisation.

In the third step, the policymaker sets policy accordingly and communicates the explanation behind it. The explanation consists of the forecasts associated with the decision and the judgements and assessments that led to the choice of this policy alternative.

In practice, identifying a policy that produces forecasts which appropriately balance trade-offs is challenging. Furthermore, the process can become cumbersome, unsystematic and difficult for outsiders to understand. This is where the checklist comes in. It simplifies and structures the second step. It helps ensure that important considerations are not overlooked and makes the decisions more transparent and easier to explain.

In reality, the forecasting and decision-making process may not follow such a strict stepwise structure as outlined above. Furthermore, decisions are typically made by a group of policymakers and involve input from central bank staff. This does not, however, diminish the relevance of the checklist, a point we return to in our concluding remarks.

2.2 Key terms

Exogenous variables are variables that domestic monetary policy cannot influence. In a small open economy like Sweden, these typically include variables describing the current economic situation, the outlook for domestic fiscal and macroprudential

policy, as well as international developments, including international interest rates and commodity prices.[1]

The numerical values assigned to the exogenous variables are called *exogenous conditions*. They are taken as given when the scenarios are prepared. *Nowcasts* are the numerical values assigned to the subgroup of variables describing the current economic situation.

Target variables are the variables that the central bank wants to influence with its monetary policy. For inflation-targeting central banks, these include inflation and any other variable that the central bank has targets for.

A *policy path* is a forecast for the central bank's monetary policy instruments, typically the policy rate.

A *scenario* consists of: (i) exogenous conditions and (ii) projections for the policy instruments (that is, the policy path), (iii) projections for the target variables, and (iv) projections for other endogenous variables. The *main scenario* is the scenario that forms the basis for the policymakers' decision. *Alternative scenarios* are scenarios that differ in one or more of the four dimensions. *Monetary policy scenarios* are scenarios where everything exogenous to monetary policy is kept unchanged from the main scenario, but where the monetary policy paths and the resulting projections for endogenous variables are different. *Risk scenarios* are scenarios where exogenous conditions, or the transmission mechanism (the ''model''), are altered relative to the main scenario. Risk scenarios may also include a monetary policy response.

We will also use the term *draft main scenario*, which is the draft main scenario crafted by the staff and submitted to the policymakers before they have given their inputs.

3 The checklist

In this section, we describe and discuss the checklist. The checklist comprises seven criteria, each with associated checkpoints. As mentioned earlier, not all criteria and checkpoints need to be fulfilled, but if there are deviations, they should be explainable. The complete list is presented in Table 1 at the end of this section.

Criterion 1. The main scenario is realistic

If policy is to be based on the main scenario, the main scenario must be realistic, where "realistic" refers to whether the scenario is consistent with observable facts, feasible policy actions, and credible economic behaviour.[2]

[1] While fiscal policy is not fully exogenous, it is often treated as such by central banks.

[2] An example of a scenario that is not realistic is a scenario where an unchanged policy rate over the whole scenario is assumed *ex ante*, as was the case at the Riksbank before November 2005 (see Sveriges Riksbank 2017).

For a scenario to be realistic, it must fulfil at least three requirements, outlined in Checkpoints 1.1–1.3.

First, exogenous conditions must be realistic. This is because the projections for the target variables depend on the exogenous conditions.

- **Checkpoint 1.1: The exogenous conditions are realistic**

Second, the policy path must be realistic.

- **Checkpoint 1.2: The policy path is realistic**

For the policy path to be realistic, it must be both ‘‘implementable’’ and ‘‘time-consistent’’.

A policy path is *implementable* if it is legal, assumes policy rates above the effective lower bound, and can be implemented with the central bank’s available capacity. An example of an illegal policy would be one where the central bank purchases assets that it is legally prohibited from purchasing. An example of a policy beyond the central bank's capacity would be one requiring expertise or resources that the central bank does not have.

A policy path is *time-consistent* if the central bank would follow through and implement it in the future should the economy evolve as in the associated scenario. This checkpoint would not be satisfied, for example, under Odyssean forward guidance (see Campbell et al. 2012).[3]

Third, the scenario should be *internally consistent*; the forecasted macroeconomic variables should be mutually coherent and reflect plausible economic interactions.

- **Checkpoint 1.3: The forecasts are internally consistent**

This checkpoint is automatically fulfilled if the scenario is generated by a plausible general equilibrium model. However, (main) scenarios rarely originate directly from a model. Instead, they are typically a blend of model outputs and judgement.

Criterion 2. Inflation is stabilised at target

Successful inflation targeting should stabilise inflation at target. This should be reflected in the scenario. Therefore, the policy path should produce inflation forecasts that return to and remain at target within a reasonable timespan.

Typically, there are multiple policy paths that produce inflation forecasts that return to and remain at target. Some may return inflation to target more quickly, while others take longer. The appropriate choice among these alternatives will depend on one’s preferences (“loss function”).

[3] This also applies if the central bank implements optimal policy under commitment, which, by definition, is time-inconsistent.

However, a more specific maximum horizon for returning inflation to target is useful as a first checkpoint. It should be long enough to allow for gradual adjustment and short enough to preserve the credibility of the target. A natural requirement is therefore that forecasted inflation should converge to and stabilise at the target within the forecast period. Thus, Checkpoint 2.1.

- **Checkpoint 2.1: Inflation stabilises at target within the forecast period**

A relevant objection is that, in the presence of unusually large shocks, optimal policy involves lengthening the targeting horizon to smooth the adjustment of inflation and the real economy. In practice, however, extending the horizon risks de-anchoring expectations if households and firms interpret the delay as a weakened commitment to the inflation target. The recent period of surging inflation illustrates this tension: while some central banks allowed for a longer horizon to return inflation to target, others maintained a stricter monetary policy out of concern that a prolonged deviation could erode credibility.

Criterion 3. The main scenario is technically efficient

The motivation behind this criterion is to avoid unnecessary deviations from the targets.

Using the terminology from Section 2, we can define technical efficiency as follows: A technically efficient scenario is one in which no alternative monetary policy forecast can improve target attainment for one target variable without simultaneously worsening it for another.

Monetary policy scenarios derived from model-based policy optimisation will satisfy this criterion within the model's context. However, as noted above, central banks' main scenarios are rarely the result of such optimisation, making it necessary to find alternative ways to evaluate technical efficiency.

One way to evaluate technical efficiency without model optimisation is to start from the forecasts for the target variables. Inflation-targeting central banks will typically seek to stabilise inflation and the real economy, and in that case, we can formulate a first checkpoint based on the following logic: Tighter monetary policy will dampen both inflation and resource utilisation, while looser policy stimulates both. If, for example, projected inflation is above the target (positive *inflation gap*) and resource utilisation is tighter than the level consistent with stable inflation (positive *real gap*), the scenario cannot be considered technically efficient as both gaps can be reduced by adjusting the policy path (more restrictive monetary policy).

- **Checkpoint 3.1: Beyond the near term, the inflation gap and the real gap are either closed or have opposite signs**

Since monetary policy affects the economy with a lag, the checkpoint concentrates on the later part of the forecast period. Exactly where the boundary lies between the ''near term'' and the ''later part'' of the forecast period depends on the characteristics of the economy and the length of its policy transmission lags.

To draw firmer conclusions on technical efficiency, we need to be more specific about preferences, for example by introducing a standard loss function. In Section 4.3, we show an example of how this has been done at the Riksbank.

Criterion 4. Monetary policy is flexible

This criterion concerns how to choose among technically efficient alternatives.

Central bank mandates and economic theory often suggest that monetary policy should stabilise both inflation and the real economy, that is, it should be flexible.[4] This motivates a the following for the preferences that guide policy: Monetary policy should be flexible in the sense that it normally fulfils the following checkpoints, which rule out strict inflation targeting – that is, policies that stabilise inflation at the expense of large and persistent real gaps.

- **Checkpoint 4.1: Monetary policy stabilises inflation and the real economy**
- **Checkpoint 4.2: Neither the inflation gap nor the real gap is substantially larger than the other when aggregated over the forecast period**

Criterion 5. Monetary policy is robust

Well-balanced policy goes beyond stabilising inflation and real activity. It is also about robustness.

Here, we think of monetary policy as robust when (a) it can be adjusted to achieve acceptable outcomes if certain risks materialise, and (b) current policy choices do not unduly increase risks or make the economy excessively vulnerable to future shocks.[5] Examples of risks that fall under (a) are adverse shocks and unanticipated changes to the transmission mechanism. Examples of risks that fall under (b) are policy actions that increase the risk of unanchored inflation expectations or increase the likelihood that monetary policy becomes constrained at a later stage, for example by the effective lower bound or by financial stability concerns.

Risk scenarios are useful for evaluating robustness. A natural first check can be to examine if risk scenarios where monetary policy is adjusted in response to the materialised risk result in acceptable outcomes.

- **Checkpoint 5.1: Plausible risk scenarios give acceptable target attainment**

But formulating relevant risk scenarios for Checkpoint 5.1. is not straightforward. Relevant risks may be overlooked, and constructing risk scenarios is time-consuming and labour-intensive. It is therefore important to also include checkpoints that do not rely on risk scenarios.

[4] For example, the Sveriges Riksbank Act states: "Without prejudice to the price stability objective, the Riksbank shall also contribute to a balanced development of output and employment." This is reflected in the Riksbank's own communication, where it refers to its policy as flexible inflation targeting (see also the Riksbank's Monetary Policy Report, p. 3).

[5] Note that this way of defining robust policy differs from another commonly used definition, where the robust policy is the one that minimises the loss in the worst possible scenario.

One possibility is to compare the policy path with that derived from so-called simple monetary policy rules.[6] Research surveyed by Taylor and Williams (2011) shows that simple policy rules often lead to more robust monetary policy when there is uncertainty about how the economy works, that is, when there is model uncertainty.

Similarly, the policy path can be compared to the expectations of external forecasters. Substantial deviations may indicate that the main scenario is based on misjudgements or unrealistic assumptions.

While divergence from simple rules or other forecasters is not inherently problematic, it should always be investigated and justified. Note also that the focus for the simple rules should be on the short term, because over the longer term the inputs to the monetary policy rules will themselves depend on monetary policy and can no longer be considered exogenous.

- **Checkpoint 5.2: The policy path in the near term is reasonably close to the policy path implied by simple monetary policy rules**

- **Checkpoint 5.3: The policy path is reasonably close to external forecasters' expectations**

Finally, we introduce a fourth checkpoint based on the principle that gradualism can enhance robustness. By adjusting the policy rate in small steps, the central bank can learn about the effects of its actions and reduce the risk of large policy errors.[7] A checkpoint about gradualism also connects back to criterion 1 (Realism), as forecasts assuming large rate changes beyond the near term are often unrealistic. Historically, large rate changes have typically only occurred in response to significant and unexpected developments.

- **Checkpoint 5.4: Policy rate changes are made in small steps (for example, 0.25 percentage points)**

Criterion 6. Monetary policy is predictable

Predictable monetary policy enhances the effectiveness of policy. If market participants understand how the central bank responds to new information, they can adjust market interest rates even before the central bank acts. This accelerates the transmission of monetary policy. It also reduces uncertainty in the economy and thereby contributes to a better allocation of resources.

A central bank that always sets policy according to an explicit policy rule or reaction function would be highly predictable. However, no inflation-targeting central bank

[6] Simple monetary policy rules state a relationship between the policy rate and a few indicators of inflation and resource utilisation (some rules include the lagged policy rate).

[7] Brainard (1967) shows that policy responses should be more cautious when there is uncertainty about the transmission mechanism. While the Brainard principle refers to the size of the policy response rather than the pace, gradualism may serve a similar purpose. Research by Sack (1998), Goodfriend (1991) and Woodford (2003) also supports the idea that gradual adjustments help maintain control over long-term interest rates and reduce the risk of market disruptions.

does that, and it would not be in line with the mature approach to inflation targeting (described in Section 2.1).[8]

Under the mature approach to inflation targeting, policy is designed to resemble theoretical optimisation. In such a framework, predictability requires that the preferences (''the loss function'') remain stable.

- **Checkpoint 6.1: Preferences are stable over time**

Another way of assessing predictability is to compare the policy path with an estimated reaction function. Although mature inflation targeting cannot be fully captured by a reaction function, such rules can still be useful for assessing predictability. One reason is that external observers sometimes estimate reaction functions and use them to forecast policy.

- **Checkpoint 6.2: The policy path in the near term is broadly consistent with estimated reaction functions**

In a similar vein, while it is not a goal for the central bank to align monetary policy with others' expectations, it is useful to compare the policy path with external forecasters' projections and market expectations to assess predictability.

- **Checkpoint 6.3: The policy path in the near term is broadly in line with that of external forecasters and with market expectations**

Criterion 7. Monetary policy is proportionate

The principle of proportionality should always apply in public policy: the benefits of any measure must justify its costs. This principle is built into flexible inflation targeting and reflected in Criteria 4 and 5. However, some costs of monetary policy measures fall outside these criteria, and it might not be straightforward to say whether and to what extent they should be considered.

Higher policy rates can raise the cost of servicing public debt and lead to financial losses for a central bank with large asset holdings. We nevertheless find it highly unlikely that such costs would outweigh the benefits of hiking the policy rate, as the central bank, by refraining from hiking rates, would risk undermining trust in the inflation target.[9]

Unconventional monetary policy, such as large-scale asset purchases, foreign exchange interventions or credit support programmes, expose the central bank, and by extension the public sector, to financial and reputational risks. These risks should

[8] This relates to the discussion about targeting vs instrument rules in the academic literature, see, for example, Svensson (2005b, 2011) and the references therein.

[9] Assessing these costs is, however, in line with the Sveriges Riksbank Act which states that the intended result of a monetary policy measure "shall be in reasonable proportion to the costs and risks that the measure entails for the Riksbank's and the central government's finances." (Chapter 1, Section 8)

be considered when the central bank assesses such monetary policy alternatives. This motivates the following checkpoint.

- **Checkpoint 7.1: Unconventional monetary policy measures do not create unacceptably high financial risk for the central bank**

In some circumstances, the very purpose of unconventional measures is precisely to absorb risks that private markets cannot or will not bear. Even such cases, potential financial losses should be weighed against the broader benefits for the economy as a whole.

Table 1. The checklist

Criterion	Checkpoint
1. The main scenario is realistic	1.1) The exogenous conditions are realistic
	1.2) The policy path is realistic
	1.3) The forecasts are internally consistent
2. Inflation is stabilised at target	2.1) Inflation stabilises at target within the forecast period
3. The main scenario is technically efficient	3.1) Beyond the near term, the inflation gap and the real gap are either closed or have opposite signs
4. Monetary policy is flexible	4.1) Monetary policy stabilises inflation and the real economy
	4.2) Neither the inflation gap nor the real gap is substantially larger than the other when aggregated over the forecast period
5. Monetary policy is robust	5.1) Plausible risk scenarios give acceptable target attainment
	5.2) The policy path in the near term is reasonably close to the policy path implied by simple monetary policy rules
	5.3) The policy path is reasonably close to external forecasters' expectations
	5.4) Policy rate changes are made in small steps (e.g. 0.25 p.p.)
6. Monetary policy is predictable	6.1) Preferences are stable over time
	6.2) The policy path in the near term is broadly consistent with estimated reaction functions
	6.3) The policy path in the near term is broadly in line with that of external forecasters and with market expectations
7. Monetary policy is proportionate	7.1) Unconventional monetary policy measures do not create unacceptably high financial risk for the central bank

4 Application

In this section, we illustrate the practical application of the checklist by providing an example of how it has been used at the Riksbank.

The example is from the initial phase of the monetary policy round in December 2025, leading up to the publication of the December Monetary Policy Report (MPR). During this phase, staff prepare the draft main scenario before the Executive Board (hereinafter referred to as the Board) provides its views.[10] Sjödin (2026) offers additional details about the process and the institutional setting at the Riksbank.[11]

4.1 Is the main scenario realistic?

Checkpoint 1.1. (exogenous conditions)

At the Riksbank, the process is designed so that exogenous conditions are as realistic as possible. Nowcasts are derived from estimated models with well-documented forecasting properties and complemented by the judgement of sectoral experts. Forecasts of the foreign economy and fiscal policy are based on both internal models and external sources – such as central banks and other government authorities, the IMF, the OECD, and consensus forecasts – and refined with additional judgement when needed. Moreover, exogenous conditions are generally established before the rest of the analysis begins, helping prevent reverse engineering, where exogenous conditions are adjusted to fit forecasts for the target variables derived by some other method. However, exogenous conditions are revised if new information that warrants such revisions emerges during the process.

Checkpoint 1.2. (Policy path)

For the path to be realistic, it must be both implementable and time-consistent.

We verify implementability by ensuring that the path complies with legal requirements, assumes rates above the effective lower bound, and can be executed with available resources and expertise.

To evaluate time consistency, we review the forecast and ask whether, at any point in the future, the policy implied by the path still represents a well-balanced policy.

The assessment in December 2025 was that the draft scenario was both implementable and time-consistent, and therefore realistic.

[10] As discussed in the December 2025 MPR, during the autumn of 2025 the Swedish government proposed a change in the VAT on food. This proposed change had a substantial direct effect on the inflation forecast. The assumption in the main scenario from December 2025 was that the VAT change will mainly have a direct and transitory effect on inflation. Therefore, all figures including inflation forecasts show inflation excluding the VAT change.

[11] The charts presented in this section have been produced using a toolbox developed to evaluate the checklist. The toolbox consists of a set of Python-based tools in the form of computations and illustrations used to assess and evaluate the checkpoints. A dashboard visualising the output is used for the internal analysis.

Checkpoint 1.3. (Internal consistency)

At the Riksbank, scenarios are typically a blend of model outputs and judgement. To assess whether the variables in the main scenario are internally consistent, that is, mutually coherent and reflect plausible economic interactions, we can use the Riksbank's workhorse DSGE model, MAJA.[12] Specifically, we can analyse which shocks are required to align the model's projections with the draft main scenario and then examine whether these shocks have a plausible economic interpretation and are statistically reasonable in both magnitude and persistence.

We carried out some of these checks in December 2025 and the results did not indicate any serious inconsistencies. However, at that time, the tools and methods used for conducting such checks were not fully developed, which limited the rigour of this checkpoint.

4.2 Does inflation stabilise on target?

This criterion is verified by examining whether the CPIF-inflation forecast reaches the inflation target of 2 per cent and remains there.

To gain stronger assurance that inflation will remain on target beyond the forecast horizon, the staff examine forecasts for other inflation measures, real gaps, and the neutral real rate. The following conditions should normally be met within the forecast period:

- Core inflation measures (for example CPIF excluding energy) reach 2 per cent
- Real gaps are close to zero
- The real interest rate is at, or approaching, its long-run neutral level

The assessment in December 2025 was that the criterion was fulfilled.

4.3 Is the main scenario technically efficient?

Checkpoint 3.1. (Opposite signs)

The checkpoint under this criterion states that the projected inflation gap and projected resource utilisation should either be zero or have opposite signs. To assess whether this criterion is met, we first review the initial draft of the main scenario. This review involves examining the projected gaps for CPIF inflation and CPIF inflation excluding energy, along with projected trajectories for resource utilisation – typically the output gap and the unemployment gap.

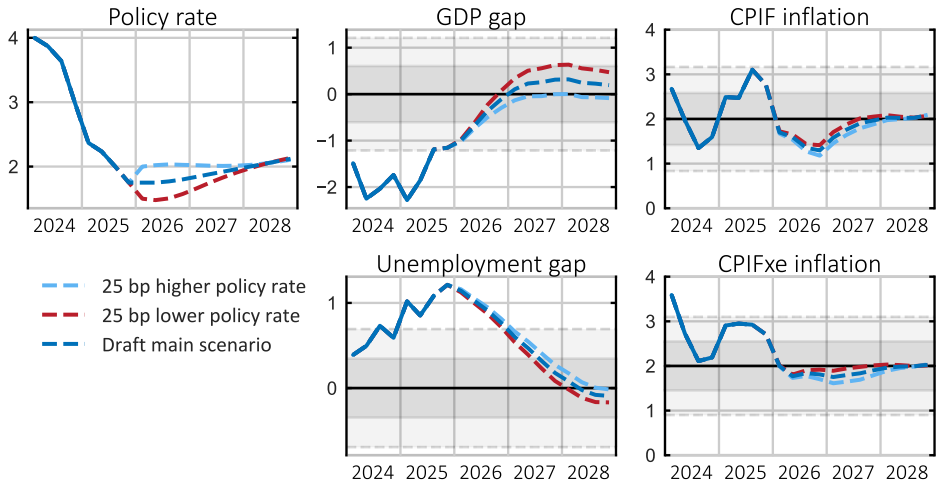
Figure 1 shows monetary policy scenarios from the December 2025 policy round. At this time, it was not clear whether the initial draft main scenario (dark blue lines) was technically efficient. The inflation trajectories in the figure are below target initially, and resource utilisation is negative in the first year of the forecast, before the output

[12] The model is estimated using Swedish data and exhibits empirically reasonable properties. For more details see Corbo and Strid (2020).

gap turns positive (the unemployment gap remains negative until the very end of the forecast period).

The figure also includes two alternative monetary policy scenarios (light blue and red lines). In these scenarios, the policy rate at the upcoming meeting was adjusted by ±25 basis points. The subsequent policy-rate paths follow from so-called impulse response functions (IRFs), which describe how the projected paths of target variables change in response to an unexpected change in (or "shock" to) the policy rate. See Andersson and Lundvall (2024) for details.

Figure 1. Internal monetary policy scenarios from the December 2025 policy round



Note. The solid blue line depicts outcomes. We use the impulse responses from a monetary policy shock, implemented in the first quarter 2026, to compute the alternative scenarios. The lines only show the point estimates and do not illustrate impulse response uncertainty. The darker grey field corresponds to 0.25 standard deviations from the target, while the outer grey field corresponds to 0.5 standard deviations. CPIF and CPIFxe inflation refer to inflation excluding the direct effect of the change in VAT on food (see Sveriges Riksbank 2025).

Sources: Statistics Sweden, Sveriges Riksbank and own calculations.

Analysis based on technically efficient frontiers

It is not always evident from figures like Figure 1 that one alternative is more efficient than another. We therefore also use a more theoretical approach, relying on a loss function commonly used in monetary policy analysis. This loss function represents policymakers' preferences as a linear combination of the inflation gap and the real-economy gap, and is defined as:

(1) $$L = L_\pi + \lambda L_y.$$

Here, L_π and L_y denote the discounted sums of the squared inflation and real-economy gaps, respectively, over the forecast period.[13] By using squared gaps, we implicitly assume that positive and negative gaps are treated symmetrically, and that an increased gap is more costly the larger the gap is. The parameter λ reflects the policymakers' relative weight on stabilising the real economy compared to stabilising

[13] The losses are discounted by $\beta = 0.98$ every quarter, see Appendix A for details.

inflation. The loss function intentionally simplifies the trade-offs faced by decision-makers. The aim is that, when considered as a whole, the checklist captures these trade-offs in a more comprehensive manner.

Given this loss function, all technically efficient monetary policy scenarios form an *efficiency frontier*, where technical efficiency means that neither L_π nor L_y can be reduced without the other increasing (see for example Svensson (2012) for more details).[14] To derive an (approximate) efficiency frontier, we extend Barnichon and Mesters' (2023) method for deriving optimal policy, see Appendix B.[15]

The curved black lines in Figure 2 represent efficiency frontiers derived from the draft main scenario in the December 2025 policy round. The four panels correspond to different combinations of measures of inflation and the output gap.[16]

The dots in Figure 2 show the losses in the three monetary policy scenarios from Figure 1.[17] As shown in the upper panels, when resource utilisation is measured by the GDP gap, both the scenario with a lower policy rate at the upcoming meeting (red dots), and the main scenario (dark blue dots) lie on the efficiency frontier, whereas the scenario with a higher policy rate (light blue dots) does not. In the lower panels, resource utilisation is instead measured by the unemployment gap. Here, none of the scenarios lie on the efficiency frontier. However, the red dot is closest to the efficiency frontier, suggesting that a more expansionary policy could be preferable.

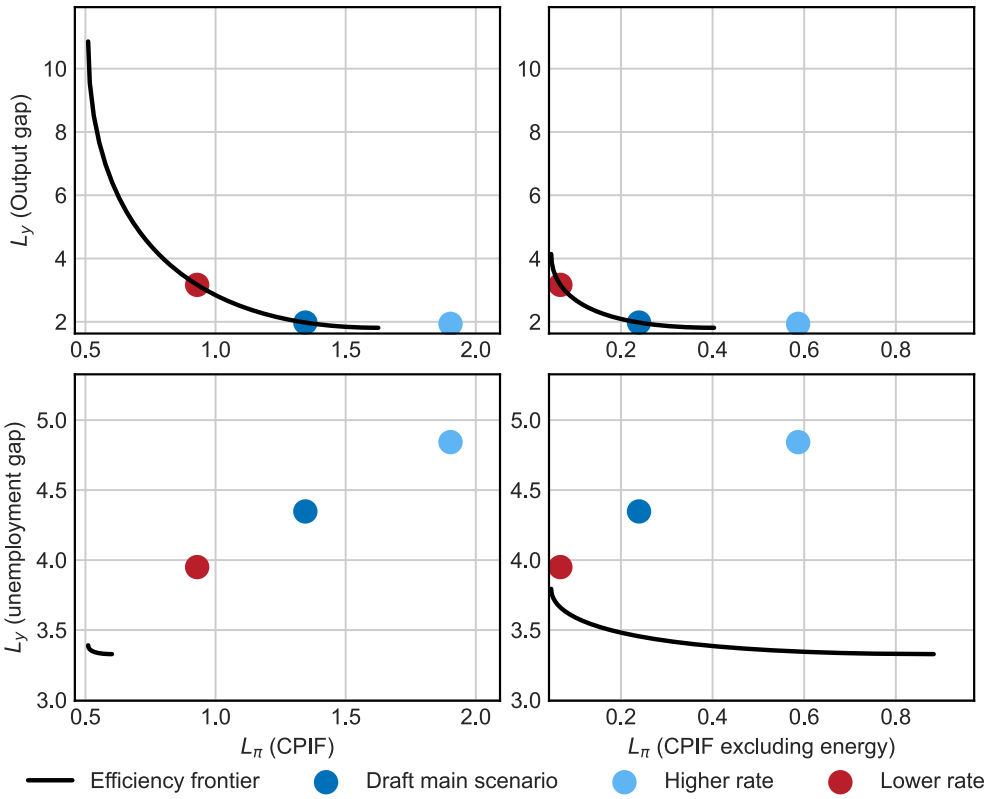
[14] The concept of an efficiency frontier is closely related to what is often called a ''Taylor curve'' in monetary policy analysis, cf. Taylor (1979, 1993).

[15] See also McKay and Wolf (2023) and de Groot et al. (2021).

[16] The frontier is bounded (has a finite length, as λ is assumed to take values in the interval [0, 1000] only; see Appendix B for details). At present, we only have IRFs for a standard monetary policy shock at the upcoming meeting. To construct a fully efficient frontier, IRFs for unexpected changes in the whole policy path would be required. Nevertheless, this method for constructing an efficiency frontier is highly useful – both for assessing criterion 3 and, as we show next, for assessing criterion 4.

[17] The Riksbank introduced this method for comparing monetary policy scenarios in MPR October 2009. In the toolbox developed to evaluate the checklist, it is easy to adjust the time period over which the losses are calculated. For example, a policymaker may want to disregard the losses in the first year since monetary policy has limited effects on inflation and resource utilisation in the short term.

Figure 2. Efficiency frontiers and monetary policy alternatives from the December 2025 policy round



Note. Dark blue dot = draft main scenario. Light blue dot = 25 bps higher policy rate. Red dot = 25 bps lower policy rate. We use the impulse responses from a monetary policy shock, implemented in the next quarter, to compute the alternative scenarios. The dots correspond to the mean squared gaps associated with the different scenarios. The efficiency frontier shows the different combinations of losses for inflation and the real economy that minimise the loss function for different values of λ.

Source: Sveriges Riksbank and own calculations.

Analysis based on bulls-eye charts

We also use so-called bulls-eye charts to assess Criterion 3.[18] A bulls-eye chart plots the average inflation gap and resource utilisation for a specific scenario on the y-axis and x-axis, respectively. The diagram has four quadrants. In scenarios where the dots are located in quadrants 2 or 4 (north-east or south-west) there is no trade-off, as both gaps can be reduced by pursuing a different monetary policy.[19] The bulls-eye

[18] Norges Bank regularly publish bulls-eye charts in their Monetary Policy Report, see for example Norges Bank (2025). The Federal Reserve Bank of Chicago has also used the bulls-eye chart to visualise the Federal Reserve's dual mandate (see for example Evans 2014).

[19] For a simple theoretical illustration of the rationale for this diagram, one might look at the three-equation New Keynesian model (comprising the IS curve, the New Keynesian Phillips curve and a quadratic loss function), where optimal policy is derived by minimising the loss function subject to the rest of the model. The first-order condition for optimality under a time-consistent policy states that the ratio of the inflation gap to the output gap should equal the ratio of the weight on the output gap in the loss function to the slope of the Phillips curve. Intuitively, this means that the central bank balances deviations in inflation and output according to their relative importance in the loss function and the responsiveness of inflation to economic activity.

chart can be useful – both for verifying Criterion 3 and, as we show next, for assessing Criterion 4. It can also be used for storytelling.

Figure 3 shows a bulls-eye chart with the projected CPIF and GDP gaps as our targets.[20] The draft main scenario from December 2025 is located in quadrant 3, one of the preferred quadrants.

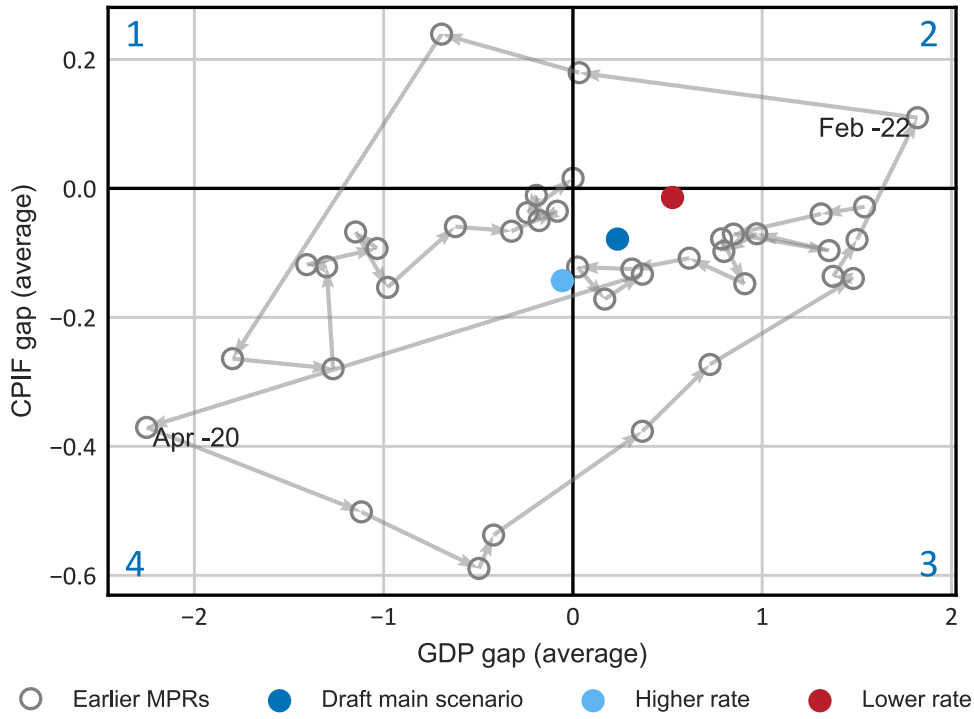
Figure 3 also shows that previous main scenarios have often been outside the preferred quadrants. Two examples are highlighted in the figure. In the first, from the early phase of the pandemic (April 2020), the scenario was in quadrant 4. At this point, output had dropped significantly and both inflation and inflation expectations were low. The policy rate was at zero and the Riksbank had already pursued large asset purchases. The scope for more expansionary monetary policy was therefore limited. In addition, there was considerable uncertainty regarding the size of the GDP gap.[21]

The second example is from the MPR in February 2022, which was published two weeks before Russia's full-scale invasion of Ukraine. The main scenario implied that both the inflation gap and the GDP gap would be positive. The assessment was that expansionary monetary policy was needed to stabilise inflation at target in the medium term. Inflation had, on average, been below target in the previous years, leading to a tolerance for some overshooting. Soon after the publication, however, it became clear that inflation would be higher and more persistent than initially expected, and the Riksbank tightened policy to bring projected inflation back to target. Consequently, the forecasts in later policy rounds shifted to quadrant 4, with both inflation and GDP gaps below zero. On these occasions, the Riksbank judged the risk of inflation becoming entrenched as large and considered it important to ensure that inflation would fall back swiftly.

[20] We focus on the last two years of the forecast period. This makes comparisons over time more meaningful, as monetary policy has limited impact in the near term and because the economy's starting point can differ substantially across different monetary policy rounds.

[21] If the projected output gaps did not properly capture supply constraints during the pandemic, for example, if supply shocks affecting the economy were not captured in the measured output gap, this would have been a reason to deviate from the checkpoint, and to put a higher weight on stabilising inflation.

Figure 3. Bulls-eye from the December 2025 policy round and earlier MPRs.



Note. Dark blue dot = draft main scenario. Light blue dot = 25 bps higher policy rate. Red dot = 25 bps lower policy rate. We use the impulse responses from a monetary policy shock, implemented in the next quarter, to compute the alternative scenarios. The dots correspond to the average gaps, computed over the last two years of the forecast, associated with the different scenarios. The dot in the figure is from the February 2018 MPR.

Source: Sveriges Riksbank and own calculations.

4.4 Is monetary policy flexible?

The two checkpoints under this criterion state that both inflation and the real gap should be stabilised within the forecast period, and that there should be a reasonable balance between achieving the inflation target and stabilising the real economy.

Checkpoint 4.1. (stabilisation of inflation and the real economy)

To assess whether these conditions are met, we first review the initial draft of the main scenario in Figure 1. If inflation stabilises at 2 per cent and the real economy stabilises, as was the case in December 2025, Checkpoint 4.1. is fulfilled.

Checkpoint 4.2. (neither gap substantially larger than the other)

To evaluate Checkpoint 4.2., which states that one gap should not be substantially larger than the other, we use bulls-eye charts. As shown in Figure 3, the main scenario from the December 2025 policy round fulfils the checkpoint (when the GDP-gap is used as measure of the real gap).

4.5 Is monetary policy robust?

Checkpoint 5.1. (Monetary policy can be adapted)

The first checkpoint under this criterion assesses whether plausible risk scenarios allow for acceptable target attainment; monetary policy should remain adaptable if risks materialise and avoid unduly increasing vulnerability to future shocks. We use risk scenarios to evaluate this checkpoint.

We construct risk scenarios by adding shocks to the draft main scenario with the help of structural and empirical models. When necessary, assumptions about the functioning of the economy may also be adjusted.[22]

In addition to the quantitative risk scenarios described above, we also consider several qualitative risk scenarios. These are typically presented in a stylised table showing combinations of (plausible) economic developments and monetary policy responses. We focus on identifying risks where monetary policy cannot easily be adjusted to achieve acceptable outcomes. We generally pay particular attention to risks that are endogenous to monetary policy, especially the risk of de-anchored inflation expectations.

0 shows some qualitative risk scenarios that were discussed in the December 2025 policy round. In this policy round, the risk scenarios identified centred on two key assumptions in the forecast: the assessment of inflationary pressures and of the economic recovery. Each row represents a risk scenario, and each column corresponds to a monetary policy alternative. The key purpose of this table is to identify whether monetary policy will lead to acceptable outcomes also under realistic alternative assumptions. While some of the risk scenarios imply that additional tightening or some change in the policy stance would be needed, the assessment in the December 2025 policy round was that there was sufficient room for manoeuvre with the policy path in the draft main scenario to deal with these risks should they materialise.

[22] For a discussion of the Riksbank's use of alternative scenarios, see Seim (2025).

Table 2. Risk Scenarios for policy deliberations from the December 2025 policy round

	Looser monetary policy in the near term	Baseline policy	Tighter monetary policy in the near term
Stronger inflationary pressure	Some change in policy stance necessary	Need some additional tightening, but no substantial change in policy stance	Policy relatively well-balanced
Weaker inflationary pressure	Policy relatively well-balanced	Baseline too tight, some change in policy stance necessary	Some change in policy stance necessary
Higher resource utilisation and stronger economic recovery	Policy too loose, clear tightening needed. Potential effect on inflation expectations	Baseline insufficient to stabilise resource utilisation and inflation, additional tightening needed	Policy relatively well-balanced
Lower resource utilisation and weaker economic recovery	Policy relatively well-balanced	Baseline too tight, some change in policy stance necessary	Change in policy stance necessary. Potential effects on inflation expectations

Note. The scenario with higher resource utilisation and stronger economic recovery could result from underestimating business cycle dynamics or from larger than expected effects of fiscal stimulus. The scenario with lower resource utilisation and weaker economic recovery could materialise if the weak labour market is a better indicator of current resource utilisation or if global demand develops weaker than expected.

Sources: Sveriges Riksbank.

Checkpoints 5.2. and 5.3. (Cross-checked policy)

The second and third checkpoints under this criterion state that the policy path should be reasonably close to simple monetary policy rules (in the near term) and external forecasters' expectations.

For the second checkpoint we use a set of simple policy rules described in Appendix C. As input data we use forecasts for the target variables from the draft main scenario, as well as forecasts from the National Institute of Economic Research (NIER).

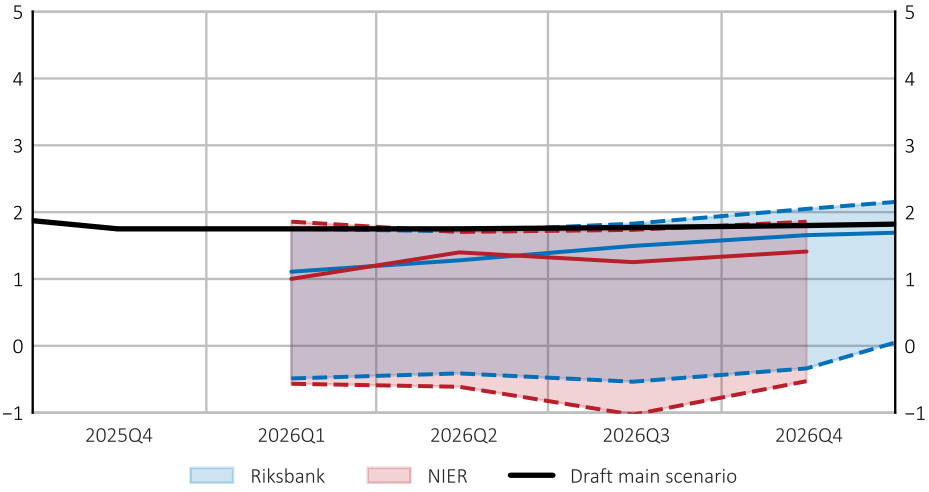
Figure 4 illustrates the policy path in the draft main scenario from the December 2025 policy round (the black line) alongside the rates implied by simple rules. The blue shaded area is based on input data from the draft main scenario. The interval shows the range between the minimum and maximum values implied by these rules, with the median depicted by the blue line. The red shaded area and the red line represent the range and the median implied by the same set of rules when using NIER forecasts as inputs.

In Figure 4, the policy rate in the draft main scenario from the December 2025 policy round is clearly in the upper range of both intervals. The rules that use unemployment as the measure of resource utilisation are generally in the lower end of the range and therefore imply a lower policy rate. Several of the rules that use the GDP gap as the measure of resource utilisation do, however, lie relatively close to the main scenario.

This holds regardless of whether we use Riksbank or NIER forecasts as inputs to the rules.

The interval from the simple policy rules is also used to check if the draft main scenario is realistic (Criterion 1). For the draft main scenario to be realistic, the policy path proposed should normally not deviate from this (blue) range.

Figure 4. Simple rules for monetary policy in the near term from the December 2025 draft main scenario

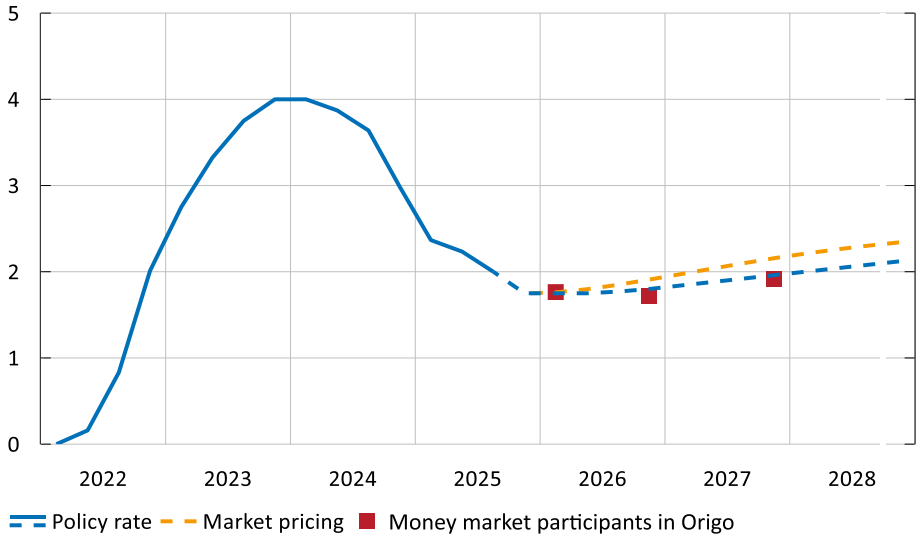


Note. The blue field illustrates the minimum and maximum of a set of monetary policy rules, taking the forecasts of inflation and the real economy in the draft main scenario as given. The blue line depicts the median value of these rules. The red field (line) illustrates the minimum and maximum (median) values of the same rules, using forecasts from the National Institute of Economic Research as inputs.

Sources: National Institute of Economic Research, Sveriges Riksbank and own calculations.

For the third checkpoint, we compare the policy path in the draft main scenario to market expectations according to forward pricing and survey-based expectations. Figure 5 shows that leading up to the December 2025 policy decision, there were no substantial discrepancies, suggesting that the draft main scenario rested on realistic assumptions.

Figure 5. Market expectations from the December 2025 policy round



Note. The yellow dashed line shows market-based expectations according to forward pricing. The red markers show survey-based expectations for the policy rate according to Origo Group's monthly survey of money market participants. The blue solid line shows the history of the policy rate, and the blue dashed line shows the policy path in the draft main scenario.

Sources: Origo Group and Sveriges Riksbank.

Checkpoint 5.4. (Small steps)

The fourth checkpoint states that policy rate changes should normally be made in small steps (for example, 0.25 percentage points), which is straightforward to verify. The policy path in the draft main scenario was consistent with this checkpoint.

4.6 Is monetary policy predictable?

Checkpoint 6.1. (Stable preferences)

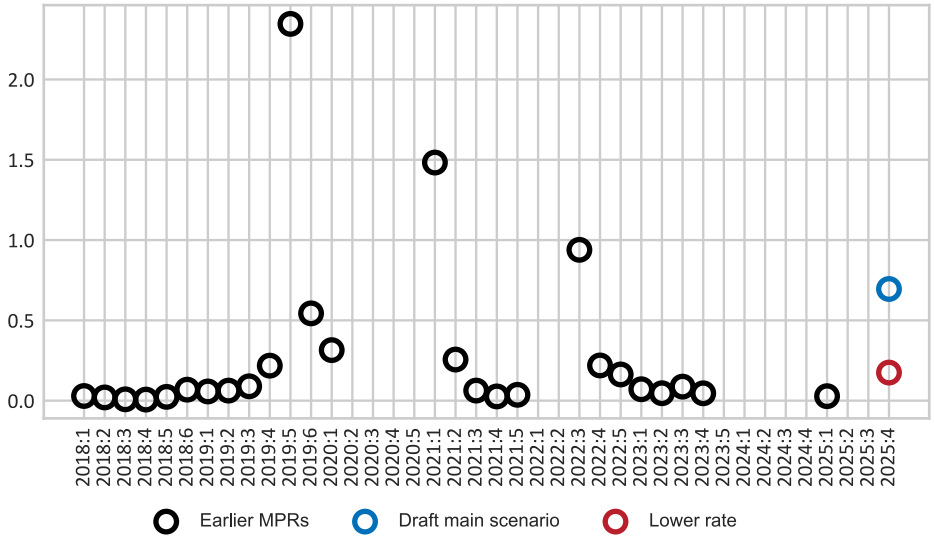
To evaluate if preferences are stable, we derive the weight on the real economy (λ) that is implicit in the draft main scenario. This is done by finding the tangent to the efficiency frontier in Figure 2, at the point where the frontier and the dot associated with the draft main scenario intersect. The method builds on the work by Barnichon and Mesters (2023), and backs out a value for λ given IRF:s and the forecast. See Appendix B for details.

It is natural for λ to shift somewhat over time, for example due to changes in the composition of the Board, or owing to other considerations not captured in the simple loss function. This can, for example, be due to robustness or financial stability reasons. However, the relative weight should remain reasonably stable over time. A λ that moves around substantially over time might indicate frequent preference shifts, reducing predictability.

Figure 6 illustrates the λ implicit in the Riksbank's published forecasts and in two of the three monetary policy scenarios from Figure 1, derived under the assumption that

decisions were optimal (see Appendix B).[23] In the figure, CPIF inflation and the GDP gap are used as target variables. In most cases, the weight on the real economy is close to zero, but in a few instances the backed-out implicit λ deviates more clearly. This was, for example, the case early in the monetary policy tightening phase in 2022. In the December 2025 policy round, the draft main scenario (dark blue dot in the figure) was higher than the historical pattern, implying a larger weight on the real economy than normal. The lower-rate scenario (red dot) was more in line with the historical pattern. However, when using underlying inflation (CPIF excluding energy) as the measure of inflation, also the draft main scenario was in line with the historical pattern.

Figure 6. Implicit lambdas from the December 2025 policy round and earlier MPRs, using CPIF and the GDP gap as arguments in the loss function



Note. Dark blue circle = draft main scenario. Red circle = 25 bps lower policy rate. Black circles = historical monetary policy decisions. We use the impulse responses from a monetary policy shock, implemented in the first quarter 2026, to compute the alternative scenarios. The circles correspond to the implied values of λ. Observations and scenarios where monetary policy is not on the efficiency frontier have been excluded.

Source: Sveriges Riksbank and own calculations.

Checkpoint 6.2. (Reaction function)

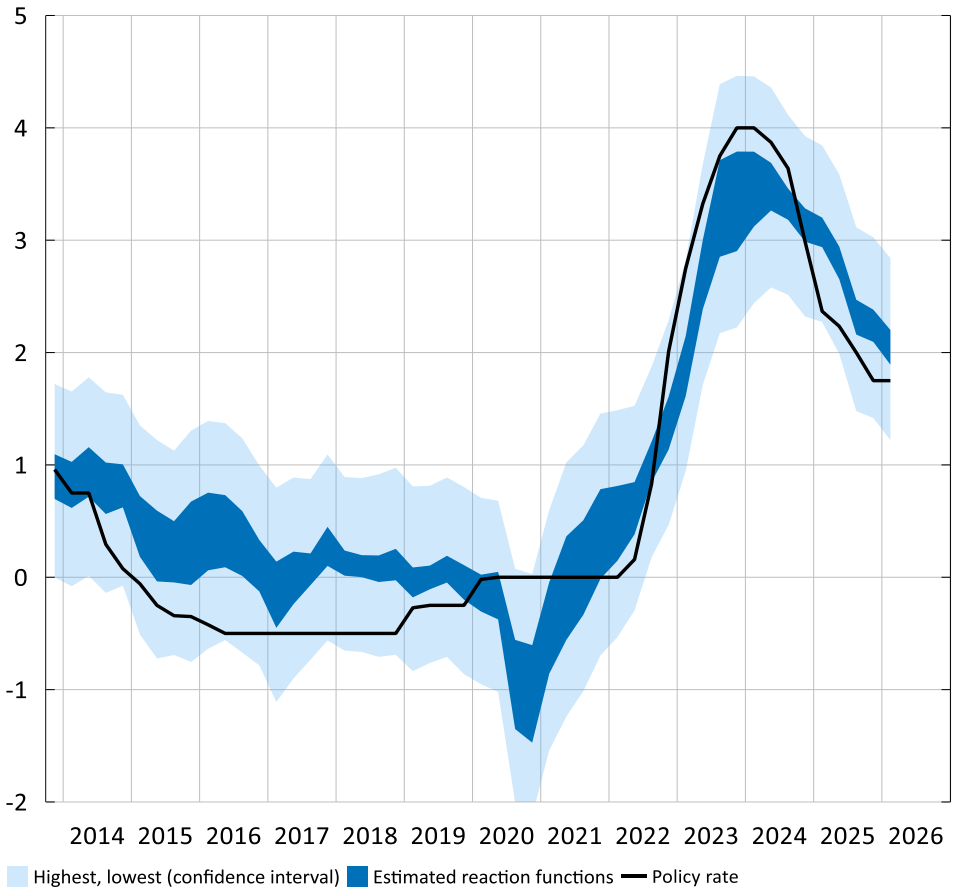
Here we compare the near-term policy path in the draft main scenario with estimated reaction functions based on Gustafsson and Nessén (2026). Unlike the simple rules in Figure 4, estimated reaction functions recover the Riksbank's actual past behaviour. The functions link the policy rate to real-time data on inflation, resource utilisation, a measure of the long-term nominal interest rate, and previous policy rate levels

[23] Monetary Policy reports where monetary policy has not been on the efficiency frontier have been excluded, as has the scenario with a higher policy rate from the December 2025 policy round, which was also not on the frontier. One possible reason why monetary policy is not on the efficiency frontier is that policymakers have taken into account factors that are not captured by the simple loss function.

(interest-rate smoothing). Specifically, they answer what the policy rate would be – conditional on the Riksbank's projections for inflation and resource utilisation next quarter – assuming that the central bank adheres to its historical reaction function.

Figure 7 shows the estimated reaction function compared to the policy path in the draft main scenario. A policy path that deviates significantly in the near term from the estimated reaction function may indicate a change in the reaction pattern, a shift in preferences or perceived risks, or a response to some other change in circumstances. In the December 2025 draft main scenario, the policy rate at the upcoming meeting was within the confidence interval (but below the range for the point estimates) of the reaction function.

Figure 7. The estimated reaction function from the December 2025 policy round



Note. The blue field shows the range between the highest and the lowest policy rate according to the estimated reaction functions. The light-blue field shows the highest and the lowest value of the policy rate using the 95 percent confidence intervals from the different estimations.

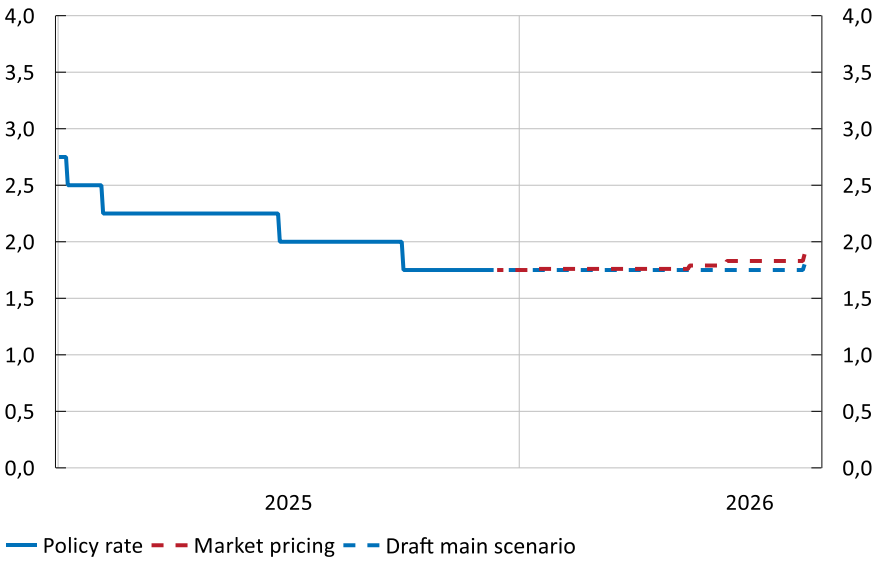
Sources: Sveriges Riksbank and own calculations.

Checkpoint 6.3. (External forecasters)

Predictability is also assessed by comparing the near-term policy rate in the draft main scenario to market pricing and to external forecasts. Figure 8 illustrates market expectations for the policy rate at upcoming monetary policy meetings, based on so-

called RIBA futures contracts. The figure shows that, for the December 2025 policy round, expectations were well aligned with the policy path in the draft main scenario.

Figure 8. Market expectations (per monetary policy meeting) in the near term



Note. The solid line refers to historical outcomes for the policy rate. Market pricing is based on the implied policy rate at upcoming monetary policy meetings, computed using RIBA contracts from 2025-12-02. For the December 2025 policy round, unusually low trading activity makes the estimates uncertain. Market pricing based on STINA contracts indicates a somewhat higher policy rate throughout this period.

Sources: Sveriges Riksbank.

4.7 Is monetary policy proportionate?

Checkpoint 7.1 states that unconventional monetary policy should not create unacceptably high financial risks. This must be concretised when the checkpoint is applied in practice.

According to the Sveriges Riksbank Act, the Riksbank shall take into account the effects of monetary policy on its balance sheet (Chapter 1, Section 8). To analyse how a given policy-rate forecast affects the balance sheet, we use an analytical tool developed by Vestin et al. (2025). When a change in the balance sheet is proposed for monetary policy purposes, we also examine whether it entails a risk that equity (in the draft main scenario or in plausible risk scenarios) falls below the statutory minimum level.

In the December 2025 policy round, no change in the balance sheet for monetary policy purposes was discussed.

5 Concluding remarks

While the checklist has proven valuable in our application, there are reasons to reflect on its limitations and its applicability to other central banks. One possible objection is that it risks functioning as a straitjacket – an overly schematic framework in a decision-making domain where judgment, experience, and intuition play a central role. Another objection is that it may be difficult to use when monetary policy decisions are made collectively rather than by a single decision-maker.

These objections are understandable, but we argue that they can be addressed. The checklist is not intended to mechanise decision-making or to replace judgment. On the contrary, it leaves room for discretion, not least in how the criteria are interpreted and weighed against one another. It can also coexist with various types of heuristic approaches, such as rules of thumb or more narrative forms of analysis. Rather than replacing such approaches, it serves as a support – a way to systematise, evaluate, and communicate the assessments.

Moreover, when decisions are made collectively, the checklist can serve a particularly important function. It can act as a shared frame of reference that structures discussions, clarifies where consensus exists, and where disagreements remain. At the same time, there is a risk that overly strict use may inhibit flexibility or dampen valuable dissenting views. How the checklist is used in practice is therefore crucial.

Overall, the checklist should be seen as a tool that supports, but does not direct, decision-making. Its primary contribution is to promote clarity, consistency, and accountability, while still leaving room for different perspectives.

It is also important to emphasize that the checklist is not universally applicable in its current form. It needs to be adapted to each central bank's institutional settings, objectives, and working methods. The criteria express broad ambitions that are likely shared by many, but the specific checkpoints must be adjusted to the particular context. They should therefore be seen as evolving components that can be adjusted with changing circumstances and experience. The objective is to maintain a framework that supports a monetary policy that is systematic, transparent, and firmly grounded in analysis, and which thereby ultimately contributes to price stability.

References

Andersson, Björn and Henrik Lundvall (2024), "Effects of monetary policy", *Economic Commentaries* no. 16, Sveriges Riksbank.

Barnichon, Régis and Geert Mesters (2023), "A sufficient statistics approach for macro policy", *American Economic Review*, vol. 113, no. 11, pp. 2809–2845.

Brainard, William C. (1967), "Uncertainty and the effectiveness of policy", *American Economic Review*, vol. 57, no. 2, 411–425.

Campbell, Jeffrey R., Charles L. Evans, Jonas D. M. Fisher and Alejandro Justiniano (2012), "Macroeconomic effects of Federal Reserve forward guidance", Brookings Papers on Economic Activity, Spring 2012, pp. 1–80.

Corbo, Vesna and Ingvar Strid (2020), "MAJA: A two-region DSGE model for Sweden and its main trading partners", Working Paper no. 391, Sveriges Riksbank.

de Groot, Oliver, Falk Mazelis, Roberto Motto and Annukka Ristiniemi (2021), "A toolkit for computing Constrained Optimal Policy Projections (COPPs)", Working Paper no. 2555, European Central Bank.

Evans, Charles L. (2014), "Monetary goals and strategy", speech at the Annual Hyman P Minsky Conference on the State of the US and World Economies, 9 May, Washington, DC.

Board of Governors of the Federal Reserve System (2018), *Monetary Policy Report*, July.

Goodfriend, Marvin (1991), "Interest rates and the conduct of monetary policy", *Carnegie-Rochester Conference Series on Public Policy*, vol. 34, pp. 7–30.

Gustafsson, Peter and Marianne Nessén (2026), "Has Riksbank monetary policy been predictable? Evidence from estimated reaction functions", *Sveriges Riksbank Economic Review*, no. 1, pp. 54–69.

McKay, Alistair and Christian K. Wolf (2023), "What can time-series regressions tell us about policy counterfactuals?" *Econometrica*, vol. 91, no. 5, pp. 1695–1725.

Norges Bank (2005), *Inflation report 1/2005*, March.

Norges Bank (2010), *Monetary policy report 3/2010*, October.

Norges Bank (2012), *Monetary policy report 1/2012*, March.

Norges Bank (2025), *Monetary policy report 4/2025*, December.

Orphanides, Athanasios and John C. Williams (2008), "Learning, expectations formation and the pitfalls of optimal control monetary policy", *Journal of Monetary Economics*, vol. 55 (supplement), pp. 80–96.

Orphanides, Athanasios and John C. Williams (2013), "Monetary policy mistakes and the evolution of inflation expectations", in *The Great Inflation: The Rebirth of Modern Central Banking*, edited by Michael D. Bordo and Athanasios Orphanides, University of Chicago Press.

Qvigstad, Jan F. (2006), "When does an interest rate path 'look good'? Criteria for an appropriate future interest rate path—A practical approach to policy decisions", Working Paper no. 2006/5, Norges Bank.

Sack, Brian (1998), "Uncertainty, learning, and gradual monetary policy", Finance and Economics Discussion Series 1998-34, Board of Governors of the Federal Reserve System.

Seim, Anna (2025), "The role of alternative scenarios in monetary policy communication". Remarks made at the Panel on "Central bank communication: current challenges" at the 2025 ECB Forum on Central Banking in Sintra, 2 July, Portugal.

Sjödin, Maria (2026), "The Riksbank's objectives, mandate and the process behind a monetary policy decision", *Sveriges Riksbank Economic Review*, no. 1, pp. 6–20.

Svensson, Lars E.O. (2005a), "Monetary policy with judgement: Forecast targeting", *International Journal of Central Banking*, vol. 1, no. 1, pp. 1–54.

Svensson, Lars E. O. (2005b), "Targeting rules vs. instrument rules for monetary policy: What is wrong with McCallum and Nelson?" *Federal Reserve Bank of St. Louis Review*, vol. 87, no. 5, pp. 613–625.

Svensson Lars E.O. (2011), "Inflation targeting", chapter 22 in *Handbook of Monetary Economics*, vol. 3B, edited by Benjamin M. Friedman and Michael Woodford, Elsevier.

Svensson, Lars. E.O. (2012), "Evaluating monetary policy", chapter 10 in *The Taylor Rule and the Transformation of Monetary Policy*, edited by Evan F. Koenig, Robert Leeson and George A. Kahn, Hoover Institution Press.

Sveriges Riksbank (2017), *The Riksbank's experiences of publishing repo rate forecasts*, Riksbank Studies, June.

Sveriges Riksbank (2025), *Monetary Policy Report*, September.

Taylor, John B. (1979), "Estimation and control of a macroeconomic model with rational expectations", *Econometrica*, vol. 47, no. 5, pp. 1267–1286.

Taylor, John B. (1993), "Discretion versus policy rules in practice", *Carnegie-Rochester Conference Series on Public Policy*, vol. 39, pp. 195–214.

Taylor, John B. (1999), "A historical analysis of monetary policy rules," chapter 7 in *Monetary Policy Rules*, edited by John B. Taylor, University of Chicago Press.

Taylor, John B. and John C. Williams (2011), “Simple and robust rules for monetary policy”, chapter 15 in *Handbook of Monetary Economics*, vol. 3B, edited by Benjamin M. Friedman and Michael Woodford, Elsevier.

Vestin, David, Anders Vredin and Magnus Åhl (2025), “Central bank capital and independence: A quantitative case study”, in *Central Bank Capital in Turbulent Times. Contributions to Finance and Accounting*, edited by Dirk Broeders, Aerdt Houben, and Matteo Bonetti, Springer.

Woodford, Michael (2003*), Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press.

APPENDIX A – The loss function measuring target attainment

When applying the checklist to evaluate alternative monetary policy scenarios, we use various tools. Several of these tools make use of a loss function. Below, we briefly explain the loss function that these tools use.

The loss function is a quantitative measure of target attainment. We have chosen one that is commonly used in the literature and specify the loss function as

$$L = L_\pi + \lambda L_y = \sum_{h=0}^{H} \beta^h (\pi_h - 2)^2 + \lambda \sum_{h=0}^{H} \beta^h y_h^2,$$

where L_π is the deviation of inflation from target (the inflation loss) aggregated over time, L_y is the resource utilisation loss aggregated over time, and H is the time period over which we measure the losses. The loss function can be used to assess checkpoints related to efficiency and flexibility, as well as predictability.

The loss function has the following properties: (i) the losses are separable in time, so that the loss in one period does not affect the loss in another period; (ii) the losses are separable between target variables; (iii) the relative weights on the two variables are constant over time, (iv) losses are symmetric, that is, it is equally costly for positive and negative deviations from the target; and finally, (v) the cost of increased deviations is greater when the deviation is already large than when it is small.

APPENDIX B – Constructing alternative monetary policy scenarios and the efficiency frontier

To construct policy counterfactuals, we use the draft main scenario forecasts for inflation and the real economy, $f_{\pi h}$ and f_{yh}, as well as impulse response functions (IRF:s), $R_{\pi h}$, R_{yh}, that follow from a monetary policy shock, $s \in \{\pm 25\ bps, \pm 50\ bps\}$. h is a period in the forecast, which at the Riksbank currently spans the interval $h \in \{0, \dots, 12\}$ (from the current quarter until 12 quarters ahead). When the IRF:s are linear, the resulting projections p_{xh} for inflation and the real economy can be written as

$$p_{xh} = f_{xh} + sR_{xh}, \qquad x \in \{\pi, y\}.$$

Calculating the optimal shock size in a linear model with quadratic preferences

We have a loss function L, IRF:s R_h, and forecasts f_h for inflation π_h and resource utilisation y_h. The maximum number of periods in the forecast is H. We can specify a loss function for a given scenario as

$$L = \sum_{h=0}^{H} \beta^h [(\pi_h - 2)^2 + \lambda {y_h}^2].$$

This loss function can be rewritten in terms of a combination of the forecast and the IRF:s that follow from the shock, s, as

$$L = \sum_{h=0}^{H} \beta^h \left[(f_{\pi h} - 2 + s \cdot R_{\pi h})^2 + \lambda \left(f_{yh} + s \cdot R_{yh}\right)^2\right].$$

The optimal shock size, s^*, is the one that minimises the loss function. Minimising the loss function with respect to the shock size yields the first-order condition:

$$\sum_{h=0}^{H} \beta^h \left[R_{\pi h}(f_{\pi h} - 2 + s \cdot R_{\pi h}) + \lambda R_{yh}\left(f_{yh} + s \cdot R_{yh}\right)\right] = 0.$$

From this, we solve for the shock size, s^*, to express the shock as a function of forecasts and IRF:s:

$$s^* = -\frac{\sum_{h=0}^{H} \beta^h \left[R_{\pi h}(f_{\pi h} - 2) + \lambda R_{yh} f_{yh}\right]}{\sum_{h=0}^{H} \beta^h \left(R_{\pi h}^2 + \lambda R_{yh}^2\right)}.$$

The optimal projections $p^*_{\lambda xh}$ for inflation and output can be written as

$$p^*_{\lambda xh} = f_{xh} + s^*_{\lambda} R_{xh}, \qquad x \in \{\pi, y\}$$

where s^*_{λ} is the optimal size of the monetary policy shock for the given weight on the real economy. From the projections and the IRF:s, we can calculate the losses for a range of different values of λ (in our example, $\lambda \in [0{,}1000]$) to construct the efficiency frontier – the combinations of losses for inflation and the real economy that minimise the loss function – for all relevant values of λ.

Implicit λ

For each monetary policy decision when a Monetary Policy Report (MPR) is published, a forecast is also published for the variables that are important for the Riksbank's monetary policy. Thus, for a given loss function, it is possible to calculate a loss associated with the monetary policy decision that was made in connection with the publication of the MPR. Above, we show how to find the optimal shock size, that is, the size of the shock to the policy rate that would minimise the policymaker's loss function. In calculating the implicit λ, we assume that the projected paths are optimal and therefore set the optimal shock size to zero. For each monetary policy decision where we have a forecast of the target variables, we can solve for λ in the equation for the optimal shock size setting $s^* = 0$:

$$\lambda = -\frac{\sum_{h=0}^{H} \beta^h R_{\pi h}(f_{\pi h} - 2)}{\sum_{h=0}^{H} \beta^h R_{yh} f_{yh}}$$

APPENDIX C – Simple monetary policy rules

Simple monetary policy rules specify how the policy rate should respond to information available to the policymaker. Specifically, they prescribe a relationship between the policy rate and a few indicators of inflation and resource utilisation. Some rules include the lagged policy rate. A common form for simple monetary policy rules is:

$$i_t = \rho i_{t-1} + (1-\rho)[r^* + \pi_t + \alpha(\pi_t - \pi^*) + \beta(y_t - y^*)].$$

The policy rate, i_t, is assumed to depend on the previous period's policy rate, a long-term real rate, r^*, actual inflation, the deviation from the inflation target and the deviation from normal resource utilisation (a real gap). Here, * denotes potential, or targets for, variables. Common measures of resource utilisation are the GDP gap or the unemployment gap. ρ captures the degree of interest-rate smoothing (normally between 0 and 1), whereas α and β determine how much the policy rate responds to deviations from the inflation target and from a normal resource utilisation.

Inspired by the Federal Reserve Bank of Cleveland, we consider several different simple policy rules listed below. [24]

- Taylor (1993)
  - $i_t = r^* + \pi_t + 0.5(\pi_t - \pi^*) + 0.5(y_t - y^*)$
- Taylor (1993) with core inflation (that is, excluding energy)
  - $i_t = r^* + \pi_t^{XE} + 0.5(\pi_t^{XE} - \pi^*) + 0.5(y_t - y^*)$
- Taylor (1999)
  - $i_t = r^* + \pi_t + 0.5(\pi_t - \pi^*) + (y_t - y^*)$
- Inertial Taylor rule[25]
  - $i_t = 0.8i_{t-1} + 0.2\big(r^* + \pi_t^{XE} + 0.5(\pi_t^{XE} - \pi^*) + 0.5(y_t - y^*)\big)$
- Forward-looking rule
  - $i_t = r^* + \pi_{t+3}^{Pr} + 0.1(\pi_{t+3}^{Pr} - \pi^*) + 0.1(y_t - y^*)$
- First-difference rule with unemployment rate (1)
  - $i_t = i_{t-1} + 1.74(\pi_{t+3}^{Pr} - \pi^*) - 1.19(u_{t-1} - u_{t-2})$
- First-difference rule (2)
  - $i_t = i_{t-1} + 0.5(\pi_t - \pi^*) + 0.5(y_t - y_{t-4})$.

[24] For more information about the different rules see "Simple Monetary Policy Rules" Federal Reserve Bank of Cleveland https://doi.org/10.26509/frbc-monpolrules. Accessed on January 16, 2026.

[25] We set $\rho = 0.8$ as used by Cleveland Fed.

To vary the measure of resource utilisation, we use both the GDP gap and the unemployment gap. For specifications with the unemployment gap, we multiply the gap by a factor of $-(1/b)$, where b is an Okun coefficient that we set to 0.5.

We assume that r^* is given by the midpoint of the Riksbank's assessed interval (-0.5-1 per cent) for the long-term neutral policy rate, that is 0.25 per cent. When we use data from the National Institute of Economic Research as input to the rules, we set the long-term neutral policy rate to 0.6 in line with their assessment.

The forward-looking policy rule includes more information and accounts for the lags in monetary policy transmission by including forecasts instead of outcomes.

The two first-difference rules omit unobserved variables. The first is based on Orphanides and Williams (2008, 2013) and its parameters are from the Federal Reserve Bank of Cleveland.[26] The second is a version from the Board of Governors of the Federal Reserve System (2018) where the change in the policy rate depends on inflation and output growth.[27]

[26] The parameters are set to minimise a specific loss function.

[27] For more information see the Federal Reserve Board of Governors' website https://www.federalreserve.gov/monetarypolicy/policy-rules-and-how-policymakers-use-them.htm.

Has Riksbank monetary policy been predictable? Evidence from estimated reaction functions

Peter Gustafsson and Marianne Nessén*
Peter Gustafsson is adviser and Marianne Nessén is senior adviser at the Riksbank's Monetary Policy Department

For monetary policy to be effective, it should be predictable. How can central banks assess and contribute to the predictability of monetary policy? In this article, we discuss how estimated reaction functions can be used in the preparation of monetary policy decisions. More specifically, we discuss how reaction functions estimated on Swedish real-time data can complement market expectations to improve the understanding of monetary policy predictability. We do this by comparing and discussing the deviations between the actual policy rate and what reaction functions imply. To obtain a robust picture of the Riksbank's reaction function, we present several estimates based on different measures of inflation and the output gap.

1 Predictability contributes to an effective monetary policy

Monetary policy will be more effective if economic agents understand how the central bank adjusts the policy rate based on economic developments. A good understanding facilitates economic planning among firms and households by enabling them to form their own judgement about how interest rates might evolve in the future. This is one of the main reasons why central banks nowadays devote considerable resources to explaining how they see future economic developments and how they might act in different situations to achieve their monetary policy objectives.[1]

But how can one determine if monetary policy is predictable? Perhaps the easiest way to do this is to monitor market reactions when an interest rate decision is communicated. In efficient financial markets, an expected decision should already be

* Many thanks to Matilda Kilström for her valuable contribution and to Jakob Almerud, Mikael Apel, Carl Andreas Claussen, Mattias Erlandsson, Peter Kaplan, Stefan Laséen, Henrik Lundvall, Anna Seim, Ulf Söderström and Anders Vredin for valuable comments on earlier drafts. The opinions expressed in this article are the sole responsibility of the authors and should not be interpreted as reflecting the views of Sveriges Riksbank.

[1] This strive for transparency regarding the conduct of monetary policy stands in stark contrast to the way monetary policy was conducted a few decades ago. During the time of Alan Greenspan's time as chair of the Board of Governors, for example, the US Federal Reserve was at times perceived as trying to say as little as possible about the principles of interest rate setting. See, for example, Blinder and Reis (2005).

reflected in current pricing, while an unexpected decision gives rise to more significant market reactions. Another, more structured approach is to examine whether the development of the policy rate can be explained by a small number of macroeconomic variables, which are precisely the variables that the central bank is tasked with stabilising. One could say that such a more structured analysis tries to capture the systematic part of monetary policy.[2]

If a stable relationship can be found between the policy rate and a few key macro variables, monetary policy can be said to follow a *simple rule*. A simple monetary policy rule thus describes how a central bank adjusts the policy rate on average in relation to a few key economic variables. In the economic research literature, different variants of the so-called Taylor rule are common examples of simple rules.[3] In these specifications, the central bank is assumed to set the policy rate as a linear function of inflation and resource utilisation. The parameters of this relationship can either be assumed (as Taylor did) or estimated econometrically. In the latter case, we choose to refer to the estimated relationship as a *reaction function*.

It is important to emphasise that Taylor rules and estimated reaction functions are strong simplifications of how monetary policy is conducted. There are key features of the conduct of actual monetary policy that are not captured in the simple linear relationships. For example, since monetary policy works with a lag, policy decisions are often guided by forecasts. Furthermore, it is not self-evident that simple rules should be perceived as normative, i.e. as descriptions of a desirable or optimal monetary policy.[4] Normative analyses of inflation targeting present the central bank's monetary policy task as minimising a loss function (often formulated in terms of the deviation of inflation from the inflation target and the output gap), with the functioning of the economy as a constraint and the policy rate as an instrument. The outcome for the setting the policy rate then becomes a complicated function, not only of the deviation of inflation from the target and the output gap, but also of important parameters in the description of the economy.[5]

A simpler way to get an idea of how a central bank determines the level of the policy rate is thus to estimate reaction functions. This is a method used by economists both inside and outside central banks. The focus then is often on whether the central bank

[2] Mervyn King, Governor of the Bank of England from 2003 to 2013, argued that central banks should endeavour to teach markets *how* to think and not *what* to think, see King (2005).

[3] Jonsson and Katinic (2017) show that the Riksbank's monetary policy has followed a Taylor rule relatively well for the period 1995-2016 if the long-term real interest rate is allowed to vary over time.

[4] In the US debate, it is common to see Taylor rules as normative. The Taylor rule was launched at a time when the monetary policy debate often centred on norms versus discretion in monetary policy decision-making. Taylor (1993) argued that his rule was better than discretionary policy. Later research on US data has also shown that simple rules work well in large macroeconomic models (see, for example, Taylor and Williams 2010). A similar consensus on simple rules estimated on Swedish data does not appear to exist, although there are several studies that have estimated simple rules, both in single-equation estimates and in large macro models, see for example Jonsson and Katinic (2017) and Corbo and Strid (2020), respectively.

[5] See, for example, Svensson (2011) for a description of inflation targeting based on a target function formulated in terms of inflation and the output gap. Woodford (2003) assumes a welfare-maximising objective function.

is deviating from its reaction function, i.e. deviating from what is considered 'normal' given economic developments.

In this article we estimate reaction functions and show how such estimated reaction functions can be used in the internal deliberations that precede a monetary policy decision to discuss the predictability of the Riksbank's monetary policy. At the time of the monetary policy decision, the amount of information on the current state of the economy is limited. We therefore present estimates of the Riksbank's reaction function based on real-time data since 2009.[6] That is, instead of using the latest estimate of the output gap, we use the assessment available at the time. In addition, we estimate a few different versions of the reaction function, with different measures of inflation and the output gap, to allow for different perspectives among the members of the Executive Board and to obtain a more robust picture of the historical reaction function.[7] We then use the estimated reaction function to make projections of what the policy rate would be set for the next period if the Riksbank followed its historical policy rule, and compare these, together with prevailing expectations on the financial markets, with the actual outcome of the policy rate. As suggested in Almerud et al. (2026), such real-time reaction functions can be included as one element (of several) in the internal monetary policy preparation to discuss whether future interest rate decisions can be considered predictable in the short term. Such an analysis is not necessarily about rating policy predictability based on differences between, on the one hand, the interest rate projections and, on the other hand, the envisaged policy and market expectations. Rather, it is about highlighting such deviations to deepen the discussion and facilitate communication that increases understanding of the monetary policy conducted.

The rest of this article has the following structure. Section 2 provides a brief introduction to simple rules and reaction functions and the real-time estimates that form the basis for the subsequent analysis. Section 3 compares projections from the real-time reaction functions and market expectations with the actual path of the policy rate. The analysis shows that the reaction functions have at times painted a picture of a systematic policy that differs from the actual interest rate policy pursued, particularly during the period when the policy rate was close to the effective lower bound. We discuss how the Riksbank's communication was used to explain some of the deviations. Section 4 summarises.

2 Evolution of the policy rate according to simple monetary policy rules and reaction functions

Simple monetary policy rules are often used to describe how monetary policy *on average* tends to be affected by economic developments. The best-known example is the Taylor rule, which was introduced over 30 years ago (see Taylor 1993 and English

[6] Since 2026 the Riksbank publishes real-time forecasts on its website, see Forecasts and outcomes | Sveriges Riksbank . See also Berg et al. (2004) for earlier analysis on real-time estimated reaction functions.

[7] Brès et al. (2026) also estimate reaction functions on Swedish data. They apply novel techniques in that they use expectations from surveys among professional forecasters of future policy rates, inflation and the output gap, as well as expectations from financial markets.

et al. 2003). According to the Taylor rule, the central bank sets the policy rate as a function of current inflation and its deviation from the inflation target, resource utilisation and the long-term real interest rate, i.e.

(1) $$i_t = r_t^* + \pi_t + \beta_1(\pi_t - \pi^*) + \beta_2(y_t - y_t^*),$$

where i_t is the nominal policy rate, r_t^* is the long-term real interest rate, π_t is the inflation rate, π^* is the inflation target, y_t is a measure of real activity (e.g. the level of GDP) and y_t^* is potential real activity, implying that $(y_t - y_t^*)$ in the case of GDP is the so-called output gap. In the original formulation in Taylor (1993), the long-term real interest rate was assumed to be constant, but it is now more common to see it as time-varying. A further change compared with Taylor (1993) is the inclusion of so-called interest rate smoothing, which takes account of the fact that the policy rate tends to be adjusted gradually.[8] With this addition, the policy rate is determined as follows

(2) $$i_t = \gamma i_{t-1} + (1-\gamma)[r_t^* + \pi_t + \beta_1(\pi_t - \pi^*) + \beta_2(y_t - y_t^*)],$$

where γ is the degree of interest smoothing. The parameters γ, β_1 and β_2 can either be set to predefined values or estimated.[9]

In this article, we focus on how simple monetary policy rules/reaction functions can be used on an ongoing basis in the monetary policy formulation process to check the predictability of monetary policy. The idea is that a simple rule ahead of each decision occasion is used to answer the question "What would the policy rate be set at, given current assessments of economic conditions, if the Riksbank follows its historical reaction pattern?".[10]

To put the reaction function into a form that can be used in a concrete decision-making situation and to be able to compare its implied interest rate with the actual decision, we update the reaction function one quarter from current forecasts/assessments.[11] [12] The projected policy rate implied by the real-time reaction function can then be written as

(3) $$i_{t+1,|t} = \gamma\, i_t + (1-\gamma)\,[\hat{r}_{t+1|t}^* + \hat{\pi}_{t+1|t} + \beta_1(\hat{\pi}_{t+1|t} - \pi^*) + \beta_2(\hat{y}_{t|t} - y_{t|t}^*)],$$

[8] The gradual adjustment of policy rates ("interest rate smoothing") is an established empirical fact, see, for example, Lowe and Ellis (1997). See Dotsey et al. (2022) for a broader discussion on interest rate smoothing.

[9] In a previous study on Swedish data, Jonsson and Katinic (2017), $\gamma = 0$ and β_1 and β_2 are assumed to be 1.5 and 0.1 respectively.

[10] Reconciling actual monetary policy with estimated rules has long been an element of monetary policy preparation, both at the Riksbank and at other central banks. What is new here is that the successively updated estimates are based on real-time data.

[11] Historically, the Riksbank has taken more than one monetary policy decision during certain quarters. To simplify our exercise, our reaction functions are based only on the last decision of each quarter. The decided interest rate will only take effect in the next quarter.

[12] The projections based on Riksbank forecasts of the output gap and inflation in the near term are allowed to affect the interest rate projection. But they are not to be considered as endogenous policy choices as they are normally based on indicator-based models and temporary variations in data.

where the notation $x_{t+1,|t}$ refers to a projection of the variable x for time $t+1$ (the next quarter) based on the information available at time t (the decision quarter). Information on inflation rates is published monthly and with a relatively short lag, and often only the inflation rate for the last month of the quarter is missing at the time of the decision.[13] Information on the output gap is more difficult, as national accounts are published with a longer lag. In this case, more comprehensive assessments are needed. To avoid introducing unnecessary uncertainty from the estimation of the current economic conditions, we let the reaction function consider the output gap of the previous quarter.[14]

As mentioned above, the parameters in the equations above can either be calibrated (i.e. reasonable values are set based on, for example, previous studies) or estimated econometrically. To try to capture the historical response pattern, we focus here on real-time response functions with estimated parameters rather than calibrated simple rules.

2.1 Real-time reaction functions

Before we can answer the question above - what policy rate would the Riksbank set if it follows its historical reaction function, given its current view of the long-term interest rate level, inflation and the output gap - we estimate the parameters of the following reaction function:

(4) $$i_{t+1,|t} = \hat{\gamma}_t i_t + (1-\hat{\gamma}_t)\,[\hat{\beta}_{3,t-1}\hat{\imath}^*_{t+1} + \hat{\beta}_{1,t-1}(\hat{\pi}_{t+1|t} - 2) + \hat{\beta}_{2,t-1}(\hat{y}_{t|t} - y^*_{t|t})].$$

In order to improve the empirical fit of estimated reaction function we assume that the decision maker is looking at a long-term nominal interest rate, which is here is approximated with a five-year swap rate in five years. In order to capture the downward trend in interest rates seen in the past decades, the parameter in front of the long-term nominal interest rate, $\hat{\beta}_{3,t-1}$, is allowed to be different from one. The parameters are estimated on data and the assessments of the trend in GDP available at the time, from the Q2 1993 to t $-$ 1, where t goes from Q1 2009 to Q2 2025.[15]

Table 1 shows the parameter estimates for the decision point in Q2 2025. Results for six different estimates are shown, with different combinations of measures of inflation (CPIF and CPIF excluding energy) and the output gap (trends based on the Riksbank's assessment, a Hodrick-Prescott filter and a sixth-degree polynomial) as explanatory variables. Figure 4 in the Appendix shows the different measures of the output gap in real time.

[13] This indicates that the Riksbank's forecast is often a good approximation of the outcome for the decision quarter.

[14] At times the output gap in the previous quarter is also missing at the time of the decision. In these cases, we have used the Riksbank's assumed development at the time.

[15] The trend in GDP is thus an assessment that is updated on an on-going basis. To handle uncertainty regarding the assessment of the trend we estimate several reaction functions with different trend assessments.

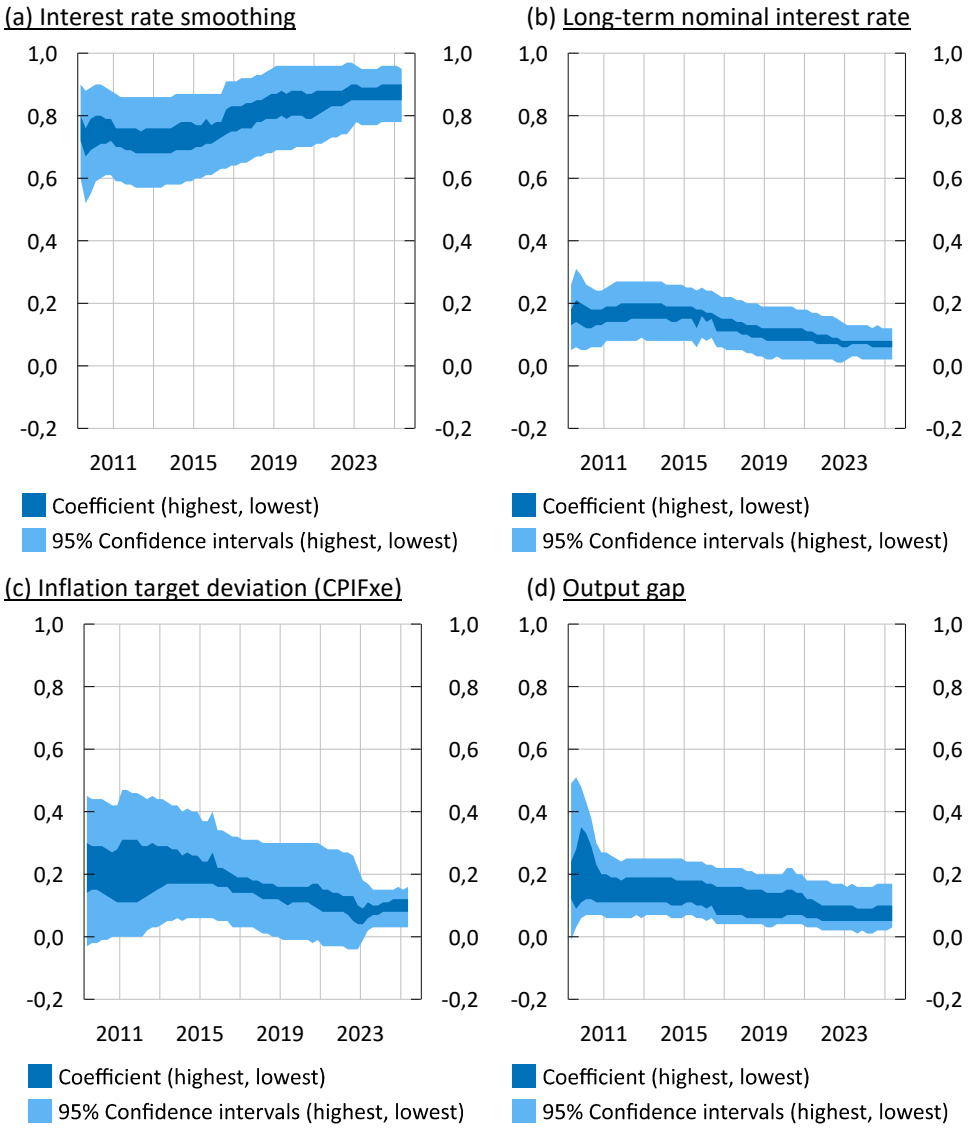
Table 1. Estimated parameters of the reaction function with different measures of inflation and the output gap, for the period 1993Q2 – 2025Q2

	Interest rate smoothing $\hat{\gamma}_{2025Q2}$	Long-term nominal interest rate $\hat{\beta}_{3,2025Q2}$	Inflation target deviation $\hat{\beta}_{1,2025Q2}$	Output gap $\hat{\beta}_{2,2025Q2})$
Output gap, CPIFxe	0.88	0.08	0.11	0.06
Output gap, CPIF	0.90	0.07	0.09	0.05
Output gap (H-P), CPIFxe	0.84	0.09	0.11	0.10
Output gap (H-P), CPIF	0.87	0.07	0.08	0.09
Output gap (Polynomial), CPIFxe	0.85	0.08	0.12	0.09
Output gap (Polynomial), CPIF	0.87	0.06	0.09	0.08

Note. All parameters are significant at the 1-per cent level.

Figure 1 provides a more comprehensive picture and shows how the parameters have evolved since 2009. The parameters have the expected signs and are significantly different from zero, with the exception of the parameter for the inflation target deviation in the years following the financial crisis (2009-2011) and in the period 2019-2022. Panel (a) of Figure 1 shows that interest rate smoothing has a high weight in the reaction functions and that it has gradually increased (thus affecting the interest rate projections of the reaction functions), while the trend for the other explanatory variables is the opposite. It is worth noting that the uncertainty surrounding the parameter of the inflation deviation clearly decreased with the rapid increase in interest rates in 2022 and 2023.

Figure 1. Parameter estimates in the reaction function with gradually increasing estimation period



Note. The dark blue fields refer to the highest and lowest parameter estimates in the reaction functions based on different measures of inflation (CPIF and CPIF excluding energy) and the output gap (trends based on the Riksbank's assessment, a Hodrick-Prescott filter and a sixth-degree polynomial). The light blue fields represent the upper and lower limits of the 95 per cent confidence intervals for the parameters. The estimation periods range from 1993Q2-2009Q1 to 1993Q2-2025Q2.

Source: The Riksbank, Statistics Sweden and own calculations.

The parameters in the Riksbank's reaction function thus change over time. This could be regarded as problematic if the hope of estimating a reaction function is to find a stable and time-independent description of the Riksbank's systematic monetary policy. Another approach is to see changes in the reaction function as natural in the light of structural changes in the functioning of the economy and the need for policies to deal with new economic shocks over time. In addition, the members of the Executive Board vary over the years, which may be reflected in changing reaction

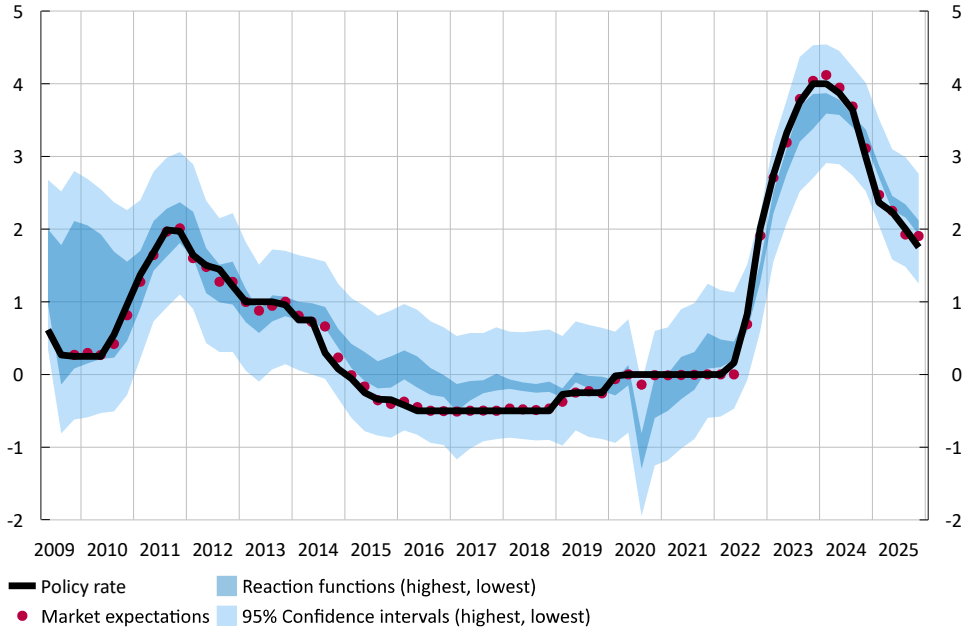
functions. However, we can conclude that the changes over time in the estimated parameters of the reaction function have been relatively small.

3 Reaction functions and the predictability of monetary policy

We can now use projections of the estimated reaction functions to illustrate the predictability of Swedish monetary policy in the short term. As mentioned above, one item in a checklist for a predictable monetary policy according to Almerud et al. (2026) is that, prior to a monetary policy decision, it identifies whether the forthcoming decision will deviate from the historical reaction pattern and from market expectations. If this is the case, it is likely that the decision may need to be clearly motivated by identifying what other factors that are seen to be of importance at the time of the decision. In other words, the predictability of monetary policy is improved by clearly justifying why the Riksbank deviates from its historical reaction pattern.

Against this background, using the reaction functions in Section 2, we have created a time series of stepwise real-time interest rate projections for the last monetary policy decision in each quarter. Figure 2 summarises the different interest rate projections from the estimated reaction functions in the dark blue field. The figure also shows market expectations ahead of each monetary policy decision and the actual outcome of the policy rate.

Figure 2. The policy rate, projected policy rate according to estimated reaction functions and market pricing ahead of each meeting



Note. The dark-blue field corresponds to the highest and lowest projected interest rates each quarter in the reaction functions. The light-blue field corresponds to the highest and lowest 95 per cent confidence intervals in the estimated reaction functions, but do not reflect uncertainty coming from the projections. Market expectations are measured by so-called RIBA contracts.

Source: The Riksbank, Statistics Sweden and own calculations.

So what can we say about the reaction function's projections of the interest rate compared with actual policy rate outcomes and with market expectations? To begin with, we note that the reaction function tracks actual interest rate policy relatively well during the period analysed, 2009-2025.[16] At the same time, there are periods showing clear deviations.

One example is the years after 2014, i.e. the years after the European debt crisis with low growth in the euro area and low inflation in most developed economies in the world. The implied interest rate of the reaction functions was above the actual policy rate (black solid line) from mid-2014 until the end of 2019 and was slightly negative only for a few years. The estimated reaction functions also gave a slightly higher weight to the output gap at that time than they did later (see panel (d) in Figure 1), which, all else being equal, gives a higher projected interest rate. But the Executive Board of the Riksbank made a different assessment, referring to the low inflation outlook and low inflation expectations (which are not part of the reaction function) and the risk that the credibility of monetary policy was about to deteriorate, see Andersson et al. (2022).[17] This was a stance that was well recognised in financial

[16] During 2009-2010 the dark-blue field is fairly wide. This is a consequence of the sixth-degree polynomial having a hard time to capture the trend in GDP during those years. See Figure 4 in the appendix. For those reaction functions that do not include polynomial-trend calculations, the deviation from the actual policy rate is small.

[17] See also the article "Why is it important that inflation rises towards the target?" in Sveriges Riksbank (2015) and, for example, Sveriges Riksbank (2017a, 2017b).

markets and therefore market expectations also differed from what the real-time reaction function implied.

Another example of relatively large deviations was during the pandemic year 2020. According to the reaction function, the interest rate would be negative, given the Riksbank's historical approach to the low inflationary pressures and the very weak development of the real economy. But the Riksbank, which the year before had raised the policy rate to zero after almost six years of a negative policy rate, chose not to cut the rate, arguing that additional monetary policy stimulus was not meaningful in an environment where demand had fallen as a result of lockdowns and widespread illness (see Sveriges Riksbank 2020, 2021). Instead, the Riksbank substantially increased its purchases of securities and took other measures to maintain the economy's credit supply. Market expectations initially deviated from how the policy rate developed but quickly adjusted following the Riksbank's communication on how it was thinking about monetary policy in this particular situation.

A third example concerns the period from the end of 2021, when the historical pattern of reaction would have been consistent with raising the policy rate. However, it took until the second quarter of 2022 before the policy rate was actually raised. This episode has been discussed in several evaluations, and external analysts argued that the Riksbank acted too late (see, for example, Hassler et al. 2023). In the autumn of 2021, when estimated reaction functions thus pointed to policy rate hikes, the Riksbank argued that weak figures on underlying inflation (other than those included in the estimation of the reaction function) continued to point to a weak inflation outlook and to an unchanged policy rate (see e.g. Sveriges Riksbank 2022). When inflation then picked up more broadly in early 2022, the Riksbank communicated well in advance of the monetary policy meeting in April and during the rest of the spring and summer that the policy rate would be raised rapidly. The aim was to allow companies and households to prepare for higher interest rates (see e.g. Sveriges Riksbank 2023). When the policy rate started to be raised in April 2022, it was also at a slightly faster pace and to a slightly higher level than implied by the reaction functions. Based on the Riksbank's communication, this was motivated by uncertainty about inflation dynamics (which also gave rise to unusually large forecast errors during the period) and concerns about the impact on inflation expectations.

A final example is the phase of policy rate cuts that started in early 2024. The reaction functions implied that they would take place at a slightly slower pace than was the case. At this stage, the Riksbank communicated that it had become more confident in the analysis of the economic shocks behind the sharp rise in inflation, the stabilising effect of wage formation and the fall in long-term inflation expectations (see e.g. Sveriges Riksbank 2024 and 2025). And inflation fell rapidly, which was reflected early on in the shorter-term (1-, 3- and 6-month) measures of inflation that became more prominent in monetary policy communication. The reaction functions include inflation measured over 12 months, which fell more slowly than the more short-term measures. All of this may help to explain why the policy rate was cut faster than implied by the historical reaction functions.

How were reaction functions affected by the low interest rate period 2015-2021?

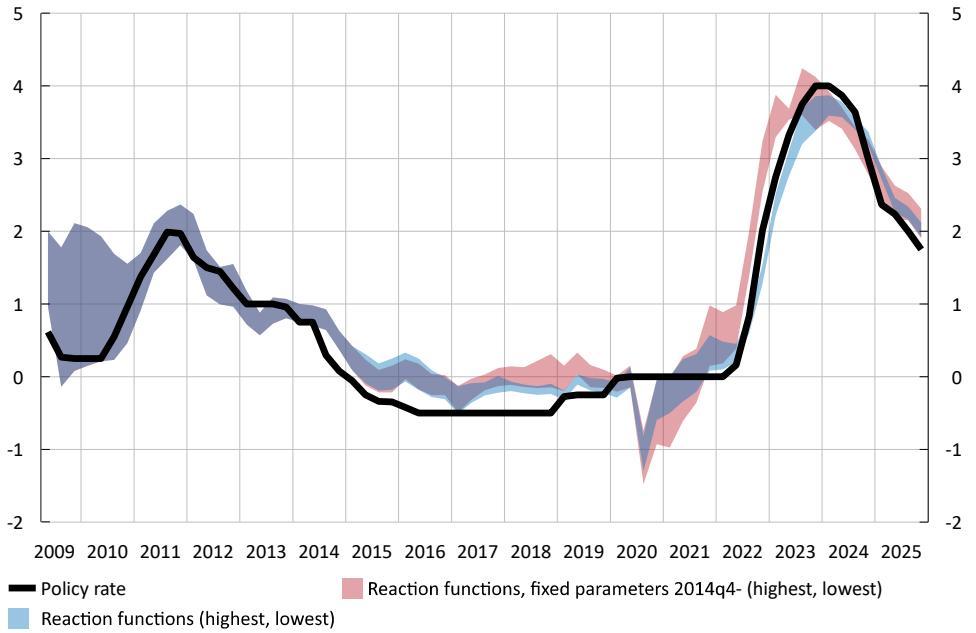
It may be worth recalling that the reaction functions do not take into account whether the Riksbank used other monetary policy instruments, such as securities purchases. From 2015 to 2022, it was mainly via adjustments to the Riksbank's securities holdings that the Riksbank calibrated monetary policy, while the policy rate was changed to a relatively small extent. Ideally, the reaction functions above would be estimated with a shadow rate, i.e. a calculation of how much the policy rate would have had to be lowered to achieve the same effect as the securities purchases (see De Rezende and Ristiniemi 2023). The fact that the policy rate was adjusted relatively little when the securities portfolio was the more active monetary policy instrument, together with the fact that the policy rate was close to the effective lower bound, are possible explanations for the increase in the interest rate smoothing parameter in the estimated equations during this period (see panel (a) of Figure 1).[18]

A simple way of illustrating how this might have affected recent interest rate projections is shown in Figure 3. The interest rate projections are based on parameter estimates estimated on data up to the start of the securities purchases, i.e. until the end of 2014, and are assumed to be constant thereafter. As can be seen from Figure 3, this exercise (the red field) implies a slightly different evolution of the implied policy rate from the reaction functions, with a tendency towards greater policy rate variability. For example, the deviation during the period of negative policy rates is even larger in 2018-2019. Another example is in 2022, when the projections are consistent with slightly earlier policy rate increases.

[18] As an example, the standard deviation of the policy rate over the period 2015Q1-2019Q4 was 0.1 percentage points. This compares with the period 1993Q1-2013Q4, when the corresponding standard deviation was 2.4 percentage points.

Figure 3. The actual policy rate and implied policy rates from reaction functions with time-varying and fixed parameters 2014-2025, respectively

Per cent



Note. The light blue field refers to the same reaction functions as in Figure 3. The red field refers to the corresponding values for the implied policy rate, where the reaction functions from the 2015 Q1 decision point onwards are based on the same parameters as at the 2014 Q4 decision point.

Sources: The Riksbank, Statistics Sweden and own calculations.

4 Reaction functions - a way to discuss the predictability of monetary policy

Estimated reaction functions have long been used at central banks and by market participants as a simple way to try to capture the systematic component of monetary policy. In this article, we discuss how estimated reaction functions can be used in the Riksbank's work to strengthen the predictability of monetary policy. We present estimated reaction functions based on Swedish real-time data for the period 2009-2025. The sequentially estimated reaction functions are used to create a time series of stepwise real-time interest rate projections. This time series, together with market expectations, is then compared with actual monetary policy to illustrate the predictability of monetary policy in the short term. In line with Almerud et al. (2026), such an analysis can be included as one element (of several) in the preparation of monetary policy decisions, with the aim of identifying deviations from a historical reaction pattern that may need to be justified and communicated.

The estimated reaction functions capture the development of the policy rate relatively well at an overall level. This suggests that monetary policy has been predictable in the sense that its development can be understood by developments in inflation and the output gap. However, the fact that interest rate smoothing is given such a large weight in the estimated reaction functions means that this interpretation should not be exaggerated.

Our analysis of the predictability of monetary policy indicates a high degree of predictability in the Riksbank's interest rate setting, even though this may partly stem from the fact that the policy rate did not vary very much during parts of the sample period and that asset purchases were used to calibrate the monetary policy stance. During the period we study, 2009-2025, there are however notable deviations between interest rate projections from the estimated reaction functions and market expectations on the one hand and actual outcomes on the other. One example concerns the period 2015-2019, when the estimated reaction functions favoured a slightly higher interest rate than was actually the case. During this period, the Riksbank referred to a low inflation outlook and weakening inflation expectations to justify a negative policy rate and securities purchases as necessary to stabilise inflation close to the target. Another example is during the pandemic, when the estimated reaction functions instead favoured a lower interest rate than was actually the case. At the time, the Riksbank communicated that it saw interest rate cuts as ineffective in a situation of lockdowns. What these examples clearly show is that reaction functions are not always consistent with the actual interest rate decision, but that they can be used to highlight deviations from the historical reaction pattern. In these situations, it is very important that the Riksbank communicates what other factors influence the decision, so that monetary policy becomes understandable and thus more predictable.

To end, a more complete analysis of ways to enhance the predictability of monetary policy needs to take into account additional factors. Actual monetary policy also tends to be largely guided by forecasts, which are not typically captured in reaction functions. History also shows that instruments other than policy rate changes can be of great importance, but these are not included in the analysis presented here. Finally, credible and consistent communication of the monetary policy strategy has a major impact on predictability, as was evident, for example, during the years of negative policy rates and large-scale securities purchases.

References

Almerud, Jakob, Carl Andreas Claussen and Matilda Kilström (2026), "A checklist for a well-balanced monetary policy - a proposal and an illustration", *Economic Review*, no. 1, pp. 21–53, Sveriges Riksbank.

Andersson, Björn, Meredith Beechey Österholm and Peter Gustafsson (2022), "The Riksbank's asset purchases 2015–2022", *Riksbank Study,* no. 2, Sveriges Riksbank.

Berg, Claes, Per Jansson and Anders Vredin (2004), "How useful are simple rules for monetary policy? The Swedish experience", Working Paper No. 169, Sveriges Riksbank.

Blinder, Alan and Ricardo Reis (2005), "Understanding the Greenspan standard", *Federal Reserve Bank of Kansas City Economic Symposium at Jackson Hole*.

Brès, Max, Alexander Czarnota and Matilda Kilström (2026), "Estimating perceived monetary policy rules for Sweden", *Sveriges Riksbank Economic Review*, no. 1, pp. 70–111.

Corbo, Vesna and Ingvar Strid (2020), "MAJA: a two-region DSGE model for Sweden and its main trading partners", Working Paper no. 391, Sveriges Riksbank.

De Rezende, Rafael B. and Annukka Ristiniemi (2023), "A shadow rate without a lower bound constraint", *Journal of Banking & Finance*, vol. 146, article no. 106686.

Dotsey, Michael, Andreas Hornstein, and Alexander L. Wolman (2022), "Interest rate smoothing," in *Essays in Honor of Marvin Goodfriend: Economist and Central Banker*, edited by Robert G. King and Alexander L. Wolman, Federal Reserve Bank of Richmond.

English, William B., William R. Nelson and Brian P. Sack (2003), "Interpreting the significance of the lagged interest rate in estimated monetary policy rules", *Contributions in Macroeconomics*, vol. 3, no. 1.

Hassler, John, Per Krusell and Anna Seim (2023), "Evaluation of monetary policy 2022" (only in Swedish), Report from the Riksdag 2022/23:5.

Jonsson, Magnus and Goran Katinic (2017), "Is Swedish monetary policy in line with the Taylor rule?", *Economic Commentary* no. 4, Sveriges Riksbank.

King, Mervyn (2005), "Remarks to the Central Bank Governors' Panel", Federal Reserve Bank of Kansas City Economic Symposium at Jackson Hole.

Lowe, Philip and Luci Ellis (1997), "The smoothing of official interest rates," in *Monetary Policy and Inflation Targeting: Proceedings of a Conference*, edited by Philip Lowe, Reserve Bank of Australia.

Sjödin, Maria (2026), "The Riksbank's objective, mandate and the process behind a monetary policy decision", *Sveriges Riksbank Economic Review*, no. 1, pp. 6–20.

Svensson, Lars E. O. (2011), “Inflation targeting”, Chapter 22 in *Handbook of Monetary Economics*, vol. 3b, Benjamin M. Friedman and Michael Woodford (eds.), Elsevier.

Sveriges Riksbank (2015), *Monetary Policy Report*, July.

Sveriges Riksbank (2017a), *Monetary Policy Report*, April.

Sveriges Riksbank (2017b), *Monetary* Policy *Report*, July.

Sveriges Riksbank (2020), *Monetary Policy Report*, April.

Sveriges Riksbank (2021), *Account of Monetary Policy,* 2020.

Sveriges Riksbank (2022), *Account of Monetary Policy,* 2021.

Sveriges Riksbank (2023), *Account of Monetary Policy,* 2022.

Sveriges Riksbank (2024), *Monetary Policy Report*, September.

Sveriges Riksbank (2025), *Account of Monetary Policy,* 2024.

Taylor, John B. (1993), “Discretion versus policy rules in practice”, *Carnegie-Rochester Conference Series on Public Policy*, vol. 39, pp. 195–214.

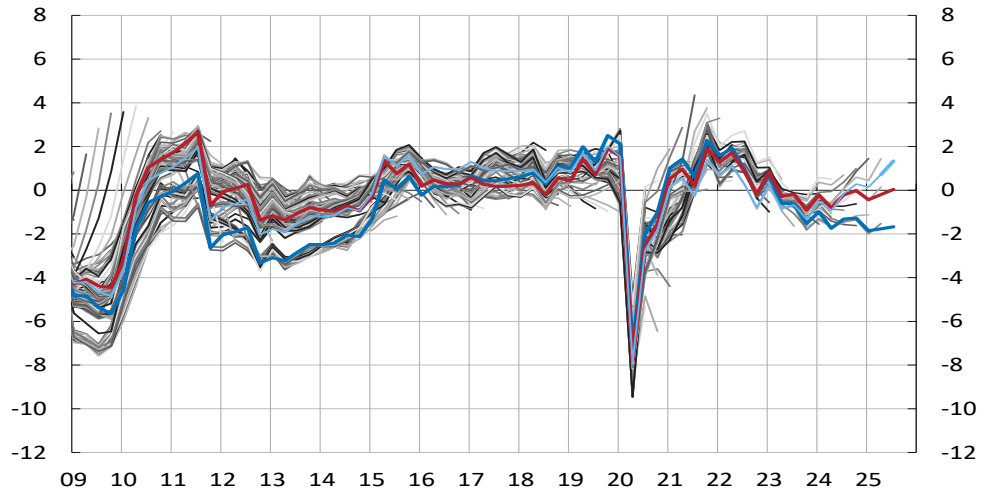
Taylor, John B. and John C. Williams (2010), “Simple and robust rules for monetary policy”, chapter 15 in *Handbook of Monetary Economics*, vol. 3, edited by Benjamin M. Friedman and Michael Woodford, Elsevier.

Woodford, Michael (2003*), Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press.

APPENDIX

Figure 4. Different real-time measures of output gaps

Percentage deviation from the trend



Note. The series show output gap series based on three different ways of calculating trend: (i) the Riksbank's assessment; (ii) a Hodrick-Prescott filter; and (iii) a sixth-degree polynomial. The latest estimated output gaps are highlighted in blue (the Riksbank's assessment), red (HP filter) and light blue (polynomial).

Source: Riksbank, Statistics Sweden and own calculations.

Estimating perceived monetary policy rules for Sweden

Max Brès, Alexander Czarnota and Matilda Kilström*
Max Brès is senior economist, Alexander Czarnota is economist, and Matilda Kilström is adviser at the Riksbank's Monetary Policy Department

Private agents' perceptions of how the central bank will respond to new information shape how interest rates react to macroeconomic news and are therefore central to the transmission of monetary policy.

In this article, we estimate a time-varying perceived monetary policy rule for Sweden using surveys of professional forecasters. The estimated rule exhibits substantial variation over time, but overall, the Riksbank is perceived to respond more strongly to expected inflation than to the expected output gap. Extending the baseline specification, we find little evidence that the exchange rate is perceived to enter the policy rule independently of its implications for expected inflation and real activity.

We then use an event-study approach to derive an independent, market-based counterpart to the survey-based rule from the response of interest rates to inflation and GDP surprises. Market rates respond positively and significantly to both, with stronger responses to inflation surprises. Finally, we find some evidence that market responses to macroeconomic news are stronger when the Riksbank is perceived to place greater weight on the corresponding variable, although this result is limited to a subset of financial instruments.

1 Introduction

Private agents' expectations about how the Riksbank will react to new information are a key determinant of how policy decisions transmit to longer-term interest rates and broader financial conditions. If market participants understand the central bank's reaction function, that is, how it will respond to new information, part of the adjustment to shocks can occur through prices and expectations even before policy is changed (Woodford, 2005).[1] For policy analysis, this makes market participants'

* The authors would like to thank Carl Andreas Claussen, Peter Gustafsson, Özer Karagedikli, Stefan Laséen, Marianne Nessén, Ricardo Reis, Anna Seim, Ulf Söderström, Anders Vredin, Francesco Zanetti and seminar participants at the Riksbank for valuable comments and suggestions. The opinions expressed in this article are the sole responsibility of the authors and should not be interpreted as reflecting the views of Sveriges Riksbank.

[1] Another case when perceptions are economically important is discussed in Bauer et al. (2024b). Using a simple theoretical framework, they show that if the public expects a strong response to inflation, this can

perceived reaction function a useful object to monitor—yet it is not directly observable and may vary over time.

Identifying the perceived reaction function of a central bank requires measuring its expected responses to movements in its goal variables. A common approach to evaluate market participants' expectations about future monetary policy is to use asset prices or survey forecasts of the policy rate. While these are informative about expected outcomes, they are not informative about the policy reaction function itself. Alternatively, estimated policy rules within structural or semi-structural models reflect the econometrician's model and information set rather than agents' subjective beliefs.

In this article, we estimate a perceived monetary policy rule for Sweden. Our approach to capturing the perceived reaction function of the Riksbank consists of estimating a perceived time-varying monetary policy rule that defines a systematic relation between the policy rate and some indicators of macroeconomic conditions using granular survey data on professional forecasts. We use data from the Riksbank monthly survey of professional forecasters from October 2006 to November 2025. Building on Bauer et al. (2024a), we form panels for each monthly survey consisting of forecasts for the policy rate, inflation and the output gap for the available forecast horizons for each forecaster. The estimated forward-looking policy rule relates the expected policy rate to expectations for inflation and real activity. This approach uses the joint distribution of individual forecasts to recover the response coefficients that are most consistent with respondents' policy rate expectations and thereby provides a structured time-varying metric of perceived policy behaviour. More precisely, it defines perceived monetary policy as the estimated coefficients on inflation and the output gap that, in a given month, rationalise the individual policy rate forecasts as a linear function of the corresponding forecasts for inflation and the output gap. The perceived policy rule is estimated with and without interest rate smoothing (inertia).

Three results stand out. First, forecasters perceive the Riksbank as responding more strongly to expected inflation deviations than to the expected output gap. Second, there is variation in both responses over time, with the 2012-2017 period showing a stronger perceived response of the Riksbank to movements in inflation than during other periods. Third, our results are robust to considering an inertial rule, alternative measures of real activity and an alternative method to control for disagreement about the long term. To address the concern of potential misspecification of the estimated perceived policy rule, we extend our baseline specification with survey forecasts of the exchange rate – a potentially important variable given that Sweden is a small open economy. We find limited evidence that the exchange rate is perceived to enter the policy rule beyond its implications for expected inflation and real activity.

The method in Bauer et al. (2024a) builds on the assumption that a simple Taylor rule is a credible "model" of how monetary policy is perceived to respond to

improve the trade-off between stabilising output and inflation by limiting the change in actual inflation going forward.

macroeconomic conditions.[2] However, this functional form can provide a more or less accurate approximation of respondents' views at different points in time.[3] Variation in the estimated coefficients may, therefore, partly reflect changes in the degree of misspecification rather than changes in the underlying perceived policy weights.

Our application of this method to Sweden involves both gains and limitations. An important advantage is that the survey provides longer-horizon expectations, which reduces the risk of contamination from expected near-term monetary policy shocks and helps identify disagreement about the steady state across respondents. However, respondents are not asked explicitly about how the Riksbank would adjust the policy rate conditional on macroeconomic outcomes. The mapping from policy rate forecasts to perceived policy responses is therefore less straightforward than in Bauer et al. (2024a).

To validate the conclusions from our survey-based perceived policy rule, we estimate an alternative perceived rule using financial market data, identified from the causal effect of inflation and GDP forecast revisions on policy rate forecast revisions. Specifically, we estimate event-study regressions of interest rate changes on inflation and GDP surprises—measured as the difference between the released value and the consensus forecast prior to the announcement—in narrow windows around the data releases. Under the assumption that these interest rate changes reflect revisions to expectations about the future policy rate, the estimated coefficients can be interpreted as the Riksbank's expected reaction to the data surprises.

We find that positive surprises in inflation and GDP releases cause statistically significant increases in market rates, consistent with the interpretation that financial markets perceive the Riksbank to raise the policy rate in response to this news. Consistent with our survey-based perceived policy rule, the implied response is stronger for inflation surprises than for GDP surprises. In terms of magnitude, the estimates align more closely with the survey-based rule in the specification with policy rate inertia.

In addition, we use rolling-window estimates of our event-study regressions and find that the perceived responses to inflation and GDP surprises vary over time in a manner that qualitatively matches the time variation in the survey-based rule. For example, according to both estimation methods, the Riksbank was perceived to

[2] Even though simple policy rules are not followed mechanically (see, e.g., Svensson, 2017), it is common for central banks to consider some type of simple policy rules as input into policy deliberations or in the external communication (see, e.g., Garga et al., 2025). In theory, optimal policy can be derived by minimising the expected loss of the policymaker, but in practice this is not directly applicable and simple policy rules can be useful. In DSGE models – the workhorse model used for policy analysis in many central banks – monetary policy is often modelled using some version of a Taylor rule. This is also the case for the Riksbank's DSGE model MAJA (see Corbo and Strid (2020) for more details).

[3] For Sweden, Jonsson and Katinic (2017) argue that Swedish monetary policy has been in line with a Taylor rule with a time-varying long-term rate between 1995-2017. In a recent paper, Nakamura et al. (2025) study monetary policy in the United States and highlight that the Federal Reserve at times has deviated strongly from the Taylor rule, in particular during the recent inflation surge. Similar evidence for Sweden is documented by Gustafsson and Nessén (2026).

respond relatively more strongly to deviations in its goal variables during 2012-2017 than in other periods.

Overall, the market-perceived rule yields conclusions similar to those from the survey-based rule. The quantitative evidence, however, is more nuanced. Allowing the sensitivity of interest rates to macroeconomic news to vary with our survey-based measure of perceived policy responsiveness, we find some evidence that rates respond more to inflation and GDP surprises when the Riksbank is perceived to place a greater weight on the respective variable. This would suggest that time variation in the survey-based rule matters for the transmission of macroeconomic news to market rates. However, since the estimated interaction effects are only statistically significant for a subset of interest rates and depend on the specification used to estimate the survey-based coefficients, these results should be interpreted with caution.

This article contributes to the literature on monetary policy expectations and transmission by developing a survey-based, time-varying measure of the perceived policy reaction function for Sweden. Existing work often infers changes in expected policy paths from financial market prices, particularly in high-frequency event-study settings around macroeconomic and policy announcements (for example, Kuttner 2001, Gürkaynak et al. 2005, or Nakamura and Steinsson 2018) or estimates policy rules within structural and semi-structural models under a maintained information set (for example, Clarida et al. 2000). Our contribution is to complement these approaches with a direct measure of how market participants perceive the Riksbank's systematic response to macroeconomic conditions, and how that perception evolves over time. By adapting the framework of Bauer et al. (2024a) to a small open economy and explicitly assessing the perceived role of the exchange rate, the article also offers a practical monitoring device for policy analysis and for interpreting variation in the sensitivity of market rates to macroeconomic news.

2 Survey data

To estimate survey-based perceived monetary policy rules for Sweden, we utilise panel data on professional forecasts. The Riksbank commissions Origo Group to measure expectations of several macroeconomic variables among money market participants, labour market parties and purchasing managers.[4] The money market participants' survey is conducted monthly, whereas the survey including all participants is conducted quarterly.[5] Origo Group publishes moments from the survey

[4] The survey has been published in some form since 1995. Between 2000-2024, the survey was carried out by Kantar Prospera.

[5] All participants are asked about their expectations for inflation, wage increases, GDP and the policy rate in Sweden. Money market participants are also asked about their expectations for the Swedish 5-year government bond rate and the EUR and USD exchange rates. Money market participants include banks, investment firms and pension funds. Labour market parties refer to employer and employee organisations. Since September 2009, the survey has been conducted monthly among money market participants. For an overview of the survey, see Lundgren (2021).

each month, focusing on the mean value of the respondents. The underlying microdata includes the (anonymised) individual respondents from each institution.[6]

For this article, we utilise data for the period October 2006 to November 2025. We focus on the money market participants' survey and use the monthly panel data from September 2009; before then, the survey was quarterly. Money market participants are surveyed about their expectations for the key variables: the policy rate, inflation and GDP growth, at three different horizons: one year, two years, and five years ahead.[7]

The expected policy rate is straightforward to include in our analysis, but we need to make some assumptions for inflation and GDP.

Until 2017, inflation expectations were measured as the expected percentage increase in the consumer price index (CPI). After the Riksbank adopted the CPI with a fixed interest rate (CPIF) as the target index in September 2017, respondents were asked about their expectations for inflation measured both as CPI and CPIF. For this latter period, we use CPIF as our measure of inflation.

For GDP, respondents are asked about expected GDP growth, but monetary policy rules are typically specified in terms of the output gap.[8] To construct a measure of the output gap, we follow a method similar to that in Bauer et al. (2024a). First, to construct forecasts for expected real GDP, we combine (i) the level of real GDP from the National Institute of Economic Research (NIER) and (ii) the survey respondents' forecast for real GDP growth. Because respondents do not have access to the outcomes for real GDP in the quarter of the survey, we construct a common nowcast for real GDP in each quarter based on forecasts from the NIER.[9] Then, because the respondents only report their expected growth rates for years one, two and five, we use interpolation to compute the growth rate for years three and four, assuming a monotonic function. Next, we compute the expected level of real GDP at the different horizons.

To construct the GDP gap, we also need a measure of expected potential GDP, GDP^*. This variable is not included in the survey. Instead, we use the projected potential GDP from the NIER—again using real-time data with the most recent vintage before

[6] In a recent paper, Gemmi and Valchev (2026) show that professional forecasters' survey responses are biased when there are strategic incentives to stand out. They argue that it is not necessarily enough to have anonymous surveys to solve this issue, if respondents also respond to non-anonymous surveys. The Origo data used in this article is both anonymous and proprietary, commissioned by the Riksbank, limiting the scope of such strategic incentives.

[7] See Appendix A for descriptive figures for these variables.

[8] GDP growth can be high in different parts of the business cycle and may therefore not be a good indicator of resource utilisation.

[9] If there is a published forecast from the NIER in the same month as the survey, we use that forecast. Otherwise, we use the most recent forecast. If the release from NIER is in the same month but shortly after the survey wave (at the end of the same month), we will assume that respondents have access to that information, that is, we take into consideration the latest GDP release (already observed by respondents) and assume that everyone makes the same nowcast for the current quarter.

the survey date.[10] Constructing the output gap in this way means that we assume that the survey respondents share the same forecast for potential output.

For a survey at time t, the expected GDP gap at horizon h, y_{t+h}, is computed based on the standard formula:

(1) $$y_{t+h} = \frac{GDP_{t+h} - GDP^*_{t+h}}{GDP^*_{t+h}},$$

where GDP_{t+h} is the forecast of GDP at horizon h, and GDP^*_{t+h} is the forecast for potential GDP. Table 1 presents some summary statistics for the survey data. The total sample over the period October 2006 to November 2025 consists of 18,514 observations, with an average of 31 respondents per wave and three forecast horizons. Over this period, average inflation was 1.85 per cent, and the average expected GDP gap was negative at –1.23 per cent.[11] The expected policy rate was 1.63 per cent, and expectations for the policy rate over this period ranged between –1 and 6 per cent.

Table 1. Summary statistics of surveyed expectations

Variable	Mean	Std. dev.	Min.	25th pct.	Median	75th pct	Max.
Policy rate	1.63	1.35	-1.00	0.50	1.50	2.50	6.00
Inflation	1.85	0.75	-2.00	1.50	1.90	2.10	8.50
GDP gap	-1.23	3.16	-19.80	-2.91	-1.04	0.97	13.60

Note. Summary statistics for the sample period October 2006 to November 2025.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

3 A perceived forward-looking monetary policy rule for Sweden

3.1 Estimating a monetary policy rule based on survey data

To recover the perceived monetary policy rule, we assume that simple policy rules are a useful descriptive device to characterise monetary policy and that forecasters first form a view of the key macroeconomic variables, inflation and output, and then use a policy rule to arrive at their policy rate forecast, conditional on these variables. This

[10] Again, if the release from NIER is shortly after the survey wave, we use the potential GDP from those projections. This will only be the case in the months when the NIER updates their projections: typically, March, June, September and December. The projections are typically published towards the end of the month, whereas the survey is carried out in the first half of the month.

[11] Figure 8 in Appendix A illustrates the GDP gap across surveys and by horizons for the sample period.

allows us to interpret the estimated coefficients of the policy rule as the perceived monetary policy responses to inflation and output.[12]

The simple monetary policy rule we assume is in the spirit of the Taylor rule and takes the following form:

$$i_t = r_t^* + \pi_t^* + \beta_t(\pi_t - \pi_t^*) + \gamma_t y_t + u_t. \quad (2)$$

Here the nominal policy rate, i_t, is determined by the long-run neutral real rate r_t^*, the inflation target π_t^*, current deviations from the inflation target ($\pi_t - \pi_t^*$), the output gap y_t, and an exogenous monetary policy shock u_t. To estimate the parameters of the policy rule in equation (2), we regress the policy rate forecasts on inflation and GDP gap forecasts. At each time t, where t is the time of the survey, we do this for a panel of forecasts made by forecaster j at horizon h:

$$E_t^j i_{t+h} = a_t^j + \hat{\beta}_t E_t^j \pi_{t+h} + \hat{\gamma}_t E_t^j y_{t+h} + e_{t+h}^j, \quad (3)$$

where a_t^j is a forecaster fixed effect capturing beliefs about long-run inflation and the long-run real rate. The interpretation of the fixed effect is that it represents the individual and time-dependent assessment of the neutral rate of interest.[13] The estimation exploits variation across forecasters and forecast horizons, to retrieve the time-varying parameters $\hat{\beta}_t$ and $\hat{\gamma}_t$.

It is an empirical fact that the policy rate is typically adjusted gradually.[14] To capture this, the simple policy rule can be adjusted to include inertia, or interest rate smoothing (here ρ_t governs the degree of smoothing):

$$i_t = \rho_t i_{t-3} + (1 - \rho_t)[r_t^* + \pi_t^* + \beta_t(\pi_t - \pi_t^*) + \gamma_t y_t] + u_t, \quad (4)$$

where we include the policy rate lagged by a quarter (i_{t-3}). To estimate the parameters of equation (4)—now including the time-varying parameter ρ_t—we estimate the following regression with inertia:

$$E_t^j i_{t+h} = a_t^j + \hat{\rho}_t i_{t+h-3} + \hat{\beta}_t E_t^j \pi_{t+h} + \hat{\gamma}_t E_t^j y_{t+h} + e_{t,t+h}^j. \quad (5)$$

We do not observe i_{t+h-3} in the survey. Therefore, we interpolate the respondents' policy rate expectations at horizons of three months, one year, two years and five years. We assume a monotonic function and interpolate to approximate the policy rate in the previous quarter (for each forecast horizon) using the policy rate at the time of the survey combined with individual expectations.[15]

---

[12] It is possible to make a broader interpretation of the estimated coefficients of the policy rule. Instead of reflecting perceived monetary policy, we can think of them reflecting the perceived endogenous co-movement between the policy rate and these macroeconomic conditions.

[13] Bauer et al. (2024a) include forecaster-fixed effects to reflect that forecaster beliefs about the long-run real rate and inflation (r_t^* and π_t^* in equation (2)) may be correlated with their forecasts for inflation and the output gap and, therefore, we should control for these. In our baseline estimation, we include such fixed effects, but since we only have three observations per forecaster and survey month, we also consider an alternative specification in Appendix B. In the alternative specification, we instead include variables in deviation from their long-run expected values, that is, in deviation from the five-year expectations.

[14] See, for instance, Sveriges Riksbank (2024).

[15] We use a monotone piecewise cubic interpolation to capture the curvature of the expected forward curve. The results are robust to alternative cubic interpolation methods. Accurately capturing this curvature

The estimation strategy relies on an ordinary least squares model and four main assumptions. First, the estimation requires that there is variation in expected inflation and output across forecasters.[16] Second, economic forecasts should be exogenous to the expected monetary policy shock from the simple policy rule, $E_t^j u_{t+h}$. Bauer et al. (2024a) discuss how it is unlikely that this assumption holds exactly and, therefore, some endogeneity bias may arise. While expected monetary policy shocks may contaminate expectations at short horizons, longer term expectations available in the survey data for Sweden somewhat limit this concern.

Third, we assume that forecasts for the policy rate are made according to the simple monetary policy rule. We obtain an average R^2 across surveys that is very similar to what Bauer et al. (2024a) present. However, while the survey used in Bauer et al. (2024a, 2024b) asks forecasters specifically about the macroeconomic assumptions underlying their policy rate forecasts, the wording is less specific in the Origo survey, and respondents are simply asked about their expectations at different horizons.[17] Under the assumption that the rule is well specified—that is, the respondents' policy rate forecasts correspond to their perceived policy responses to macroeconomic conditions—we can make a causal interpretation of the estimated coefficients as response coefficients. Finally, the fourth assumption is that parameters are constant over the forecast horizon.

A potential concern is that misspecification of the policy rule drives the variation in our estimates over time. In Section 3.3, we show that our results are robust to different specifications of the rule.

3.2 A time-varying perceived monetary policy rule for Sweden

Table 2 shows the coefficients of the baseline rules with and without inertia (interest rate smoothing) estimated over the whole sample. The estimated coefficient for inflation is substantially larger than that for the GDP gap for both specifications. Accounting for the lagged policy rate leads to estimated coefficients on inflation and the GDP gap that are considerably smaller. This is expected since, when we include the lagged policy rate, the coefficients only capture the perceived short-term response of the policy rate.

is important for our estimates: by contrast, a simple linear interpolation implies a persistence coefficient consistently above one, which appears economically implausible.

[16] Since we estimate policy rule within each cross-section, it requires either that we observe variation across respondents or within respondent but across horizons.

[17] See Appendix A for more details on the Origo survey.

Table 2. Average estimated policy rule with and without inertia

	Policy rate	
	(1)	(2)
Policy rate$_{t-1}$		0.983*** (0.006)
Inflation	0.659*** (0.076)	0.044*** (0.007)
GDP gap	0.194*** (0.029)	-0.008** (0.003)
Observations	18,229	18,229
R^2	0.805	0.996
Within R^2	0.296	0.986
Individual-time FE	YES	YES

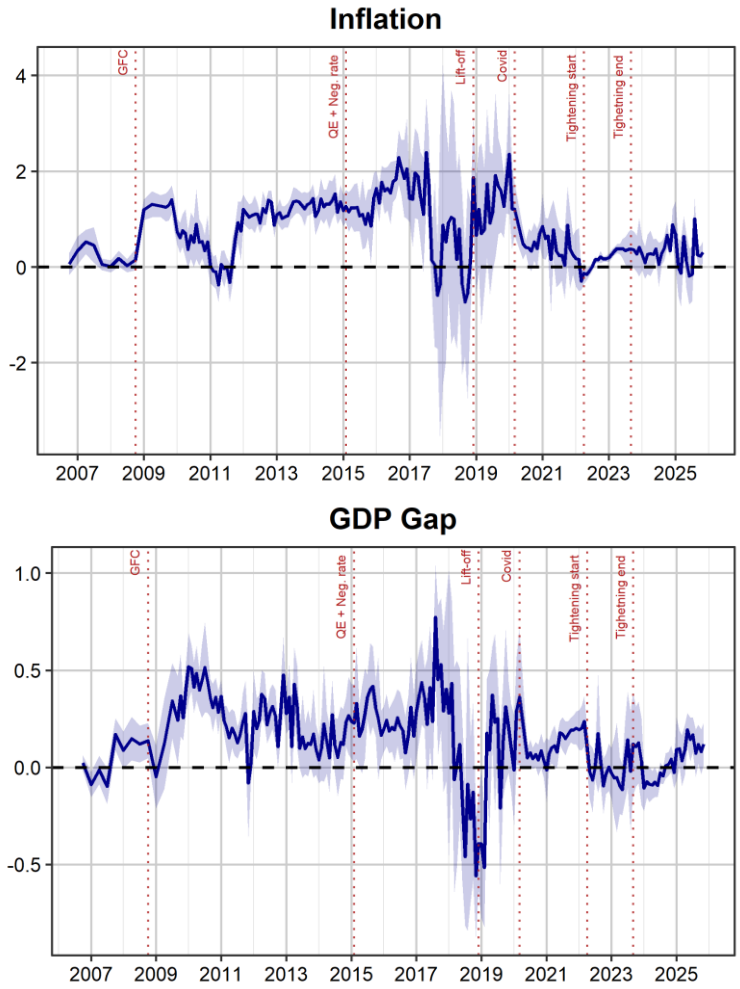
Note. Column (1) corresponds to Equation (3) and column (2) corresponds to Equation (5). Regressions are estimated on monthly surveys (quarterly frequency before September 2009) from October 2006 to November 2025. Standard errors clustered at the respondent-time level are shown in parentheses.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

We move on to a narrative interpretation of the time-varying rule. Overall – and in line with the Riksbank's primary price stability objective – we find that throughout the sample period the Riksbank is viewed as placing relatively greater weight on inflation than on the output gap, that is, the estimated coefficient on inflation is larger than the coefficient on the output gap. In addition, we find qualitatively similar patterns for the estimated coefficient on inflation for both specifications. Our measure of the GDP gap is likely subject to measurement errors due to the existence of uncertainty around the level of potential GDP. This can potentially bias our results and explain the negative coefficient on the GDP gap in column (2). To address this concern, we later present robustness checks of our main results assuming alternative measures of real activity in the policy rule.

Figure 1 shows the time variation in the estimated parameters for the perceived monetary policy rule without inertia, that is, according to Equation (3). The blue solid lines report the point estimates, and the shaded regions report 95 per cent confidence intervals. The top panel shows that the coefficient on inflation, $\hat{\beta}_t$, is relatively stable leading up to the Great Financial Crisis (GFC) and then increases around the onset of the GFC before falling back in 2010. In June 2010, the Riksbank started tightening monetary policy. Over the next two years, the Riksbank expressed concerns about rising household debt, and one interpretation consistent with the low $\hat{\beta}_t$ is that – at this time – forecasters did not think that the policy rate hikes were motivated by the economic outlook but rather by such financial stability concerns (see, for example, Svensson, 2017, Bylund et al., 2023, and Coglianese et al., 2025).

Figure 1. Parameter estimates for perceived policy rule



Note. Estimated policy-rule coefficients for inflation, $\hat{\beta}_t$, and the output gap, $\hat{\gamma}_t$. The blue lines refer to the estimated coefficients from Equation (3), estimated on monthly surveys (quarterly frequency before September 2009) from October 2006 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

In late 2011, $\hat{\beta}_t$ goes back to the level seen before June 2010 and is relatively stable around 1-1.5 until 2016. In February 2015, the Riksbank cut the policy rate to -0.10 per cent. The policy rate cut was combined with an announcement of asset purchases as well as an assurance that the central bank was ready to do more. In February 2016, following unexpectedly low inflation outcomes, the Riksbank also emphasised that it was ready to make monetary policy even more expansionary to ensure confidence in the inflation target, and $\hat{\beta}_t$ increases somewhat around this time.

Between 2017 and the end of 2018, when the policy rate was raised, $\hat{\beta}_t$ varies substantially and is overall less precisely estimated. This could be consistent with money market participants not perceiving a consistent reaction function for the Riksbank during this period. Leading up to 2020, $\hat{\beta}_t$ increases but the confidence intervals are much wider than in the years prior to 2017. From March 2020, at the

beginning of the Covid pandemic, money market participants again expect the Riksbank to put a lower weight on inflation. This is in line with the discussion in Bauer et al. (2024a), that the perceived coefficients are lower in times of crises. One explanation for this can be that the central bank is perceived to pursue risk management rather than act on the economic outlook.

The estimates of $\hat{\beta}_t$ trend downward until the start of monetary policy tightening in April 2022. This marks a turning point for $\hat{\beta}_t$, but the estimated coefficient remains at a relatively low level until 2024. Compared to the pre-Covid period, particularly the years prior to 2018, there is a clear shift downwards. Furthermore, from the second half of 2024 until the end of the sample period, $\hat{\beta}_t$ fluctuates substantially.

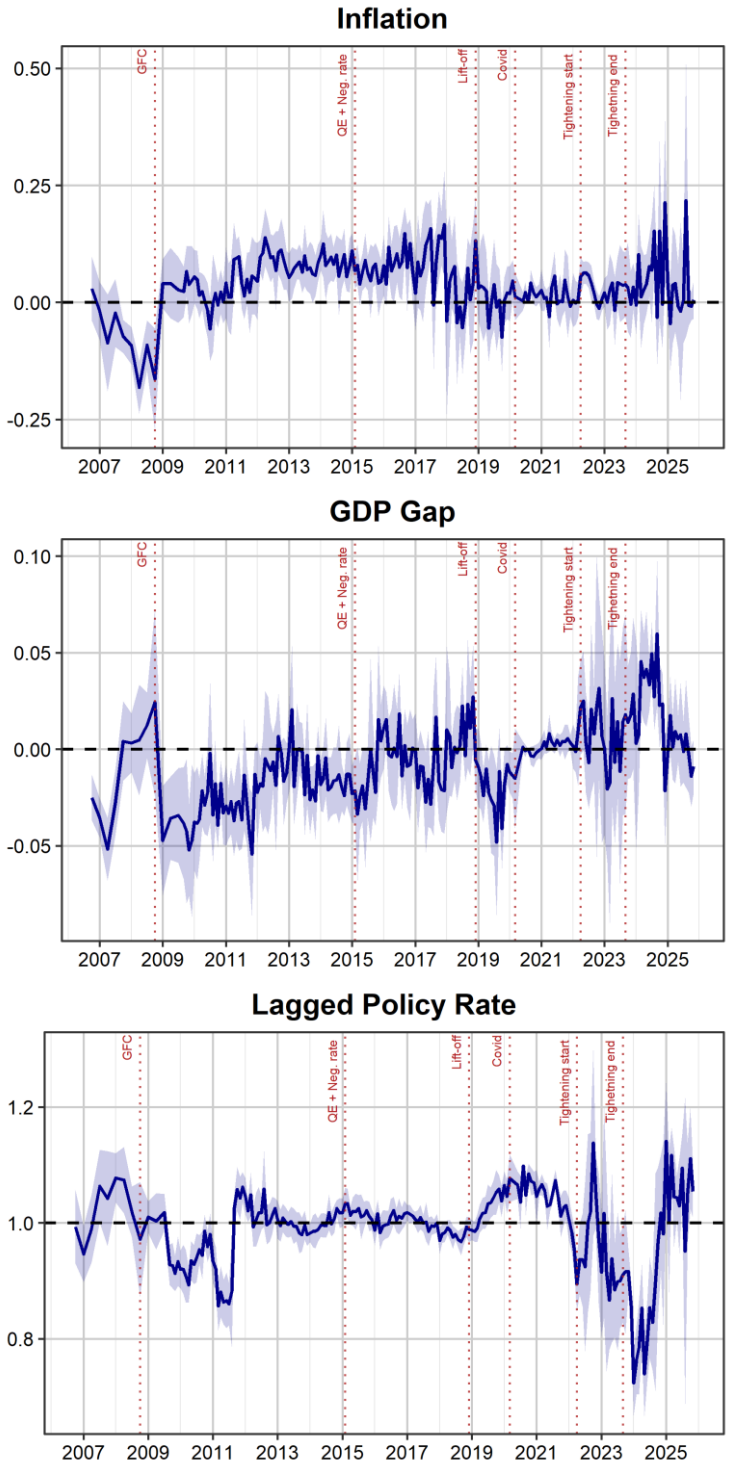
The bottom panel shows the coefficient on the expected GDP-gap, $\hat{\gamma}_t$. As expected, given the Riksbank's price stability objective, the magnitude of this coefficient is smaller than that of the coefficient on inflation, and the patterns are somewhat less clear. At the beginning of the sample period, $\hat{\gamma}_t$ moves from around zero to positive. Then, at the onset of the GFC, $\hat{\gamma}_t$ initially falls back to zero before trending up to around 0.5 in 2010.

When the Riksbank starts expressing concerns about rising household debt, $\hat{\gamma}_t$ trends downward, from around 0.5 to (briefly) around zero, until around 2012. $\hat{\gamma}_t$ then moves between around 0.1 and around 0.4 until 2017 when, as for inflation, there are more pronounced swings in the estimated coefficient and the standard errors increase. The perceived weight on the GDP gap even falls to a negative number before lift-off in December 2018.

Similar to the estimated coefficient for inflation, $\hat{\gamma}_t$ falls at the beginning of the Covid pandemic as money market participants expect the Riksbank to put a lower weight on macroeconomic conditions. Following Covid, $\hat{\gamma}_t$ gradually increases until monetary policy tightening begins in 2022 when the estimated coefficient falls back and fluctuates around zero. Starting in the second half of 2024, $\hat{\gamma}_t$ increases and turns positive in the beginning of 2025.

Empirically, monetary policy is often adjusted gradually. Therefore, for the rest of the article we emphasise the results for the policy rule with inertia based on Equation (5). Figure 2 shows the estimated coefficients for the perceived policy rule with inertia. Accounting for the lagged policy rate affects the interpretation of the coefficients on inflation and the GDP gap – here they only capture the perceived short-term response of the policy rate. As in Bauer et al. (2024a), the estimated coefficients are therefore smaller than if we do not include interest rate smoothing. If we focus on level shifts and abstract away from short-term noise, the variation over time in the estimated coefficient on inflation, $\hat{\beta}_t$, is qualitatively similar to Figure 1. There is a clear level shift in the period 2012-2017. During this period, $\hat{\beta}_t$ is larger and more precisely estimated than in the years prior to 2012. From 2017, $\hat{\beta}_t$ is less precisely estimated and overall smaller in magnitude.

Figure 2. Parameter estimates for perceived policy rule with inertia



Note. Estimated policy-rule coefficients for inflation, $\hat{\beta}_t$, the output gap, $\hat{\gamma}_t$, and the lagged policy rate $\hat{\rho}_t$. The blue lines refer to the estimated coefficients from Equation (5), estimated on monthly surveys (quarterly frequency before September 2009) from October 2006 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

For the inertial rule, $\hat{\beta}_t$ is low (even negative) in the period leading up to the GFC but increases quickly at the onset of the crisis. The perceived weight on inflation again drops, slightly and temporarily, in 2010 during the period when the Riksbank expressed concerns about rising household debt. Following this period, $\hat{\beta}_t$ moves around 0.05-0.1. As for the policy rule without inertia, there is more variation and $\hat{\beta}_t$ is less precisely estimated in the period between 2017 and 2019. While the perceived weight on inflation is low already following lift-off at the end of 2018, it remains low during the Covid pandemic and until the Riksbank starts hiking the policy rate in 2022. At the onset of monetary policy tightening, we see a short-lived increase in $\hat{\beta}_t$. Then, in the most recent years, we note that $\hat{\beta}_t$, while somewhat higher than during the period between 2020-2022, is overall imprecisely estimated. These are years when we have also seen an increase in various measures of uncertainty.

The coefficient on the GDP gap, $\hat{\gamma}_t$, is presented in the middle panel. $\hat{\gamma}_t$ moves from a negative number to just above zero before the onset of the GFC, when it falls to around -0.05. It remains negative, but relatively close to zero, until after 2011 and then starts to move back towards just below zero.[18] Between 2015 and 2018, $\hat{\gamma}_t$ hovers around zero, before trending upwards (slightly) leading up to lift-off at the end of 2018. Following lift-off, $\hat{\gamma}$ again falls and remains negative until the beginning of the Covid pandemic in 2020. After around two years at zero, $\hat{\gamma}_t$ starts to increase somewhat as the Riksbank starts hiking the policy rate. It drops in the beginning of 2023 but then increases in 2024 before moving down again in 2025. In 2023, the Riksbank was still signalling that the policy rate would remain high for longer. The policy rate cuts in the most recent monetary policy cycle started in May 2024. Overall, in 2024 inflation decreased or was even below the target of 2 per cent and the real economy was weak. In 2025, the trade-off between inflation and the real economy was different since inflation was assessed to be temporarily above the target, while the real economy was still weak.

In the bottom panel we show the estimated coefficient on the lagged policy rate, $\hat{\rho}_t$. We note that the coefficient fluctuates around one until mid-2009 when it drops somewhat. $\hat{\rho}_t$ remains below one until around 2012. Between 2012 and the end of 2018 (lift-off), $\hat{\rho}_t$ is very close to one. Starting shortly after lift-off, $\hat{\rho}_t$ increases and remains above one until the start of the policy rate hikes in 2022. We see a sharp drop right at the start of the monetary policy tightening, but early on during the tightening, the perceived inertia increases again before decreasing towards the end of 2022 and then even further in the beginning of 2024. In the spring of 2024, the Riksbank starts cutting the policy rate and the perceived inertia remains low. $\hat{\rho}_t$ starts trending up in the second half of 2024 and fluctuates around 1.05-1.10 from the beginning of 2025.

A unique feature of our survey data is that we can compare the perceived policy rule of the money market participants to that of other economic agents – labour market parties and purchasing managers. In Appendix B we show the perceived policy rules

[18] In simple policy rules with fixed coefficients, the coefficient on the output gap is positive. While a negative coefficient may imply that the output gap is not perceived to be relevant for monetary policy, due to some considerations, we note that the estimated coefficient is small. Table 2 shows that it is -0.008 on average over the sample period.

for these other agents. For the policy rule without inertia, there are clear qualitative similarities for a large part of the sample period.

3.3 Potential misspecifications and robustness checks

We have estimated two versions of a time-varying perceived monetary policy rule, with and without interest rate inertia. A causal interpretation of these estimates relies on the assumption that forecasters form expectations about key macroeconomic variables and subsequently map these expectations into a policy rate forecast using a perceived policy rule specified as in Equations (2) and (4). If these perceived rules are mis-specified—for example due to omitted variables—part of the estimated time variation in the coefficients may reflect changes in the relevance of those omitted variables rather than genuine shifts in perceived policy preferences.[19]

We therefore assess robustness along three dimensions. First, we reproduce the analysis using GDP growth as an alternative activity measure, which also helps alleviate concerns that measurement error in the GDP gap may affect the estimates. Second, we use five-year-ahead expectations to proxy respondents' perceived long-run levels of inflation and the real rate instead of relying on respondent fixed effects. Third, we allow for a potentially omitted open-economy state variable by introducing the exchange rate. Across these alternatives, our results remain broadly similar.

Our baseline estimation is based on using the GDP gap as our measure of resource utilisation, but it is robust to using alternative measures of GDP. There are two main reasons for this robustness check. First, since survey respondents do not report their estimate of the GDP gap, we must – as described in Section 2 – make some assumptions to construct this variable. Specifically, we assume that the survey respondents share the same forecast for potential output and the same nowcast for real GDP. Second, while it is common to use the GDP gap in the policy rule, there are alternative activity measures that do not rely on the unobservable variable, potential GDP. Therefore, as a robustness check, we also estimate a perceived monetary policy rule using GDP growth, as well as a version without any activity measure, instead of the GDP gap. We show that the estimated coefficient for inflation is robust to using an alternative measure of the state of the real economy (see Appendix B). The estimated response to inflation in the inertial rule remains quantitatively similar irrespective of the measure of activity.

Following Bauer et al. (2024a), forecaster fixed effects can be viewed as absorbing heterogeneity in the long-run component of interest rate forecasts—that is, disagreement about long-run inflation and real rates that loads into the perceived intercept and is common across horizons within a survey wave. A distinctive feature of our data is that respondents report five-year-ahead expectations for the key macroeconomic variables, which provides a direct proxy for these long-run beliefs. This is particularly valuable in our setting because each respondent provides forecasts

[19] Bauer et al. (2024a) address this concern and assess if a more comprehensive rule, including a role for financial conditions, changes the time variation. They conclude that while financial conditions are perceived to have a substantial and significant effect, including financial conditions has little effect on the estimates of interest.

at only a limited number of horizons per wave, making fixed-effects estimation potentially noisy. We therefore re-estimate the perceived policy rule in deviations from each respondent's own five-year expectations (and, in the inertial specification, analogously net out the long-run component of the lagged rate term). The resulting coefficient paths are qualitatively similar to the main estimates: while the deviations approach implies some level differences early in the sample—most visibly for the non-inertial inflation coefficient—the time-variation patterns and the estimates in recent years are very close (Appendix B).

Finally, given that Sweden is a small open economy, we extend the baseline specification by allowing for a potential role of the exchange rate in the perceived monetary policy rule. For a central bank with a price stability objective – and a flexible inflation target – the exchange rate should matter for policy only through its effects on inflation and real economic activity. Nevertheless, market participants may believe that the Riksbank responds to exchange rate movements beyond these channels. This belief could be shaped by frequent communication on exchange rate developments, by past currency reserve operations with significant exchange rate effects (Artta et al., 2025), or by the view that inflation and the output gap do not fully summarize the state of the Swedish economy (Leitemo and Söderström, 2005).[20]

The Origo survey includes money market participants' forecasts for the exchange rates EURSEK and USDSEK at one- and two-year horizons. We build an exchange rate index of these two exchange rates based on KIX weights.[21]

To isolate perceived exchange rate considerations beyond expected inflation and economic activity, we first regress exchange rate expectations on inflation and output-gap expectations at the same forecast horizon:

$$E_t^j FX_{t+h} = a_t^j + \lambda_t E_t^j \pi_{t+h} + \xi_t E_t^j y_{t+h} + \sigma_{t,t+h}^j. \quad (6)$$

The residual $\sigma_{t,t+h}^j$ captures variation in exchange rate expectations that are orthogonal to the expected paths of inflation and the output gap. We then include this purged exchange rate component in the perceived policy rule with inertia to estimate the following regression:

$$E_t^j i_{t+h} = a_t^j + \tilde{\rho}_t i_{t+h-3} + \tilde{\beta}_t E_t^j \pi_{t+h} + \tilde{\gamma}_t E_t^j y_{t+h} + \tilde{\mu}_t \hat{\sigma}_{t,t+h}^j + e_{t,t+h}^{j,FX}. \quad (7)$$

[20] Leitemo and Söderström (2005) study whether the exchange rate should be included in the monetary policy rule in the framework of a New-Keynesian model of a small open economy. They find that, in this model framework, the gains from including the exchange rate in an optimised Taylor rule are small (in addition, because there is uncertainty about the exchange rate model, the unmodified Taylor rule is more robust to model uncertainty). The intuition is simple, since changes in the exchange rate affect both inflation and output, the added value of allowing for a separate response to the exchange rate is small. For financially robust advanced economies, Stone et al. (2009) also find that the gains from adding the exchange rate to the monetary policy rule are relatively small. However, distinguishing between demand and supply (cost-push) shocks, they argue that for supply shocks it can be beneficial to put some weight on the exchange rate.

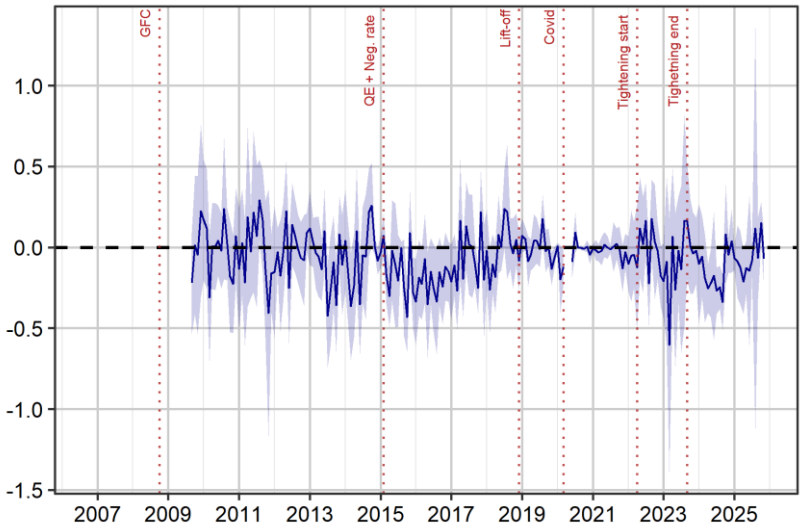
[21] While updated yearly, the weights for the euro area and the US remain relatively stable over time. For simplicity, we assume the weights for the US and the euro area to be constant at their 2024 level of respective 0.85 and 0.15. For more information on the theory and practice behind the general KIX index, see Erlandsson and Markowski (2006).

The coefficient $\tilde{\mu}_t$ captures the extent to which forecasters expect the policy rate to respond to exchange rate movements over and above their effects on expected inflation and the output gap. Because a higher exchange rate index corresponds to a weaker krona, a positive value of $\tilde{\mu}_t$ indicates that participants expect tighter monetary policy following a krona depreciation (conditional on inflation and activity expectations).

Figure 3 shows the evolution of $\tilde{\mu}_t$ over time. The estimated exchange rate term is, for most of the sample, economically small and statistically not different from zero. This implies that, on average, market participants do not view the Riksbank as systematically reacting to exchange rate movements over and above the information contained in expected inflation and expected real activity. Deviations from zero are concentrated in a few episodes that coincide with 'regime changes' or stress, most notably around the QE and negative interest rate period and during the 2022-2023 tightening phase. It indicates that money market participants may (temporarily) assign an independent policy role to exchange rate developments in such environments. A weaker krona may then coincide with higher risk premia, weaker demand prospects, or expectations of a lower policy rate path. Alternatively, the residual may reflect disagreement about the effects of exchange rate movements. Respondents may believe that the Riksbank assigns less pass-through from depreciation to inflation, or less weight to its effects on real activity, than they do. Overall, the evidence is consistent with a perceived policy rule in which the exchange rate is generally a second-order consideration, punctuated by occasional episodes in which it is viewed as temporarily salient.[22]

[22] However, it does not rule out that other variables omitted in our baseline specification, such as financial conditions and households' debt level, may be relevant for the perceived policy rule.

Figure 3. Estimated impact of the exchange rate on the policy rate forecast net of its effect on inflation



Note. Estimated policy-rule coefficients for the residualised exchange rate index $\tilde{\mu}_t$ from Equation (7), estimated on monthly surveys from October 2009 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details. The exchange rate index is built with 85% weight on EURSEK and 15% on USDSEK. Higher values indicate a weaker krona.

Sources: Kantar Prospera, Origo Group and the Riksbank.

4 Perceived monetary policy in financial markets

Having established that perceived monetary policy estimated from survey data varies over time, we now turn to estimating perceptions about monetary policy from financial markets. Following Hamilton et al. (2011) and Bauer et al. (2024a, 2024b), we estimate the market-perceived rule using changes in interest rates in narrow windows around the release of macroeconomic news. Specifically, we compare the release of actual inflation and GDP data to the consensus forecasts of the same variables using the average market forecast collected by Bloomberg. The basic idea is that changes in interest rates around the release dates mainly reflect changes in market expectations about the Riksbank's response to this news.

The purpose of this exercise is twofold. First, estimating the response of interest rates to macroeconomic news and analysing how the coefficients vary over time serves as a robustness check of our estimation strategy based on survey data. The advantage of using financial market data is that we estimate the causal effect of revisions to the market's inflation and GDP forecasts on revisions to policy rate forecasts under the assumption that no other news affecting the forecasts is systematically released simultaneously. Given the narrow window in which we measure the forecast revisions, this assumption is likely to hold in practice. Second, using financial market data also allows us to estimate whether the estimated perceived monetary policy rule from the survey data matters for the transmission of macroeconomic news to interest rates.

We start by estimating the following event-study regression

$$\Delta i_t = \alpha + \theta News_t^c + \epsilon_t, \quad (8)$$

where Δi_t is the daily change in a given interest rate on the release date of macroeconomic news and $News_t^c$ is the difference between the actual value of news category c (either CPIF or GDP) and the average market forecast, that is, the surprise component of the published statistic.

To match the survey data, we estimate the effect on interest rates with one-, two-, and five-year maturities for the sample period October 2006 to November 2025. The interest rates we consider are forward rate agreements (FRAs) with maturity four and eight quarters ahead, two- and five-year government bond yields, and one-, two-, and five-year swap rates.[23] For the macro news, we use surprises in the monthly CPI releases until September 2017 and CPIF thereafter, as we do for the survey data. In October 2024, Statistics Sweden started publishing flash estimates of the Consumer Price Index one week before the release of the actual value. We use the flash estimates for the part of the sample for which they are available. For GDP, released quarterly, we use the surprise of the actual GDP year-on-year growth. In Table 7 in Appendix B, we show that our results are robust to using surprises in the unemployment rate as an alternative measure of the Riksbank's perceived response to real activity.

Table 3 shows the estimates of the event-study regression equation (8) to both inflation and GDP growth surprises. Panel (a) shows the response of interest rates to a one percentage point inflation surprise. Overall, all interest rates react positively and significantly at the one-percent level. In other words, when the released inflation data is higher than expected, interest rates increase, indicating that financial markets expect the Riksbank to react to this news by raising the policy rate. The estimated coefficients are quite small. The coefficients vary between around 0.1 and 0.14, meaning that a 10-basis point positive surprise in inflation leads to a 1-1.4 basis point increase in interest rates.[24]

[23] The FRA contracts are close proxies for the expected future Swedish policy rate. The contracts offer cash settlement of the difference between the ex-ante agreed-upon fixed rate and the actual rate of the three-month Stockholm Interbank Offered Rate (STIBOR) on the settlement day. STIBOR, in turn, is a reference rate that shows the average interest rate at which a number of active banks on the Swedish money market are willing to lend to one another, without collateral, at different maturities.

[24] Our estimated coefficients are similar in terms of magnitude to those estimated by Bauer et al. (2024b) for US data over the period January 2014 to March 2022. See Panel A of Table 1 in their paper.

Table 3. Event-study regression of interest rates on macroeconomic news

	FRA4	FRA8	Gov. 2y	Gov. 5y	Swap 1y	Swap 2y	Swap 5y
				(a) Inflation			
θ	0.141*** (0.023)	0.128*** (0.017)	0.123*** (0.018)	0.111*** (0.018)	0.099*** (0.015)	0.112*** (0.017)	0.100*** (0.016)
R^2	0.170	0.202	0.234	0.158	0.274	0.236	0.162
N	230	230	230	230	230	230	230
				(b) GDP			
θ	0.017*** (0.005)	0.018*** (0.006)	0.023*** (0.005)	0.024*** (0.006)	0.013*** (0.005)	0.017*** (0.005)	0.020*** (0.005)
R^2	0.107	0.082	0.174	0.153	0.106	0.116	0.125
N	76	76	76	76	76	76	76

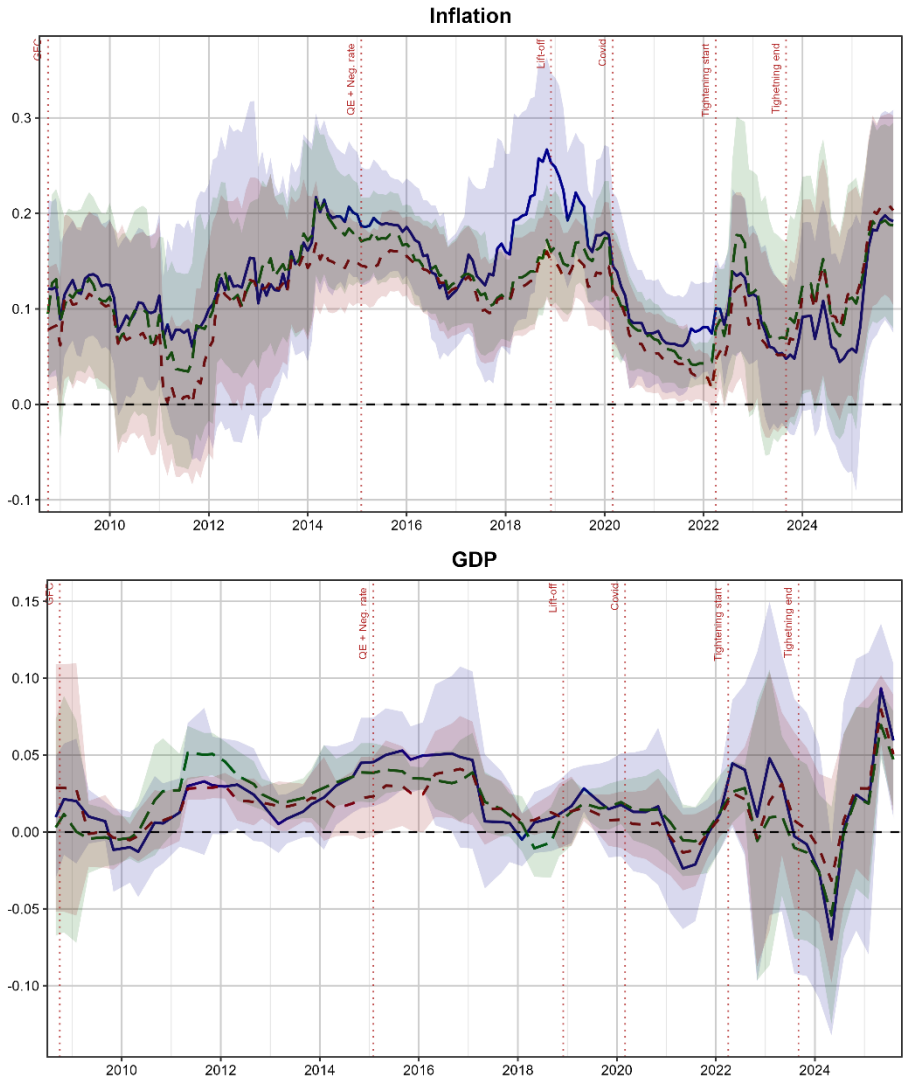
Note. Estimated coefficients θ and regression R2 from event-study regressions $\Delta i_t = \alpha + \theta News_t^c + \epsilon_t$, where Δi_t is the daily change in a given interest rate on days of macroeconomic news and $News_t^c$ is the surprise component of the news in category $c \in (CPIF, GDP)$, defined as the difference between the actual value and the consensus forecast. Heteroskedasticity-robust standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. Sample period: October 2006 to November 2025. See text for details.

Sources: Bloomberg and Macrobond.

Panel (b) shows the response of interest rates to a one percentage point surprise in year-on-year GDP growth. Again, the estimated coefficients are positive and significant at the one-percent level, indicating that financial markets expect the Riksbank to react to surprises in GDP growth by raising the policy rate. Quantitatively, the estimated effects are smaller than those for the inflation surprises. The estimated coefficients vary between 0.013 and 0.024, meaning that a 10-basis point positive surprise in the release of the GDP growth data leads to a 0.13-0.24 basis point increase in interest rates.

Overall, these estimates are qualitatively in line with the results from the survey-based estimates of the Riksbank's perceived monetary policy rule. Both methods suggest that the Riksbank is perceived to respond relatively more to inflation compared to GDP.

Figure 4. Rolling window estimates of interest rates on macroeconomic news



Note. Estimated two-year rolling window coefficients θ from event-study regressions $\Delta i_t = \alpha + \theta News_t^c + \epsilon_t$, where Δi_t is the daily change in a given interest rate on days of macroeconomic news and $News_t^c$ is the surprise component of the news in category $c \in (CPIF, GDP)$, defined as the difference between the actual value and the consensus forecast. Blue solid line is estimated with the FRA8 rate as the outcome variable, green long dashed lines with the two-year government bond yield, and the red dashed lines with the two-year swap rate. The shaded regions show 95% confidence intervals based on heteroskedasticity-robust standard errors. Sample period: October 2006 to November 2025. See text for details.

Sources: Bloomberg and Macrobond.

As a second step, we estimate how these coefficients vary over time by estimating a two-year rolling window of Equation (8).[25] Figure 4 shows the rolling window estimates for the inflation and GDP growth surprises, displayed in the top and bottom panel, respectively. To conserve space, we show only the estimates for the two-year maturity interest rates in the main text. The estimates for the one- and five-year maturity interest rates, which yield very similar results, are shown in Figure 15 and

[25] The estimates are similar both in terms of precision and variation over time if we use a three-year window instead (not shown).

Figure 16 in Appendix B. The blue solid lines report the point estimates for the FRA8 rate, the green long dashed lines report the point estimates for the two-year government bond yield, and the red dashed lines report the point estimates for the two-year swap rates. The shaded regions report 95 per cent confidence intervals.

Given that the rolling window estimates smooth out a lot of the month-to-month volatility, the estimates are less volatile compared to the survey-based estimates in Figure 1 and Figure 2. However, there are a lot of qualitative similarities between the estimates. Starting with inflation and the inflation surprises, we see that the estimated coefficients fell somewhat during the period when the Riksbank expressed concerns about rising household debt, particularly for the two-year swap rate. They then rose and remained elevated until the first year after the QE and negative interest rate period before falling during 2017. The coefficients rose during the lift-off period in 2019, particularly for the FRA8 rate, and then fell during Covid. The coefficients rose after the start of the 2022 tightening cycle and then reverted by the end of the cycle. Finally, the coefficients are somewhat elevated during the end of the sample in 2025.

The estimated coefficients on the GDP growth surprises are smaller and vary less over time compared to the coefficients of the inflation surprises. This is again consistent with the estimated survey-based coefficients. The coefficients were at the lower end after the GFC, before increasing between 2010 and 2012. The coefficients increased again and remained elevated during the first part of the QE and the negative interest rate period. They then fell in 2017 and remained low until the beginning of the tightening cycle in 2022. The coefficients fell to around -0.05 in early 2024, before rebounding and reaching a peak of over 0.05 in 2025.

Finally, we estimate how the sensitivity of interest rates to macroeconomic news depends on the coefficients from the survey-based rules. To this end, we estimate the following event-study regression

$$\Delta i_t = \alpha + \theta News_t^c + \xi z_t^c + \kappa News_t^c z_t^c + \epsilon_t, \tag{9}$$

where $z_t^c \in (\hat{\beta}_t, \hat{\gamma}_t)$, that is, either the estimated perceived inflation or GDP gap coefficient. We estimate the interaction with both the coefficients from the specification with and without inertia, that is, the coefficients from Equations (3) and (5), respectively. A positive interaction coefficient, κ, indicates that interest rates are more sensitive to macroeconomic news when the Riksbank is – according to the survey-based rule – perceived to be more responsive to economic conditions.

To ensure the exogeneity of the perceived coefficients with respect to the news, we use estimates from the most recent survey conducted before the news was released. In most cases, this corresponds to using coefficients from the same period as the news release, since the interview period typically occurs before the news release. When a survey is conducted after the news release, we instead use the coefficients from the previous period. For example, we interact the inflation news released in January 2024 with the perceived coefficient from December 2023, since the interview period began on January 17 while the news was released on January 15.

Table 4. Event-study regression of interest rates on inflation news

	FRA4	FRA8	Gov. 2y	Gov. 5y	Swap 1y	Swap 2y	Swap 5y
				(a) Inertia			
θ	0.131***	0.122***	0.109***	0.098***	0.087***	0.100***	0.096***
	(0.032)	(0.019)	(0.022)	(0.023)	(0.016)	(0.018)	(0.019)
ξ	-0.055	0.044	-0.060	-0.068	-0.017	-0.019	-0.015
	(0.091)	(0.050)	(0.057)	(0.068)	(0.036)	(0.044)	(0.051)
κ	0.291	0.233	0.444	0.375	0.412**	0.423*	0.126
	(0.651)	(0.251)	(0.344)	(0.405)	(0.197)	(0.226)	(0.282)
R^2	0.174	0.207	0.247	0.168	0.288	0.246	0.163
N	229	229	229	229	229	229	229
				(b) Without inertia			
θ	0.160***	0.130***	0.132***	0.107***	0.106***	0.120***	0.107***
	(0.041)	(0.029)	(0.033)	(0.031)	(0.025)	(0.029)	(0.028)
ξ	-0.000	0.009*	-0.001	-0.001	-0.001	0.001	-0.000
	(0.007)	(0.006)	(0.005)	(0.005)	(0.003)	(0.004)	(0.005)
κ	-0.031	0.000	-0.016	0.006	-0.012	-0.013	-0.011
	(0.036)	(0.028)	(0.028)	(0.029)	(0.024)	(0.026)	(0.026)
R^2	0.172	0.212	0.234	0.158	0.276	0.238	0.163
N	229	229	229	229	229	229	229

Note. Estimated coefficients θ, ξ, and κ and regression R2 from event-study regressions $\Delta i_t = \alpha + \theta News_t^c + \xi z_t^c + \kappa News_t^c z_t^c + \epsilon_t$, where Δi_t is the daily change in a given interest rate on days of macroeconomic news, $News_t^c$ is the surprise component of the news in category $c \in (CPIF)$, defined as the difference between the actual value and the consensus forecast, and $z_t^c \in (\hat{\beta}_t, \hat{\gamma}_t)$, is the estimated perceived responses to inflation and GDP from the survey data. Panel (a) shows the interaction with the coefficient with inertia and Panel (b) the coefficients without inertia. Heteroskedasticity-robust standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. Sample period: October 2006 to November 2025. See text for details.

Sources: Bloomberg, Macrobond, Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

Table 4 shows the estimates of the event-study regression for the inflation surprises and their interaction with the estimated perceived inflation coefficient from the survey data. Panel (a) shows the interactions with the coefficient with inertia. The estimated interaction coefficient, κ, is positive, indicating that a larger than expected inflation data release has a larger effect on interest rates when the Riksbank is perceived to be more responsive to inflation. In terms of magnitudes, the coefficients vary between 0.126 and 0.444. The coefficients are only significant for the one- and two-year swap rates, which represent the most liquid segment of the interest rate derivatives market, and the part most tightly linked to expectations about the near-term policy path. For these variables, the coefficients are 0.412 and 0.423, respectively, meaning that if the Riksbank is perceived to react 0.01 percentage point more strongly to inflation, a 10-basis points surprise in the inflation data release leads to an additional 0.04 basis points increase in the one and two-year swap rates, respectively. This corresponds to a 4.6 and 4 per cent increase in the respective average responses.

Panel (b) shows the results when using the interaction with the inflation coefficient without inertia. For all outcome variables, the interaction coefficients are small and insignificant, indicating that interest rates do not react differently when the Riksbank is perceived to be more responsive to inflation.

Finally, we note that the addition of the interaction with either the coefficient with or without inertia does not substantially alter the estimate of the non-interacted coefficient, θ, compared to the results in Table 3.

Table 5. Event-study regression of interest rates on GDP growth news

	FRA4	FRA8	Gov. 2y	Gov. 5y	Swap 1y	Swap 2y	Swap 5y
				(a) Inertia			
θ	0.018*** (0.006)	0.020*** (0.007)	0.026*** (0.006)	0.025*** (0.008)	0.015*** (0.005)	0.020*** (0.006)	0.020*** (0.007)
ξ	-0.072 (0.260)	-0.113 (0.293)	-0.405 (0.249)	-0.329 (0.257)	-0.243 (0.194)	-0.258 (0.232)	-0.068 (0.238)
κ	0.006 (0.197)	0.105 (0.202)	0.061 (0.191)	-0.012 (0.205)	0.049 (0.179)	0.099 (0.175)	-0.017 (0.174)
R^2	0.109	0.086	0.215	0.174	0.135	0.138	0.128
N	76	76	76	76	76	76	76
				(b) Without inertia			
θ	0.014*** (0.005)	0.016** (0.007)	0.018*** (0.006)	0.023*** (0.006)	0.009* (0.005)	0.014*** (0.005)	0.018*** (0.005)
ξ	0.007 (0.016)	0.008 (0.024)	0.020 (0.020)	0.017 (0.024)	0.007 (0.012)	0.006 (0.016)	0.001 (0.022)
κ	0.025 (0.023)	0.017 (0.027)	0.049** (0.024)	0.013 (0.028)	0.037** (0.017)	0.027 (0.018)	0.017 (0.026)
R^2	0.118	0.086	0.214	0.159	0.143	0.128	0.126
N	76	76	76	76	76	76	76

Note. Estimated coefficients θ, ξ, and κ and regression R2 from event-study regressions $\Delta i_t = \alpha + \theta News_t^c + \xi z_t^c + \kappa News_t^c z_t^c + \epsilon_t$, where Δi_t is the daily change in a given interest rate on days of macroeconomic news, $News_t^c$ is the surprise component of the news in category $c \in (CPIF)$, defined as the difference between the actual value and the consensus forecast, and $z_t^c \in (\hat{\beta}_t, \hat{\gamma}_t)$, is the estimated perceived responses to inflation and GDP from the survey data. Panel (a) shows the interaction with the coefficient with inertia and Panel (b) the coefficients without inertia. Heteroskedasticity-robust standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. Sample period: October 2006 to November 2025. See text for details.

Sources: Bloomberg, Macrobond, Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

Table 5 shows the estimates of the event-study regression of the GDP growth surprises and their interaction with the estimated perceived GDP gap coefficient from the survey data. Panel (a) shows the interaction with the coefficient with inertia. Apart from the regressions on the five-year government bond yield and swap rate, the interaction coefficients are positive, indicating that the response of interest rates to surprises in GDP growth is stronger when the Riksbank is perceived to be more responsive to GDP. However, the coefficients are not significant. The interpretation is further complicated by the fact that the GDP coefficient with inertia is negative on

average, as shown in Table 2.

Panel (b) shows the interaction with the coefficient without inertia. All coefficients are positive and significant for the two-year government bond yield and swap rate. For these two outcome variables, the values of the interaction coefficients are 0.049 and 0.037, respectively. This means that if the Riksbank is perceived to react 0.01 percentage point more strongly to GDP, a 10-basis points surprise in the GDP growth data release leads to an additional 0.005 and 0.003 basis points increase in the two-year government bond yield and swap rate, respectively. This corresponds to a 2.8 and 2.1 per cent increase in the respective average responses.

As for the inflation surprises, we note that the addition of the interaction with either the coefficient with or without inertia does not substantially alter the estimate of the non-interacted coefficient, θ, compared to the results in Table 3.

In summary, the estimated perceptions about monetary policy from financial markets yield similar conclusions to those derived from the survey data. That is, markets expect the Riksbank to raise interest rates in response to positive inflation and GDP growth surprises, with a relatively greater weight placed on inflation. The perceived responses vary over time, and the changes in the perceived responses qualitatively match the pattern estimated from the survey data. Moreover, we find some evidence that the estimated perception about monetary policy from the survey data matters for the transmission of macroeconomic news to interest rates. Specifically, we find that when the Riksbank is perceived to care more about inflation (GDP), interest rates respond more to surprises in inflation (GDP-growth) data releases. However, the coefficients are only significant for a subset of rates and depend on whether the surprises are interacted with the perceived coefficients estimated with or without inertia in the policy rule. The interaction results should therefore be interpreted with caution.

5 Concluding remarks

We have estimated perceived forward-looking monetary policy rules for Sweden based on the empirical strategy in Bauer et al. (2024a). We find substantial variation in the estimated coefficients over time. Throughout our sample, the Riksbank is perceived to place greater weight on inflation than on the output gap. This is not surprising given that the Riksbank has a primary price stability objective. We discuss the fact that a causal interpretation of our estimated coefficients relies on the assumption that the forecasts of the policy rate really capture perceived responses to macroeconomic condition, that is, that the policy rule is well-specified. In addition to considering policy rules with and without interest rate smoothing, we also consider an extension of the baseline rule to test for the extent to which forecasters expect the policy rate to respond to exchange rate movements beyond what is motivated by their effects on expected inflation and real activity. This is generally not the case, except during occasional episodes.

Expectations – or perceptions – of future monetary policy affect the sensitivity of interest rates to news today and therefore matter for the transmission of monetary policy through financial markets. In the second part of the article, we characterise the perceived monetary policy rule in financial markets. The estimated rule is qualitatively consistent with our survey-based perceived monetary policy rule. In both cases, the Riksbank is perceived to put greater weight on stabilising inflation and there is variation in the estimated coefficients over time. We also find that – for some financial instruments – the sensitivity of interest rates to inflation surprises rises when the (survey-based) perceived response increases. This implies that, in these cases, perceptions of the policy rule matter for market rates that transmit monetary policy to the real economy.

Finally, in this article we have focused on how money market players and financial markets perceive the central bank's behaviour. An obvious next step for future work is to assess whether this strategy is in line with what the central bank aims to communicate. Given that the Riksbank publishes a policy path – and has a long-standing history of publishing different kinds of alternative scenarios – it is possible to estimate a communicated monetary policy rule and relate this to the perceived rule as well as to measures of uncertainty. We leave this for future work.

References

Artta, Katja, Marianne Nessén, Ettore Savoia and Anders Vredin (2025), "Financial flows and exchange rate dynamics: Evidence from Sweden", Working Paper no. 456, Sveriges Riksbank.

Bauer, Michael D., Caroline E. Pflueger and Adi Sunderam (2024a), "Perceptions about monetary policy", *Quarterly Journal of Economics*, vol. 139, no. 4, pp. 2227–2278.

Bauer, Michael D., Caroline E. Pflueger and Adi Sunderam (2024b), "Changing perceptions and post-pandemic monetary policy", *Proceedings of 2024 Jackson Hole Economic Policy Symposium*, Federal Reserve Bank of Kansas City.

Blinder, Alan S., Michael Ehrmann, Marcel Fratzscher, Jakob De Haan and David-Jan Jansen (2008), "Central bank communication and monetary policy: A survey of theory and evidence", *Journal of Economic Literature*, vol. 46, no. 4, pp. 910–945.

Bylund, Emma, Jens Iversen and Anders Vredin (2023), "Monetary policy in Sweden after the end of Bretton Woods", Working Paper, no. 429, Sveriges Riksbank.

Clarida, Richard, Jordi Galí and Mark Gertler (2000), "Monetary policy rules and macroeconomic stability: Evidence and some theory", *Quarterly Journal of Economics*, vol. 115, no. 1, pp. 147–180.

Coglianese, John, Maria Olsson and Christina Patterson (2025), "Monetary policy and the labor market: A quasi-experiment in Sweden", *American Economic Review,* vol. 115, no. 10, pp. 3451–3486**.**

Corbo, Vesna and Ingvar Strid (2020), "MAJA: A two-region DSGE model for Sweden and its main trading partners", Working Paper no. 391, Sveriges Riksbank.

Erlandsson, Mattias and Alek Markowski (2006), "The effective exchange rate index KIX – Theory and practice", Working Paper no. 95, National Institute of Economic Research.

Garga, Vaishali, Edward Herbst, Alisdair McKay, Giovanni Nicolò and Matthias Paustian (2025), "Monetary policy, uncertainty, and communications", Finance and Economics Discussion Series, no. 74, Board of Governors of the Federal Reserve System.

Gemmi, Luca and Rosen Valchev (2026), "Biased surveys", *Journal of Monetary Economics*, vol. 157, article no. 103868.

Gürkaynak, Refet S., Brian Sack and Eric T. Swanson (2005), "Do actions speak louder than sords? The response of asset prices to monetary policy actions and statements", *International Journal of Central Banking*, vol. 1, no. 1, pp. 55–93.

Gustafsson, Peter and Marianne Nessén (2026), "Has Riksbank monetary policy been predictable? Evidence from estimated reaction functions", *Sveriges Riksbank Economic Review*, no.1, pp. 54–69.

Hamilton, James D, Seth Pruitt and Scott Borger (2011), "Estimating the market perceived monetary policy rule," *American Economic Journal: Macroeconomics*, vol. 3, no. 3, pp. 1–28.

Jonsson, Magnus and Goran Katinic (2017), "Is the Swedish monetary policy in line with the Taylor rule?", *Economic Commentary*, no. 4, Sveriges Riksbank.

Kuttner, Kenneth N. (2001), "Monetary policy surprises and interest rates: Evidence from the Fed funds futures market", *Journal of Monetary Economics*, vol. 47, no. 3, pp. 523–544.

Lundgren, Gustaf (2021), "Survey-based inflation expectations", *Economic Commentary*, no. 7, Sveriges Riksbank.

Leitemo, Kai and Ulf Söderström (2005), "Simple monetary policy rules and exchange rate uncertainty", *Journal of International Money and Finance*, vol. 24, no. 3, pp. 481–507.

Nakamura, Emi, Venance Riblier and Jón Steinsson (2025), "Beyond the Taylor rule", *NBER Working Paper Series*, no. 34200, National Bureau of Economic Research.

Nakamura, Emi and Jón Steinsson (2018), "High-frequency identification of monetary non-neutrality", *Quarterly Journal of Economics*, vol. 133, no. 3, pp. 1283–1330.

Stone, Mark, Scott Roger, Seiichi Shimizu, Anna Nordstrom, Turgut Kis and Jorge Restrepo (2009), "The role of the exchange rate in inflation-targeting emerging economies", *IMF Occasional Papers*, no. 267, International Monetary Fund.

Svensson, Lars E.O. (2017), "What is wrong with Taylor rules? Using judgment in monetary policy through targeting rules", *Journal of Economic Literature*, vol. 41, no. 2, pp. 426–477.

Svensson, Lars E.O. (2017), "Cost-benefit analysis of leaning against the wind", *Journal of Monetary Economics*, vol. 90, pp. 193–213.

Sveriges Riksbank (2024), "The policy rate is often adjusted gradually", fact box in *Monetary Policy Report*, September.

Woodford, Michael (2005), "Central bank communication and policy effectiveness", *NBER Working Paper Series*, no. 11898, National Bureau of Economic Research.

APPENDIX A – Additional details

Origo survey questions

What CPI inflation do you expect in Sweden over the coming year, that is, the annual rate calculated from:

- now and 12 months ahead, measured as the percentage change in the Consumer Price Index (CPI),
- and what is the annual rate for year 2, that is the period from month 12 to 24, and year 5, that is from month 48 to 60?

What CPIF inflation do you expect in Sweden over the coming year, that is, the annual rate calculated from:

- now and 12 months ahead, measured as the percentage change in the Consumer Price Index with a fixed interest rate (CPIF),
- and what is the annual rate for year 2, that is the period from month 12 to 24, and year 5, that is from month 48 to 60?

What GDP growth, in percent, do you expect Sweden to have:

- over the coming year, that is the annual rate calculated from now and 12 months ahead,
- and what is the growth rate for year 2, that is the period from month 12 to 24, and year 5, that is from month 48 to 60?

What level do you expect the Riksbank's policy rate (previously known as the repo rate) to be at in:

- 3 months;
- 12 months;
- 24 months;
- 60 months?

How much do you think one euro will cost in Swedish kronor in:

- 3 months;
- 12 months;
- 24 months?

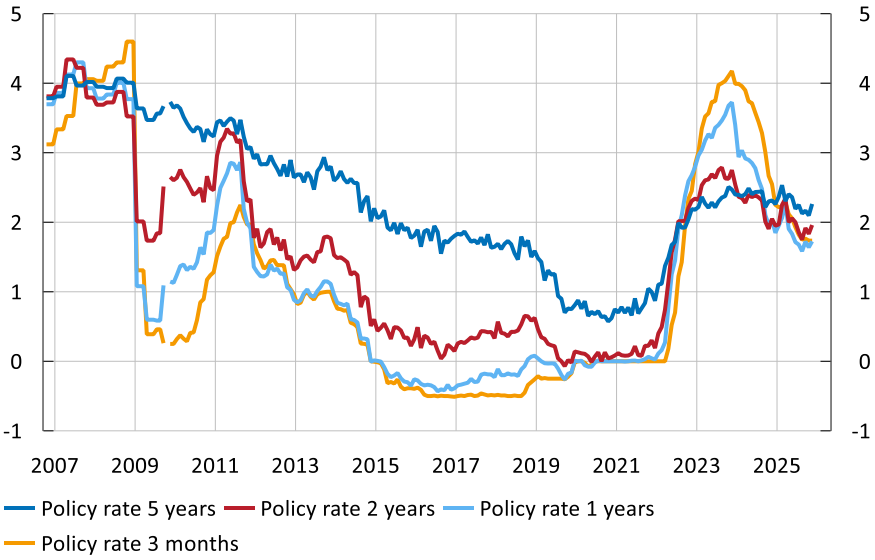
And one USD in:

- 3 months;
- 12 months;
- 24 months?

Origo survey data

Figure 5. Expected policy rate

Per cent

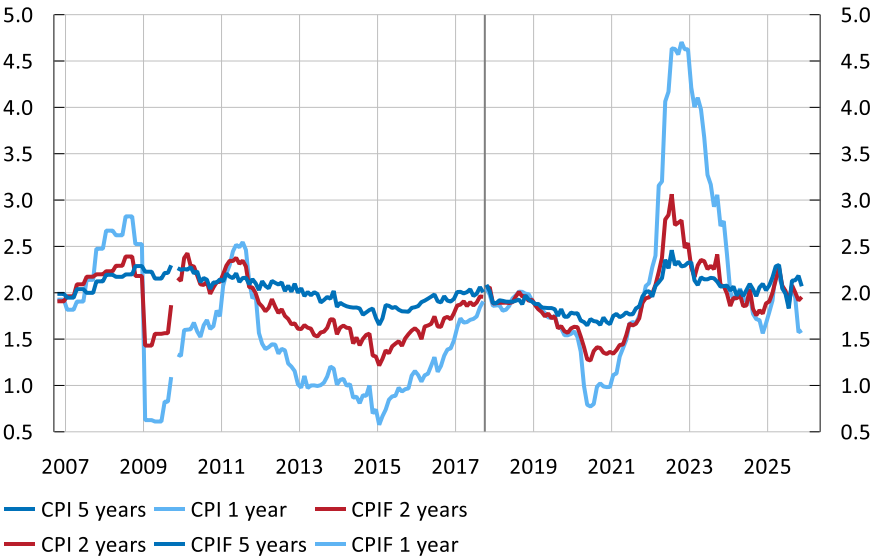


Note. Average policy rate forecast. Money market participants. Quarterly data before September 2009.

Source: Kantar Prospera and Origo Group.

Figure 6. Expected inflation

Per cent

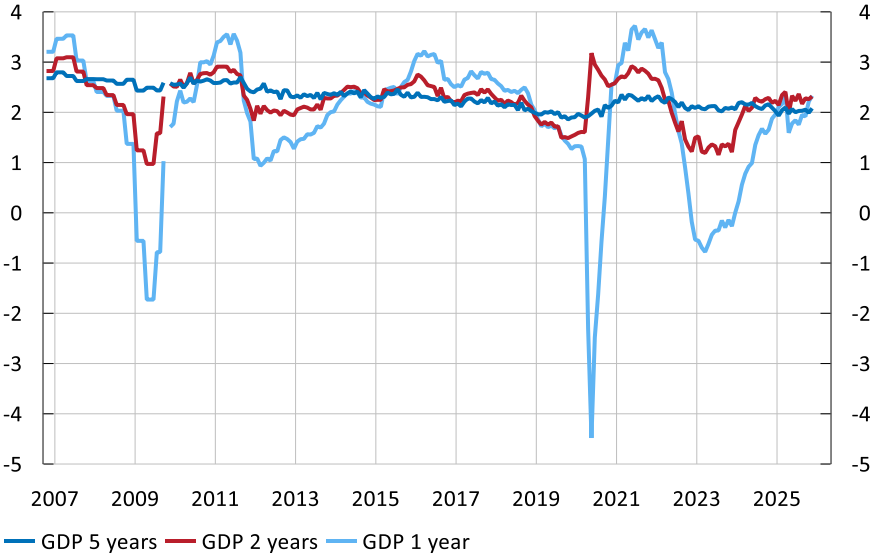


Note. Average expected CPI (until September 2017, marked by the vertical line) and CPIF (from October 2017 onward). Money market participants. Quarterly data before September 2009.

Source: Kantar Prospera and Origo Group.

Figure 7. Expected GDP growth

Annual percentage change

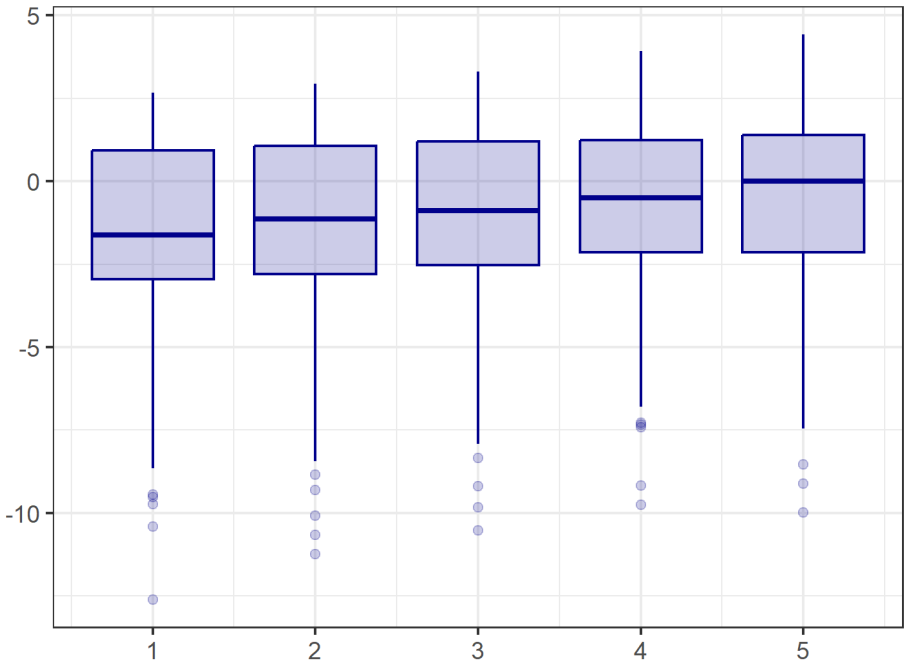


Note. Average real GDP-growth forecast. Money market participants. Quarterly data before September 2009.

Source: Kantar Prospera and Origo Group.

Illustration of the GDP gap

Figure 8. GDP gap by horizon



Note. The box plot illustrates the distribution of constructed expected GDP gaps by horizons for the sample period October 2006 to November 2025. Note that horizons three and four are imputed assuming a monotonic function. The upper edge of the box corresponds to the third quartile, the lower edge to the first quartile, and the middle line to the median. The height of the box corresponds to the interquartile range. The whiskers extend to the smallest and largest observations within 1.5 × IQR of the lower and upper quartiles, respectively; values beyond the whiskers are shown as outliers.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

APPENDIX B – Additional results

Table 6. Summary of events highlighted for the time-varying perceived monetary policy rule

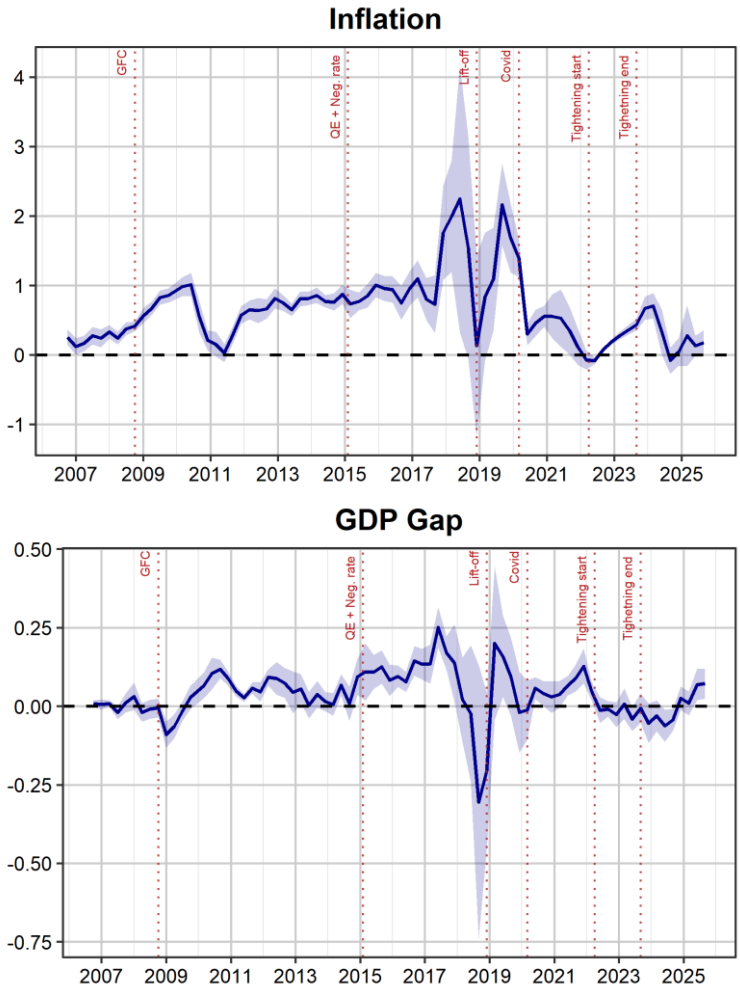
Date	Event
October 2008	Great Financial Crisis
February 2015	QE + negative interest rate
December 2018	Lift-off
March 2020	Covid
April 2022	Tightening starts
September 2023	Tightening ends

Estimating a perceived monetary policy rule for labour market parties and purchasing managers

Below we show the estimated time-varying perceived policy rule (both without and with inertia) for the non-money market participants, that is, the labour market parties and purchasing managers.

For the specification with inertia, the estimated perceived policy rule for non-money market participants differs more clearly from that of money market participants, both in levels and in the magnitude of time variation. The estimated coefficient on inflation is close to zero for most of the sample, with somewhat larger movements only around the period of Riksbank concerns about household debt and following the tightening cycle that began in 2022. One interpretation is that these respondents pay less attention to short-run monetary policy dynamics, so that the rule may be a less accurate approximation of their policy rate expectations in normal times. The coefficients on the GDP gap and the lagged policy rate, however, follow broadly similar qualitative patterns to those estimated for money market participants.

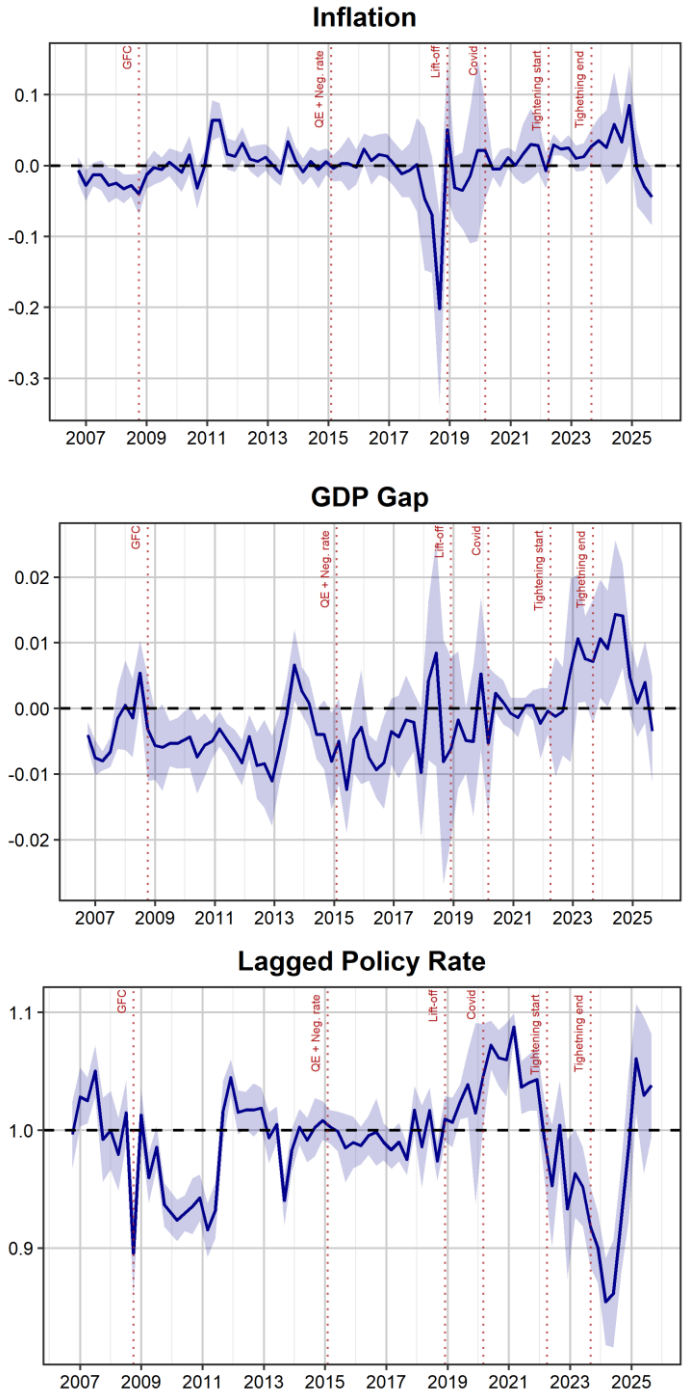
Figure 9. Parameter estimates for the perceived rule for labour market parties and purchasing managers



Note. Estimated policy-rule coefficients for inflation, $\hat{\beta}_t$,and the output gap, $\hat{\gamma}_t$. The blue lines refer to the estimated coefficients from Equation (3), estimated on quarterly surveys for non-money market participants (labour market parties and purchasing managers) from October 2006 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

Figure 10. Parameter estimates for the perceived rule with inertia for labour market parties and purchasing managers



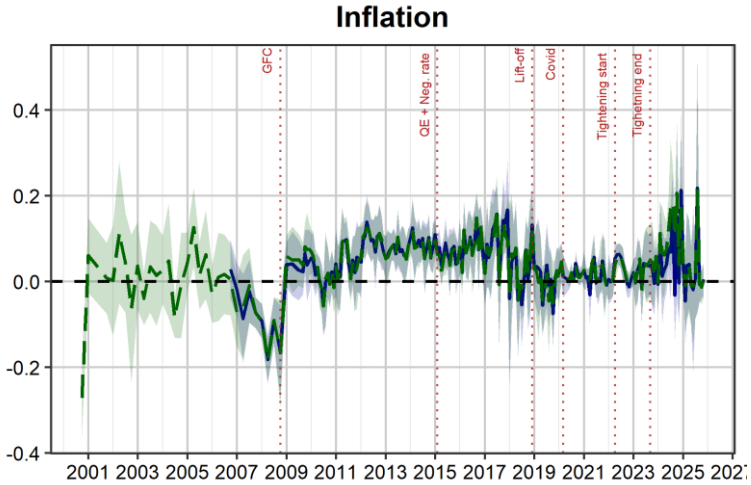
Note. Estimated policy-rule coefficients for inflation, $\hat{\beta}_t$, the output gap, $\hat{\gamma}_t$, and the lagged policy rate $\hat{\rho}_t$. The blue lines refer to the estimated coefficients from Equation (5), estimated on quarterly surveys for non-money market participants (labour market parties and purchasing managers) from October 2006 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

Estimating a perceived monetary policy rule with alternatives to the GDP gap

Figure 11 shows the estimated coefficient on inflation, the coefficient of main interest to us, with or without including the GDP gap in the inertial policy rule. The blue line shows the estimated coefficient from equation (5), that is, including the GDP gap, whereas the dashed green line shows the estimated coefficient from a regression where we exclude the GDP gap. There are no substantial differences between the blue and the dashed green lines. Figure 12 shows the estimated coefficients from a perceived rule with GDP growth instead of the GDP gap. While the coefficient on GDP growth differs from the one for the GDP gap, the estimated coefficient for inflation is also robust to using this alternative measure of the state of the real economy.

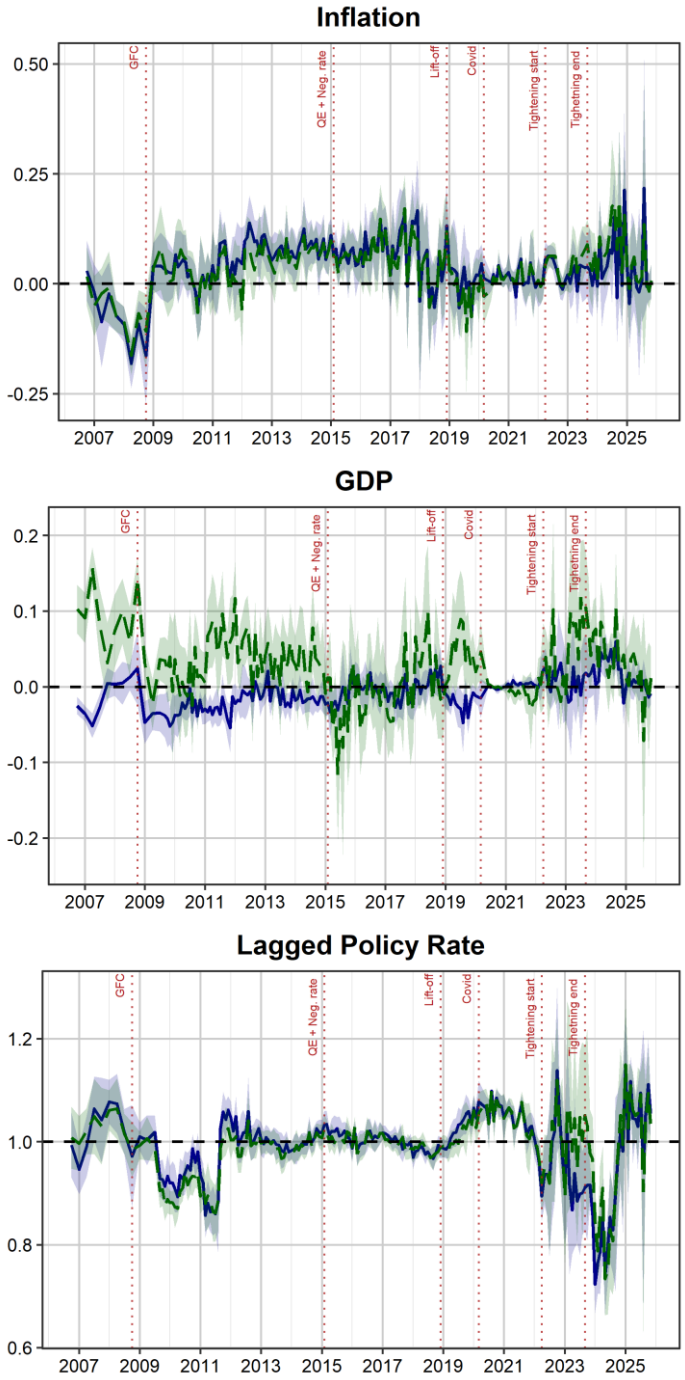
Figure 11. Estimated coefficient on inflation for the perceived rule with inertia, with (blue) or without (dashed green) the GDP gap



Note. Estimated policy-rule coefficients for inflation, $\hat{\beta}_t$. The blue line refers to the estimated coefficient on inflation from Equation (5), estimated on monthly surveys (quarterly frequency before September 2009) from October 2006 to November 2025. The dashed green line refers to estimated coefficients based on the following regression: $E_t^j i_{t+h} = a_t^j + \hat{\rho}_t i_{t+h-3} + \hat{\beta}_t E_t^j \pi_{t+h} + e_{t,t+h}^j$, estimated on monthly surveys (quarterly frequency before September 2009) from October 2000 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details.

Sources: Kantar Prospera and Origo Group.

Figure 12. Parameter estimates for the policy rule with inertia using the GDP-gap (blue) or GDP growth (dashed green)



Note. Estimated policy-rule coefficients for inflation, $\hat{\beta}_t$, the output gap, $\hat{\gamma}_t$, and the lagged policy rate $\hat{\rho}_t$. The blue lines refer to the estimated coefficients from Equation (5), estimated on monthly (quarterly frequency before September 2009) surveys from October 2006 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details. The dashed green lines refer to estimated coefficients using the expected GDP growth instead of the expected GDP gap.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

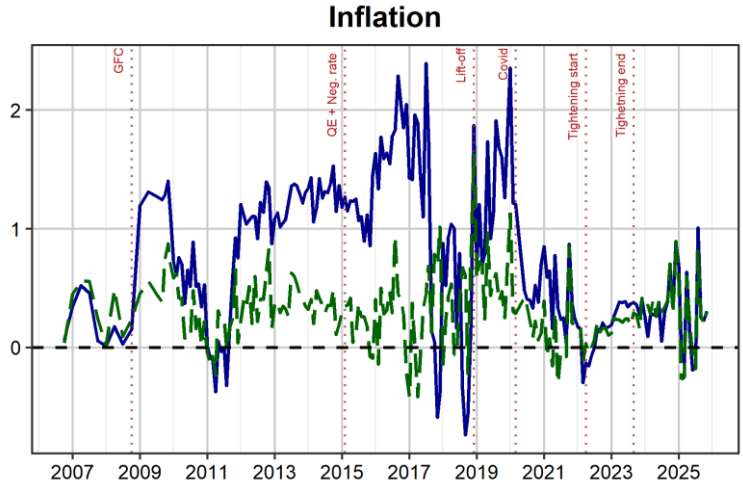
Estimating a perceived monetary policy rule without fixed effects

In the baseline estimation we include forecaster-fixed effects that we interpret as representing the individual and time-dependent assessment of the neutral rate. Because we only have three observations per forecaster and survey month, implementing fixed effects is not optimal.

We therefore estimate an alternative specification where we include variables in deviations from their long-run expected values. We replace inflation and the output gap (and the policy rate when we include inertia) by the variables $\tilde{\pi}_{t+h}$, $\tilde{y}_{t+h}$ (and $\tilde{\imath}_{t+h-3}$), where ~ denotes variables where we have subtracted the long-term (five year) expected value.

For the perceived rule without inertia, Figure 13 shows the estimated coefficient on inflation. There is a clear level difference between the blue (baseline) and green (with variables in deviation) lines in the earlier years. The qualitative pattern is, however, similar and in recent years the difference is very small. Figure 14 shows the corresponding figure for the policy rule with inertia with all three coefficients. The pattern is overall similar between the baseline and the alternative specification.

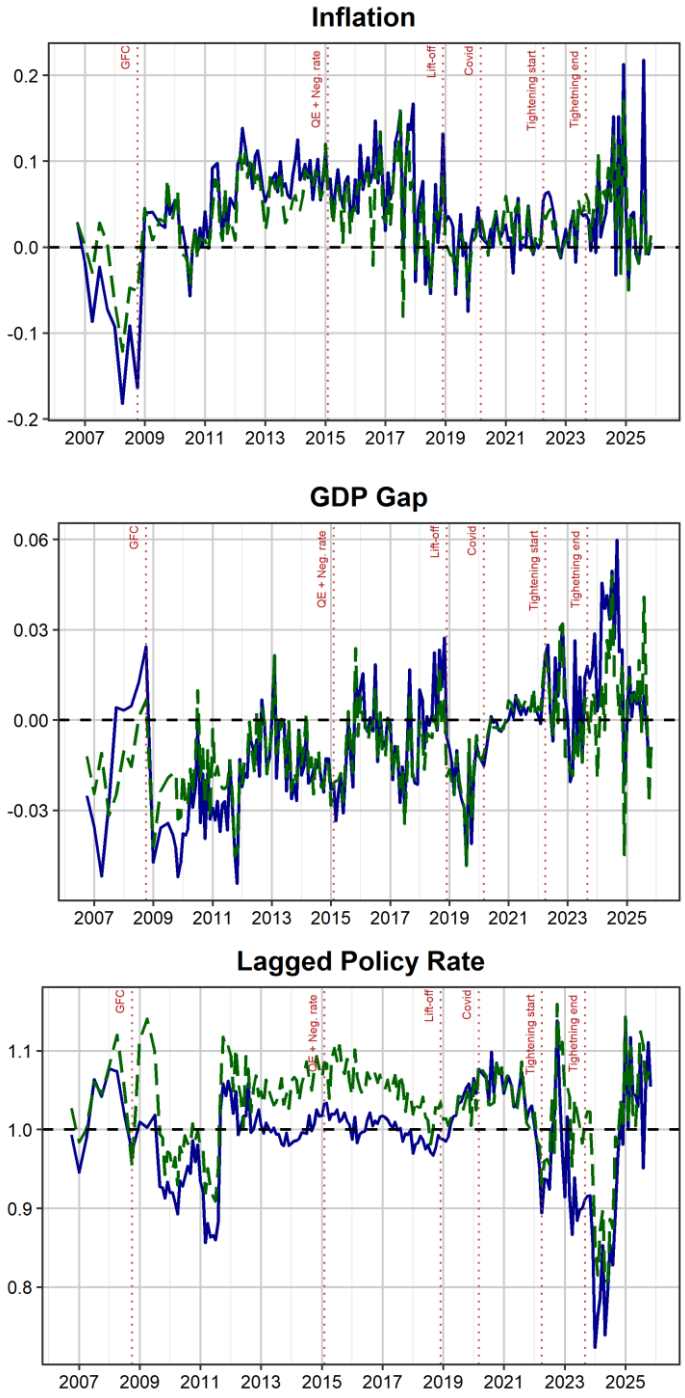
Figure 13. Parameter estimates for the perceived rule, using variables in deviation



Note. Estimated policy-rule coefficients for inflation, $\hat{\beta}_t$. The blue lines refer to the estimated coefficients from Equation (5). The dashed green line refers to estimated coefficients using deviations from the long run instead of fixed effects. Regressions are estimated on monthly (quarterly frequency before September 2009) surveys from October 2006 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

Figure 14. Parameter estimates for the perceived rule with inertia, using variables in deviation



Note. Estimated policy-rule coefficients for inflation, $\hat{\beta}_t$, the output gap, $\hat{\gamma}_t$, and the lagged policy rate $\hat{\rho}_t$. The blue lines refer to the estimated coefficients from Equation (5). The dashed green lines refer to estimated coefficients using deviations from the long run instead of fixed effects. Regressions are estimated on monthly (quarterly frequency before September 2009) surveys from October 2006 to November 2025. The shaded regions show 95% confidence intervals based on standard errors clustered at the respondent-time level. Vertical dashed lines highlight dates of specific events, see Appendix B for details.

Sources: Kantar Prospera, Origo Group, National Institute of Economic Research and own calculations.

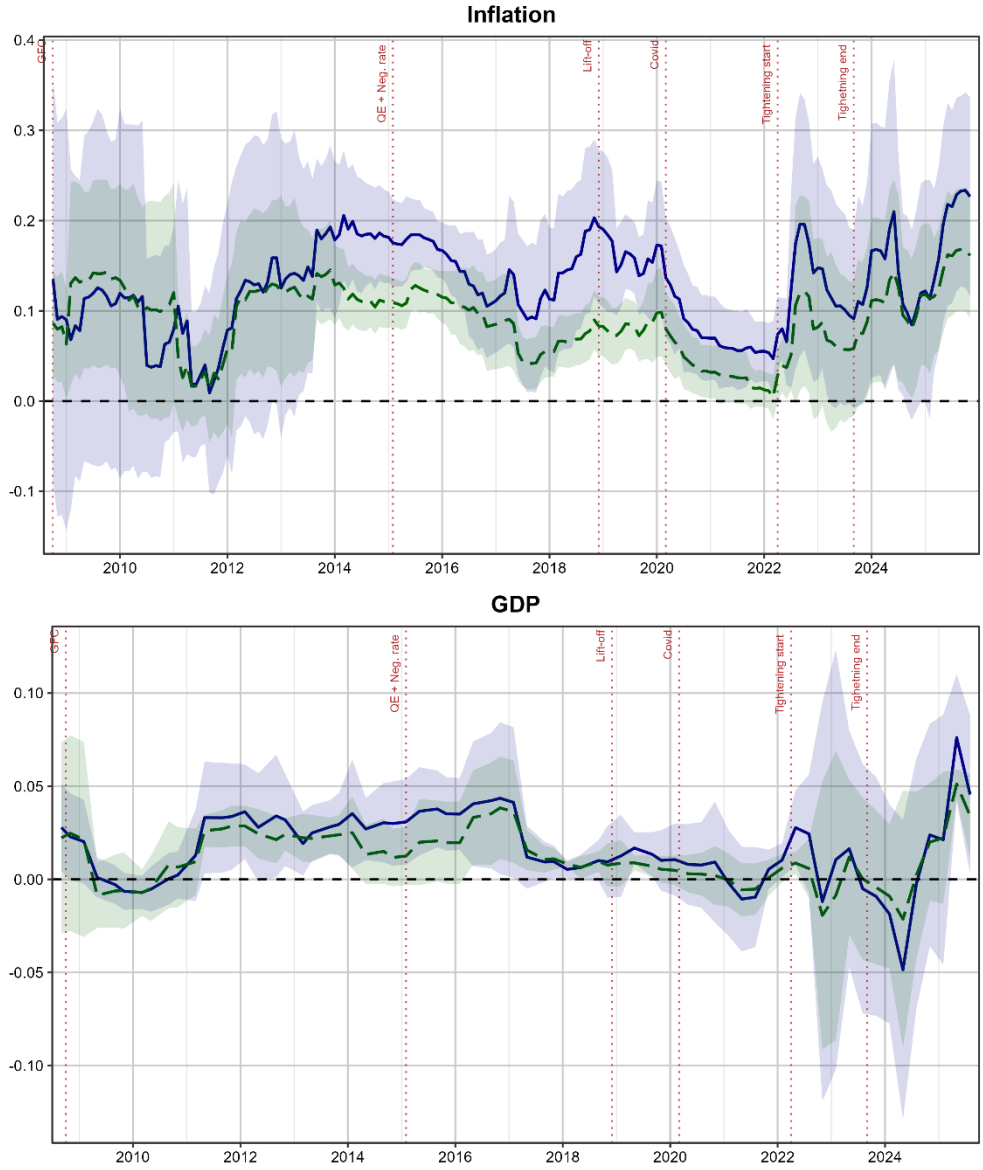
Table 7. Event-study regression: Unemployment rate surprises

	FRA4	FRA8	Gov. 2y	Gov. 5y	Swap 1y	Swap 2y	Swap 5y
			Unemployment rate				
θ	0.012** (0.009)	0.022** (0.011)	0.026*** (0.009)	0.025** (0.010)	0.017*** (0.006)	0.025*** (0.008)	0.021** (0.009)
R^2	0.019	0.020	0.042	0.028	0.035	0.044	0.029
N	230	230	230	230	230	230	230

Notes. Estimated coefficients θ and regression R2 from event-study regressions $\Delta i_t = \alpha + \theta News_t^c + \epsilon_t$, where Δi_t is the daily change in a given interest rate on days of macroeconomic news and $News_t^c$ is the surprise component of the news in category $c \in (Unemployment\ rate)$, defined as the difference between the actual value and the consensus forecast. Heteroskedasticity-robust standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. Sample period: October 2006 to November 2025. See text for details.

Sources: Bloomberg and Macrobond.

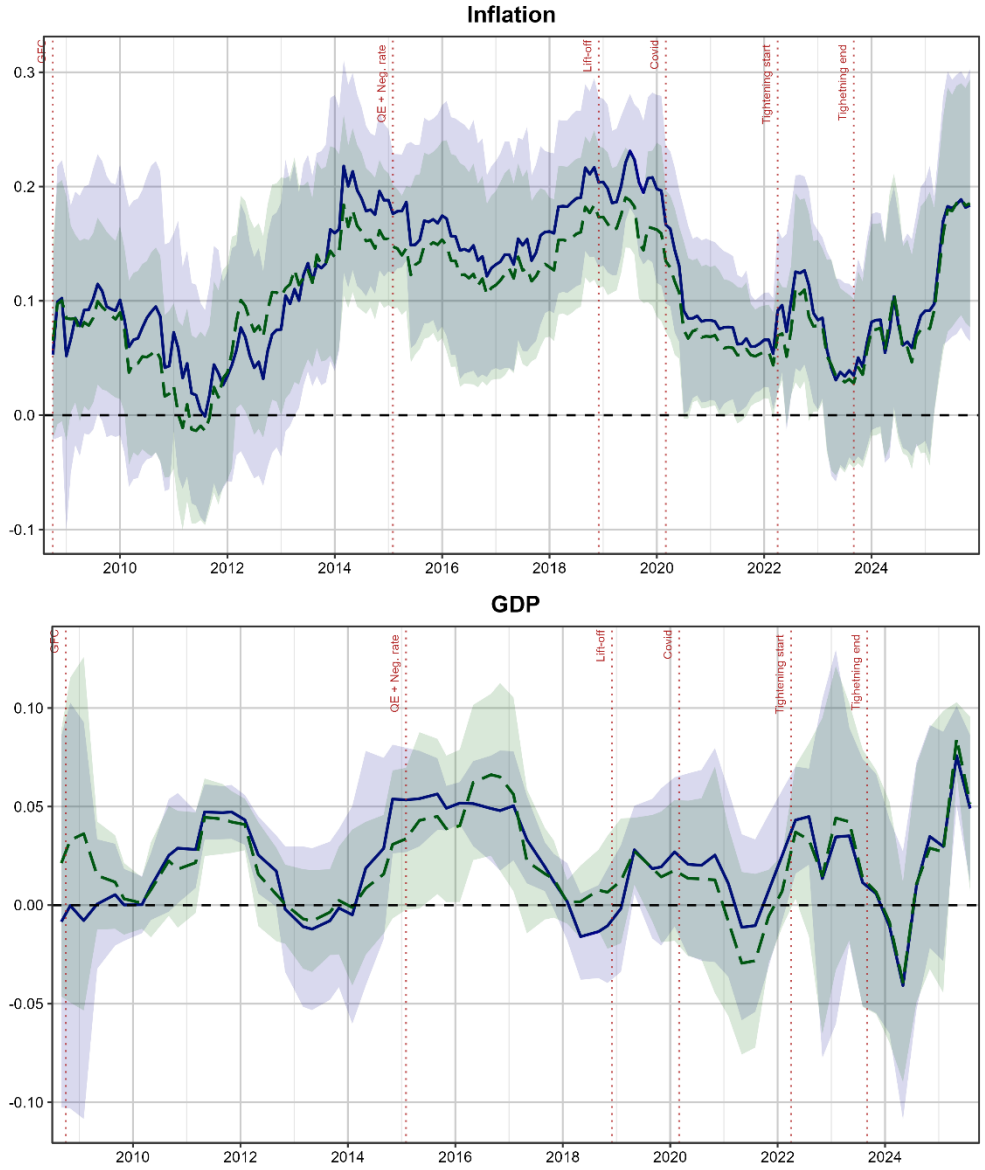
Figure 15. Rolling window estimates of interest rates on macroeconomic news



Note. Estimated two-year rolling window coefficients θ from event-study regressions $\Delta i_t = \alpha + \theta News_t^c + \epsilon_t$, where Δi_t is the daily change in a given interest rate on days of macroeconomic news and $News_t^c$ is the surprise component of the news in category $c \in (CPIF, GDP)$, defined as the difference between the actual value and the consensus forecast. The blue solid line is estimated with the FRA4 rate as the outcome variable and the green long dashed lines with the one-year swap rate. The shaded regions show 95% confidence intervals based on heteroskedasticity-robust standard errors. Sample period: October 2006 to November 2025. See text for details.

Sources: Bloomberg and Macrobond.

Figure 16. Rolling window estimates of interest rates on macroeconomic news



Note. Estimated two-year rolling window coefficients θ from event-study regressions $\Delta i_t = \alpha + \theta News_t^c + \epsilon_t$, where Δi_t is the daily change in a given interest rate on days of macroeconomic news and $News_t^c$ is the surprise component of the news in category $c \in (CPIF, GDP)$, defined as the difference between the actual value and the consensus forecast. The blue solid line is estimated with the five-year government bond yield as the outcome variable and the green long dashed lines with the five-year swap rate. The shaded regions show 95% confidence intervals based on heteroskedasticity-robust standard errors. Sample period: October 2006 to November 2025. See text for details.

Sources: Bloomberg and Macrobond.

Climate risk and commercial real estate: Lessons and challenges to strengthen financial stability

Cristina Cella, Kent Eriksson, Mark Sanctuary, Valentin Schubert and Ulf Söderström*

Cristina Cella is advisor at the Riksbank's Financial Stability Department; *Kent Eriksson* is Professor at the Department of Real Estate and Construction Management at KTH Royal Institute of Technology and Director of the Sustainable Finance Lab; *Mark Sanctuary* is Associate Professor at the Department of Industrial Economics and Management at KTH Royal Institute of Technology and Vice-Director of the Sustainable Finance Lab; *Valentin Schubert* is economist at the Riksbank's Research Division; and *Ulf Söderström* is Head of Research at Sveriges Riksbank.

Climate change poses growing risks to commercial real estate and, by extension, to financial stability. In Sweden, where roughly half of bank lending to non-financial corporations is directed to the commercial real estate sector, physical risks such as flooding, rising sea levels and ecosystem degradation can erode collateral values and amplify systemic vulnerabilities. A joint workshop organised by the Sustainable Finance Lab and Sveriges Riksbank in November 2025 explored how climate-related risks transmit through commercial real estate markets to the financial system. This article summarises the workshop's insights on how to strengthen climate resilience in the financial system through improved data quality, better governance coordination, and policy responses including stress testing, regulatory disclosure and preventive investment.

1 Introduction: Climate risk and the financial system's core vulnerability

Commercial real estate (CRE) plays an important role in many economies and has an important impact both on economic and financial stability. The sector influences business activity, employment, credit markets, and wider macroeconomic trends. Financial instability has often been linked to developments in real estate markets.[1] About 51 per cent of Swedish bank lending to non-financial corporations is to CRE firms, and roughly half of this is secured by physical property. This ties a large share of banks' balance sheets directly to real estate values and their market stability. While a high rate of collateralization offers some protection, the scale of this concentration

* The opinions expressed in this article are the sole responsibility of the authors and should not be interpreted as reflecting the views of Sveriges Riksbank.

[1] See, for example, Sun et al. (2015) and Campiglio et al. (2023).

creates a potential “single point of failure”, where a downturn in property markets could threaten broader financial stability.

These links are increasingly shaped by evolving climate-related risks. More frequent and severe weather events – such as the 2011 floods in Copenhagen and Hurricane Sandy in New York in 2012 – show how physical climate shocks can translate into financial losses. As the costs of such disasters continue to rise, approaches to managing climate-related and financial commercial real estate risks need to adjust.

In this context, the Sustainable Finance Lab and Sveriges Riksbank organized a workshop on “Climate Risk and Commercial Real Estate” in November 2025. The event aimed to deepen understanding of climate-related financial, physical and transition risks in CRE and to promote cooperation among banks, insurance companies, public institutions, and academia. The goal was to identify ways to strengthen stability in the CRE sector and financial stability more broadly.

This article summarizes the workshop’s main discussions. It first considers the role of CRE in financial stability, then examines key challenges in managing climate risks, particularly related to data, governance, and coordination among private actors and public institutions. It concludes with a discussion of policies that could enhance resilience. While focused on CRE, many insights are relevant for the broader financial system.

2 Commercial real estate and financial exposures

Sveriges Riksbank’s mandate includes promoting the stability and efficiency of the financial system. Because climate risks can affect both financial institutions and the real economy, they are an increasingly important consideration (see Sveriges Riksbank 2019). In particular, the strong exposure of banks to commercial real estate calls for close policy attention (Sveriges Riksbank 2022).

The growing influence of climate-related risks compounds this exposure. Physical risks—such as rising sea levels and extreme weather – and transition risks – such as tighter carbon and energy efficiency standards – can both reduce asset values and create stranded assets. Similar patterns exist across Europe, where corporate lending is largely directed to sectors that contribute significantly to climate change. Since much of this lending is tied to real estate, European banks face both physical and transition risks, creating pressures on collateral and credit quality (see Ceglar et al. 2025).

Research presented at the workshop highlighted both direct and indirect climate-related channels of risk. Even with full insurance coverage, Norwegian households affected by flooding have experienced persistent declines in housing wealth due to falling property prices – peaking at about USD 13,000 two years after a flooding event (Espegren et al. 2025). This repricing of risk lowers collateral values and illustrates how insurance alone cannot eliminate direct financial stability risks transmitted via the real estate sector. The authors also document a decrease in household

consumption that, in aggregate, can have significant consequences for both economic growth and financial stability.

Environmental degradation can affect property values without causing direct physical damage (Piseddu 2025). In particular, increases in water temperature during the summer in Sweden have led to harmful algae blooming, which were found to reduce housing investment returns by roughly 5.5 per cent. In Sweden, where mortgage loans make up 83 per cent of household credit, such declines in collateral value can have noticeable effects on bank balance sheets and profitability.

These vulnerabilities highlight the need for better data and measurement approaches to climate risks in the financial sector. They also point to a need for combining risk assessment methods developed for natural sciences with those of finance.

3 Addressing data deficiencies and measurement uncertainty

Robust climate risk assessment requires high-quality, accessible, and standardized data. However, the data required for risk assessment is often deficient. Key challenges arise from uncertainty in framing the problem itself – such as defining the scope of the system under analysis and deciding which data sources, metrics, and processes to include or exclude. This ambiguity complicates efforts to measure exposures accurately and consistently across institutions.

3.1 The nature of data uncertainty

Climate risk assessment relies on observational data, which are subject to multiple sources of uncertainty. Workshop discussions identified five main types.

At-station point measurement uncertainty arises from errors at the primary sensor level. High-quality instruments can still produce systematic or random errors – for example, wind turbulence often causes rain gauges to underestimate precipitation. Sensor degradation, improper calibration, or disturbances like animal activity can further distort readings. Regular maintenance, calibration, and traceability help address these issues.

Derived data uncertainty occurs when target variables must be estimated from proxy measures. River discharge, for instance, is typically calculated from water level data using stage–discharge relationships, that is, how the water level is linked to water flow rates. These relationships are often non-linear and influenced by factors such as soil moisture, leading to uncertainty ranges of 10–40 per cent in the estimates. Inaccurate modelling of these derivations can bias hydrological predictions.

Interpolation uncertainty emerges when values at unmeasured locations are estimated from observation stations that are spread out. This estimation process assumes that nearby points are strongly correlated, but this is often not the case due to spatial error patterns. Uncertainty increases with the distance to the nearest

station and depends on the density of the sensor network and the interpolation method employed.

Scaling uncertainty results when data collected at one scale are applied to another scale. Soil moisture, for example, varies sharply over short distances due to differences in soil type, vegetation, and evaporation. Using a single point measurement to represent a larger area – or downscaling satellite data – introduces errors that require advanced statistical adjustments.

Finally, *data management uncertainty* stems from errors in the data lifecycle, such as manual entry mistakes or procedural lapses. One documented case involved rain gauge checks being skipped on weekends, creating artificial gaps in records. Inconsistent formatting, poor documentation of coordinates, or changes in collection protocols over time can also undermine long-term datasets.

3.2 Bridging the data gap: standardization and accessibility

In Sweden, public data from authorities such as SMHI (Swedish Meteorological and Hydrological Institute) and the Swedish Civil Defense and Resilience Agency (previously MSB) cover high-risk areas but remain highly fragmented. Professionals often face data that lack sufficient detail for neighbourhood-level analysis or are delivered in formats requiring specialized skills. Legal restrictions, acquisition costs, and large file sizes further limit scalability for financial and insurance risk models. Coverage gaps also persist, with only parts of the country adequately mapped, complicating model validation.

Denmark offers a contrasting example. Building on initiatives from 2017–2021, authorities have developed centralized platforms like klimatilpasning.dk, providing free, high-resolution tools for address-level flood risk assessment from sea levels, groundwater, and cloudbursts.

To address these issues in Sweden, efforts could target three areas. First, standardize data through a uniform framework and consistent coverage across regions. Second, improve interpretability with simplified explanations and visualizations for non-experts. Third, issue clear guidelines on data use, including appropriate applications and limitations.

3.3 Technological solutions and cost barriers

Advances in downscaling methods now enable researchers to derive local climate information from coarse global models. These techniques produce more realistic representations of regional patterns, which serve as inputs for impact models in urban planning and hydrology.

High-resolution data at a very granular level are essential for assessing local threats such as extreme precipitation and heat stress. Producing such projections, however, requires substantial technical expertise and financial resources.

Artificial intelligence (AI) offers one possible solution. AI methods can improve data accessibility, refine downscaling, and enhance hydrological modelling. In several applications, these approaches have reduced biases in historical data and matched or exceeded the accuracy of conventional simulations.

New observational technologies complement these efforts. Image-based flow monitoring – using drones, smartphones, and satellites – measures flood severity directly via surface velocity. Unlike traditional derived estimates, which rely on proxy variables, these tools reduce associated uncertainties.

For commercial real estate and financial applications, high-resolution data must be packaged into accessible formats with assured long-term availability. Building this infrastructure may require collaborative frameworks, such as Nordic partnerships, to share development costs.

4 Existing collaborations could be improved

Given the potential effects of climate risks on the financial system, a key takeaway from the workshop is the need for closer collaboration between policymakers and the financial industry to strengthen risk management, transparency, and regulatory tools.

4.1 Enhancing risk management frameworks

The guidelines of the European Banking Authority (EBA) on climate and ESG (Environmental, Social, and Governance) risks provide a structured approach for integrating these risks into banks' strategies, governance, and risk management. They explicitly require banks to consider real estate and collateral when assessing climate risk. Yet implementation remains incomplete, and many institutions still do not systematically incorporate physical risks such as flooding or rising sea levels into collateral valuation and financial risk assessment.

An important supervisory objective is to improve transparency. Disclosure obligations for banks are intended to create a common information base and allow markets and authorities to price risk more accurately. Under Pillar 3, banks must publish information on their real estate exposures and relevant energy performance indicators, such as EPC (Energy Performance Certificate) labels, and classify them by transition and physical risk dimensions.

4.2 Stress testing and scenario analysis

Policy can encourage the wider use of climate stress testing and scenario analysis. Stress tests help assess short-term impacts of acute events on capital and liquidity, while scenario analysis provides a long-term view of how portfolios and business models perform under different transition pathways.

Frameworks such as the CSRD (Corporate Sustainability Reporting Directive) of the EU and the EU Taxonomy require firms to describe how they manage climate risks and use scenario analysis, and they provide a common reference for defining

environmentally sustainable activities. Although the EU Taxonomy is still evolving, it helps identify activities that support mitigation and adaptation, including non-life insurance products that incentivize loss prevention.

If climate risks rise and banks' resilience does not keep pace, regulators may need to consider more stringent measures. Possible options include higher capital requirements or risk weights for exposures in high-risk geographical areas and targeted macroprudential tools such as stricter loan-to-value limits for properties exposed to floods or landslides.

4.3 Incentives and the treatment of "green" assets

Ongoing policy debates examine how regulatory treatment can support investments in sustainable assets. One line of discussion concerns whether, and under what conditions, preferential capital treatment for certain "green" exposures could be justified. The broader objective is to align financial incentives with preventive investments, so that financial capital increasingly supports measures that reduce future losses rather than only financing reconstruction after damage has occurred.

4.4 The governance and coordination gap

Despite clear evidence on the need for adaptation, implementation of risk-reducing measures remains uneven. This action gap is closely linked to governance arrangements and funding constraints, and addressing it requires clearer mandates and better coordination across actors. There is a clear need to better coordinate natural science-based risk assessments and financial risk assessments. A key challenge is that these forms of assessment have historically been conducted by separate actors and are grounded in different analytical traditions. Natural science and financial risk assessments rest on distinct epistemological and ontological foundations, relying on different types of data, methods, and modelling approaches. As a result, risks may be assessed in parallel but not in an integrated manner. This points to the need for governance arrangements that enable effective coordination between natural science risk assessment bodies, such as SMHI, and financial risk assessment institutions, such as the Riksbank.

4.4.1 Limits of municipal authority

Municipalities such as Stockholm are central to adaptation because they are responsible for critical services and own substantial public property. At the same time, primary responsibility for adapting buildings lies with individual property owners. Municipalities can typically intervene on private land only when a project can be justified as serving a general public interest.

This setting raises questions about when it is appropriate to use public funds to reduce risks to private commercial assets. It also creates coordination challenges: neighbourhood-scale measures often require agreement among many private owners, which can make negotiations long and complex. Free-rider problems are common, as measures such as flood walls or nature-based solutions provide benefits to a wider area, including actors who do not contribute financially.

4.4.2 Formal responsibilities and national guidelines

To accelerate local adaptation, especially in urban areas, governance frameworks may need to be adjusted so that municipalities have clearer responsibilities and effective tools. These include rights of disposition in defined areas, predictable financing models, and enforcement mechanisms that reduce dependence on purely voluntary cooperation from private stakeholders.

National guidelines can also improve consistency and reduce administrative burdens. When each municipality must develop its own assumptions about climate scenarios and methods, efforts are duplicated and risks may be assessed unevenly. Standardized scenarios and guidance would allow local authorities to focus more on concrete solutions.

Large-scale infrastructure projects, such as coastal protection or sluice gates, generally exceed the financial capacity of a single municipality. Treating these investments as matters of national interest would facilitate broader funding arrangements. Progress to date has been relatively slow: only a minority of Swedish municipalities have completed systematic analyses of how climate change may affect them, compared with a substantially higher share in Norway. Clarifying mandates and elevating coastal defence to a national priority would strengthen the protection of high-value commercial real estate and, in turn, support financial stability.

4.4.3 The role of the insurance sector

Insurers can support adaptation by moving beyond loss compensation toward risk reduction. Through risk-based pricing, differentiated deductibles, and conditional coverage requirements, insurance policies can incentivize households, firms, and municipalities to invest in preventative measures such as flood-proofing, resilient building materials, and urban nature-based solutions. Insurers have access to forward-looking risk assessment data that can inform spatial planning, infrastructure design, and capital allocation decisions. Data sharing and engagement with municipalities and other stakeholders can enhance risk management.

However, some insurers argue that the scalability of such contributions is constrained by regulatory and institutional barriers. Fragmented regulatory regimes inhibit standardized data use and cross-border risk pooling. Insurers have the technical capacity and market leverage to support adaptation at scale, but insurers are often constrained by governance gaps and policy failure rather than actuarial or financial innovation constraints.

5 Conclusions: lessons for policymakers

Climate risks to commercial real estate could pose important challenges for financial stability. Recent disasters in Europe and beyond illustrate the rising costs of inaction, requiring Sweden to move beyond traditional approaches. The workshop identified several potential opportunities that can help strengthen the CRE sector’s resilience to climate-related risks.

Regulators should continue to promote a shift from post-disaster repairs to preventive investments. Technical measures and regulatory pressure alone cannot close the action gap, which stems from governance and funding constraints.

Robust climate risk integration into financial decision-making depends on standardized, high-resolution, and accessible data. Current fragmentation, methodological inconsistencies, and multiple layers of uncertainty weaken assessment, stress testing, and portfolio analysis. Without coordinated national data frameworks and clearer guidance on use and interpretation, financial institutions cannot price risk consistently. Strengthening data governance is critical to strengthening financial resilience. National guidelines on data use and risk scenarios would reduce duplication, ensure consistent assessments, and address free-rider issues, where actors benefit from others' investments without contributing. Regulators should integrate physical risks into collateral valuations through stress testing and scenario analysis. Transparency requirements – such as Pillar 3 disclosures, CSRD, and the EU Taxonomy – provide a foundation for identifying exposures across sectors.

The workshop highlighted these key challenges, but a necessary effort is ongoing dialogue among banks, insurers, municipalities, authorities, and researchers. Continued collaboration can help mitigate climate risks to CRE and support broader financial stability.

References

Campiglio, Emanuele, Louis Daumas, Pierre Monnin and Adrian von Jagow (2023), "Climate-related risks in financial assets", *Journal of Economic Surveys*, vol. 37, no. 3, pp. 950–992.

Ceglar, Andrej, Alexandra Marques, Simone Boldrini, Chiara Lelli, Andreas Toreti, Laura Parisi and Irene Heemskerk (2025), "European banks face significant vulnerability to ecosystem degradation and climate change", *Communications Earth & Environment*, vol. 6, article 750.

Espegren, Caroline, Sigurd Mølster Galaasena, Emilia Garcia-Appendini and Mathis Mæhlum (2025), "Weathering the storm: the effects of natural disasters on households under universal insurance", Manuscript, November 2025.

Piseddu, Tommaso (2025), "Blooming algae and falling returns on investments. The Swedish housing market in the face of biodiversity risk", Working Paper no. 2025:11, Division of Real Estate Economics and Finance, Royal Institute of Technology (KTH).

Sun, Libo, Shreidan D. Titman and Garry J. Twite (2015), "REIT and commercial real estate returns: a postmortem of the financial crisis", *Real Estate Economics*, vol. 43, no. 1, pp. 8–36.

Sveriges Riksbank (2019), "Climate-related risks are a source of financial risk", article in *Financial Stability Report* 2019:2.

Sveriges Riksbank (2022), "Financial sector linkages with the commercial property sector", article in *Financial Stability Report* 2022:2.

APPENDIX – Workshop program

Welcome address: Aino Bunge, First Deputy Governor, Sveriges Riksbank

Session I: Research presentations

Chair: Ulf Söderström (Sveriges Riksbank)

Emilia Garcia-Appendini (University of St. Gallen)
"Weathering the storm: The effects of natural disasters on households under universal insurance"
Discussant: Christian Thomann (KTH Royal Institute of Technology)

Tommaso Piseddu (Stockholm Environment Institute)
"Blooming algae and falling returns on investments. The Swedish housing market in the face of biodiversity risk"
Discussant: Kent Eriksson (KTH Royal Institute of Technology and Sustainable Finance Lab)

Giuliano Di Baldassarre (Uppsala University)
"The challenge of unprecedented floods and droughts in risk management"
Discussant: Øyvind Paasche (NORCE)

Session II: Panel discussions

Panel 1 – Data and measurement

Deep dive into the challenges related to the measurement, interpretation, and application of climate data for assessing financial risk

Chair: Valentin Schubert (Sveriges Riksbank)
Ralf Doescher (SMHI – The Swedish Meteorological and Hydrological Institute)
Laura Ni (If P&C Insurance)
Ida Westerberg (IVL Swedish Environmental Research Institute)

Panel 2 – Policy implications

Focus on current private and public policy responses to commercial real estate's exposure to climate risk

Chair: Cristina Cella (Sveriges Riksbank)
Niklas Frykström (Sveriges Riksbank)
Rolf Marquardt (Swedbank)
Philip Thörn (If P&C Insurance)

Panel 3 – Ways forward

Where do the key governance and coordination gaps lie in addressing climate risks in commercial real estate, and what policy or institutional actions are needed to close them?

Chair: Mark Sanctuary (KTH Royal Institute of Technology and Sustainable Finance Lab)
Per Bolund (Stockholm University)
Karin Dhakal (Stockholms stad)
Fedra Vanhuyse (Stockholm Environment Institute)

Wrap-up

Kent Eriksson (KTH Royal Institute of Technology and Sustainable Finance Lab)

Organising committee

Cristina Cella (Sveriges Riksbank)
Kent Eriksson (KTH Royal Institute of Technology and Sustainable Finance Lab)
Mark Sanctuary (KTH Royal Institute of Technology and Sustainable Finance Lab)
Valentin Schubert (Sveriges Riksbank)
Ulf Söderström (Sveriges Riksbank)

SVERIGES RIKSBANK
Telephone +46 8 787 00 00
registratorn@riksbank.se
www.riksbank.se

PRODUCTION SVERIGES RIKSBANK
ISSN 2001-029X