



Economic Commentary

The Riksbank's purchases of covered bonds and the impact on mortgage rates

Robert Emanuelsson, Erik O Andersson,
Tamás Vasi

NO. 12 2022, 19 December

Summary

In this Economic Commentary, we examine how well the Riksbank's purchases of covered bonds during the coronavirus pandemic have passed through to Swedish mortgage rates. To measure this, we conduct an event study using the information published by the Riksbank on its purchases of covered bonds. Our results indicate that the Riksbank's purchases contribute to a fall in mortgage rates, but that it takes at least six months for this to happen. The Riksbank's purchases have the fastest and largest effect on mortgage rates with a fixation period of between one and two years. The effect is somewhat later and weaker on variable mortgage rates.

Authors: Robert Emanuelsson, Erik O Andersson and Tamás Vasi - currently or previously working at the Financial Stability Department.¹

¹ We thank Jan Alsterlind, David Forsman, Peter Gustafsson, Ida Hansson, Jens Iversen, Caroline Jungner, Kristian Jönsson, Dominika Krygier, Stefan Laséen, Samantha Myers, Olof Sandstedt, Annika Svensson, Roine Vestman and Gary Watson for their valuable comments on earlier drafts. The opinions expressed are the authors' own and should not be taken to reflect the views of the Riksbank on these issues.

The Riksbank's asset purchases during the coronavirus pandemic

The spread of the coronavirus in early 2020 brought both production and consumption to an abrupt halt worldwide, and led to increased uncertainty in the financial markets. To mitigate the impact of the coronavirus pandemic on the economy, central banks chose to cut their policy rates and make large-scale asset purchases, among other measures. The Riksbank acted mainly by making it easier for banks to lend money to companies and by buying financial assets, including covered bonds. In this way, the Riksbank sought to safeguard the banks' role as credit providers, mitigate frictions in important funding markets and ensure a smooth transmission from the policy rate to lending rates, including mortgage rates for households.

The Riksbank has released several studies examining the impact of its asset purchases during the pandemic.² For example, Gustafsson (2022) shows that these asset purchases contributed to more expansionary financial conditions by lowering interest rates, particularly on municipal bonds and covered bonds, slightly weakening the krona and slightly increasing equity prices. Alsterlind (2022) also shows that risk premiums on covered bonds, which initially rose during the pandemic, fell to virtually zero after the Riksbank offered to buy bonds. The authors of these studies emphasise that it is difficult to determine what was due to the Riksbank's actions and what was due to other measures taken by both central banks and governments in Sweden and abroad. Moreover, the authors frequently stress that in order to estimate the effects more fairly, it would be necessary to compare developments with a counterfactual scenario in which the Riksbank refrained from announcing its asset purchases.

Despite these studies, no one has yet investigated in detail whether lower covered bond rates also contributed to lower costs for households with mortgages, i.e. lower mortgage rates. In this Economic Commentary, we therefore attempt to quantify the impact of the Riksbank's purchases of covered bonds on Swedish mortgage rates.

Falling interest rates on covered bonds and mortgages

In Sweden, banks finance their mortgages mainly by issuing covered bonds. Changes in the interest rates on these bonds therefore have a major impact on the total cost of financing mortgages. This change will in turn affect mortgage rates. However, how quickly this happens can vary. Eidestedt et al. (2020) argue that mortgage interest rates with a longer fixation period will be affected relatively quickly. Variable mortgage interest rates will also be affected, but this occurs over a longer period of time and mainly by changes in the banks' short-term funding sources, for example in the Stockholm interbank offered rate (Stibor).³

² See, for example, Gustafsson and von Brömsen (2021), Gustafsson (2022) and Alsterlind (2022).

³ Covered bonds account for about 70 per cent of total funding for Swedish mortgages.

The outbreak of the pandemic increased uncertainty in the financial markets. As a result, interest rates on covered bonds rose rapidly. However, when the Riksbank announced on 16 March 2020 that it would buy covered bonds, the rates on these bonds quickly fell to a lower level than previously, as we can see in Chart 1. However, it took until autumn 2020 before mortgage rates started to fall, as we can see in Chart 2. One interpretation of this could be that the lower funding costs resulting from the Riksbank's purchases affected mortgage rates with a certain lag.

Chart 1. Covered bond yields

Per cent

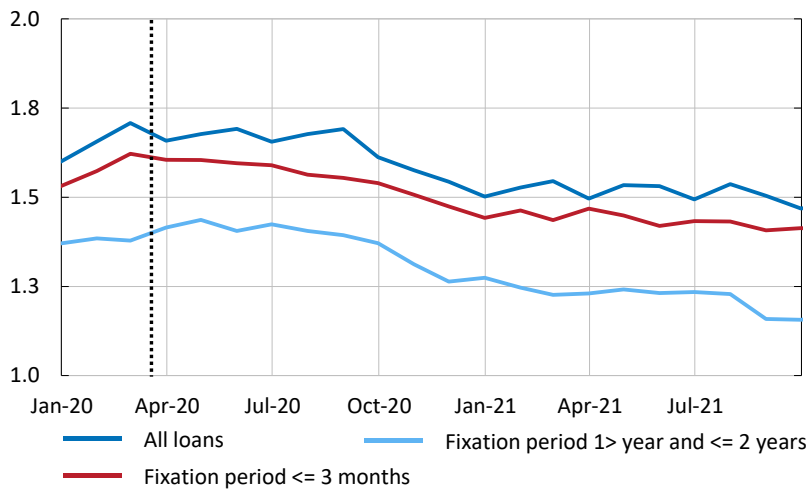


Note. Closing rates for benchmark bonds issued in Swedish kronor. The shift in January 2021 is due to a benchmark change. The black dotted line refers to the time when the Riksbank announced that it would buy covered bonds (16 March 2020).

Sources: Macrobond and the Riksbank.

Chart 2. Average mortgage rates on new and renegotiated loans

Per cent



Note. The black dotted line refers to the time when the Riksbank announced that it would buy covered bonds (16 March 2020).

Source: Statistics Sweden.

Asset purchases affect risk premiums

The Riksbank's purchases of covered bonds during the pandemic were primarily aimed at lowering or counteracting increases in risk premiums in the covered bond market.⁴ The lower risk premiums facilitated the issuance of new covered bonds at low rates. To the extent that banks' funding costs also influenced their lending rates, this would also have had a dampening effect on mortgage rates for households.

Prior to the pandemic, the Riksbank had not previously purchased covered bonds, which means that there are few studies analysing the effects of these purchases. The studies that have been carried out since the pandemic show that the Riksbank's purchases probably contributed to a fall in the risk premiums on covered bonds. According to Alsterlind (2021), risk premiums fell after the Riksbank's purchases were announced, although it is not possible to say with certainty that this change was due to the Riksbank's purchases.

There are also foreign studies showing that the purchase of covered bonds affects the risk premiums on bank funding in other jurisdictions. For example, Krishnamurthy and Vissing-Jørgensen (2011) show that the Federal Reserve's purchases of mortgage-backed securities (MBS) during the 2008-2009 global financial crisis contributed to lower risk premiums for both MBS and corporate bonds. Lower risk premiums on MBS in turn contributed to banks lowering their mortgage rates.

An event study estimates the impact

We analyse how well the Riksbank's purchase of covered bonds passed through to Swedish mortgage rates by performing an event study.⁵ More specifically, we compare covered bond rates the day before and the day after the Riksbank published information about the purchases. We then use this announcement effect in a panel regression to see what the impact is on mortgage rates a number of months after the event. We also undertake several robustness checks, including using estimated risk premiums on covered bonds instead of the change in interest rates, and these are presented in the appendix. We obtain similar results to our main analysis.

Impact on covered bond rates

We study how the interest rate payable on covered bonds changes for the seven institutions included in the Riksbank's asset purchase programme when the Riksbank announces its intention to make purchases.⁶ Our study period extends from March 2020

⁴ For an account of how asset purchases can affect financial prices, see, for example, Gustafsson and von Brömsen (2021) and Di Casola (2021).

⁵ Event studies capture the effects that operate exclusively through pricing and generally follow the approach of the study by Fama et al. (1969), who make three critical assumptions: (i) the event is unexpected; (ii) there are no other factors affecting the asset prices being studied; (iii) the markets are efficient. See also Kuttner (2001), Chochrane and Piazzesi (2002) and Nakamura and Steinsson (2018).

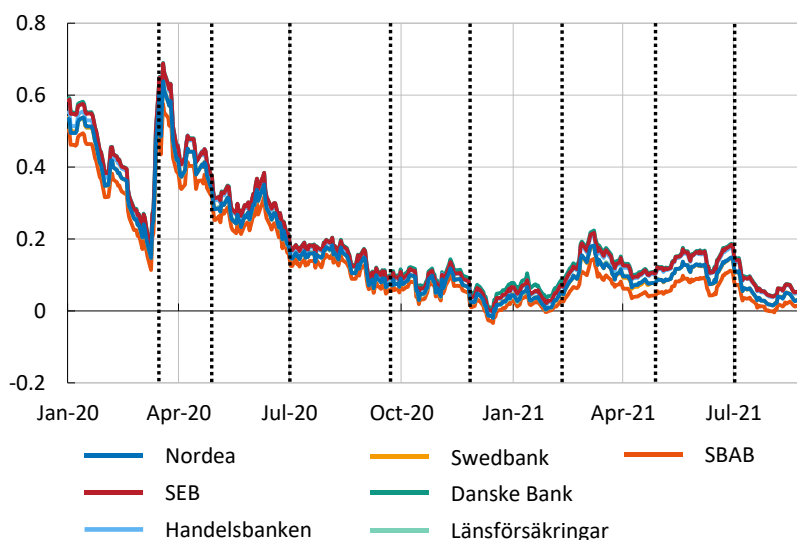
⁶ The Riksbank's purchases include only covered bonds with high credit-ratings issued in Swedish kronor by Swedish institutions. This means that the Riksbank has purchased so-called benchmark bonds from seven

to the monetary policy decision in July 2021, which means that we examine a total of eight purchase announcements by the Riksbank. We assume that the news about the Riksbank's purchases dominated developments in the covered bond market on the days when they were announced. How rates change during the day can therefore give an indication of how large the impact was.⁷

Chart 3 and Table 1 show the development of rates on covered bonds maturing in 2024 issued by the seven largest institutions in Sweden.⁸ We can see that almost all rates fell on the days the Riksbank announced information about its purchases to the market. Unsurprisingly, we see that the announcement had the greatest effect on 17 March 2020, i.e. the day after the Riksbank first announced its purchases. Rates then fell by just under twelve basis points. We also see the second largest effect in connection with the monetary policy decision in November 2020, when the Riksbank decided to expand and extend the purchases. Rates then fell by just over three basis points.

Chart 3. Rates on institutions' covered bonds maturing in 2024

Per cent



Note. The black dotted lines refer to the dates when the Riksbank announced that it would purchase covered bonds (see Table 1).

Sources: Bloomberg and the Riksbank.

credit institutions (Danske Bank, Nordea, SEB, Swedbank, Länsförsäkringar, SBAB and Handelsbanken (Stadshypotek)) whose bonds account for around 90 per cent of the outstanding loan stocks in Swedish kronor. The announcements include a nominal total amount and a date range for making purchases.

⁷ By assuming that the Riksbank's announcement about the purchase of covered bonds was not expected by the market, we can assume that the rates on these bonds changed during the announcement day as a result of this news. The change in rates during this day is thus considered exogenous.

⁸ See Table 1 for the Riksbank's publications containing information on the purchases of covered bonds. If we look at the change in covered bond rates at the time of the Riksbank's monetary policy decisions before the pandemic, the changes are small compared to those reported in Table 1.

Table 1. The effect of the Riksbank's announcement on covered bonds maturing in 2024 issued by the seven institutions

Date	Type of announcement	Nordea (18 Sep 2024)	SEB (18 Dec 2024)	SHB (12 Mar 2024)	Swedbank (18 Sep 2024)	Danske Bank (18 Dec 2024)	LF (18 Sep 2024)	SBAB (18 Dec 2024)
16 March 2020	Publication about purchases of covered bonds	-11.8	-11.9	-11.9	-11.8	-11.7	-11.5	-12
28 April 2020	MPR	-0.5	-0.4	-0.4	-0.6	-0.4	-0.5	-0.1
1 July 2020	MPR	-1.8	-2.5	-2.4	-1.8	-2.4	-1.8	-1.8
22 September 2020	MPR	-0.1	-0.1	-0.2	-0.2	-0.1	0.3	0.1
26 November 2020	MPR + announcement of extension and extended purchases	-3.3	-3.5	-3.5	-3.3	-3.5	-3.3	-3.2
10 February 2021	MPR	-0.4	-0.5	-0.6	-0.5	-0.5	-0.2	0
27 April 2021	MPR	-0.2	-0.4	-0.3	-0.3	-0.2	-0.3	-0.1
1 July 2021	MPR	-2.5	-2.6	-2.7	-2.6	-2.6	-2.5	-2.4

Note. Changes refer to the difference in basis points between the closing price on the day of announcement and the closing price on the previous day. See Sveriges Riksbank (2020) and Sveriges Riksbank (2021) for more information on the purchases of covered bonds and other monetary policy decisions taken by the Executive Board of the Riksbank on these dates. MPR is an abbreviation for the Riksbank's Monetary Policy Report. The dates in brackets refer to the maturity dates of the bonds.

Sources: Bloomberg and the Riksbank.

There are at least two likely explanations for why the effect of the March 2020 monetary policy decision was greater than that of the November 2020 decision. First, the November decision was less of a surprise to the market than the March decision.⁹ Second, covered bond rates were lower in November than in March and the purchases are less likely to have an effect when rates are already at low levels.

⁹ See Gustafsson (2022) for a discussion of how well the market's expectations matched what the Riksbank announced.

The impact on mortgage rates

We utilise the announcement effect above when we examine whether the Riksbank's purchases of covered bonds have a significant effect on mortgage rates. We expect the impact of lower funding costs on mortgage rates to happen with a lag. Therefore, we use a method called *local projection*, which is a panel regression that allows us to quantify what the impact of the purchases on mortgage rates looks like over time.¹⁰ We perform the following model estimation for each h month ahead (where $h =$ one to twelve months):

$$y_{j,t+h} = \alpha_i + \beta_1^h y_{j,t-1} + \beta_2^h \Delta i_{j,t} + \beta_3^h S_{j,t} + \beta_4^h FinCost_{j,t-1} + \beta_5^h Bank\ control_{j,t-1} + \beta_6^h Macro\ control_{t-1} + \gamma_j + \epsilon_{j,t+h} \quad (1)$$

where $y_{j,t+h}$ is bank j 's interest rate on new and renegotiated mortgages for h months after the event, $\Delta i_{j,t}$ is the announcement effect of bank j 's interest rate on covered bonds maturing in 2024 (see Table 1), $S_{j,t}$ is bank j 's issued covered bonds expressed as a share of the bank's total assets in Sweden and used as a control for the amount of covered bonds the bank uses in its funding and, $FinCost_{j,t}$ represents the bank's short-term funding sources and is estimated by the difference between the three-month Stibor and the Riksbank's policy rate.¹¹ The variables *Bank control* and *Macro control* refer respectively to bank-specific and macro control variables with a one-month lag that may also affect banks' mortgage rates.¹² The coefficient γ_j indicates a bank-specific fixed effect. The effect of the Riksbank's purchases of covered bonds on mortgage rates is given by the coefficient β_2^h .

We use data on new and renegotiated mortgage contracts from SCB's Financial Market Statistics, the subset of the seven institutions' issued covered bonds maturing in 2024, and their outstanding stock of covered bonds.¹³ Mortgage rates are broken down into interest-rate fixation periods equal to or less than three months (variable rate) and between one and two years (fixed rate). The time period in our estimate is from January 2017 through August 2021.

¹⁰ See Jordá (2005) for a description of the method.

¹¹ We also estimate the model when $FinCost_{j,t}$ is approximated with only the three-month Stibor. We then get similar results as shown in Chart 4 (see Chart 7 in the appendix).

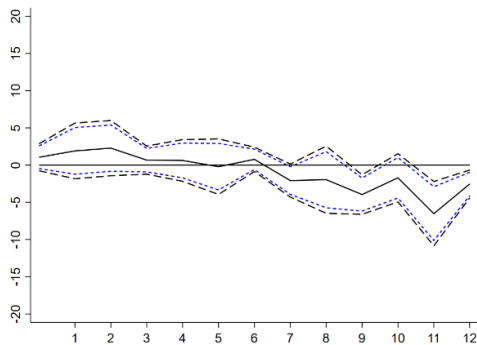
¹² We use net interest margin (NIM) and return on equity (ROE) as bank control variables. GDP growth and the interest rate on a three-month treasury bill are used as macro control variables.

¹³ Approximately 60 per cent of the bonds purchased by the Riksbank have a repayment (maturity) date between 2023 and 2025. In order to follow the development before and during the pandemic, it is necessary to examine bonds that had already been issued in 2020. All institutions have issued bonds in 2020 or earlier that have a repayment date in 2024. See Alsterlind (2021) for more information.

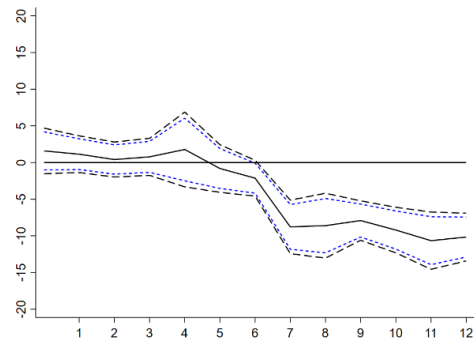
Chart 4. Estimated impulse response for mortgage rates with interest-rate fixation periods of ≤ 3 months and between 1 and 2 years

Basis points

Mortgage interest rate with an interest-rate fixation period of ≤ 3 months



Mortgage rate with an interest-rate fixation period of between 1 and 2 years



Note. The lines are the impulse response h months ahead for mortgage rates when the Riksbank's announcements about purchases of covered bonds reach the market. The market reaction to the announcement (the shock) is calibrated to correspond to a 10 basis point decline in the covered bond rate. The blue broken lines are 90-percent confidence intervals and the black broken lines are 95-percent confidence intervals. The change is in basis points.

Source: The Riksbank.

In Chart 4 we can see what the effect is on mortgage rates when the rates on covered bonds fall by ten basis points in connection with the Riksbank's announcements about purchases of covered bonds (the model's impulse response). The horizontal axis running from zero to twelve shows how many months have passed since the shock occurred. The vertical axis shows the effect of the change on mortgage rates.

As we can see in Chart 4, the effect on both variable and fixed mortgage rates tends to occur at least six months after the Riksbank publishes information about its purchases of covered bonds. Variable mortgage rates fall by about two basis points and the effect is statistically significant at the five-percent significance level nine months after the shock. The fixed mortgage rate falls slightly earlier and by more - about ten basis points in total - than the variable mortgage rate. This result is statistically significant at a five-percent significance level from six months after the shock. This result also shows that it is mainly mortgage rates with longer fixation periods that are affected in the short term when covered bond rates change.¹⁴

The effect on mortgage rates disappears when estimating without the announcement on 16 March 2020 and the monetary policy decisions in April and November 2020, suggesting that these particular announcements drive the results.

¹⁴ See Eidestedt et al (2020).

Conclusions

In this Economic Commentary, we have conducted an event study to examine whether and how the Riksbank's purchases of covered bonds have affected Swedish mortgage rates. Admittedly, it is difficult to separate the impact of the Riksbank's actions from other measures implemented during the pandemic. Nevertheless, our results indicate that the Riksbank's purchases contribute to a fall in mortgage rates, but that it takes at least six months for this to happen. The purchases have the fastest and largest effect on mortgage rates with a fixation period of between one and two years. The effect is somewhat later and weaker for variable mortgage rates.

References

- Alsterlind, Jan (2021), "The development of risk premiums on covered bonds during the coronavirus pandemic", *Economic Commentaries* No 13, Sveriges Riksbank.
- Cochrane, John H. and Monika Piazzesi (2002), "The fed and interest rates-a high-frequency identification", *American economic review*, 92(2), pp. 90-95.
- Di Casola, Paola (2021), "What does research say about effects of central bank balance sheet policies?", *Economic Commentaries* No 2, Sveriges Riksbank.
- Eidestedt, Richard, Forsman, David and Emre Ünlü (2020), "The funding of the major Swedish banks and its effect on household mortgage rates", *Economic Commentaries* No 8, Sveriges Riksbank.
- Fama, Eugene F., Lawrence Fisher, C. Jensen, Michael and Richard Roll (1969), "The Adjustment of Stock Prices to New Information", *International Economic Review*, vol. 10, no. 1, pp. 1-21.
- Gustafsson, Peter (2022), "An event study of the effects of asset purchases on financial prices during the pandemic", *Staff memo*, Sveriges Riksbank.
- Gustafsson, Peter and Tommy von Brömsen (2021), "Coronavirus pandemic: The Riksbank's measures and financial developments during spring and summer 2020" *Economic Review No. 1*, pp 51–88, Sveriges Riksbank.
- Jordà, Òscar (2005), "Estimation and inference of impulse responses by local projections", *American Economic Review*, 95(1), pp. 161-182.
- Krishnamurthy, Arvind and Anette Vissing-Jørgensen (2011), "The effects of quantitative easing on interest rates: channels and implications for policy", *National Bureau of Economic Research*, (no. w17555).
- Kuttner, Kenneth N. (2001), "Monetary policy surprises and interest rates: Evidence from the Fed funds futures market", *Journal of Monetary Economics*, 47(3), pp. 523-544.
- Nakamura, Emi and Jón Steinsson (2018), "High-frequency identification of monetary non-neutrality: the information effect", *The Quarterly Journal of Economics*, 133(3), pp. 1283-1330.
- Sveriges Riksbank (2020), "Account of Monetary Policy", Sveriges Riksbank.
- Sveriges Riksbank (2021), "Account of Monetary Policy", Sveriges Riksbank.

APPENDIX - Robustness test

Swedish banks convert their fixed funding cost into a variable one in order to match the interest rate on variable-rate mortgages.¹⁵ In this way, they reduce the interest rate risk arising from the fact that the covered bond rate is fixed and the mortgage rate is variable. Banks therefore convert the fixed rate on covered bonds into a three-month Stibor rate through a swap contract. The bank's financial cost at a variable mortgage rate can therefore be expressed as the three-month Stibor plus a risk premium linked to the covered bond. The risk premium in this case refers to the difference between the fixed rate of the bond and the swap rate.

An objection to the approach in our study could therefore be that our estimates of the announcement effect in Table 1 are not representative of the Swedish banks' funding cost when we estimate the impact on mortgage rates. An alternative way of identifying the Riksbank's announcement effect could therefore be not to look at interest rates in level as we do in Table 1 but instead to measure the difference between the bond's fixed interest rate and the swap rate (the so-called asset swap spread, ASW), i.e. an estimate of the risk premium.¹⁶ By using the ASW, we could, for example, control for the Riksbank's purchases of other bonds and, for example, changes in the Riksbank's operational framework.¹⁷

Table 2 therefore shows the evolution of ASW on covered bonds maturing in 2024 issued by the seven largest institutions in Sweden. Almost all ASW fell on the days the Riksbank published new information on its purchases of covered bonds. Similar to the results we obtain when we look at interest rates in level (Table 1), we find that the two largest effects occurred when the Riksbank first announced its purchases of covered bonds and at the time of the monetary policy decision in November 2020. When we then estimate this announcement effect based on changes in ASW, we obtain a similar impulse response for mortgage rates with the two different interest-rate fixation periods (see Chart 5).

Finally, a further objection to our estimates of the announcement effect could be that the Riksbank presented many other monetary policy measures at the same time. One way to check for this is to look at the change in the difference between the interest rate on bank-issued covered bonds and the five-year Swedish government bond rate. Using this estimate, we can control for information announced by the Riksbank that affected both government bonds and covered bonds. Our estimates show that the impulse responses for mortgage rates show similar patterns to our other results (see Chart 6). In Chart 7, we also show the results from the model when $FinCost_{j,t}$ consists of Stibor three months. We then get similar results as shown in Chart 4. The conclusions presented in our study would therefore hold even if we used these approaches.

¹⁵ See Eidestedt et al (2020).

¹⁶ ASW refers to the difference between the fixed rate of the bond and the swap rate.

¹⁷ The Riksbank announced the asset purchases during a period when the Riksbank's monetary policy operational framework was being reformed. This enabled cheaper funding (against collateral) at the Riksbank for the banks. This could explain part of the decline in covered bond rates.

Table 2. The Riksbank's announcement effect on the asset swap spread (ASW) of covered bonds maturing in 2024 issued by the seven institutions

Date	Form of announcement	Nordea (18 Sep 2024)	SEB (18 Dec 2024)	SHB (12 Mar 2024)	Swedbank (18 Sep 2024)	Danske Bank (18 Dec 2024)	LF (18 Sep 2024)	SBAB (18 Dec 2024)
16 March 2020	Publication about purchases of covered bonds	-7.7	-7.9	-6.9	-7.3	-6.9	-6.8	-7.4
28 April 2020	MPR	-1.3	0.0	-2.1	-1.5	-0.9	-3.9	-0.7
1 July 2020	MPR	-0.8	-1.5	-2.5	-1.7	-1.4	-1.6	-0.8
22 September 2020	MPR	-0.2	1.3	-0.6	-0.2	-0.9	-0.9	-0.3
26 November 2020	MPR + announcement of extended purchases	-2.3	-2.6	-2.5	-2.3	-2.6	-2.3	-2.3
10 February 2021	MPR	-0.5	-0.7	-0.4	-0.3	-0.0	-0.2	-0.3
27 April 2021	MPR	-1.2	-1.2	-0.6	-1.1	-0.5	-0.9	-0.1
1 July 2021	MPR	0.0	0.3	-0.5	-0.2	-0.5	0.0	-0.0

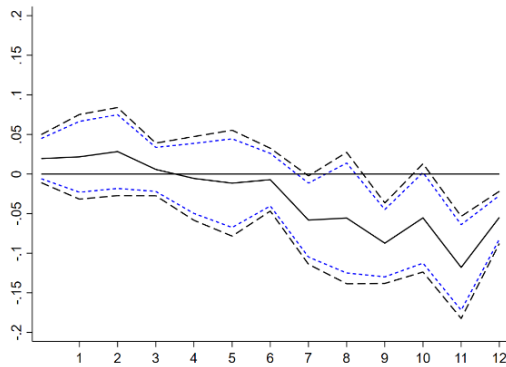
Note. Changes refer to the difference in basis points between the closing price on the day of announcement and the closing price on the previous day. See Sveriges Riksbank (2020) and Sveriges Riksbank (2021) for more information on the purchases of covered bonds and other monetary policy decisions taken by the Executive Board of the Riksbank on these dates. MPR is an abbreviation for the Riksbank's Monetary Policy Report. The dates in brackets refer to the maturity dates of the bonds.

Source: The Riksbank.

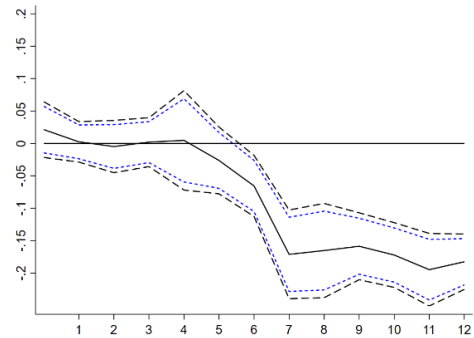
Chart 5. Estimated impulse response for mortgage rates with interest-rate fixation periods of ≤ 3 months and between 1 and 2 years

Basis points

Mortgage interest rate with an interest-rate fixation period of ≤ 3 months



Mortgage rate with an interest-rate fixation period of between 1 and 2 years



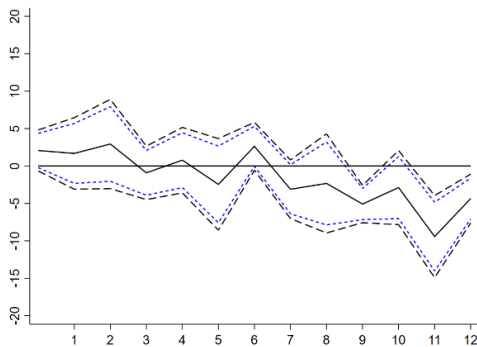
Note. Announcement effects are estimated based on changes in ASW. The lines are the impulse responses h months ahead for mortgage rates when the Riksbank's announcements on covered bonds positively surprise the market. The market surprise (shock) is calibrated to correspond to a 10 basis point decline in the covered bond rate. The blue broken lines are 90-percent confidence intervals and the black broken lines are 95-percent confidence intervals. The change is in points.

Source: The Riksbank.

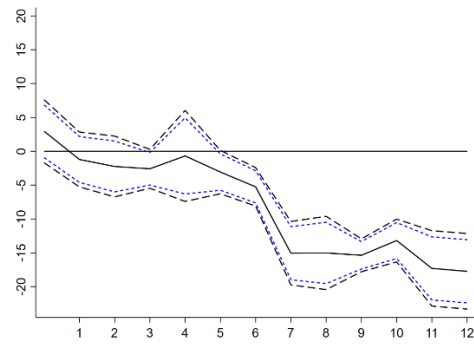
Chart 6. Estimated impulse response for mortgage rates with interest-rate fixation periods of ≤ 3 months and between 1 and 2 years

Basis points

Mortgage interest rate with an interest-rate fixation period of ≤ 3 months



Mortgage rate with an interest-rate fixation period of between 1 and 2 years

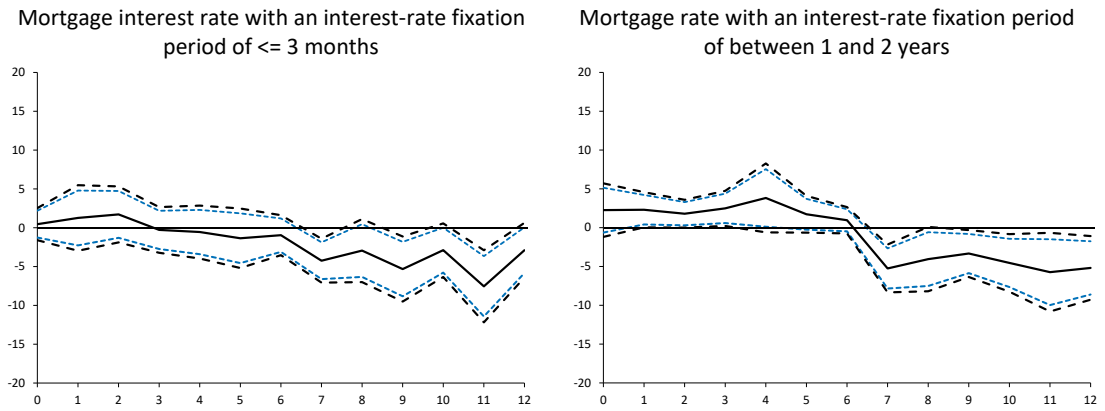


Note. Announcement effects are estimated based on changes in the difference between the bank's covered bond rate and the 5-year government bond rate. The lines are the impulse responses h months ahead for mortgage rates when the Riksbank's announcements on covered bonds positively surprise the market. The market surprise (shock) is calibrated to correspond to a 10 basis point decline in the covered bond rate. The blue broken lines are 90-percent confidence intervals and the black broken lines are 95-percent confidence intervals.

Source: The Riksbank.

Chart 7. Estimated impulse response for mortgage rates with interest-rate fixation periods of ≤3 months and between 1 and 2 years

Basis points



Note. The announcement effects are estimated using the same model as shown in equation 1 except that $FinCost_{j,t}$ is estimated using only Stibor three months. Announcement effects are estimated based on changes in the difference between the bank's covered bond rate and the 5-year government bond rate. The lines are the impulse responses h months ahead for mortgage rates when the Riksbank's announcements on covered bonds positively surprise the market. The market surprise (shock) is calibrated to correspond to a 10 basis point decline in the covered bond rate. The blue broken lines are 90-percent confidence intervals and the black broken lines are 95-percent confidence intervals.

Source: The Riksbank.



SVERIGES RIKSBANK

Tel. 08 - 787 00 00

registratorn@riksbank.se

www.riksbank.se

PRODUCTION SVERIGES RIKSBANK