

The yield curve and the Riksbank's signalling

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The Riksbank determines the repo rate with the aim of influencing the yield curve and thereby in turn economic activity and inflation. In this article we study to what extent the Riksbank's monetary policy signalling, that is to say, how future monetary policy intentions are communicated to market operators, may cause fluctuations in the yield curve. It appears that monetary policy signals from monetary policy speeches in particular, but also to some extent the minutes of Executive Board meetings and Inflation Reports, have influenced the short market rates. However, these effects are slight compared with the effects of changes in the repo rate. On the other hand, the monetary policy speeches appear to have had a greater effect than changes in the repo rate on the longer market rates. The role played by the speeches thus appears to have primarily entailed signalling monetary policy intentions in the slightly longer term. In addition, one can see that the speeches containing signals regarding a tightening of policy have had a much stronger effect on the yield curve than speeches signalling future interest rate reductions. As a result of this, the repo rate increases have influenced the market rates much less than the reductions. This can be interpreted as the Riksbank's monetary policy signalling being most effective when the repo rate is to be raised.

The importance of monetary policy signalling

Monetary policy aims to influence the economy and inflation through its effects on the yield curve. The size of the effect a central

Clear signalling can contribute to more predictable monetary policy.

bank has on interest rates is not merely dependent on the instrumental rate it sets; it is also related to how monetary policy decision-makers express their intentions in, for instance, speeches and inflation reports. Clear signalling can contribute to

greater predictability in monetary policy. This in turn diminishes uncertainty and reduces exaggerated fluctuations in the yield curve in connection with the central bank's interest rate announcement. It is therefore in the interest of the Riksbank that market expectations should gradually adapt to monetary policy intentions.

In this article we study the connection between monetary policy signalling and the Swedish yield curve, while taking into account the effects of other factors that influence interest rates.¹ To begin with, we describe the Riksbank's monetary policy process and different forms of signalling. Then we describe how one can construct a model of the Swedish yield curve. Following a report of the results obtained from the model, we conclude with a more in-depth analysis of the monetary policy speeches and report our conclusions.

The Riksbank's monetary policy process and signalling

The speeches fulfil an important function by signalling the decision-makers' interpretation of new economic information.

In an ideal world, where the central bank slavishly follows a simple monetary policy rule that is understood by the general public, there is no need for signalling. In this type of world the market operators know how the central bank will react and directly adapt their expectations when new macroeconomic outcomes are published. These expectations are expressed in the yield curve. In reality, monetary policy decisions are of course more complicated. The speeches fulfil an important function by signalling the decision-makers' interpretation of new economic information. A skilful communication of monetary policy intentions probably contributes to minimising the fluctuations in the yield curve when the announcement of a change in the repo rate is made.²

The channels for monetary policy signalling are speeches, inflation reports, repo rate decisions and separate minutes of monetary policy meetings.

Figure 1 provides a general and very simplified picture of the policy process at the Riksbank. At the point in time marked t_0 the Riksbank analyses macroeconomic outcome and presents its view of future inflation in speeches. At t_1 the Riksbank publishes a more complete

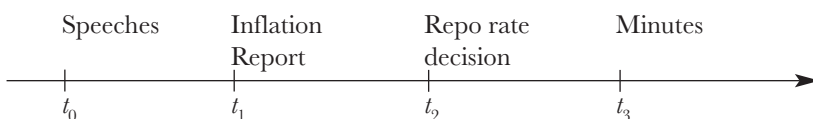
¹ See Andersson, Dillén & Sellin (2002). Earlier studies of monetary policy effects on the yield curve have been made by, for instance, Cook & Hahn (1989), Buttiglione, Del Giovane & Tristani (1997), Lindberg, Mitlid & Sellin (1997), Favero, Iacone & Pifferi (1996), Haldane & Read (2000), Kuttner (2001) and Evans & Marshall (1998).

² In line with this reasoning, Woodford (2001) points out that it may be inappropriate to measure the efficiency of monetary policy in terms of how large an effect on the yield curve is caused by the implementation of a change in the instrumental rate.



analysis of the available macroeconomic news, together with an explicit inflation forecast, in its Inflation Report. At t_2 the Executive Board reaches a decision on the interest rate at a monetary policy meeting. The announcement of the interest rate coincides sometimes with the publication of the Inflation Report. At t_3 the separate minutes of the monetary policy discussion at the meeting are published. These contain a detailed account of the Executive Board members' discussions and individual views expressed at the meeting. The channels for the monetary policy signals are thus speeches, Inflation Reports, repo rate decisions and minutes from monetary policy meetings.

Figure 1. The policy process at the Riksbank



The process described here has been simplified considerably, as we said, and has also changed over time. One important change took place on 1 January 1999 when

The new legislation applying from January 1999 entailed important changes in the Riksbank's signalling.

the new legislation came into force. This meant that it was no longer the Governor who made monetary policy decisions together with other members of the General Council, but a newly-appointed Executive Board. This Board consists of six members who have joint responsibility for ensuring that the Riksbank's overall objective, price stability, is attained. The new legislation also entailed important changes with regard to the Riksbank's signalling:

- The speeches that were held by the Governor and the then two deputy governors prior to 1999 comprised “pure” monetary policy signalling, while the speeches after this date more explicitly reflect the Executive Board members’ personal views of monetary policy. For this reason, the speeches could be considered to have had greater effect on the yield curve prior to 1999. Similarly, monetary policy could have been perceived as clearer then, as the Governor and two deputy governors had greater insight into future changes in the instrumental rate then and they did not primarily express individual opinions.
- Prior to 1999 monetary policy conclusions were discussed in the Inflation Report and, if necessary, an announcement concerning the repo rate came after the Report was published. With effect from 1999, the Inflation Report reflects more a majority view of future inflation and there are no concrete mon-

etary policy conclusions. The repo rate is announced in a separate press release at the same time as the Inflation Report is published.³ All in all, this may have contributed to the publication of the Inflation Report having less effect on the yield curve after 1999, primarily with regard to interest rates with short durations. On the other hand, the Inflation Report is now more detailed than it was before and also contains a quantitative risk assessment that can give some indication of monetary policy in the longer term.

- The new Executive Board introduced the system of monetary policy meetings, which take place eight to ten times a year. The separate minutes of these meetings are published with a two to three week delay. The minutes, like the speeches and Inflation Reports, can contain indications of future monetary policy changes that affect market operators' expectations as expressed in the yield curve.⁴

Model for the Swedish yield curve

In the model fluctuations in the yield curve are explained by unexpected monetary policy signalling.

To enable us to examine how monetary policy signalling affects expectations of future short interest rates, we have constructed a model in which each variable is stated, where possible, in terms of deviations from the expected value. We thus imagine that unexpected fluctuations in the Swedish yield curve are influenced by *unexpected monetary policy signalling*. *Deviations in the notified repo rate in relation to the expected change in the repo rate, unexpected outcomes for important domestic macro statistics, fluctuations in the international yield curve and unexpected changes in domestic market conditions* are also included as explanatory variables in the model.⁵

Fluctuations in the Swedish yield curve are represented in our model by the weekly change in nominal rates for treasury bills with 90 and 360 days duration respectively and for treasury bonds with two and five years duration respectively. To obtain the unexpected component in the change, we make some adjustment to the nominal rates.⁶

³ With regard to the press release, we have only used information on how the repo rate level determined relates to the level expected by market operators immediately prior to the decision. Many press releases also contain signals regarding future monetary policy intentions. However, we have not taken these into account in our study.

⁴ This conclusion is also reached by Gerlach-Kristen (2001) for the Bank of England.

⁵ A more detailed and technical description of the model is given in Andersson, Dillén & Sellin (2002).

⁶ The expected weekly change in market rates is in most cases very slight, so the correction is also slight. However, with regard to interest rates with short durations, the correction can have some importance; see Andersson, Dillén & Sellin (2002).

UNEXPECTED MONETARY POLICY SIGNALLING

The signalling variables in the model consist of the Riksbank's inflation forecast two years ahead in relation to the inflation target of 2 per cent, the speeches held by members of the Executive Board and a minority view indicator that shows a possible deviating opinion from one or more members with regard to a decision on the instrumental rate.

The inflation forecast is expressed as the mode, or most probable outcome, for inflation two years ahead. It should be added that

Signalling in the Inflation Report is via the inflation forecasts.

the main aim of the Inflation Report is to provide a foundation for the decision on the repo rate taken by the Executive Board in connection with the publication of the report, rather than to contribute further monetary policy signals.

The classification of the speeches has been achieved through the following subjective, two-stage process. The first stage entails selecting the speeches that contain a monetary policy message.⁷ We then create an indicator variable for these speeches and give it a value of 1 (–1) if the speech signals a more stringent (more expansionary) monetary policy and 0 if monetary policy is considered well-balanced. In a second stage we determine whether the speech can be said to have given rise to a change in the yield curve that is *not expected* by the market. This is done by studying the slope of the yield curve in terms of the difference between the interest rate on a 30-day treasury bill and the repo rate for the week prior to the speech. A new indicator variable is created on the basis of the earlier indicator variable and expectations. The new variable can take the value 1 (–1) in two cases: if the speech signals tightening (more expansionary) policy while the slope of the yield curve during the week before the speech was held was less than 5 (greater than –5) basis points or if the speech signals that the repo rate will be retained unchanged while the yield curve has a negative (positive) slope of 5 basis points or more. This procedure can be illustrated by the following example: Governor Urban Bäckström's speech on 8 November 2000 contained a message regarding tighter monetary policy (stage one), which was not expected by the market operators according to the definition above, as the slope of the yield curve was less than 5 basis points (stage two). On the other hand, the message regarding tighter monetary policy in the speech held by Deputy Governor Lars Heikensten the following week, on 17 November, was expected, as the yield curve had already taken on

The signalling effect of the speeches depends on the slope of the yield curve.

7 Members of the Executive Board also make speeches not concerning monetary policy. These are not included here.

a positive slope as a result of Urban Bäckström's speech the previous week. We thus do not classify the Heikensten speech as one containing unexpected monetary policy signals.

The minority variable reflects the Executive Board members' possible reservations against decisions on the instrumental rate.

The minority variable reflects the Executive Board members' possible reservations against decisions on the instrumental rate. These reservations can be seen in the minutes of the monetary policy meetings. The variable is defined as the deviation between the Executive Board's average wish to change the instrumental rate and the actual change in the rate. A positive (negative) value for the variable can thus be interpreted as the average preferences with regard to the repo rate among the members of the Board signalling a more stringent (expansionary) monetary policy than the majority of the members desire. If, for example, one member of the Executive Board advocates an unchanged repo rate while the other members advocate an increase of 0.25 percentage points, the minority indicator is given the value $-0.04 (= (1/6 * 0 + 5/6 * 0.25) - 0.25)$. Here it may be worth noting that the publication of the minutes does not have the purpose of signalling future monetary policy in the same way as, for instance, the speeches, but is aimed at increasing transparency with regard to monetary policy decision-making.

DEVIATIONS BETWEEN EXPECTED AND ACTUAL CHANGES IN THE INSTRUMENTAL RATE

The model is supplemented with the unexpected change in the repo rate.

In addition to the signalling variables above, the model is supplemented with the unexpected change in the repo rate. This is measured as the deviation between the change in the repo rate and the expected change in the repo rate. An unexpected repo rate decision can in many cases be perceived as a signal of long-term monetary policy intentions. A decision not to change the repo rate can also be unexpected, but in this case it is less likely that it contains any long-term monetary policy signals. We therefore make a division between unexpected decisions to change the repo rate and unexpected decisions to retain the rate unchanged. The expected future repo rate is approximated with a two-week forward rate the week prior to the publication of the repo rate decision.

SURPRISING DOMESTIC ECONOMIC NEWS

Unexpected outcome for CPI and GDP also affects the yield curve.

Economic news is added to the model in terms of deviations between actual and, according to Reuters' surveys, expected out-

come for the Swedish consumer price index (CPI) and the Swedish gross domestic product (GDP). The variables are expressed as annual percentage inflation rate and growth rate respectively. We could of course also include other variables, but these two types of macro data are considered the most important determinants for future inflation.

FLUCTUATIONS IN THE INTERNATIONAL YIELD CURVE

The Swedish yield curve is, of course, affected to a large degree by fluctuations in the international yield curve. In the model, these are represented by changes in nominal interest rates with durations corresponding to the

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Swedish ones. We have construed the international rate as a weighted average of estimated effective zero coupon rates for Germany, the UK and the USA.⁸ Unexpected fluctuations in the international yield curve can be said to reflect economic information abroad that deviates from the expected as well as changes in global market conditions.

UNEXPECTED CHANGES IN DOMESTIC MARKET CONDITIONS

Fluctuations in the yield curve that are not captured by the variables for monetary policy signalling, actual changes in the interest rate, unexpected macroeconomic results or international interest rate fluctuations can often

Changed domestic market conditions are expressed as changes for a ten-year forward rate towards other countries.

be connected to changes in domestic market conditions, such as the demand for liquidity or portfolio effects. During periods of financial unease, such as in 1998, investors wish to transfer their portfolio holdings from Swedish to foreign bonds, which increases the spread towards foreign long interest rates. Changed domestic market conditions are expressed as changes for a ten-year forward rate towards other countries.

In the study we use weekly data from 16 April 1996 to 25 September 2001. This time period is limited historically by two factors. Firstly, it is difficult to find suitable measures of expectations for inflation and growth further back in time than 1996. Secondly, Swedish interest rates were high and unstable during the first half of the 1990s, which is connected with the credibility problems faced by the Swedish economy. To make it easier to interpret the results, we have avoided

⁸ The effective zero coupon rate is the annual rate for a bond adjusted for coupon dividends.

including data prior to 1996. For both Swedish and international interest rates we use effective zero coupon rates that are, with few exceptions, listed on Tuesdays. One week thus stretches from the final listing on one Tuesday to the final listing on the following Tuesday.

Results from the model

The model, with the variables we have described, shows a number of interesting results. These are reported in Table A1 in the appendix.⁹ Most of the policy-related variables have significant and intuitively interpretable effects on interest rates with short durations. Some of the signalling variables also have effects on longer durations.

Future monetary policy actions are already largely discounted when the Inflation Report is published.

The effects of the publication of the inflation forecasts proves to be so slight that there is reason to believe that coming monetary policy actions have already been largely discounted when the Inflation Report is published. No effects on interest rates can be seen in the attempts to take into account the quantitative risk assessment made in the Inflation Report.¹⁰ The greatest effect of the Inflation Report appears to be on one-year rates, which indicates that it primarily contains signals of monetary policy intentions beyond the immediate decisions.

The minority indicator only appears to affect interest rates with short duration.

On the other hand, the minority indicator appears only to affect interest rates with short duration. This indicates that the minority view to some extent cause market operators to adapt their expectations regarding the decisions at the next few monetary policy meetings.¹¹

Unexpected signals from the monetary policy speeches prove to have significant effects, not merely in the short term, but also on the entire yield curve. In addition, speeches are the only one of the policy variables that has an effect on

⁹ Andersson, Dillén & Sellin (2002) report the time-delayed (lagged) effects of different variables. These effects are, with few exceptions, slight and statistically insignificant and are therefore not shown here.

¹⁰ There are also other reasons why it is difficult to measure signalling effects from the publication of the Inflation Reports. Publication has often coincided with the press release containing the monetary policy decision and it is difficult then to extract a signalling effect from the Inflation Report. Nor is it possible to exclude the possibility that the speeches held immediately prior to publication have prepared the market operators for the information then given. The analysis is also obscured by the fact that we do not know the expected value of the inflation forecast, which means that this variable contains some measurement error.

¹¹ However, this variable is also measured with some error as we do not have access to the market operators' expectations of a minority outcome.



the five-year rate. The result indicates that speeches have as great an effect on long rates as an unexpected change in the repo rate of approximately 30 basis points, which is a considerable effect. To some extent this is

Unexpected signals from monetary policy speeches prove to have significant effects on the entire yield curve.

due to the fact that the speeches often contain a discussion of monetary policy in the longer term. However, one cannot rule out the possibility that a large part of the effect of the speeches on the yield curve can be explained by a few individual speeches preceding economic turnarounds and thereby shifts in the direction of monetary policy. A tentative conclusion is, nevertheless, that speeches comprise the variable with the strongest signalling effects to the market with regard to long-term monetary policy intentions.

It is clear from the results that the repo rate decisions, despite the monetary policy signalling, have not usually been completely discounted. The decisions appear to lead to the market revising its view of monetary poli-

Despite the monetary policy signalling, repo rate decisions have not usually been completely discounted.

cy for the near future. This is shown by the effect on the three-month treasury bills. In addition, one should bear in mind when interpreting Table A1 that unexpected changes in the repo rate are generally relatively large, around 20 basis points. This emphasises the impression that monetary policy signalling has not contributed to any great extent to making monetary policy more predictable in the short term. However, the effect of unexpected changes in the repo rate declines with the length of the duration and for durations of two years or more the effect of speeches is equally large. This is natural as the aim of the interest rate decision is primarily to implement monetary policy and not to signal long-term monetary policy intentions.

The total impression is that changes in the repo rate only to a limited extent cause market operators to revise their monetary policy expectations in the longer term, but that in the short-term perspective, operators are sometimes surprised by when interest rate changes occur. In this context, we would point out that the economic significance of delaying a change in the repo rate is relatively slight, given that the long-term monetary policy intentions remain the same. For this reason, it is easy that differing opinions arise as to *when* the repo rate should be adjusted. This is occasionally also visible in the minutes of the monetary policy meetings.

The announcement of an unchanged repo rate only has an effect on short rates. Although market operators sometimes appear to be surprised by a ‘wait

and see' interest rate policy, these 'non-decisions' do not appear to be interpreted as indications of the long-term monetary policy direction.

With regard to the results for the non policy-related factors, a number of observations can be made.¹² The economic information proves to have limited effect on the long Swedish interest rates. Judging by the size, the effects do not support the idea of the Riksbank reacting mechanically to outcomes for Swedish GDP and CPI according to any simple monetary policy rule. The economic news can be expected to also influence expectations via speeches, depending on how the members of the Executive Board interpret the new information. If, for instance, an unexpectedly strong GDP growth could be associated to an increase in productivity rather than an increase in demand factors, one can expect limited effects on monetary policy and market rates. The effect of unexpected fluctuations in the international yield curve is relatively slight with regard to short durations. On the other hand, international fluctuations appear to be the dominant factor with regard to interest rates with longer durations. A possible monetary policy-related explanation is that shocks on an international level, in line with the increasingly internationally co-ordinated business cycles, would affect the long-term monetary policy direction in several countries in a similar manner, while short-term monetary policy measures could only to a minor extent be connected to foreign policy intentions. Unexpected changes in domestic market conditions can also explain to some extent the fluctuations in the Swedish yield curve.

Closer analysis of the monetary policy speeches

With regard to interest rates with a duration of up to one year the effect of speeches that within three weeks are followed by a change in the repo rate will be slightly greater than the effect of other speeches.

Given the significance of the monetary policy speeches in the monetary policy process, it may be interesting to analyse the effects of the speeches in greater depth.¹³ An analysis of the speeches can be structured in many different ways. One way is to select the speeches that were followed within three

weeks by a change in the repo rate, as these speeches can be assumed to contain monetary policy messages to a greater extent than the others. The result shows,

¹² See Table A1 in the appendix.

¹³ Coefficients for the other variables are not reported in this section, as they are largely the same as the estimates in Table A1.



as expected, that the effect of these speeches is slightly greater with regard to interest rates with a duration of up to one year.¹⁴

A division of the Governor's speeches into before and after 1 January 1999 shows whether or not the effect of the speeches has become less with the establishment of the Executive Board and the consequently less clear channel for 'pure' monetary policy signalling for individual Board members. However, the result does not support the theory that the Governor has greater difficulty in communicating monetary policy messages after the establishment of the Executive Board – rather the opposite.¹⁵

The results do not support the theory that the Governor has greater difficulty in communicating monetary policy messages after 1999.

A third division shows, somewhat surprisingly, that speeches with an unexpected message of tighter monetary policy have had a much stronger influence on the yield curve than speeches with an expansionary monetary policy message.¹⁶ On the other hand, it appears that unexpected decisions of a lower repo rate have had a much greater effect than the corresponding unexpected decisions to raise the interest rate.¹⁷ This indicates that investors have had problems in perceiving signals regarding lowering interest rates and that these therefore came as a surprise when they were put into practice. However, we cannot rule out the possibility that there is an asymmetric confidence effect, that is to say, that a raise in the interest rate leads to a lower nominal rate via lower inflation expectations, but not vice versa. The result can also be connected to the fact that most interest rate reductions since 1996 have gone against the long-term trend; the rate has been lowered when the repo rate has been below its long-term level. It is also possible that an asymmetrical effect arises if market operators demand a premium as they expect the repo rate to be raised to guard against capital losses in connection with surprise raises in the repo rate.

Speeches with an unexpected message of tighter monetary policy have had a much stronger influence on the yield curve than speeches with an expansionary message.

¹⁴ See panel A in table A2 in the appendix.

¹⁵ See panel B in table A2 in the appendix.

¹⁶ See panel C in table A2 in the appendix.

¹⁷ See table A3 in the appendix.



Asymmetrical effect of monetary policy signalling

The Riksbank's intention is to use changes in the instrumental rate to influence the yield curve and thereby the economy and inflation. Monetary policy signalling fulfils an important function by preparing market operators for coming decisions on the repo rate and in this way reducing uncertainty regarding future monetary policy.

Monetary policy signalling has only to a very limited extent contributed to making monetary policy more predictable in the short term.

However, the signalling increases in relative significance with regard to the longer market rates.

signalling has only contributed to a limited extent to making monetary policy more predictable in the short term. However, monetary policy signalling increases in relative significance with regard to the effects on longer market rates, which is more important from an economic perspective. Monetary policy speeches appear to have as great an influence as actual changes in the repo rate with regard to interest rates with a duration of two years or more. This reinforces the impression that the main role of the speeches has been to signal monetary policy intentions in the slightly longer term.

Signalling of future interest rate raises appears to have had greater effect than signalling of a future lowering of the rate.

The market has had greater difficulty in perceiving signals of future repo rate reductions in speeches than signals of future increases. This could be one explanation why the reductions in the repo rate have had a much greater effect on the yield curve than increases in the repo rate. Signalling of future increases thus appears to have been more effective than signalling of future reductions.

The total impression is that monetary policy signals, primarily from speeches, but to some extent also from minutes of monetary policy meetings and Inflation Reports, has influenced the Swedish yield curve. The effects on short durations are slight compared with the effects of unexpected changes in the repo rate. This indicates that the monetary policy

The market has had greater difficulty in perceiving signals of future repo rate reductions in speeches than signals of future increases. This could be one explanation why the reductions in the repo rate have had a much greater

Appendix

The result of the estimates for interest rates with four different durations, one three-month rate, one one-year rate, one two-year rate and one five-year rate, are shown in tables A1, A2 and A3.

The equations have been estimated with the use of SUR (seemingly unrelated regression estimator). GDP refers to actual minus expected annual percentage change in the gross domestic product, CPI refers to actual minus expected annual change in the consumer price index, REPO is the announced change in the repo rate minus the expected change, NOREPO refers to the REPO where no change has been announced, REPORT is the inflation forecast two years ahead minus 2 percentage points, SPEECH is a dummy variable that indicates the person holding the speech's stand on monetary policy, MINUTES reflects the minority view in connection with a change in the repo rate as expressed in the minutes of the Executive Board's monetary policy meeting, R* is the change in the international rate with the same duration as the dependent variable and RDIFF is the change in the spread between domestic and foreign forward rates.

Table A1. Effect on the yield curve of economic information, monetary policy and market factors

Variable	Treasury bill, 3-month	Treasury bill, 12-month	Treasury bond, 2-year	Treasury bond, 5-year
Constant	-0.006 (1.624)	-0.004 (0.873)	-0.004 (0.766)	-0.003 (0.567)
GDP	0.014 (0.766)	0.036 (1.530)	0.058 (2.059)	0.063 (2.162)
CPI	0.037 (1.048)	0.151 (3.452)	0.157 (2.960)	0.085 (1.555)
REPO	0.589 (9.940)	0.341 (4.642)	0.268 (3.014)	0.127 (1.390)
NOREPO	0.856 (3.096)	0.192 (0.562)	-0.175 (0.422)	0.094 (0.219)
REPORT	0.064 (0.850)	0.161 (1.723)	0.136 (1.203)	0.104 (0.890)
SPEECH	0.043 (3.111)	0.054 (3.124)	0.056 (2.661)	0.038 (1.779)
MINUTES	0.342 (1.631)	0.039 (0.151)	0.085 (0.271)	0.223 (0.687)
R*	0.234 (4.896)	0.305 (7.496)	0.420 (11.128)	0.632 (15.950)
RDIFF	0.028 (1.345)	0.125 (4.867)	0.158 (5.057)	0.119 (3.682)
R2/R2 adjusted	0.407/0.367	0.350/0.306	0.372/0.329	0.471/0.435

Note. Coefficients that are significant at a 10-per cent level are shown in bold. t-values are given in brackets.

Table A2. Alternative methods for measuring unexpected signals from speeches

Variable	Treasury bill, 3-month	Treasury bill, 12-month	Treasury bond, 2-year	Treasury bond, 5-year
A. Effect from speeches held during the three weeks prior to a change in the repo rate				
SPEECH	0.047 (1.781)	0.076 (2.366)	0.056 (1.447)	0.030 (0.744)
R2/ R2 adjusted	0.386/0.344	0.334/0.288	0.360/0.317	0.471/0.435
B. Effect from speeches made by the Governor prior to and after 1999				
SPEECH (prior to 1999)	0.067 (2.935)	0.047 (1.672)	0.022 (0.655)	-0.007 (0.186)
SPEECH (after 1999)	0.061 (2.305)	0.105 (3.214)	0.124 (3.136)	0.052 (1.275)
R2/R2 adjusted	0.410/0.365	0.362/0.313	0.383/0.336	0.477/0.437
C. Effect from speeches with unexpected tightening or expansionary monetary policy signals				
SPEECH- tightening	0.0944 (4.706)	0.091 (3.651)	0.116 (3.835)	0.116 (3.736)
SPEECH- expansionary	-0.002 (0.117)	0.020 (0.822)	0.001 (0.048)	-0.031 (1.058)
R2/R2 adjusted	0.433/0.389	0.360/0.311	0.389/0.342	0.494/0.455

Note. Coefficients that are significant at the 10-per cent level are shown in bold. t-values are stated in brackets.

Table A3. Effect of unexpected increases and reductions in the repo rate

Variable	Treasury bill, 3-month	Treasury bill, 12-month	Treasury bond, 2-year	Treasury bond, 5-year
Repo rate increase	0.571 (5.559)	0.084 (0.671)	-0.049 (0.323)	-0.049 (0.306)
Repo rate reduction	0.604 (8.052)	0.479 (5.223)	0.436 (3.946)	0.220 (1.916)
R2/R2 adjusted	0.413/0.368	0.363/0.315	0.385/0.338	0.474/0.433

Note. Coefficients that are significant at the 10-per cent level are shown in bold. t-values are stated in brackets.

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