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Signalling the Future Path of Monetary Policy

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Abstract

In this paper we proxy expectations about the course of future monetary policy using media data and test the effectiveness of central bank communication in guiding these. Our results indicate that central bank communication significantly influences media reports in the aftermath of the monthly press conference.

preliminary and incomplete

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1 Introduction

Market participants use the interest rate decision as well as the communication of the central bank to infer the future path of monetary policy. Very recent studies like Ehrmann und Fratzscher (2009) and Brand et al. (2006) explore the importance of the press conference relative to the announced interest rate decision for guiding the markets. Monitoring market interest rates, they find that information provided by the press conference is even more relevant than the implication of the announcement of the interest rate decision.

This study draws conclusions on the relative importance of these instruments by employing a different way of measuring expectations. Commonly, changes in future market instruments or changes in the slope of the yield curve have been utilized to track the impact of central bank actions and infer the future path of policy making. However, measuring expectations via market movements leaves room for interpretations and these effects are often short-lived. Thus, it seems sensible to consider alternatives.

We infer the expectations of the public by surveying media releases printed one respectively two days after the ECB's press conference. In a survey of a random sample of the U.S. population, Blinder and Krueger (2004) identify television and newspapers as the two most important sources of economic information. That the ECB receives great attention by the media can be taken from the study by Berger et al. (2006b). In the media echo, journalists write about how the interest rate decision of the ECB and the communication of the ECB has to be interpreted and what this implies for the upcoming future. As accumulating and interpreting all information is costly, it is rational for the public to assimilate the judgment that is relevant for their expectations formation from a reliable and cheap source: the media.¹

The analysis is structured in the following way. Section 2 describes the data and the econometric methodology used. Section 3 presents the results while section 4 concludes.

¹Sims (2003) argues that information processing is costly and thus agents are rationally inattentive.

2 Data and Methodology

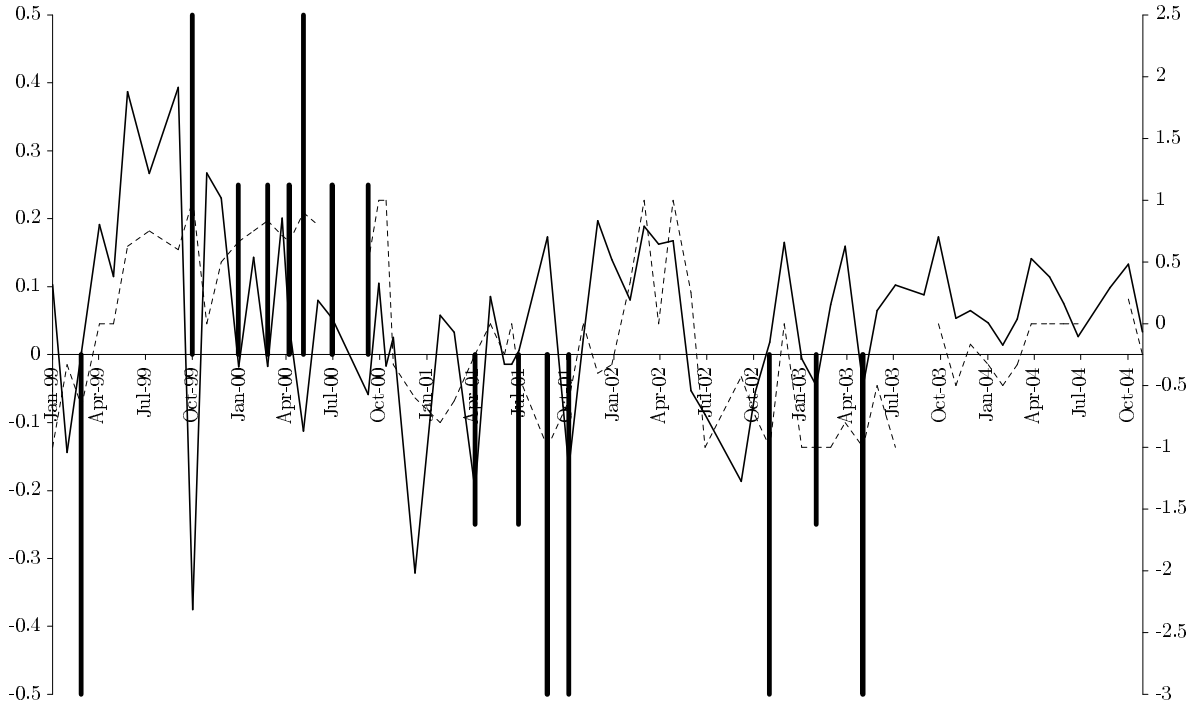
The new expectations measure is based on data kindly provided by **Mediatenor**, a media research institute. **Mediatenor** surveys and codes all media articles dealing with the past interest rate decision and the policy relevant assessment of the ECB published one respectively two days after a central bank meeting. They capture whether the authors of the article expect the ECB to perform a tightening or loosening policy as a next step. The coding is based on articles extracted from the **Financial Times Europe** (FTE). Our dependent variable is calculated as the difference of the share of articles expecting an upcoming tightening monetary policy and those expecting a loosening monetary policy in the future. We name this variable “Expectations”. On average we capture slightly more than ten articles dealing with the ECB monetary policy in the aftermath (1-2 days) of a meeting.

The communication indicator is taken from Berger et al. (2006a). It monitors the risk to price stability, e.g. a rising indicator means that the ECB’s assessment of the economic situations implies a higher risk to price stability. This indicator can be disaggregated into three policy-relevant topics and is able to capture the risk to price stability stemming from the real sector, the monetary sector as well as developments related to prices.

Figure 1 depicts our expectations indicator together with the communication indicator and the interest rate change. We observe a strong comovement between our expectations indicator and the ECB communication indicator. This implies that expectations of the public are adjusted according to the tone of the ECB communication. Moreover, both seem to lead the interest cycle. Thus, there is evidence that ECB is preparing the public.

In order to make some valid statements about the importance of the signal we employ further variables to condition on. A surprise measure for the interest rate surprise is taken from the **Reuters** survey of professional forecasters. Interest rate decisions deviating from

Figure 1: Interest Rate Changes, ECB Communication and Expectations



Bars are changes in the main refinancing rate of the ECB; the dashed line represents the expectations concerning the next interest rate step; the solid line and the right-hand scale denote the ECB communication indicator.

the professionals forecast should indeed be a surprise to the markets. They should trigger an significant adjustment to expectations.

euro-area CPI denotes the euro average Harmonized Index of Consumer Prices as published by Eurostat. We create a dummy variable indicating whether the euro area inflation overstepped the announced target rate and a second variable if inflation was within the band.

Market uncertainty is measured as the standard deviation of the three month ahead interest rate expectations as delivered by Consensus Economics. If the banks are not sure about the current state of the economy their expectations of the interest rate should be

more disperse. If professionals are not sure about the state of the economy the ECB as well as the public might be subject to this uncertainty as well.

As we want to tackle this issue econometrically, we employ the following setup:

$$Exp_t = \alpha + \beta \Delta c_t^j + \gamma \Delta c_t^i + \varepsilon_t, \quad (1)$$

where Exp_t denotes our proxy for the public's expectations with respect to the next interest rate decision given the information set available today. c_t^i is the announced interest rate decision and c_t^j with $j = a, p, m, r$ represents the communication of the central bank with respect to prices (p), monetary aggregates (m), the real sector (r) and an overall assessment (a) in the introductory statement. Note that t relates to the meeting in each month. To make the coefficients comparable we standardize the explanatory variables. We do this by normalizing each variable.

As we are dealing with a dependent variable that is bounded between $[-1, 1]$, ordinary least squares (OLS) might be inappropriate. It has to be taken into account that if Exp_t is bounded, the marginal effect of any particular explanatory variable cannot be constant throughout its range. Furthermore, the predicted values of the OLS regressions cannot be guaranteed to lie within the unit interval. The problem becomes severe if a substantial mass of the distribution is located close to the bounds.

If the dependent variable $y \in (0, 1)$ – which is an affine transformation to our case $y \in (-1, 1)$ – one could simply model the log-odds ratio as

$$E \left(\log \left[\frac{y}{(1-y)} \right] | X \right) = X\beta.$$

However, this is not an option as our variable takes on the values at the bounds $[-1, 1]$. In order to circumvent inference problems we follow Papke and Wooldridge (1996). First, we have to re-scale our variable to fit into the interval $[0, 1]$ using the formula $\hat{y} = (y - \bar{y}) / (\bar{y} - \underline{y})$,

where $y \in [\underline{y}, \bar{y}]$. Afterwards we estimate the equation using the Bernoulli log-likelihood function given by

$$l_i(b) = \hat{y}_i \log[G(x_i b)] + (1 - \hat{y}_i) \log[1 - G(x_i b)],$$

where $G(\cdot)$ is the logistic function. β will be obtained by maximizing

$$\max_b \sum_{i=1}^N l_i(b).$$

The Bernoulli quasi-maximum likelihood estimator (QMLE) is a consistent and asymptotically normal estimator *regardless* of the distribution of y . To test the for necessity of using the QMLE estimation method Papke and Wooldridge (1996) propose the Ramsey (1969) RESET test. Applying this test using OLS to the first regression on our communication indicator as well as the interest rate decision as explanatory variables the RESET test rejects the null hypothesis that the powers of the fitted dependent variable are insignificant at the 5% confidence level.²

3 Results

First, we analyze the impact of the communication indicator and its different sub-dimensions in conjunction with the interest rate movements. Table 1 depicts the results. Column (1) reveals that both instruments affect the expectations of the future interest rate path of the public. Moreover, we find that the interest rate decision has similar power to guide markets as the communication signal as both coefficient estimates have a similar magnitude. In that respect deeds do not necessarily matter more than words. Monitoring and interpreting intraday movements in the EUR-\$ exchange rate Ehrmann and Fratzscher (2009) as well as Brand et al. (2006) and Conrad and Lamla (2007) find a similar result.

²F-test(3,58)=3.19; Prob>F=0.03

Table 1: Signalling – Topics and Surprises

	(1)	(2)	(3)	(4)	(5)	(6)
Δi	1.052*** (0.213)	0.984*** (0.183)	1.008*** (0.176)	0.984*** (0.161)		
Δ Comm All	1.021*** (0.338)				0.707* (0.406)	0.698* (0.415)
Δ Comm prices		0.623** (0.274)				
Δ Comm money			0.254 (0.264)			
Δ Comm real				0.512 (0.317)		
MedianSurp					0.289 (0.203)	
MeanSurp						0.285* (0.171)
Constant	-0.272* (0.157)	-0.233 (0.153)	-0.212 (0.156)	-0.213 (0.154)	-0.196 (0.154)	-0.194 (0.157)
Obs.	64	64	64	64	64	64

Robust standard errors in parenthesis; ***/**/* denote the 1/5/10%-significance level

Columns (2), (3) and (4) investigate the relevance of the topic communicated. In line with very recent studies like Lamla and Rupperecht (2006), Conrad and Lamla (2007) as well as Ehrmann and Fratzscher (2009) we confirm that the ECB's assessment of price developments matters most. Moreover, congruent with Berger et al. (2006a) we show that communication on the monetary aggregates is, relative to statements on prices, of minor importance. These observations seems reasonable. Romer and Romer (2000) provide evidence in favor of an information advantage of the Federal Reserve in forecasting real output growth and inflation. This type of asymmetric information may also likely be present for the ECB.

Columns (5) and (6) investigate whether the interest rate signal is mainly driven by market surprises (news). Contrary to often reported significant responses to surprises, we find that they only marginally affect expectations. A explanation could be that sur-

prises increase the uncertainty about the future interest rate path and thus are associated with lower or insignificant coefficients while anticipated decisions mainly reinforce ex-ante expectations.

The relevance of the signals might also strongly depend on the economic situation. To analyze the stability of the estimated coefficients we condition on situations where inflation is above the target level or not, on the position within the interest rate cycle, on the type of the interest rate change and on market uncertainty. Table 3 summarizes the results. Columns (1), (2) and (3) show the estimated coefficients conditional on the level of inflation. We can observe that communication is most relevant if inflation is within the target range as compared to a situation where inflation is above. If inflation is above the limit of close but below 2% it should be straightforward that the ECB will do what is necessary to fight inflation. As this counter-reaction is expected, journalists may attach less importance to further information provided in the introductory statement. If, contrary to that, inflation is within the band they listen carefully as the upcoming policy action is less obvious as in the latter scenario.

Column (4) filters out events where no interest rate change occurred. As the interest rate variable drops, people rely solely on central bank communication. Consequently communication gains importance and the estimated coefficient value almost doubles. One could expect that “no change” happens in a phase of a gradual adjustment process (inertia) or in a time where the interest rate level matches the target interest rate level. In both scenarios people have a greater incentive to listen carefully in order to predict and prepare for the next adjustment in the interest rate.

Column (5) investigates the response to positive relative to negative interest rate changes. First, we can observe that the communication coefficient increases dramatically. Second, we detect a significant asymmetry in the adjustment to an announced interest rate change. The response to a positive interest rate change is much more pronounced compared

to a negative interest rate change. It seems that rising risk to inflation in combination with a positive interest rate change are a clearer signal to the public. This might rest in the hawkishness of the ECB, which shows strong commitment to fight inflation.

The last column accounts for market uncertainty. Although the interaction terms are not statistically significant at conventional levels, we observe that the coefficient estimates with respect to a change in the interest rate as well as a change in the communication indicator increase substantially in their magnitude. Thus, if markets are stable and if uncertainty is modest, the signalling is more effective. This is a remarkable result. One could have also argued that the ECB should have incentives to guide markets in turbulent times. However, this appears to be not true. One reason for this may be that the ECB is reluctant to provide information about future interest rate steps as it itself cannot distill the future path of the economy much better than the market participants and wants its credibility not to put at risk.

4 Conclusions

In this study we investigate how the ECB guides the expectations of the public. Via a novel approach we are able to infer how much weight the public places on the interest rate signal relative to the communication signal when it comes to predicting the next interest rate decision of the monetary authority. We proxy expectations by the judgement transmitted by media releases. As it is costly for the general public to evaluate the monetary policy decision by themselves it is likely that they update their expectations by reading newspapers. We conclude that both instruments are important tools to guide market expectations. Nevertheless, the interest rate signal outperforms. However, not as much as one could expect. While the interest rate signal is significant in *all* specifications, its impact is not necessarily bigger than that of the communication signal. Thus and in line with, for

Table 2: Signalling – Conditioning Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	$EUCPI < 2$	$EUCPI > 2$	$EUCPI$	$\Delta i = 0$	$\Delta i < 0 \vee \Delta i > 0$	Δi vola
Δ Comm All	1.141*** (0.369)	0.900 (0.842)	0.592 (0.708)	1.557*** (0.367)	1.119*** (0.325)	1.935*** (0.711)
Δi	1.100*** (0.312)	0.974*** (0.257)	0.925*** (0.242)			2.126** (0.873)
vola*Comm						-0.270 (0.183)
vola*i						-0.306 (0.213)
$\Delta i < 0$					-1.429** (0.558)	
$\Delta i > 0$					2.828*** (0.559)	
step						
step*Comm						
step* Δi						
highinf*Comm			0.239 (0.388)			
highinf* Δi			0.629 (0.789)			
Constant	-0.181 (0.238)	-0.163 (0.226)	-0.289* (0.161)	-0.348** (0.169)	-0.289* (0.160)	-0.345* (0.177)
Obs.	33	25	64	50	64	64

Robust standard errors in parenthesis; ***/**/* denote the 1/5/10%-significance level

instance Ehrmann and Fratzscher (2009), we find new evidence that not necessarily deeds matter more than words.

With respect to communication, especially information with respect to price developments seems to be of major importance. Moreover, at the beginning of the interest rate cycle as well in a situation where no interest rate change took place central bank communication via the introductory statement becomes an important ingredient in expectation formation. Notably, surprises, as measured by the difference between the interest rate change and the figures delivered by the Reuters survey of professional forecasters, have only a low informational value. A surprise might immediately disturb the precision of the expectations of the public or may result in a situation of substantial state uncertainty. Overall, we get some compelling result shedding light on the driving forces of expectation formation in monetary policy.

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