

CESifo Venice Summer Institute

19 - 24 July 2010



“CENTRAL BANK COMMUNICATION, DECISION-MAKING AND GOVERNANCE”

to be held on **23 - 24 July 2010**
on the island of San Servolo in the Bay of Venice, Italy

Writing Clearly: ECB's Monetary Policy Communication

Ales Bulír, Martin Cihák and Katerina Smídková



Writing Clearly: ECB's Monetary Policy Communication

Prepared by Aleš Bulíř, Martin Čihák, and Kateřina Šmídková¹

June 2010

Abstract

The paper presents a methodology for measuring the clarity of central bank communication, illustrating it with the case of the European Central Bank (ECB). The analysis identifies the ECB's written communication as clear in about 95 percent of instances, which is comparable to, or better than, similar results available for other central banks. We also find that the additional information on individual inflation factors and especially projection risk assessment contained in the ECB's Monthly Bulletins helps to improve communication clarity compared to ECB's press releases. In contrast, the Bulletin's communication on monetary developments has a negative, albeit small, impact on clarity.

JEL Classification Numbers: E31, E43, E58

Keywords: Monetary policy, Communication, European Central Bank

Authors' E-Mail Addresses: abulir@imf.org; mcihak@imf.org; katerina.smidkova@cnb.cz

¹ Bulíř and Čihák are with the International Monetary Fund (IMF); Šmídková is with the Czech National Bank (CNB). The views presented in this paper are those of the authors and do not necessarily represent those of the IMF or the CNB. The authors would like to thank Helge Berger, Michael Ehrmann, Wolfgang Gerke, Felix Hammermann, Alex Mourmouras, Emil Stavrev, and Bernhard Winkler for useful discussions, and participants in IMF and ECB seminars for insightful comments, and Michael Lamla for sharing the KOF data. Research assistance by Radu Păun is gratefully acknowledged. All remaining errors are those of the authors.

[...] by studying the ECB's statements about its assessment and outlook of economic conditions, we can obtain a better understanding about its conduct of monetary policy than is possible by solely estimating empirical reaction functions.

Stefan Gerlach (2007)

WRITING CLEARLY: ECB'S MONETARY POLICY COMMUNICATION

I. INTRODUCTION

This paper presents a novel approach to measuring the clarity of the monetary policy message, using the European Central Bank (ECB) as an example. The dramatic increase in monetary policy communication in the past two decades or so has been justified by benefits of policy transparency (Geraats, 2002, Čihák, 2007). Most of the empirical literature on central bank communication has focused either on quantitative measures of monetary policy transparency, such as the volume of information, or short-term effects of central bank announcements, with much less attention paid to the overall clarity of the communication. In our view, large volumes of information disclosed in real-time are of little use if they have the potential to confuse the intended recipients. The contribution of the paper is twofold: first, we add clarity as a crucial dimension of central banks' communication and apply the measure to the ECB case and, second, we extend the analysis of ECB's communication to the more analytical *Monthly Bulletin* in addition to previously researched press releases.

ECB's monetary policy has been subject to considerable scrutiny and "ECB watching" has become an industry in itself.² The ECB sees communication as an important part of its toolkit (ECB, 2004), providing a fertile ground for empirical analysis (de Haan, 2008), including

² The annual "ECB Watchers' Conference" organized by the Center for Financial Studies in Frankfurt, brings together academics, analysts, and policymakers to discuss euro area monetary policy (<http://www.ifk-cfs.de>).

communication clarity (Winkler, 2000). The ECB's monetary policy regime is unique in having a two-pillar approach to setting monetary policy: the first ("economic analysis") pillar monitors a range of data and using various models to produce short-to medium-term inflation projections for the euro area; the second ("monetary") pillar pays attention to monetary developments, which are assumed to play a role in determining medium- to long-term inflation (ECB, 2000 and 2004).

To analyze the clarity of the ECB's communication, we follow Bernanke and Woodford (1997) and Svensson (1997) in assuming that inflation projections and the monetary policy (inflation) target are the main explanatory variables of policy interest rates. To this end, we use the methodology introduced by Guthrie and Wright (2000), Šmídková and Bulíř (2007), and Bulíř and others (2008) that analyzes the various measures of risks attached to the central inflation projection (the projection risk) that the public can derive from central bank communication. The projection risk measure provides additional information to the public, improving the understanding of monetary policy decisions.

The information on the projection risk is necessary when the monetary policy decisions are complex and a policy rule fails to explain the moves in the policy rate. The public is able to understand monetary policy only if the key documents send a coordinated message identifying the projection risk that explains why the interest rate path deviates from that identified by the policy rule. In such a case, we would call monetary policy communication *clear*. In the opposite case, when the messages are uncoordinated, we would call monetary policy communication *confusing*. If monetary policy communication is confusing, it hampers transparency, even if large amounts of information are being disclosed.

There are various ways to extract projection risk measures from the key documents. For example, one can count words typically associated with upward or downward projection risk (Heinemann and Ullrich, 2007 and Rosa and Verga, 2007). Our approach goes further by encompassing additional resources—we analyze all verbal assessments of inflation factors (both in ECB’s press releases and *Monthly Bulletin*), including those coming from the second, monetary pillar. We also analyze the explicitly mentioned overall projection risk and transform these assessments into numerical representation of the inflation projection risk. Clear policy communication is achieved when the various communication tools (the inflation projections, monetary policy target, and verbal assessments contained in the key documents) are consistent with the policy rate changes.

Our main finding is that during 1999–2007,³ the ECB’s communication was clear in about 95 percent of cases and that the clarity improved in 2003–2007 as compared to 1999–2002. This compares favorably with other central banks using the same methodology (Šmídková and Bulíř, 2007 and Bulíř and others, 2008). On the one hand, additional information tends to be good for clarity—overall, the ECB’s *Monthly Bulletin* improves clarity as compared to relying on press releases only. On the other hand, additional information may create scope for confusion: while the bulletin information on inflation factors improves clarity and so does an explicit description of the projection risk, the usefulness of its discussion of monetary developments is less clear; in fact, this seems to reduce clarity slightly. The ECB’s communication policy has been appropriate, however: putting more emphasis on an explicit

³ To keep the analysis contained, we focus on the period preceding the global financial crisis. During the crisis, the core part of ECB’s policy framework remained unchanged, but important enhancements have been made, placing an increased premium on clear communication (e.g., to distinguish liquidity management and monetary policy stance). For an analysis of ECB’s policies in the crisis, see Čihák, Harjes, and Stavrev (2009).

description of the projection risk and less emphasis on the monetary pillar may have improved the understanding of monetary policy decisions.

The paper is ordered as follows. Section II provides an overview of the literature, section III explains the methodology and data, section IV presents the results, and section V concludes.

II. LITERATURE ON MONETARY POLICY COMMUNICATION

The impetus for central bank communication is “that transparency is not only an obligation for a public entity, but also a real benefit to the institution and its policies,” (Issing, 2005) and that transparent banks tend to achieve lower inflation (Geraats, 2009). While much of the information communicated by central banks is either noisy or imperfect (Morris and Shin, 2002, Woodford, 2005), the value of communicating detailed, yet imperfect information is ambiguous (Dale, Orphanides, and Österholm, 2008). Conveying a “more certain” information may improve the public’s understanding of monetary policy to the extent that clear communication “crowds out” noise generated by imperfect information.

The body of empirical literature on the quantity and timeliness of ECB’s communication is large (see Blinder and others, 2008 for a survey). The ECB staff evaluations of the ECB’s monetary policy strategy indicated that communication was “an area where the institutional and multilingual context of the euro area poses particular challenges,” and noting that one of the main purposes was to address “certain misunderstandings that had emerged in [the ECB’s] communication with the public” (ECB, 2003). The subsequent review of the ECB’s communications to the financial markets found a high level of predictability for its monetary policy decisions, comparable with other major central banks (ECB, 2006).

Measuring communication quality is naturally more difficult than measuring its quantity and most studies therefore asked an indirect question: does the ECB's communication help in predicting future monetary policy moves? Brand, Buncic, and Tutunen (2006) have found that the ECB's communication results in significant changes in the euro area money market yield curve, that is, market expectations of future monetary policy, and that these changes affect medium- to long-term rates. Jansen and de Haan (2007) have found some evidence of a negative relationship between the ECB's communication of risks to price stability (measured by the use of the keyword "vigilance") and changes in euro area inflation. Rosa and Verga (2007) focused on the ECB president press conferences, finding that the public generally understands and believes the ECB's signals. ECB (2007) has cited a trend towards lower market volatility on the short-term money market as an indication that the ECB's communication has improved over time. Jansen and de Haan (2009) have studied the link between the ECB's communication and predictions of its interest rate decisions, finding that communication-based models of policy rate changes do not outperform models based on macroeconomic data. Sturm and de Haan (2009) have reversed, however, that result by finding that the President's press conference introductory statement adds information that helps predict the next policy decision.

The focus of ECB's communication is still evolving as the ECB transitions from an institution stressing the information content of monetary aggregates to one that focuses on inflation projections. Gerlach (2007) have concluded that the ECB's Governing Council reacts to M3 growth, however, the impact of monetary developments is nonlinear. Berger, de Haan, and Sturm (2006) concluded that the ECB has paid diminishing attention to monetary analysis and its statements became more correlated with the inflation-projection analyses. Lamla and Rupprecht (2006) have argued—based on the analysis of high-frequency interest-

rate data—that financial markets have stopped paying attention to Governing Council communication regarding the monetary pillar altogether and react either to price news or economic analyses. Conrad and Lamla (2007) have shown that, based on the high-frequency response of the euro-U.S. dollar exchange rate, ECB information on price developments are considered news by foreign exchange market participants, but that the ECB's assessments of monetary developments are not. Coffinet and Gouteron (2007) have reported that long-term market rates react to M3 growth surprises, but short-term rates do not. Still, even if short-term, indicator properties of monetary aggregates are limited, they may be useful for medium-term inflation projections (Roffia and Zaghini, 2007; Hofmann, 2008).

A more direct approach to assessing the quality of central bank communication has been pioneered by Fracasso, Genberg, and Wyplosz (2003), who proposed the following three criteria for good central bank communication: clarity, consistency, and coverage of key issues (policy objectives, decision-making, analytical framework, input data, presentation of forecasts, evaluation of past forecasts and policies). The authors examined 19 inflation-targeting central banks, other than the ECB, finding a positive link between report quality and policy predictability. Closely aligned with this approach are the papers by Šmídková and Bulíř (2007) and Bulíř and others (2008) that assess clarity of monetary policy communication by analyzing numerical measures of projection risk that the public can obtain from various sources of central bank communication.

III. METHODOLOGY AND DATA

A. Communicating Clearly

Clear communication requires that the various communication tools send signals that are mutually consistent. On the one hand, the public would be confused if (i) the ECB did not change the policy rate, while (ii) the official inflation projection came out as (substantially) below the target, and (iii) the ECB press release dwelled on a downward inflation projection risk. On the other hand, confusion could be averted by either emphasizing pro-inflation factors or projection risks in the press release, that is, explaining why the policymakers decided to deviate from the policy rule. Of course, clarity of communication does not guarantee precision of the projection—actual inflation deviates from its projection because of unforeseen shocks that hit the economy in the interim. The following three events can occur with regard the clarity of monetary policy communication:

1. *Clarity, no shocks.* The ECB consistently communicates its policy response, inflation projection, and projection risk. No significant shocks occur afterwards. This is the most favorable outcome: the public understands well the policy response and forms inflation expectations appropriately, anticipating correctly the eventual inflation outcome.
2. *Clarity under shocks.* The ECB provides the same consistent communication as in the first case, however, post-projection, unanticipated shock(s) push inflation above or below the projection. These shocks may even push inflation in the opposite direction to that indicated in the projection risk communication. This is a less favorable outcome: the public is surprised by the inflation outcome, but it is still able to form inflation expectations. Owing to the ECB's consistent communication, it is understood that inflation deviated from the projection because of some unanticipated, temporary shocks.

3. *Confusion.* The ECB's inflation projection and policy rate point in different directions, while the policy documents send an inconsistent message vis-à-vis the projection risk. This is the least favorable outcome: the public is confused and fails to form meaningful inflation expectations.

B. Measuring Clarity: 4-Step Methodology

We analyze the clarity of ECB's communication by comparing the inflation projections, monetary policy target, monetary policy interest rate changes, and projection risk, all of which are readily available. The ECB uses a definition of price stability of "inflation below, but close to, 2 percent," regularly publishes inflation projections⁴ as well as various documents. We use two of these documents—the press release and *Monthly Bulletin*—to construct the *projection risk* variable encompassing verbally described inflation factors, monetary developments, and ECB's assessment of the inflation projection risk.

First step: the inflation projection and target

The public tries to understand monetary policy with the least effort possible. Initially, the public relies on the three main economic variables (the target, inflation projection, and policy rate) that are readily observable. If an analysis of these variables confirms that the ECB follows a policy rule, the public would form its inflation expectations using the ECB's inflation projection. The ECB let it be known that it would follow a forward-looking strategy of monitoring inflation, output gap, and so on (Gerlach and Smets, 1999) and, therefore, we expect the public measure the ECB's actions against a simple policy rule approximating such

⁴ The ECB inflation projection is conditional on the future interest rates path following the existing market expectations, bilateral exchange rates remaining unchanged, and fiscal policy following the national budget plans (ECB, 2004).

a strategy (King, 2005). Unfortunately, the variables such as the output gap are not readily available (Orphanides, 2001) and the public is likely rely on a simpler rule, such as that in which the policymaker reacts only to the inflation projection deviating from the target, both of which are real-time, readily available variables (Batini and Haldane, 1999):

$$i_t = \gamma i_{t-1} + (1 - \gamma) [\delta (\pi_{t+j}^{F,ECB} - \pi^*) + i^n], \quad (1)$$

where i_t is the policy instrument (the short-term nominal interest rate); $\pi_{t+j}^{F,ECB}$ denotes the ECB's inflation projection published quarterly at time t (we use $j=4$, that is, projection for 1 year ahead); π^* is the publicly announced price-stability target of about 2 percent; and i^n is a policy-neutral interest rate, equal to the sum of an equilibrium real interest rate and the policy target. The equilibrium real rate is assumed to be 2 percent, a typical number used in the literature on the euro area (Bernhardsen, 2005). The public extracts the policy rate-smoothing and inflation aversion coefficients, γ and δ , respectively, from ECB's decisions. After considering the available evidence (Appendix I), we set $\gamma = 0.7$ and $\delta = 5$ in the benchmark version of the rule and this parameterizations reflect the ECB's rate setting reasonably well (Figure 1). While the smoothing parameter is close what most empirical studies have found, the inflation aversion coefficient is higher, capturing the effect of the omitted output gap. The baseline calibration is such as to jointly minimize the statistical bias and mean square forecast error of the policy rate—lower values of δ quickly increase the statistical bias.

Figure 1

Second step: an implied projection update

If the policy rate decision corresponds to that implied by the rule (1), the public will not examine any additional information sources. If the policy rate decision contradicts the one

suggested by the policy rule, the public will look for clarification. In other words, a rule-contradicting rate change implies a different inflation projection. The rule-based inflation projection, $\pi_{t+j}^{F,RULE}$, can be obtained by rearranging (1):

$$\pi_{t+j}^{F,RULE} = \frac{\Delta i_t}{(1-\gamma)\delta} + \frac{i_{t-1} - i^n}{\delta} + \pi^*, \quad (2)$$

where $\pi_{t+j}^{F,RULE}$ measures what the public thinks inflation will be given the rule and the policy rate change effected by the ECB, Δi_t . The need for clarification is proportional to the difference between the above rule-based inflation projection and the official ECB inflation projection, $\pi_{t+j}^{F,ECB}$. We call this difference the *implied projection update* (2):

$$\pi_{t+j}^{F,RULE} - \pi_{t+j}^{F,ECB} = \frac{\Delta i_t}{(1-\gamma)\delta} + \frac{i_{t-1} - i^n}{\delta} - (\pi_{t+j}^{F,ECB} - \pi^*), \quad (3)$$

The public knows, of course, that the rule is an approximation of policymaking and is concerned only about large implied projection updates that indicate that the policymaker revised the original inflation projection with some additional information.

When to call the projection update “substantial”? This depends on the ex ante admitted uncertainty of the monetary policy decision making (Šmídková, 2005). For example, the December 2007 *Monthly Bulletin* said that “staff projections foresee annual inflation [...] to rise between 2.0% and 3.0% in 2008,” implying a central projection of 2.5 percent with a ± 0.5 percentage point confidence interval, that is, the ECB’s publicly admitted uncertainty of inflation projections in the 1-year projection horizon. Thus, the public will try to understand the reasons for the ECB’s inflation projections deviating from the rule by more than ± 0.5 percentage points and ignore smaller deviations. While the previous studies have used

1 percentage point as a threshold for the implied update for the emerging market economies (Šmídková and Bulíř, 2007; Bulíř and others, 2008), the 0.5 percentage point threshold corresponds to the much lower euro-area inflation volatility.

To assess the robustness of our calculations, we present the results for alternative parameterizations of the rule (Table 1). These include a higher inflation aversion parameter, a higher smoothing parameter, a higher sensitivity to shocks (the threshold for the implied projection update is halved), and lower emphasis on the inflation target (the ECB is set to react only to inflation projections higher/lower than the target by 0.75 percentage points).

Table 1

Third step: reading what the ECB says about inflation the projection risk

Substantial implied projection updates are to be explained verbally in monetary policy documents as descriptions of the projection risk (Bernanke and Woodford, 1997). To this end we construct a numerical approximation of the ECB's projection risk, ρ_t , from the verbal assessments of the inflation factors, monetary developments, and projection risk, relying on two documents: the introductory statement at the ECB's monthly press conference and the ECB's *Monthly Bulletin*.⁵ The introductory statement—known as “the principal vehicle of the ECB's communication” (ECB, 2007)—conveys the collective monetary policy decision of the ECB's Governing Council and reaches out to a wide audience through the media. The *Monthly Bulletin*—published monthly one week after the first meeting of the Governing Council—provides a more comprehensive analysis than the press releases, especially with

⁵ We exclude interviews and speeches by the members of the Governing Council from our analysis. Such exclusion may bias our results towards higher clarity, since previous research has suggested that such releases lower the market's ability to anticipate future path of interest rates (Ehrmann and Fratzcher, 2005).

respect to supply-side developments. While the verbal assessments from the press releases have been used in previous studies (Rosa and Verga, 2007 and Heinemann and Ullrich, 2007), the bulletins have been mostly ignored. To our best knowledge, the only other paper analyzing them is Gerlach (2007), who scrutinized the ECB's views on economic activity, realized inflation, and M3 growth on inflation. Overall, we used 108 press releases and bulletins from January 1999 to December 2007.

First, classifying the inflation factors in the ECB documents is labor intensive, requiring that each is catalogued into a supply, demand, or external environment factors (corresponding to the “economic analysis” pillar), and then classified as pushing the rate of inflation either higher (+1), lower (-1), or neutral (0), see Figure 2 for summary indicators. We gave each inflation factor an equal weight, because neither document provides information on the factors' quantitative importance and we wanted to avoid subjective judgments of the type made by Rosa and Verga (2007). Monthly observations were then averaged into quarterly frequency and aggregated to obtain the desired index-like measure of the projection risk. Two observations are worth noting. The balance of the factors has been clearly positive for most of the sample period, except for 2001–03 (Figure 2), indicating a pro-inflation projection risk. The inflation factors—with the exception of aggregate supply factors—have been serially correlated (Table 2).

Table 2

Second, the interpretation of the monetary pillar is less straightforward. Although the short-run implications of M3 growth should not be taken mechanically, ECB documents restated the usefulness of this indicator in understanding ECB's monetary policy (ECB, 2003 and 2004). Until the 2003 review of the ECB monetary policy framework (ECB, 2003) it was

understood that the rate of growth of M3 above/below the reference rate of 4.5 percent annually implies loose/tight monetary conditions in the medium to long run.⁶ Starting with the May 2003, the bulletins include a verbal statement of the following sort: “the monetary analysis confirms the prevailing upside risks to price stability at medium to longer horizons.” However, these statements have remained highly correlated with the M3 growth indicator and we therefore continue to use the M3 growth relative to the reference rate.

Figure 2

Third, explicit verbal assessments of downward or upward projection risk are summarized in the bulletin’s editorial, presumably encompassing both the economic and monetary pillars. A typical assessment thereof reads: “[...] the outlook for price developments remains [...] subject to upside risks”. The correlation between the projection risk and inflation factors (the economic pillar) was high, between 0.5 and 0.8, breaking only during the low-inflation period of 2001-2003, when the ECB communication did not mention downward risks to the inflation projection, despite the economic pillar signaling strong deflationary pressures.

Our estimates of the projection risk, ρ_t , are comparable to the alternative estimates. Our summary index is highly correlated, at 0.77 and 0.82, respectively, with the KOF Monetary Policy Communicator published by the Swiss Federal Institute of Technology in Zurich and the Rosa-Verga index of ECB President announcements (Table 3). These correlations also highlight the value added of the bulletins: the press releases, and therefore also the KOF and Rosa-Verga indexes, largely ignore the supply-side factors of inflation as they focus almost exclusively on demand factors.

⁶ From January 1999 to April 2003 the actual M3 rate of growth always exceeded the reference rate.

Table 3

Fourth step: does the projection risk explain the implied projection update?

The public views monetary policy communication as clear if the projection risk, ρ_t , matches the inflation projection update ($\pi_{t+j}^{F,RULE} - \pi_{t+j}^{F,ECB}$). For example, a positive inflation projection update is explained away by upward inflation factors or upward risks to the inflation projection, or both. If, however, the projection update and projection risk point in the opposite directions, the ECB communication is not clear, no matter how much information was disclosed in the process. As a result, the public is confused and does not know which inflation projection is relevant for expectation formation.

Clarity in communication ensures that the public understands the actions of the ECB and that it can form its inflation expectations effectively, however, it does not guarantee that the ECB is going to fulfill either the inflation target or the inflation projection. Other things being equal, inflation will differ from the projection by the cumulative shocks hitting the economy during the j projection periods:

$$\left(\pi_{t+j} = \pi_{t+j}^{F,RULE} + \sum_{t=1}^j \varepsilon_t \right). \quad (4)$$

C. Stylized Facts

To test our methodology empirically, we use the publicly-available harmonized consumer price index from the ECB and Eurostat. While the headline inflation frequently exceeded the 2 percent target, core inflation was subdued and inflation expectations remained stable

(Figure 3). The ECB inflation projections are constructed from the published midpoints of the projection range. The policy interest rate is the repo rate, measured at end-quarter.

Figure 3

The inputs for our methodology are summarized in Figure 4. The public uses the ECB's 4-quarter-ahead inflation projections (Chart I in Figure 4) and policy rate changes (Chart II) to derive an implied projection update (Chart III). Positive values of the update indicate that the public's expectations of inflation—conditional on the policy rule—are above the official ECB projection, $(\pi_{t+j}^{F,RULE} > \pi_{t+j}^{F,ECB})$. If the deviation is sizable, say, ± 0.5 , the public tries to match the projection update with corresponding inflation factors (Chart IV).

Figure 4

IV. RESULTS

We present our results in several steps, gradually adding more components to the estimate of the projection risk. We start with the press release; add inflation factors contained in the *Monthly Bulletin*, then the explicit verbal description of projection risk; and finally the monetary pillar. To assess the robustness of our findings, we present the results of each of these steps for different calibrations as defined in Table 1. The main results are summarized in Figures 5–8; and robustness checks are provided in Figure 9.

A. Press Statements

Assuming the public reads the press releases only, the ECB communication is found clear in about 85–95 percent of all cases and potentially confusing in the remaining 5–15 percent

cases, depending on the calibration used (Figure 5). The ECB communication appears the clearest when one assumes a high level of inflation aversion—this result holds for all calibrations (2) in Figure 5 to 8. Narrowing down the sample period to after mid-2003—following the 2003 clarification of the communication framework—the share of potentially confusing communication declines to 5 percent in the benchmark specification and 0 to 5 percent in the alternative specifications.

Figure 5

B. Monthly Bulletins: Inflation Factors

Additional details about inflation factors without the explicitly stated projection risks do not improve the understanding of the ECB vis-à-vis the press releases (Figure 6). In the benchmark calibration, communication is found clear in about 80 percent of all cases and potentially confusing in the remaining 20 percent. The alternative calibrations provide slightly worse results: 60–85 percent of clear cases and 15–40 percent of potentially confusing cases, respectively. The results imply that a more detailed inspection of the ECB projection process, in particular on the supply-side, failed to clarify the instances of ECB deviating from the policy rule.

Figure 6

C. Monthly Bulletins: Adding the ECB’s Description of the Projection Risk

The ECB’s explicit description of the projection risk significantly improves communication clarity vis-à-vis the two previous cases—clear in 95 percent of all cases and potentially confusing in only 5 percent of cases (Figure 7). In the alternative specifications, the communication is clear in 75–95 percent of all cases, and confusing in the rest. The results

suggest that a big part of monetary policy ambiguity can be eliminated by saying “we don’t know.” By observing the ECB’s projection risk—the policymaker’s uncertainty about the future—the public will understand and tolerate bigger departures from the rule than it would do otherwise.

Figure 7

D. Monthly Bulletins: Adding the Monetary Pillar

Lastly, adding information on the monetary pillar does little to improve the understanding of the ECB’s policymaking and may confuse the public (Figure 8). In the benchmark calibration, the results are comparable to those for the press release and for the inflation factors, Figure 5 and 6, respectively, that is, 80 percent of communication can be characterized as clear, while 20 percent has potential for confusion. However, the results for most of the robustness calibrations are worse than those without the monetary pillar and the communication is clear in only 60–85 percent of cases, and potentially confusing in 15–40 percent of cases. The monetary pillar information improves communication over the other information sets only if one assumes either higher inflation aversion ($\delta = 7$ rather than 5) or less attention to the inflation target.

Figure 8

E. When Might the Public Get Confused?

Based on the above, a reader could get a clear picture of ECB’s monetary policy based on reading either the *Monthly Bulletin* or the press releases augmented with the bulletin’s description of the projection risk. The results suggest that a part of potential confusion can be eliminated by explaining the projection risk, that is, the policymakers’ uncertainty about the

inflation projection. The monetary pillar communication did not improve the understanding of ECB's monetary policy, although the loss in clarity was not large. In all cases, the exact share of clear/confusing communication depends on the calibration of the rule.

The periods of potentially confusing communication are identifiable (Figure 9). First, using the baseline calibration and the inflation target of 1.8 percent, we find only one case of potentially confusing communication (Chart I): following the 2001q3 above-target projection, $(\pi_{t+j}^{F,ECB} - \pi^* = 0.3)$, the policy rate was lowered by 1 percentage point during the next four quarters, however, our indicator of the projection risk was close to zero (-0.33). Thus, the verbal assessments failed to explain the case for the rate cut. Second, should the public expect the ECB to react to smaller projection-to-target deviations, say, 0.25, the cases of confusing communication increase to four (Chart II). For example, in 2004q3 the ECB kept the rate unchanged despite the negative implied projection update and the verbal assessments were strongly biased toward pro-inflation factors (our indicator of the projection risk was equal to 2). Third, increasing the inflation target to 2.0 percent, the number of confusing cases declines to three (Chart III). Charts IV–IX show, similarly, the instances of potentially confusing communication for the various parameterizations described in Table 1.

Figure 9

V. CONCLUSIONS

The ECB's press releases and *Monthly Bulletins* help in understanding its monetary policy. Based on our analysis of the ECB's inflation projections, policy target, and verbal descriptions of the inflation factors and projection risk, and the monetary pillar, we conclude that the ECB's written communication has been fairly clear during 1999-2007, and instances

of potential confusion have been rare. The overall clarity is either comparable or higher than in other central banks for which similar analysis has been carried out.

The ECB's flagship publication, the *Monthly Bulletin*, contains additional information that helps improve clarity compared to ECB's press releases. In particular, the assessment of the projection risk improves clarity measurably. The bulletin's detailed information on individual inflation factors (demand, supply, and external) do not seem to matter for clarity as compared to the press releases. The bulletin's discussion of monetary developments seems to reduce communication clarity, although this negative impact on clarity is small.

The policy implication of our paper is that although the overall ECB's communication is mostly clear, some scope remains for improvements in clarity. Additional emphasis on explicit description of the projection risk in the press releases and the monthly bulletins could improve understanding, and so could less emphasis on the monetary pillar.

References

- Batini, Nicoletta, and Andrew G. Haldane, 1999, "Forward Looking Rules for Monetary Policy," In: *Monetary Policy Rules*, NBER Conference Report series. (Chicago and London: University of Chicago Press).
- Berger, Helge, Jakob de Haan, and Jan-Egbert Sturm, 2006, "Does Money Matter in the ECB Strategy? New Evidence Based on ECB Communication," CESifo Working Paper No. 1652. Available at: http://www.cesifo-group.de/~DocCIDL/cesifo1_wp1652.pdf.
- Bernanke, Ben, and Woodford, Michael, 1997, "Inflation Forecasts and Monetary Policy," *Journal of Money, Credit and Banking*, Vol. 29 (November), pp. 653–684.
- Bernhardsen, Tom, 2005, "The Neutral Interest Rate," Norges Bank Staff Memo, 2005/1 (Oslo: Norges Bank). Available at: http://www.norges-bank.no/upload/import/publikasjoner/staff_memo/memo-2005-01.pdf
- Blinder, Alan S., Michael Ehrmann, Marcel Fratzscher, Jakob De Haan, David-Jan Jansen, 2008, "Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence," *Journal of Economic Literature*, Vol. 46 (December), pp. 910–945.
- Brand, Claus, Daniel Buncic, and Jarkko Tutunen, 2006, "The Impact of ECB Monetary Policy Decisions and Communication on the Yield Curve," ECB Working Paper No. 657 (Frankfurt: European Central Bank). Available at: <http://www.ecb.int/pub/pdf/scpwps/ecbwp657.pdf>.
- Buliř, Aleř, Kateřina Šmídková, Viktor Kotlán, and David Navrátil, 2008, "Inflation Targeting and Communication: It Pays Off to Read Inflation Reports" IMF Working Paper No. 08/234 (Washington: International Monetary Fund). Available at: <http://www.imf.org/external/pubs/ft/wp/2008/wp08234.pdf>.
- Carare, Alina and Robert Tchaidze, 2005, "The Use and Abuse of Taylor Rules: How Precisely Can We Estimate Them?" IMF Working Paper No. 05/148 (Washington: International Monetary Fund). Available at: <http://www.imf.org/external/pubs/ft/wp/2005/wp05148.pdf>.
- Carstensen, Kai, 2006, "Estimating the ECB Policy Reaction Function," *German Economic Review*, Vol. 7, Issue 1, pp. 1–34.
- Čihák, Martin, 2007, "The Art and Science of Monetary Policy Communication," *Czech Journal of Economics and Finance*, Vol. 57, No. 11–12, pp. 490–8. Available at: <http://journal.fsv.cuni.cz/mag/article/show/id/1089>.
- Čihák, Martin, Thomas Harjes, and Emil Stavrev, 2009, "Euro Area Monetary Policy in Uncharted Waters" IMF Working Paper No. 09/185 (Washington: International Monetary Fund). Available at: <http://www.imf.org/external/pubs/ft/wp/2009/wp09185.pdf>.

- Coffinet, Jerome, and Sylvain Gouteron, 2007, Euro Area Market Reactions to the Monetary Policy Developments Press Release, ECB Working Paper No. 792 (Frankfurt: European Central Bank). Available at: <http://www.ecb.int/pub/pdf/scpwps/ecbwp792.pdf>.
- Conrad, Christian and Michael Lamla, 2007, “The High-frequency Response of the EU-US Dollar Exchange Rate to ECB Monetary Policy Announcements,” KOF Swiss Economic Institute ETH Zurich Working Paper, 07-174. Available at: http://www.kof.ethz.ch/publications/science/pdf/wp_174.pdf.
- Dale, Spencer, Athanasios Orphanides, and Pär Österholm, 2008, “Imperfect Central Bank Communication –Information versus Distraction,” IMF Working Paper No. 08/60 (Washington: International Monetary Fund). Available at: <http://www.imf.org/external/pubs/ft/wp/2008/wp0860.pdf>.
- de Haan, Jakob, 2008, “The Effect of ECB Communication on Interest Rates: An Assessment,” *The Review of International Organizations*, Vol. 3, No. 4, pp. 375–398.
- European Central Bank, 2000, “The two pillars of the ECB's monetary policy strategy,” *ECB Monthly Bulletin*, November. Available at: <http://www.ecb.int/mopo/strategy/html/index.en.html>.
- European Central Bank, 2003, “The outcome of the ECB’s evaluation of its monetary policy strategy,” *ECB Monthly Bulletin*, June. Available at <http://www.ecb.int/mopo/strategy/html/index.en.html>.
- European Central Bank, 2004, “The monetary policy of the ECB,” Chapter 3, January. Available at: <http://www.ecb.int/mopo/strategy/html/index.en.html>.
- European Central Bank, 2006, “The predictability of the ECB's monetary policy,” *ECB Monthly Bulletin*, January. Available at: <http://www.ecb.int/mopo/strategy/html/index.en.html>.
- European Central Bank, 2007, “Communicating monetary policy to financial markets,” *ECB Monthly Bulletin*, April. Available at: <http://www.ecb.int/mopo/strategy/html/index.en.html>.
- Ehrmann, Michael, and Marcel Fratzscher, 2005, “How Should Central Banks Communicate,” ECB Working Paper No. 557 (Frankfurt: European Central Bank). Available at: <http://www.ecb.int/pub/pdf/scpwps/ecbwp557.pdf>.
- Fracasso, Andrea, Hans Genberg, and Charles Wyplosz, 2003, “How Do Central Banks Write?” Geneva Reports on the World Economy, Special Report 2, The Center for Economic Policy Research. Available at: http://hei.unige.ch/~wyplosz/IR_fgw.pdf.
- Geraats, Petra M., 2002, “Central bank transparency,” *Economic Journal*, Vol. 112, F532–F565.

- Geraats, Petra M., 2009, "Trends in Monetary Policy Transparency," CESifo Working Paper No. 2584. Available at: http://www.cesifo.de/~DocCIDL/cesifo1_wp2584.pdf.
- Gerdesmeier, Dieter, and Barbara Roffia, 2004, "Empirical Estimates of Reaction Functions for the Euro Area," *Swiss Journal of Economics and Statistics*, Vol. 140, No. 1, pp. 37–66.
- Gerlach, Stefan, 2007, "Interest Rate Setting by the ECB, 1999-2006: Words and Deeds," *International Journal of Central Banking*, Vol. 3, No. 3, pp. 1–45.
- Gerlach, Stefan, and Frank Smets, 1999, "Output Gaps and Monetary Policy in the EMU Area," *European Economic Review*, Vol. 43 (April), pp. 801–12.
- Guthrie, Graeme, and Julian Wright, 2000, "Open Mouth Operations," *Journal of Monetary Economics*, Vol. 46, Issue 2, pp. 489–516.
- Heinemann, Friedrich, and Katrin Ullrich, 2007, "Does It Pay to Watch Central Bankers Lips? The Information Content of ECB Wording," *Swiss Journal of Economics*, Vol. 143, No. 2, pp. 155–185.
- Hofmann, Boris, 2008, "Do Monetary Indicators Lead Euro Area Inflation?" ECB Working Paper, 867 (Frankfurt: European Central Bank). Available at: <http://www.ecb.int/pub/pdf/scpwps/ecbwp867.pdf>.
- Issing, Otmar, 2005, "Communication, Transparency, Accountability: Monetary Policy in the Twenty-First Century," *Federal Reserve Bank of St. Louis Review*, Vol. 87 (March/April), pp. 65–83.
- Jansen, David-Jan, and Jakob de Haan, 2007, "The Importance of Being Vigilant: Has ECB Communication Influenced Euro Area Inflation Expectations?" CESifo Working Paper No. 2134. Available at: http://www.cesifo-group.de/~DocCIDL/cesifo1_wp2134.pdf.
- Jansen, David-Jan, and Jakob de Haan, 2009, "Has ECB Communication Been Helpful in Predicting Interest Rate Decisions? An Evaluation of the Early Years of the Economic and Monetary Union," *Applied Economics*, Vol. 41, pp. 1995–2003.
- King, Mervyn, 2005, *Monetary Policy: Practice Ahead of Theory*, Mais Lecture delivered at the Cass Business School, City University, London, May 17. Available at: <http://www.bankofengland.co.uk/publications/speeches/2005/speech245.pdf>.
- Lamla, Michael, and Sarah Rupprecht, 2006, "The Impact of ECB Communication on Financial Market Expectations," KOF Swiss Economic Institute, ETH Zurich Working Paper, 06-135. Available at: http://www.kof.ethz.ch/publications/science/pdf/wp_135.pdf.
- Morris, Stephen, and Hyun Song Shin, 2002, "Social Value of Public Information," *American Economic Review*, Vol. 92(December), pp. 1521–1534.

- Orphanides, Athanasios, 2001, "Monetary Policy Rules based on Real-Time Data," *American Economic Review*, Vol. 91, pp. 964–985.
- Roffia, Barbara, and Andrea Zaghini, 2007, "Excess Money Growth and Inflation Dynamics," ECB Working Paper, 749 (Frankfurt: European Central Bank). Available at: <http://www.ecb.int/pub/pdf/scpwps/ecbwp749.pdf>.
- Rosa, Carlo, and Giovanni Verga, 2007, "On the Consistency and Effectiveness of Central Bank Communication: Evidence from the ECB," *European Journal of Political Economy*, Vol. 23, Issue 1, pp. 146-75.
- Rudebusch, Glenn, 2006, "Monetary Policy Inertia: Fact or Fiction?" *International Journal of Central Banking*, Vol. 2, No. 3, pp. 85–136.
- Sauer, Stephan, and Jan-Egbert Sturm, 2007, "Using Taylor Rules to Understand European Central Bank Monetary Policy," *German Economic Review*, Vol. 8, pp. 375–398.
- Šmídková, Kateřina, 2005, "How Inflation Targeters (Can) Deal with Uncertainty," *Czech Journal of Economics and Finance*, Vol. 55, No. 7-8, pp. 316–32. Available at: http://journal.fsv.cuni.cz/storage/1024_s_316_332.pdf.
- Šmídková, Kateřina, and Aleš Bulíř, 2007, "Striving to Be 'Clearly Open' and 'Crystal Clear': Monetary Policy Communication of the CNB," *Czech Journal of Economics and Finance*, Vol. 57, No. 11–12, pp. 540–57. Available at: <http://journal.fsv.cuni.cz/mag/article/show/id/1092>.
- Sturm, Jan-Egbert, and Jakob de Haan, 2009, "Does Central Bank Communication Really Lead to Better Forecasts of Policy Decisions? New Evidence Based on a Taylor Rule Model for the ECB," KOF Swiss Economic Institute ETH Zurich Working Paper, 09-236 Available at: http://www.kof.ethz.ch/publications/science/pdf/wp_236.pdf.
- Svensson, Lars, 1997, "Inflation Forecast Targeting: Implementing and Monitoring Inflation Targets," *European Economic Review*, Vol. 41, pp. 1111–46.
- Winkler, Bernhard, 2000, "Which Kind of Transparency? On the Need for Clarity in Monetary Policy-Making," ECB Working Paper No. 26 (Frankfurt: European Central Bank). Available at: <http://www.ecb.int/pub/pdf/scpwps/ecbwp026.pdf>.
- Woodford, Michael, 2005, "Central Bank Communication and Policy Effectiveness," NBER Working Paper No. 11898, (Cambridge: National Bureau of Economic Research). Available at: <http://www.nber.org/papers/w11898>.

POLICY RULE CALIBRATION

The values of the behavioral parameters γ and δ are unknown and their estimation is plagued by problems (for a survey see Rudebusch, 2006). The question asked here, “what the public expects the central bank to do,” is different from that asked in the empirical literature on policy rules, “what the central bank has been doing in practice”. While the former rule cannot be too different from the latter, there is little reason to assume that they have been identical.

The empirical policy rule literature has had problems with observational equivalence—one can obtain the same policy rate adjustment with very different parameters.⁷ While many regression-based estimates have found both high coefficient for inflation aversion and smoothing, (Gerdesmeier, and Roffia, 2004, Carstensen, 2006, Sauer and Sturm, 2007), it has been shown that a policy rule with interest rate smoothing is difficult to distinguish from a rule with serially correlated policy shocks as is the case in the euro area (Rudebusch, 2006 and Carare and Tchaidze, 2005). Thus rather than being deliberately and unreasonably slow to react to random shocks, policymakers simply respond to persistent factors.

The baseline smoothing parameter, $\gamma = 0.7$, is close to the mean of forward-looking rules, while the much higher value of the inflation aversion coefficient, $\delta = 5$, reflects the omission of the output gap in the rule. Other things being equal, the output gap enters the rule indirectly through its impact of future inflation. The baseline calibration is such as to minimize the bias and mean square forecast error of the policy rate: while lower values of δ do not improve the mean square forecast error, they worsen the bias, Table A1.

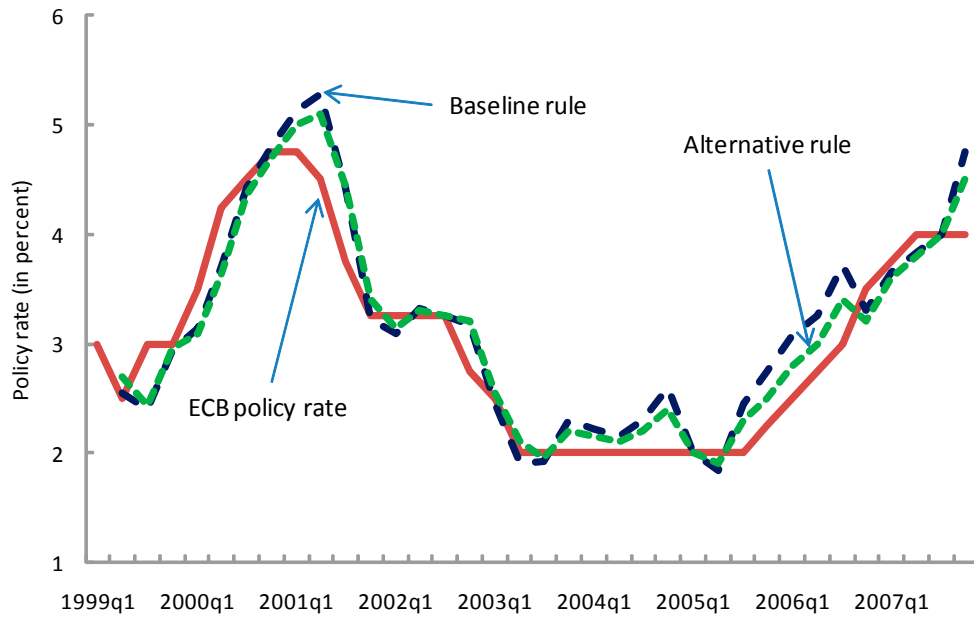
Table A1. Mean Square Forecast Error and Bias for Alternative Calibrations of Inflation Aversion

	$\delta = 7$	$\delta = 5$	$\delta = 3$	$\delta = 1$
Mean square forecast error	0.23	0.14	0.13	0.17
Bias	-0.09	-0.14	-0.19	-0.24

Notes: The baseline calibration with $\gamma = 0.7$, inflation target of 2 percent, and real interest rate of 2 percent. Bias is the sum of forecast errors and mean square forecast error is the sum of squared errors.

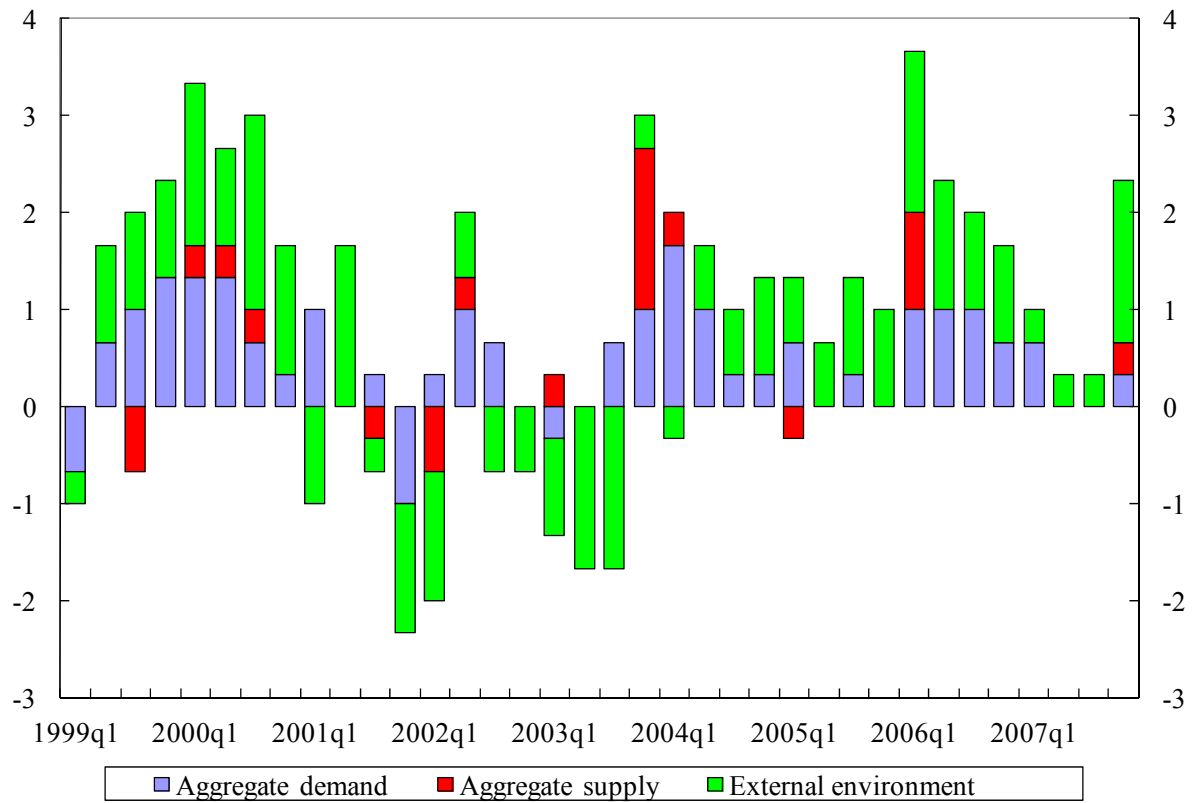
⁷ One obtains an identical rate adjustment from the rule describing an inflation averse but interest-smoothing central bank ($\delta = 5$ and $\gamma = 0.9$) and from an inflation indifferent but fast-moving central bank ($\delta = 0.56$ and $\gamma = 0.1$).

Figure 1. Actual ECB Policy Rate and Fitted Rates Using Two Rules
 (Calibration of the baseline rule: $\gamma = 0.7$ and $\delta = 5$, $\pi^* = 2.0$; the alternative rule: $\gamma = 0.8$)



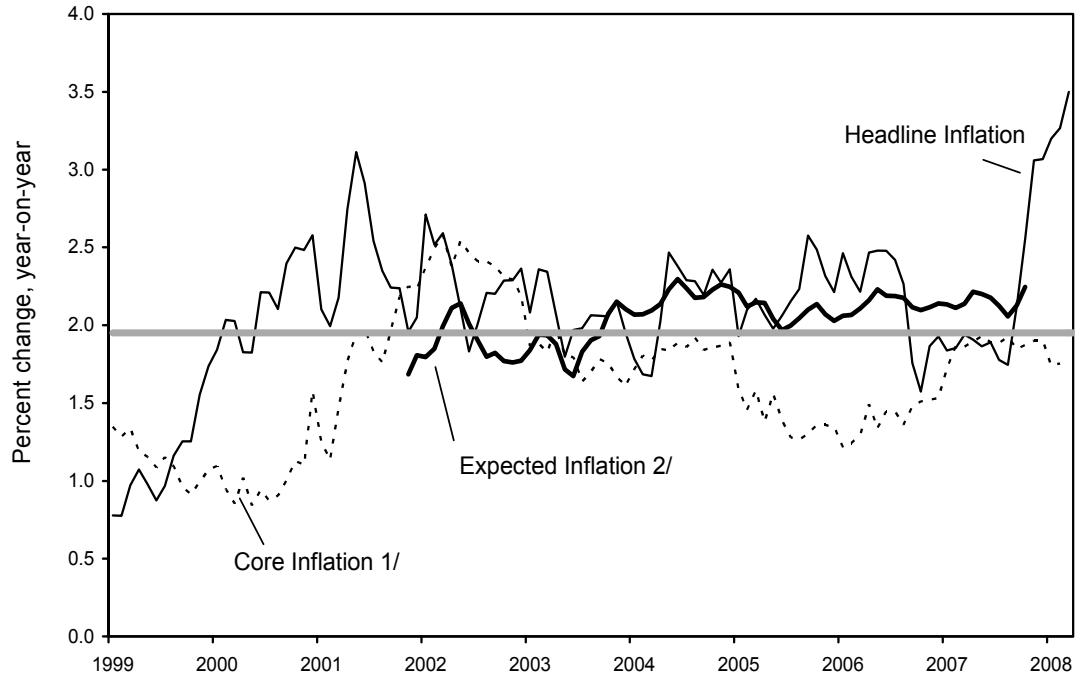
Source: ECB; authors calculations.

Figure 2. ECB Bulletins: Inflation Factors



Source: European Central Bank; authors' calculations.

Figure 3. Euro Area: Inflation Developments, 1999-2008

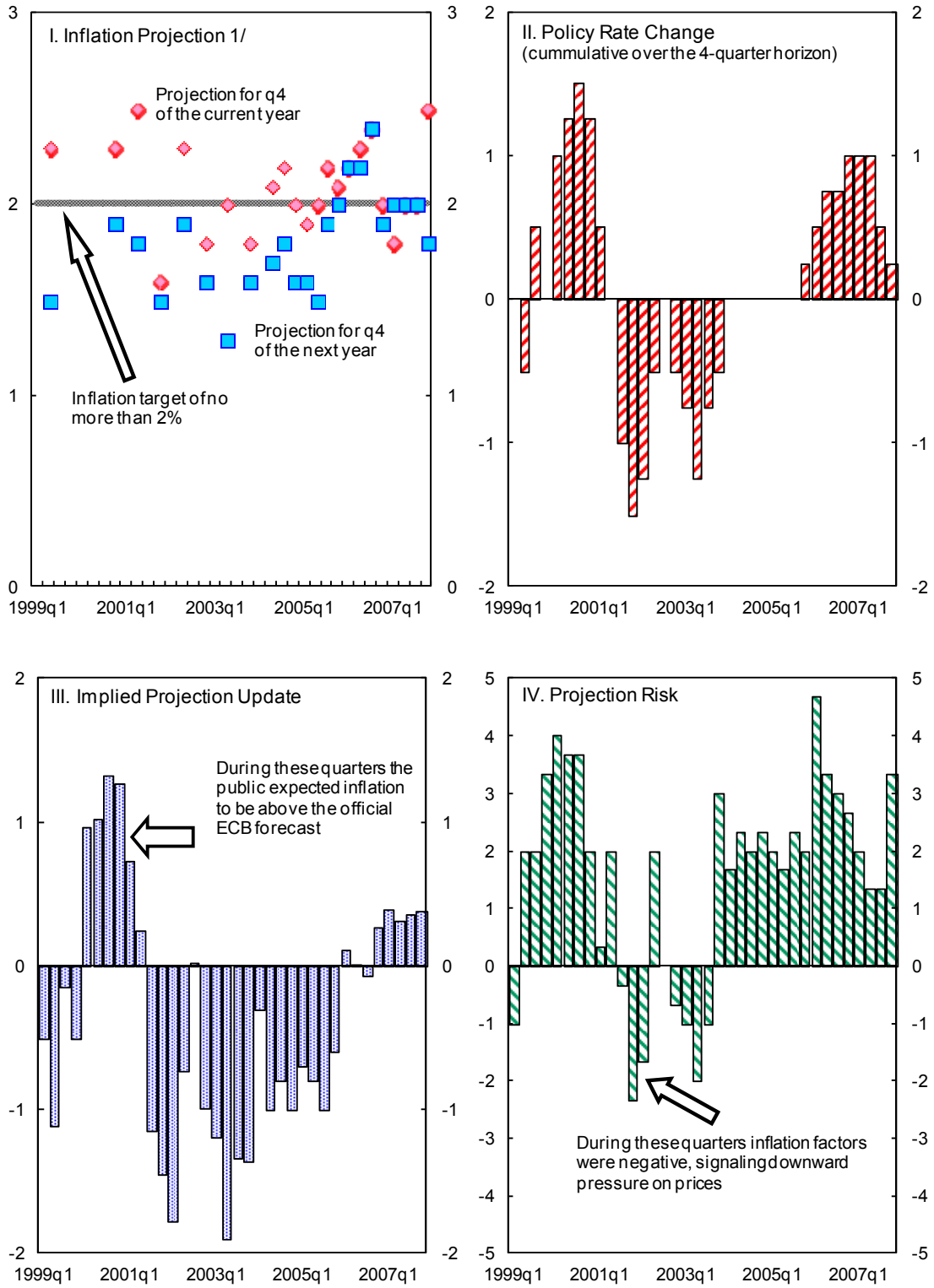


Sources: Eurostat; ECB; and Haver Analytics.

1/ Excludes energy, food, alcohol, and tobacco.

2/ Break-even expected inflation derived from inflation-indexed sovereign bonds.

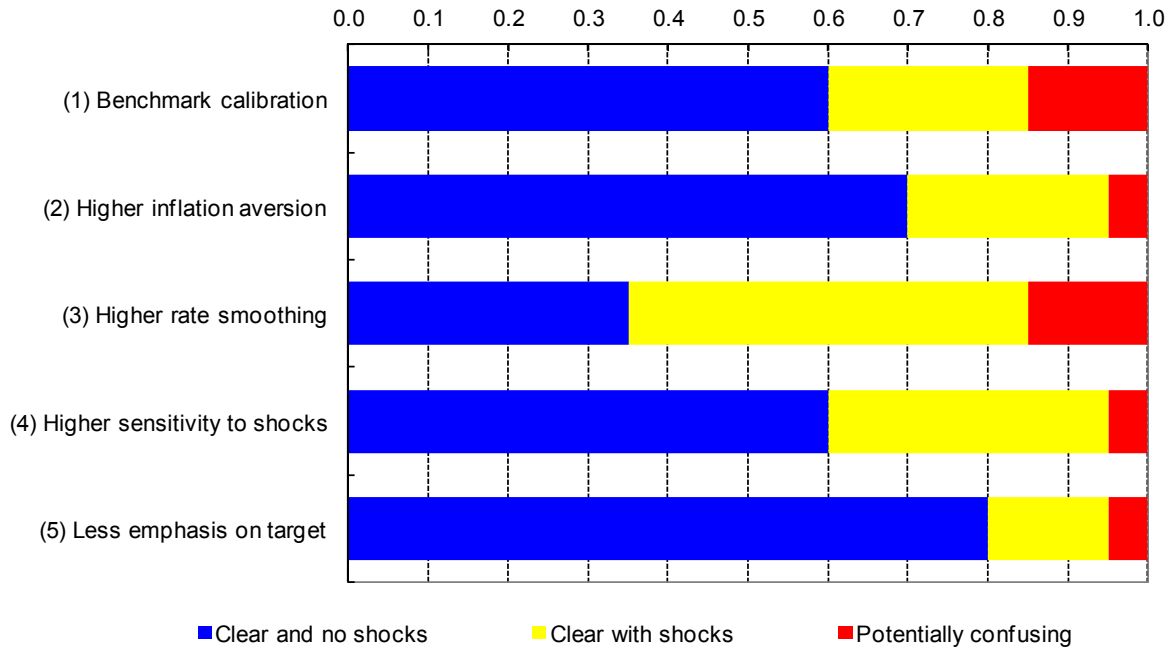
Figure 4. The ECB: The Implied Projection Update and Projection Risk



Source: European Central Bank; author's calculations.

1/ The ECB's projections were initially published annually, semiannually from 2001, and quarterly from 2004q3.

Figure 5. The Clarity of Communication with Press Releases Only



Notes: The blue bars indicate the percentage where the projection risk matched the implied projection update and actual inflation was within ± 0.5 percentage points; the yellow bars indicate a projection error of more than ± 0.5 percentage points; the red bars indicate that the projection risk did not match the implied projection update.

Figure 6. The Clarity of Communication with the Bulletins:
Inflation Factors, but No Projection Risk Description

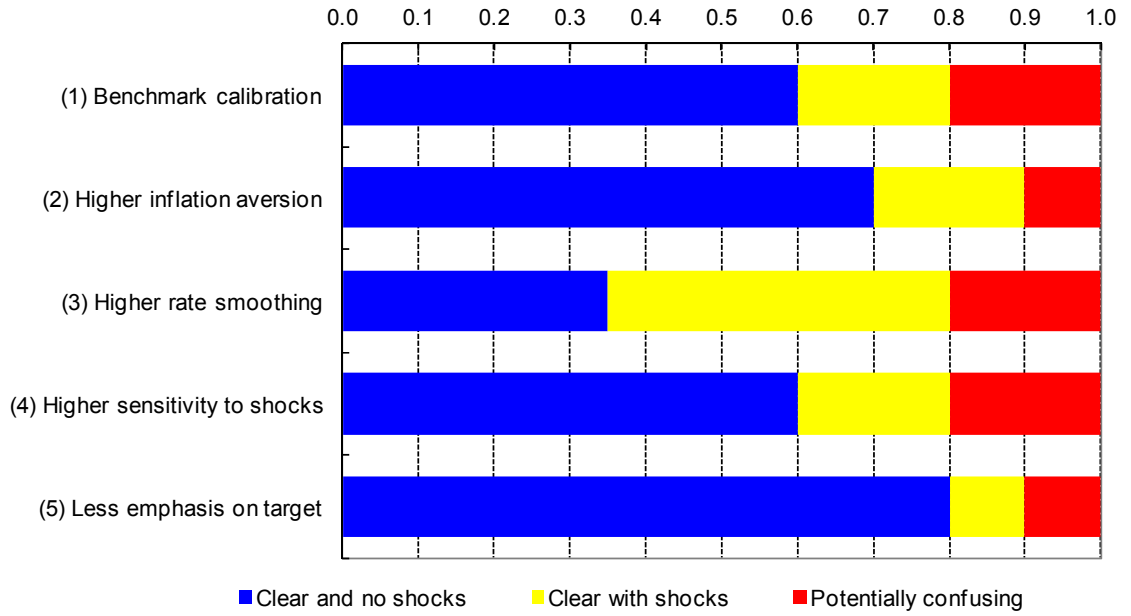


Figure 7. The Clarity of Communication with the Bulletins:
Inflation Factors and the Explicit Projection Risk

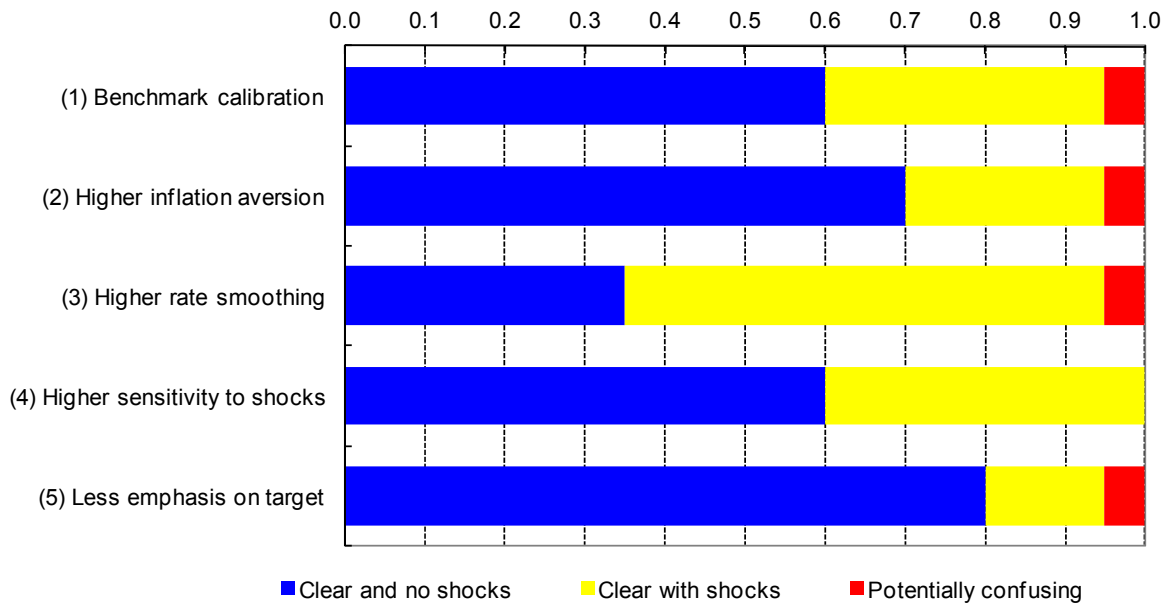


Figure 8. The Clarity of Communication with the Bulletins: Adding the Monetary Pillar

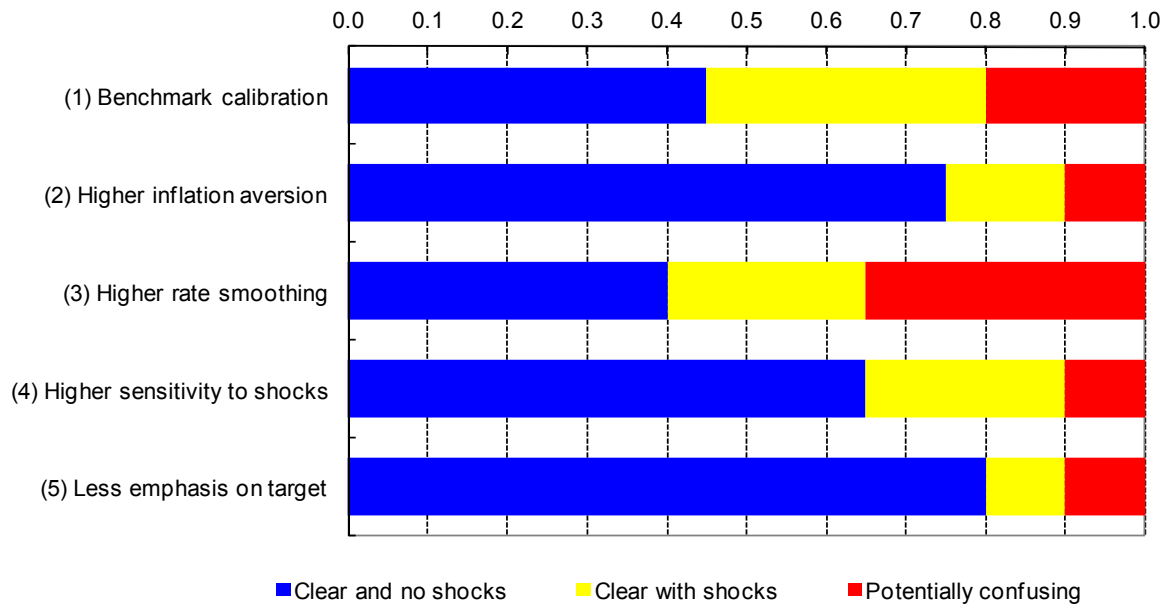
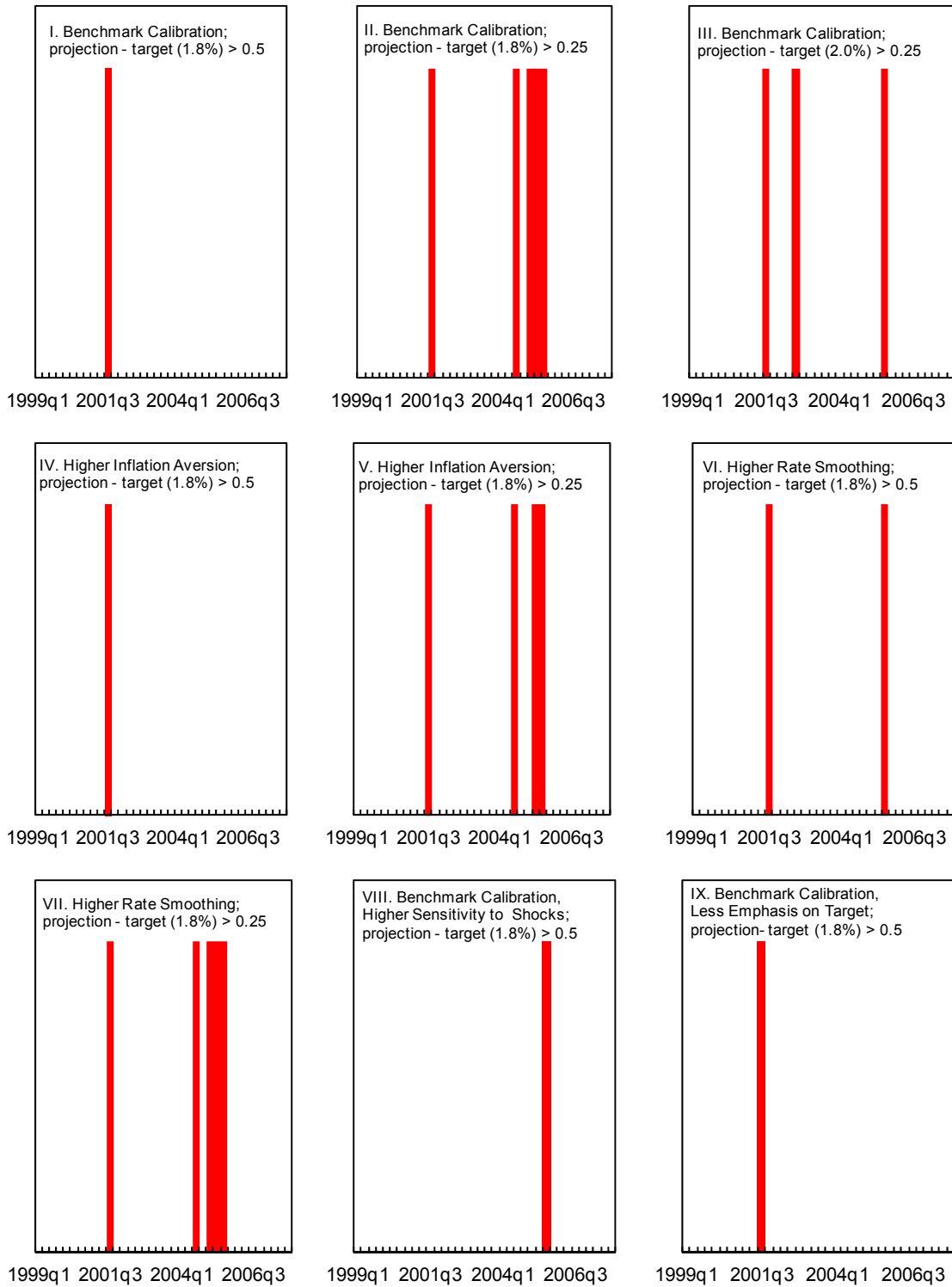


Figure 9. Cases of Confusing Communication: Robustness Checks



Source: Author's calculations.

Notes: The calibrations correspond to those in Table 1 in the main text.

Table 1. Robustness Scenarios

	Policy rule parameters		When are the implied projection updates “substantial”?	
	Smoothing (γ)	Inflation aversion (δ)	Shocks	Deviations from the target
Benchmark calibration	0.7	5.0	0.50	0.50
Higher inflation aversion	0.7	7.0	0.50	0.50
Higher rate smoothing	0.8	5.0	0.50	0.50
Higher sensitivity to shocks	0.7	5.0	0.25	0.50
Less emphasis on target	0.7	5.0	0.50	0.75

Table 2. Components of the Projection Risk and Their Serial Correlation

Components	One lag	Two lags
Aggregate demand	0.41	0.05
Aggregate supply	0.06	-0.02
External environment	0.49	0.42
All factors combined	0.49	0.21
Explicit projection risk	0.89	0.77

Source: European Central Bank; authors' calculations.

Table 3. Correlation of the Alternative Indexes with Our Indexes
(Spearman's rank correlation coefficient; the corresponding p -level in brackets)

	KOF MPC	RV	Press release	Aggregate Demand	Aggregate Supply
RV	0.76 (0.00)				
Press release	0.83 (0.00)	0.77 (0.00)			
Our summary index	0.77 (0.00)	0.82 (0.00)	0.76 (0.00)		
<i>Of which</i>					
Aggregate Demand	0.58 (0.00)	0.60 (0.00)	0.48 (0.02)		
Aggregate Supply	0.02 (0.92)	0.19 (0.36)	0.24 (0.26)	0.36 (0.09)	
External Environment	0.61 (0.00)	0.72 (0.00)	0.60 (0.00)	0.36 (0.09)	0.23 (0.28)

Notes: KOF is the Monetary Policy Communicator based on the ECB president's statements on risks to price stability made during the monthly press conferences; RV is the Rosa-Verga index of ECB President announcements about future monetary policy moves. Press releases and the remaining entries are based on our coding of the ECB documents.

Source: authors' calculations; KOF MPC index was kindly provided by the KOF; Rosa and Verga (2007).