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MONETARY POLICY IN THE MEDIA

by Helge Berger,
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In 2006 all ECB publications feature a motif taken from the €5 banknote.

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CONTENTS

Abstract

Media coverage of monetary policy actions is a central channel of a central bank's communication with the wider public, and thus an important factor for its credibility and policy effectiveness. This paper analyses the coverage which ECB monetary policy decisions receive in the print media, and the determinants of its extent and of its favorableness. We find that that the press critically discusses the ECB's policy decisions in the context of prior market expectations and of the inflation environment, and that the media's coverage of decisions is generally highly responsive to ECB communication – in particular its Press Conference on meeting days. However, the paper also finds clear limitations in this regard, thus underlining the critical monitoring role assumed by the media.

Non-technical summary

Communication is an important part of the process of conducting monetary policy. Central banks have direct control only over a single interest rate, usually the overnight rate, while they wish to influence asset prices and interest rates at all maturities in order to achieve their aims. Effective communication as much as credible policy actions are of fundamental importance for achieving these objectives. For central bank communication to be effective, it is important that it is disseminated to the general public, whose inflation expectations eventually feed into the actual evolution of inflation, e.g. through corresponding wage claims and savings, investment and consumption decisions, and thus determine whether a central bank is able to achieve its policy objectives.

This paper analyses how the media, specifically the printed press, report about the monetary policy of the European Central Bank (ECB). One element is the extent of the media coverage, as more extensive reporting in general allows a central bank to reach and to disseminate information to a wider audience. Another element relates to the favorableness with which the ECB's monetary policy decision is discussed (a proxy for how well the reasons for a decision are *understood* and the decision therefore finds the consent of the media), since a positive reporting is an important factor influencing its credibility and thus ultimately its policy effectiveness. The analysis focuses on the press reporting in response to the Press Conference on the days of the rate-setting meetings of the ECB's decision-making body, the Governing Council.

The paper uses a novel dataset that contains quantitative information both on the extent and on the favorableness of the reporting of ECB monetary policy decisions, reaching back to 1999 and covering 57 international and national newspapers. As a first step, the paper shows that there is a clear mapping between favorableness and the extent of press coverage: the stronger the opinions expressed, the more is reported in the print media. Additionally, there is an asymmetry in the reporting as critical views are allocated more space in the newspapers than positive ones. Accordingly, it is important for the ECB to explain its decisions well, as particularly those decisions that are poorly understood are reported on more extensively

The main part of the paper analyses the determinants of the extent and the favorableness of media reporting of ECB decisions. In particular, we find that the press critically discusses the ECB's policy decisions in the context of prior market expectations and of the inflation environment. If a given policy decision comes as a surprise for markets, the tone of the reports is generally more negative. Similarly, the current decisions are discussed less favorably if the most recent euro area inflation figures exceed 2%, the ECB's definition of price stability. These findings suggest that the media assumes a monitoring role, whereby it evaluates the performance of the independent central bank.

From a policy perspective, an important question is how central bank communication affects understanding and acceptance of a given policy decision, and whether this is reflected in improved favorableness and/or increased media coverage. We find both to be responsive to ECB communication, through the press conference as well as through statements in the inter-meeting period. The empirical results show that in

particular press conferences with a large informational content (as measured through the size of financial market reactions during the press conference, though keeping in mind that not all relevant information necessarily moves markets) imply a better understanding of a given decision by the public, which is reflected in more favorable press reports. Moreover, we find that decisions that have been accompanied by a relatively large number of statements by the ECB president, and to a lesser extent by other committee members, in the preceding inter-meeting period receive a significantly more extensive a well as more positive coverage.

Both of these findings suggest that media reports are responsive to efforts by the ECB to explain the motivation behind a given decision. This is in particular the case for relatively surprising decisions, which are normally reported upon in a rather critical fashion. A provision of substantial information during the Press Conference in the aftermath of such a decision implies a better acceptance by the public, which is mirrored in more positive press reporting. However, there also appear clear cases where the press is unresponsive to the provision of information in its assessment of ECB decisions. For instance, we find that the media reporting of ECB policy decisions is always more negative in tone when inflation is relatively high, even when communication is intense and the information content of press conferences is high

In relation to this, we also find that the release of special information and a number of special events during the press conferences help a better perception of policy decisions, and consequently enhance the favorableness of reporting. In the years from 1999-2002, the ECB used to announce the outcome of its review of the reference value for M3 growth on the occasion of the December press conference; more recently, the ECB has started to release inflation and output growth projections on a quarterly basis during the press conference. In both cases, favorableness of the newspaper reports is found to be significantly improved. In addition, the ECB's tradition of holding Governing Council meetings with subsequent press conferences outside Frankfurt twice a year appears to increase awareness of the public in the visited country, as newspaper reports in these countries turn substantially more favorable and significantly expand the coverage of ECB press conference.

Finally, looking into the national dimension of newspaper coverage, we find that there is basically no role for national biases in the tone of the discussion: national media coverage intensifies if national inflation deviates relatively strongly from the euro area figures; however, the favorableness of the coverage is unaffected. One interpretation of this finding is that national media explain more extensively why a given monetary policy decision has been taken, without judging it from a purely national viewpoint. As such, the national media may play an important role in transmitting the ECB's policy intentions to their national audiences, and may contribute to a more homogeneous understanding and perception of the role of the ECB.

1.   Introduction

Communication is an important part of the process of conducting monetary policy. Central banks have direct control only over a single interest rate, usually the overnight rate, while they may attempt to influence asset prices and interest rates at all maturities in order to achieve their aims. Effective communication as much as credible policy actions are of fundamental importance for achieving these objectives. For central bank communication to be effective, it is important that it is disseminated to and understood by the targeted audience, and furthermore considered relevant by the receivers. Financial market participants, one major addressee of central banks, can be safely assumed to listen and indeed have been shown to be highly sensitive to central bank communication.[1] However, a central bank needs to reach out to a wider audience as well, in particular as it is the general public whose inflation expectations eventually feed into the actual evolution of inflation, e.g. through corresponding wage claims and savings, investment and consumption decisions, and thus determine whether a central bank is able to achieve its policy objectives.

To our knowledge, there is to date no systematic analysis of how central bank actions and communication are disseminated to and perceived by the general public. The objective of the paper is to help fill this gap. In particular, the paper analyses how the media, specifically the printed press, report about the monetary policy decisions of the European Central Bank (ECB). We focus on two elements of the media reporting. One element is the extent of media coverage, as more extensive reporting in general allows a central bank to reach and to disseminate information to a wider audience. Another element relates to the favorableness with which the ECB's monetary policy decision is discussed (a proxy for how well the reasons for a decision are *understood* and the decision therefore finds the consent of the media), since a reporting that explains the motivation of a given decision is an important factor influencing the central bank's credibility and thus ultimately its policy effectiveness.

Moreover, focusing on the case of the ECB adds an interesting dimension to the communication challenge. Monetary policy in the euro area is conducted within a multi-country, multi-cultural, and multi-lingual context. With the formation of the European Economic and Monetary Union (EMU), countries with markedly different histories of inflation, monetary policy strategies as well as central banking institutions have delegated the conduct of monetary policy to a single entity, the ECB. EMU also means that monetary policy has a euro area-wide perspective and is no longer conducted with a focus on individual countries. Accordingly, communication by the ECB, and the implied euro area-wide focus of monetary policy, needs to be understood and received by a relatively heterogeneous audience. National media do therefore have an important role in making the central bank actions and its objectives understood by the national audiences.

An analysis of the press reporting on the ECB is particularly interesting also because of a special feature of its communication policy, namely the conduct of a Press Conference on the days of the rate-setting meetings of its decision-making body, the Governing Council. These meetings typically take place on the first Thursday of each month. After the announcement of its monetary policy decisions at 13:45 (ECT), the Press Conference commences at around 14.30, lasts about 45 minutes and is held by the ECB President and Vice-President. The Press Conference is an important element of the ECB's communication strategy as it allows the ECB to elaborate in detail on the policy decision. It comprises two elements; a prepared

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[1] See e.g. Guthrie and Wright (2000), Kohn and Sack (2004), and Ehrmann and Fratzscher (2006) for three studies in the rapidly growing literature on the effectiveness of central bank communication in moving financial markets.

Introductory Statement that contains the background considerations for the monetary policy decision, and a Questions & Answers part during which the President and the Vice-President are available to answer questions by the attending journalists. The combination of the release of monetary policy decisions and their explanation in the press conference the same day gives the print media a chance to discuss the central bank's current assessment of the economic situation, its views on the economic outlook and the latest decision in one newspaper report. How the conduct of a Press Conference is reflected in press reporting is a natural question, that we investigate in detail in this paper.

This paper uses a novel dataset that contains information both on the coverage and on the favorableness of the reporting of ECB monetary policy decisions, reaching back to 1999 and covering 57 international and national newspapers. The extent of coverage is measured as an index ranging from 0 (moderate coverage) to 4 (very extensive coverage). It is quantitative in nature, measuring the space and location of press reporting devoted to each policy decision. By contrast, the favorableness index ranges from -2 (very negative coverage) to 2 (very favorable coverage). It is qualitative in nature, gauging the assessment of each policy decision by the media. It should be emphasized that the favorableness index strictly relates to the opinions expressed on any given decision, and not on the ECB or its monetary policy in general. As such, the index reflects whether or not a given decision is judged as justified given the economic environment. This, in turn, is likely to depend on the explanation for the given decision provided at the occasion of the press conference. Accordingly, the index is a proxy for how well the underlying motivation of a decision is *understood* by and finds the consent of the media, which is crucial for the credibility and ultimately the effectiveness of the central bank.

As a first step, the paper shows that there is a clear mapping between favorableness and the extent of press coverage: the stronger are journalists' opinions, the more is reported in the print media. Additionally, there is an asymmetry in the reporting as critical views are allocated more space in the newspapers than positive ones. Accordingly, it is important for the ECB to explain its decisions well, as particularly those decisions that are poorly understood are reported on more extensively.

The main part of the paper then turns to analyzing the determinants of the extent and the favorableness of media reporting of ECB decisions. In particular, we find that the press critically discusses the ECB's policy decisions in the context of prior market expectations and of the inflation environment. If a given policy decision comes as a surprise for markets, the tone of the reports is generally more negative. Similarly, the current decisions are discussed less favorably if the most recent euro area inflation figures exceed 2%, the ECB's definition of price stability. These findings suggest that the media assumes a monitoring role, whereby it evaluates the performance of the independent central bank. By contrast, changes in monetary policy rates in the past have generally had a positive effect on the extent, and in some circumstances also on the favorableness of media coverage.

From a policy perspective, an important question is how central bank communication affects the understanding and acceptance of a given policy decision, and whether this is reflected in improved favorableness and/or increased media coverage. We find both to be responsive to ECB communication, through the press conference as well as through statements in the inter-meeting period. The empirical results show that in particular press conferences with a large informational content (as measured through the size of financial market reactions during the press conference, though keeping in mind that not all relevant information necessarily moves markets) imply a better understanding of a given decision by the public, which is reflected in

more favorable press reports. Moreover, we find that decisions that have been accompanied by a relatively large number of statements by the ECB president, and to a lesser extent by other committee members, in the preceding inter-meeting period receive a significantly larger and more positive coverage.

Both of these findings suggest that media reports are responsive to efforts by the ECB to explain the motivation behind a given decision. This is in particular the case for relatively surprising decisions, which are normally reported upon in a rather critical fashion. A provision of substantial information during the Press Conference in the aftermath of such a decision implies a better acceptance by the public, which is mirrored in more positive press reporting. However, there also appear clear cases where the press is unresponsive to the provision of information in its assessment of ECB decisions. For instance, we find that the media reporting of ECB policy decisions is always more negative in tone when inflation is relatively high, even when communication is intense and the information content of press conferences is high.

In relation to this, we also find that the release of special information and a number of special events during the press conferences help a better perception of policy decisions, and consequently enhance the favorableness of reporting. In the years from 1999-2002, the ECB used to announce the outcome of its review of the reference value for M3 growth on the occasion of the December press conference; more recently, the ECB has started to release inflation and output growth projections on a quarterly basis during the press conference. In both cases, favorableness of the newspaper reports is found to be significantly improved. In addition, the ECB's tradition of holding Governing Council meetings with subsequent press conferences outside Frankfurt twice a year appears to increase awareness of the public in the visited country, as newspaper reports in these countries turn substantially more favorable and significantly expand the coverage of ECB press conference.

Finally, looking into the national dimension of newspaper coverage, we find that there is basically no role for national biases in the tone of the discussion. Whereas national media coverage *intensifies* if national inflation deviates relatively strongly from the euro area figures, the *favorableness* of the national coverage is unaffected. One interpretation of this finding is that national media explain more extensively why a given monetary policy decision has been taken, without judging it from a purely national viewpoint. As such, the national media may play an important role in transmitting the ECB's policy intentions to their national audiences, and may contribute to a homogeneous understanding and perception of the role of the ECB.

The remainder of this paper is structured as follows. Section 2 presents a brief overview of the relevant literature, and develops some hypotheses about the determinants of press coverage of central bank actions. Section 3 discusses the data set that is employed in the analysis, while Section 4 explains the empirical methodology. The link between favorableness and extent of newspaper reporting is explained in Section 5. Section 6 reports the results regarding the determinants of both favorableness and coverage, whereas Section 7 provides more details on how communication by the ECB to explain the motivation behind a given decision, either through the press conference, or in the inter-meeting period, affect understanding and acceptance of a given policy decision. Section 8 concludes.

2.   The Media and Monetary Policy – Related Literature and Some Hypotheses

Given the importance of communication for monetary policy, central banks closely monitor the press coverage they receive; for the ECB, this is done on the basis of the indices that we will use in our empirical analysis. In the academic literature, however, to our knowledge this paper is the first to provide a comprehensive and systematic analysis of the determinants of press coverage a central bank receives. There is a notable exception, De Haan et al. (2004), who analyze reports on the ECB's monetary policy decisions in 1999 and 2000, published in the Frankfurt Allgemeine Zeitung (FAZ) and in the Financial Times (FT). The paper finds differences in the reporting of the two newspapers, as, e.g., the FT reports considerably less and more critical about the role of monetary aggregates in the ECB's monetary policy decisions than the FAZ. Beyond this partial analysis, to our knowledge no research has been conducted into this topic for any central bank.[2] This is surprising, as the role of communication in the conduct of monetary policy has been the focus of a substantial body of research recently. However, most of this research focuses on the effects of communication on financial markets, thus limiting the analysis to only one (although important) target group for central banks.

Monetary policy has a relatively direct leverage over very short-term (i.e., overnight) interest rates. To steer the behavior of economic agents, however, it is necessary to affect longer-term interest rates, where the central bank influence is much more indirect. Blinder (1998) and Bernanke (2004), among others, emphasize the importance of communication as a means for central banks to influence these asset prices, provided that the central bank has acquired credibility. In that respect, communication can enhance the effectiveness of monetary policy implementation. To this end, communication must be able to influence the expectations of economic agents, such that the desired reaction of longer-term interest rates is achieved. In addition, communication is a crucial central bank instrument to limit the scope for unwanted policy surprises in the short-term. Beyond its importance in normal times, communication has been highlighted as a particularly effective tool under the zero lower bound, i.e. when nominal interest rates are close or equal to zero (Bernanke, Reinhart and Sack 2004, Woodford 2005).

The empirical literature has come to a consensus that communication, including by the ECB, is a powerful tool to move financial markets. Guthrie and Wright (2000) find this for the Reserve Bank of New Zealand, Kohn and Sack (2004) for the Federal Reserve, Reeves and Sawicki (2005) for the Bank of England, and Ehrmann and Fratzscher (2006) in a comparative study for the Federal Reserve, the Bank of England and the ECB. Looking at the content of communication in more detail, there is evidence that it is in particular statements including an indication about the future path of policy that move financial markets (Brand, Buncic and Turunen 2006, Ehrmann and Fratzscher 2005a, Gürkaynak, Sack and Swanson 2005).

Several studies have recently looked at communication by the ECB, covering a wide range of the ECB's communication tools. Ehrmann and Fratzscher (2006) study the effect of statements by individual Governing Council members, and find them to exert sizable effects on financial markets. This holds in particular when the communication is directly related to the future path of interest rates, whereas statements about the economic outlook are less influential. One important aspect is the extent to which communication is consistent across committee members. Jansen and de Haan (2006) find that statements among the individual

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[2] A broadly related discussion among media analysts focuses on the coverage economic news *per se*, for instance, changes in the inflation and unemployment rate, receive in the media. See, e.g., Fogarty (2005) and the references therein.

members of the ECB's Governing Council about interest rates exhibited some degree of dispersion initially, which decreased over time, whereas they identify an increasing dispersion in statements about inflation. Ehrmann and Fratzscher (2005b) find that dispersed communication lowers the predictability of monetary policy decisions for the Federal Reserve, the Bank of England as well as the ECB, although dispersed communication about the economic outlook may actually help financial markets better anticipate the path of future policy. Gerlach (2004) develops a quantitative indicator from the assessment of inflation, economic activity and M3 growth in the editorial of the ECB's Monthly Bulletins, and finds that this indicator can explain interest-rate setting of the ECB. In a similar fashion, Rosa and Verga (2005) and Heinemann and Ullrich (2005) analyze the content of the ECB's introductory statements to the press conference following Governing Council meetings. They construct indicators for the monetary policy stance based on the words used in the statements, and similarly show that the indicators can explain interest-rate setting, although they serve as substitutes, not as complements to macroeconomic variables in Taylor-type rules.

While the literature agrees that communication is an important policy tool, the role of the media in this transmission process has, surprisingly, hardly been studied before. Similarly, to our knowledge there has been no research into the role of *national* media in informing the general public on monetary policy in the euro area. The creation of a monetary union of countries with markedly different economic and financial structures, with substantial diversity in the historical role of central banks and, accordingly, heterogeneous historical experiences of inflation have led to concerns that there might be asymmetries in the transmission of the ECB's monetary policy across countries. In the run-up to EMU, several papers asked whether a change in policy rates would affect national economies in a heterogeneous fashion (e.g., Dornbusch, Favero and Giavazzi 1998; Cecchetti 2001; Mihov 2001). However, results are contradictory across studies (Mojon and Peersman 2003). Differences in the way and intensity with which national media report about the ECB might come into play here, too; on the one hand, they could lead to, or perpetuate, different perceptions of economic agents about the role of central banks; on the other hand, press coverage that respects national characteristics and backgrounds might actually be conducive to a more homogeneous public understanding of the ECB's monetary policy.

Finally, for a central bank to be accountable, a public discussion of its performance in parliamentary committees, through central bank watchers but also in the media, is an important ingredient. An independent central bank in a democratic society has the legal and political obligation to justify and explain its decisions to the public and its elected representatives. For instance, Eijffinger, Hoeberichts and Schaling (2000) show that transparency enhances central bank accountability. However, ever since its establishment, the ECB has been faced with considerable discussions on the extent to which it is accountable and transparent (see recently Goodhart, 2005). The ECB itself has clarified how it aims to be accountable (e.g. ECB 2002). However, very little empirical research has yet been conducted on the link between monetary policy and the media, and this is where the present paper attempts to contribute.

A key issue in order to understand the role of the media in the transmission process of central bank communication is: what determines the favorableness and the extent of the media coverage? A good starting point to answer this question is the concept of a market for information. In principle, the market outcome will reflect both supply and demand side forces. On the supply side, journalists' partisan preferences could play a role, a factor that media experts discussing the question of political bias in U.S. media tend to stress (see Groseclose and Milyo 2005). Economists are more likely to look for the influence of preferences on the

demand side. For instance, Mullainathan and Shleifer (2005) make a convincing argument that it is the interaction of consumer demand and profit maximizing news providers that explains whether, how, and to what extent a certain news item is reported in media.

One implication of economic theory is that, among other factors, the favorableness of a media report is likely to influence the amount of coverage a particular news item gets. This may be of particular importance when it comes to news about monetary policy. Typical consumers of news in this field, such as financial market professionals or citizen voters trying to gauge the performance of their government, will often have certain expectations on the future policy path and the economy. Because information and its processing are costly, they are likely to pay special attention to media reports that may cause changes in the outlook.[3] As a consequence, news production will seek out and give more room to messages that are extraordinary and unexpected, which will often take the form of "good" or "bad" news. Thus, we should expect something like a U-shaped relation between the favorableness with which a particular news item is perceived and reported, and the coverage it will receive in the media. Moreover, if the market for information on monetary policy functions like other information markets, the coverage will be asymmetrical, that is, coverage of what is considered bad or negative news will tend to exceed that of other news (Galtung and Ruge 1965; Fogarty 2005).

Central banks are an important principal news source in this respect. They not only provide a steady stream of routine information (e.g., on financials statistics such as the growth of monetary aggregates[4]) that may qualify as "neutral" news, they also supply ample material of potential front-page caliber (for instance, through interest rate or other policy action), which, depending on circumstances, may fall in the good or bad news category. In addition, central banks communicate intensively through the media with the public and financial markets. Taking the example of the ECB, policy decisions taken during regular Governing Council meetings are announced, commented by the Council in the written introductory statement read by the ECB President on the outset of the regular press conference following the meeting, and discussed in an often extensive give-and-take between journalists, the President and the Vice-President during the press conference. Moreover, the President as well as other Governing Council members (i.e., members of the centrally appointed ECB Executive Board, including the Vice President, as well the Governors of all euro area member country central banks) frequently deliver speeches addressing the public. Finally, the ECB also makes more technical announcements, including on its monetary strategy and its staff's inflation forecast.

This suggests that the circumstances of a given policy decision as well as the explanation given for it in the accompanying communication, will influence the amount and the type of news coverage it receives. For instance, the type of a *policy decision* will play an important role. This is certainly true for interest rate changes, which have the potential of being cast as particularly good or bad news (depending on perspective) and should, therefore, increase central bank news coverage. But a similar argument holds, more generally, for policy surprises, including the absence of an expected interest rate change.

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[3] The classical reference on the newsworthiness of information is Galtung and Ruge (1965). They identified a number of factors making it more probable that an event would be selected as news, including the element of unambiguity, surprise, and the intensity of newsworthiness beyond certain thresholds. See, for instance, Hamilton (2004) for a recent discussion.

[4] For instance, the ECB (other than the Federal Reserve) still reports regularly on M3 growth. Comparing the development of M3 with a pre-set reference value thought to be compatible with the ECB's inflation objective (of below but close to 2 percent) is part of its monetary policy strategy.

Furthermore, central bank *communication*, both on and between Governing Council meeting days, will be crucial for the perception of a decision and the ensuing press coverage it receives. Clearly, if the ECB Governing Council makes more intensive use of its post-meeting press conference to channel information to journalists, financial markets and the public, there is more room for reporting on the ECB than otherwise. The same holds true for inter-meeting communication efforts by Governing Council members and *other communication*, including, for example, the release of the reference value for M3 growth or of the ECB staff's projections. Finally, a special feature of the ECB's communication relevant in this regard is that the Governing Council holds its meetings outside Frankfurt in other euro area countries twice a year. We would expect the national media in the respective country to report more extensively about those press conferences. The meeting may be a noteworthy fact in itself, in particular in smaller countries, and the governor of the corresponding national central bank attends the post-meeting press conference at the occasion.

But central bank news coverage will also depend on the *economic environment*. We can expect *macroeconomic conditions* to influence the favorableness and amount of central bank news coverage. In part, this may also reflect a "watchdog" function of the media. For instance, if the media takes on a role as a critical observer that scrutinizes the actions of the ECB as an independent central bank, we would expect media coverage to be more negative and extensive if rates of inflation exceeded the ECB's objective. Similarly, media attention may vary with real activity in the euro area. Another (mostly exogenous) element in the economic environment that may be important is monetary policy elsewhere, in particular in the U.S. The ECB operates in an *international environment*. Contrasting the ECB's policy with those of other central banks may help financial markets and the public gauging the actions of the ECB.

Finally, a number of *country-specific conditions* could possibly influence the tone and the extent of the coverage a central bank like the ECB will receive in the media. They include deviations of a country's inflation or growth performance from the euro area average and a country's historical inflation experience, which might be indicative of a larger established preference for central bank watching. For instance, we can imagine that the media in a country with relatively large deviations of inflation from the euro area average and/or a history of high inflation rates would be more concerned with the doings of the ECB than elsewhere. Country size may matter as well in the sense that larger countries may have more specialized media outlets that, quite naturally, would devote more time to ECB coverage. What is more, national media attention might be affected if one of the members of the ECB's Executive Board is of the same nationality. In short, the objective of the present paper is to test these various hypotheses for the case of ECB monetary policy decisions.

Summing up the main hypotheses, we expect to find a non-linear link between ECB press coverage and the favorability of reporting on the ECB, with a possible bias in the sense that news perceived as negative will receive larger media coverage. One implication is that, because favorableness is a determinant of news coverage, variables driving the perception of ECB-related events should, in principle, also influence the amount of media coverage these events receive. Other variables, unrelated to favorableness, may influence media coverage directly. In either case, determinants of favorableness and coverage are likely to include the ECB's own policy decisions, the ECB's communication, the economic environment, and various country-specific factors.

3. Data on Press Coverage

The analysis in this paper is based on a novel dataset that measures the favorableness and the quantity of press coverage of the ECB's monetary policy decisions received after the press conference. This dataset comprises indices for each euro area country and some international press. It has been created by specialized media experts in the ECB's Press and Information Division for the purpose of internal reporting, with a view to analyzing press reactions in a systematic fashion, and to provide comparisons over time and across countries.[5]

The ECB's media experts read the reports in a large sample of European newspapers immediately following the Governing Council meetings. As the ECB's monetary policy decisions are announced and shortly afterwards explained in a press conference on Thursdays, the indices are based on the Friday and weekend editions of 57 newspapers, 18 of which can be categorized as financial press. Table 1 gives an overview of the newspapers that are covered.

Table 1

Coverage of each newspaper is measured in a qualitative index and a quantitative index. The qualitative index measures the favorableness with which the ECB's monetary policy decision is discussed on a scale ranging from -2 to 2, with the interpretation

-2 – very negative;
-1 – negative;
 0 – neutral;
 1 – favorable;
 2 – very favorable.

The favorableness index strictly relates to the opinions expressed on any given decision, and not on the ECB or its monetary policy in general. As such, the index reflects whether or not a given decision is judged as justified given the economic environment. This, in turn, is likely to depend on the explanation for the given decision provided at the occasion of the press conference. Accordingly, the index is a proxy for how well a decision is understood by the media – which is crucial for the credibility and ultimately the effectiveness of the central bank – rather than the popularity of the decisions or the institution.

Negative entries of the index imply that the media express their discontent with a given decision, whereas positive numbers reflect media's approval. To give an example, a decision not to lower interest rates could be criticized by the media if the journalists think that a rate cut was possible without posing risks to price stability at the current juncture. Alternatively, a decision not to hike interest rates could be criticized, e.g., if the media perceive inflation as too high, and would have preferred a more aggressive tightening. In both cases, the favorableness index would report a negative number.

For the quantitative index, each newspaper is allocated a ranking between 0 and 4, implying different coverage *intensities* as follows:

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[5] The underlying concept of media analysis and monitoring has been developed by Jukka Ahonen, a press officer in the ECB's Press and Information Division. Each Governing Council meeting is covered by several press officers, as a number of languages need to be covered. This number ranges from 3 to 8; in total, 20 press officers have been involved in the construction of the indices since 1999.

0 – poor; minor news item based possibly on a news agency report, a couple of sentences added to another story, or no coverage at all;

1 – moderate; one column headline or a small news item, report written by the newspaper's staff, the issue mentioned;

2 – average; no front page news, medium importance elsewhere in the paper, two to three column headline;

3 – extensive; a minor hint on the first page, one of the leading news items elsewhere;

4 – very extensive; major news, headlines of four to six columns on the front page.

These rankings are adjusted to the style of the newspaper. Finally, a national index is constructed by taking a simple arithmetic average of the different newspapers in a given country or for the international press, and by rounding it to the closest half-point. Accordingly, the indices range over nine possible outcomes, namely {-2; -1.5; -1; -0.5; 0; 0.5; 1; 1.5; 2} for the favorableness index, and {0; 0.5; 1; 1.5; 2; 2.5; 3; 3.5; 4} for the quantitative measure of press coverage. The indices are available to us starting with the Governing Council meeting on October 7, 1999, and ending with the meeting on January 13, 2005.

Given the novelty of this data set, a number of remarks are in order. In particular, it should be kept in mind that our analysis focuses exclusively on a particular segment of the printed press, as e.g. it does not include regional newspapers, which very often have a large circulation. Also, it does not include other media, such as television or radio reporting. Accordingly, there is a substantial part of the general public that is out of reach of the media analyzed here.

Despite the substantial experience of the media experts with such assessments, the favorableness index is clearly subject to a good deal of judgment by the media experts, and might therefore entail elements of subjectivity. We will address this possibility in our econometric analysis by controlling for expert-fixed effects. As the quantitative ranking gives much more precise and objective instructions to the media experts, subjectivity should be less of a concern for this index. However, because it cannot be entirely excluded, we will resort to expert-fixed effects when analyzing press coverage as well.

A potential caveat is that the extent of press coverage that the ECB's monetary policy decisions receives is likely to depend on the occurrence of other news on the same day, which could possibly crowd out the reporting on the ECB (a factor that should apply less to the favorableness of the reporting, though). For sufficiently large samples, this issue should be less of a concern; if anything, it would bias the effect of our explanatory variables downwards. Furthermore, the panel structure employed in the empirical analysis is well equipped to handle the effects of fixed and random national events which will mainly be limited to the respective national press.

The averaging across newspapers within countries implies certain advantages, but at the same time brings about some disadvantages. For instance, the index does not take into account differences in circulation or the importance of each newspaper as an opinion leader, as it does not attach larger weights to more widely read newspapers. It can therefore not assess in detail how many readers are likely to be reached by the reports. The averaging across specialized and general newspapers implies similar complications – as the two types of newspapers target different audiences, dissemination of the news among the general or the specialized public cannot be precisely assessed. The main advantage of averaging lies in its robustness to outliers, however. As the indices for each country are generally based on several newspapers, the average indices are likely to represent a good overall picture of media attention in a given

country. All in all, the indices are therefore particularly useful in comparative analyses, either over time, or across countries.

Table 2

Table 2 provides a number of summary statistics for the indices. Our sample consists of 54 meetings, although the coverage is slightly smaller for some individual countries and for the quantitative index. The coverage of individual countries varies slightly over time, due to possible delays in delivery of the newspapers. Overall, the favorableness index is rather balanced, with a mean across countries and over time of 0.041. Interestingly, the most extreme cases of ±2 are never reached in the country averages.

There is substantial variation in the indices, both across countries and over time. While Greece and Ireland are the countries with the overall least favorable reporting, Luxembourg and Spain are those with the most favorable, with a difference in the index of around 0.2. This difference is even larger if it comes to quantities, with coverage in Austria and Luxembourg being around one point lower than in Germany and Italy. Most of the variation is found over time, though. With respect to favorableness, the range within a given country spans at least 2 full points; for coverage, in all but one country the maximal entry is equal to four, i.e. the highest possible. The full range of entries, from zero to four, is covered for two countries; in most others, the index covers at least three full points.

Table 3

Table 3 shows cross-country correlations of both indices, with the correlations for the favorableness index reported below, and those for the coverage index above the diagonal. All but two entries are positive, and generally, correlations are relatively large, pointing to the fact that there is a substantial amount of time variation that is common across countries.

Figures 1 and 2

Figures 1 and 2 plot the average value of the indices for each Governing Council meeting and the standard deviation across countries as a measure of the country differentiation. An interesting observation from Figure 1 is that favorableness seems to have been relatively more volatile in the beginning of the sample, whereas it appears to have stabilized around a relatively neutral level towards the end, with little effect on the cross-country standard deviation. Regarding the quantity of press coverage, the level of reporting on the ECB seems to have been somewhat lower toward the end of the sample—perhaps reflecting the absence of interest rate changes during that period. Figure 2 seems to suggest that this had little or no influence on cross-country differences in ECB coverage, however. Overall, the figures suggest that there is substantial variation over time, but no systematic longer-term trend. Finally, it is interesting to note that cross-country differences as measured by the standard deviation are substantially larger for quantities than for the favorableness index.

4.   Empirical Model

As the next step, we turn to outlining the definition of the various potential determinants for the press coverage of ECB decisions (section 4.1), before explaining the empirical methodology employed for the analysis (section 4.2).

4.1 Determinants of media coverage

In section 2, we derived a number of hypotheses as to the likely determinants of favorableness and the extent of press coverage. To test these hypotheses, we define a comprehensive set of explanatory variables, which are described below.[6]

ECB's policy decisions and communication

Policy decisions

ECB Monetary Policy Surprise	Dummy variable; set to one if the monetary policy decision has surprised markets (defined by the median response in the regular Reuters poll)[7]
ECB Interest Rate Change	Dummy variable; one for Governing Council meetings at which policy rates are changed

Meeting-Day Communication

Market Reaction During the Press Conference	Proxy for the informational content of the Press Conference, based on the absolute return in the German long-term bund futures contracts during the course of the entire press conference[8]
Governing Council Meetings Outside Frankfurt	Dummy variable; one for the country in which the meeting takes place, zero for all other countries, zero for all countries for meetings in Frankfurt

Inter-Meeting Communication

Communication Frequency, President	Number of statements about monetary policy inclination by the ECB president in the inter-meeting period, based on Ehrmann and Fratzscher (2006)

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[6] Sources for the data, if not indicated otherwise in the text: central bank websites; macro variables are real-time data as available at the day of the respective press conference, taken from Bloomberg. Details are available on request.

[7] The Reuters poll surveys between about 30 and 60 financial market forecasters prior to each meeting during our sample period.

[8] We opted for long-term contracts due to data availability and because longer maturities react more to monetary policy statements (such as the ECB's press conference) than to the release of monetary policy decisions (see Brand, Buncic and Turunen 2006 for the euro area and Gürkaynak, Sack and Swanson 2005 for the US). Returns are based on long-term German government bond futures contracts with a remaining term to maturity of between 8.5 and 10.5 years, traded on the European Exchange (EUREX; Source: TickData Inc). These contracts reflect the benchmark status in the long-term segment of the euro area bond market. Absolute returns are calculated as $r_t = abs[100*ln(p_t/p_{t-1})]$, where p_{t-1} and p_t relate to the price of the last trades prior and during the ECB's press conference, respectively. For further details on the underlying data, such as the methodology applied for switching to the next maturity contracts, see Andersson et al. (2006).

Communication Frequency, Others	Number of statements about monetary policy inclination by Governing Council members other than the president in the inter-meeting period, based on Ehrmann and Fratzscher (2006)

Other Communication

Clarification of the Strategy	Step dummy, takes the value of one after the ECB has clarified its monetary policy strategy in May 2003
Release of Reference Value of M3 Growth	Dummy variable, set to one for press conferences where the reference values of M3 growth have been released
Release of Staff Projections	Dummy variable, set to one for press conferences where the ECB staff projections for future inflation and output growth have been released

Economic Environment

Euro Area Macro Conditions

Euro Area Inflation	Dummy variable; one if the latest figure for euro area HICP inflation released by the time of the press conference exceeds 2%, the ECB's definition of price stability
Euro Area Industrial Production	Dummy variable; one if the latest figure for euro area industrial production released by the time of the press conference exceeds the sample average

Federal Reserve

Interest Rate Change by the Federal Reserve's FOMC	Dummy variable; one if US policy rates have been changed in the two weeks preceding the ECB's press conference, zero otherwise

Country-Specific Conditions

Absolute National Inflation Differential	Absolute difference between national and euro area HICP inflation
Nationality of Executive Board Members	Dummy variable; one for countries with an Executive Board member of the same nationality
Country Size	Dummy variable; one for the three largest economies in the euro area (France, Germany and Italy) and for the international press
Historical Inflation	Average national consumer price inflation, 1950-1998

This set comprises the benchmark explanatory variables for our model, although other controls are added in some instances to the empirical specification to ensure and test for robustness, as explained in the subsequent sub-section.

4.2 Empirical methodology

In the empirical analysis, we proceed in three steps. First, we establish the relationship between favorableness and the amount of press coverage. In line with the hypotheses

expressed above, the evidence suggests that more extreme, positive or negative, values of favorableness lead to larger press coverage. At the same time, however, negative news is reported upon more extensively than positive or neutral news. As this supports the notion of favorableness as a likely determinant of press coverage, the second step in the empirical analysis will be to identify the drivers of favorableness. Building on these results, we will, in the third step, attempt to identify which factors can help explaining the *quantity* of press coverage.

For the formulation of the empirical model, we need to take into account that the dependent variable is an ordinal variable, in the sense that larger values imply more favorable or more extensive press coverage, although it is not possible to interpret a doubling in the value of the indices as a doubling in the favorableness or amount of press reporting. We will therefore resort to estimating panel ordered probit models. These models estimate an underlying score as a linear function of the independent variables X and a set of cut-points μ_i. The probability of observing a given outcome for the indices (*outcome*) does then depend on the probability that the linear function $\beta'X+u$, when evaluated with the realizations of the independent variables, lies within the range of the cut-points for the respective outcome:

$$\Pr(outcome = i) = \Pr(\mu_{i-1} < \beta' X + u \le \mu_i)$$

The error term u is assumed to be normally distributed; the lowest and highest cut-points are assumed to be minus and plus infinity.

Beyond the independent variables outlined above, we introduce a large number of controls, covering a range of factors that could affect the way the press reports about the ECB's policy decisions.[9] These include an impulse dummy for conferences after the summer break. Traditionally, in August, the ECB holds its Governing Council meeting in the form of a teleconference, and does not hold a press conference afterwards. Accordingly, we want to allow for the possibility that the summer break increases media attention in the subsequent meeting. Moreover, as shown in Table 1, the coverage of newspapers varies across countries, with differences in the overall number, as well as the fraction of specialized journals. Furthermore, newspaper coverage varies slightly over time, due to unavailability of some newspapers at the time of the construction of the index. We control for this composition effect in three ways. First, we construct a dummy variable for countries with one or no specialized newspaper in the sample. Second, we enter the number of newspapers sampled within each country for each press conference, as a variable that varies across countries and over time. Third, on top of this, we construct and include an equivalent variable for the coverage of specialized newspapers for each country and press conference.

A last group of controls captures possible idiosyncrasies in the evaluation and categorization process. We introduce fixed effect variables for each of the experts producing the press indices, which take the value of one for any index measure produced by this individual. In addition to expert-fixed effects, we initially enter country-fixed effects in some of the empirical models to extract country-specific differences in the favorableness or amount of press coverage. In a later stage, these country-fixed effects are dropped in favor of trying to explain country-differences by country-specific variables.[10]

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[9] Results for most of those control variables are not reported here for brevity, but are available upon request.
[10] All results are qualitatively identical, and even quantitatively extremely similar with using country-random effects or simple OLS.

5.   The Relationship between Favorableness and Quantity of Press Coverage

In Section 2, we had hypothesized that more extreme opinions on the side of the press are likely to be reflected in more extensive reporting, such that favorableness should be a determinant of press coverage. Table 4 reports results from a number of models that aim to explain the amount of press coverage by different variants of favorableness. Model (1) shows that there is no linear relationship between favorableness and press coverage. However, Model (2) provides evidence of a non-linear relationship: the absolute value of the favorableness index is significantly related to the amount of reporting, with more extreme opinions leading to more extensive coverage. Finally, Model (3) amends the previous one by adding a dummy variable that is equal to one if the favorableness index is negative.

These results suggest, on the one hand, that more extreme opinions raise the level of reporting, and, on the other, that negative opinions lead to more extensive coverage than positive or neutral ones. Accordingly, it is important for the ECB to explain its decisions well, as particularly those decisions that are poorly understood are reported on more extensively.

Table 4

On the basis of this evidence, we will proceed in two steps in the analysis below. First, we will estimate a model for the favorableness index, searching for factors that affect the opinions expressed in the press. In a second step, we will then analyze whether these factors translate directly into the amount of press coverage, or whether some of the determinants of press coverage do not impact on the intensity of reporting. Finally, we will allow for the possibility that other factors, which do not have a bearing on the favorableness of the reporting, determine the intensity of press coverage.

6.   Determinants of Favorableness and Press Coverage

In our empirical approach, we first estimate a benchmark Model (1) containing only a small set of the potentially most relevant determinants. Further explanatory variables are then added in the second step (2) to assess the robustness of results in Model (1). Both models include country-fixed effects to ensure that all other parameter estimates are not affected by cross-country differences in the average favorableness or extent of press coverage. Continuing from there, we modify the model to (3) by dropping the country-fixed effects and adding country-specific variables, in order to identify possible determinants for different average favorableness or coverage across countries.

All results are reported in Tables 5 (favorableness) and 6 (extent of press coverage), showing the parameter estimates for the underlying linear function of the independent variables, β, as described above.

Tables 5 and 6

6.1 ECB policy decisions and communication

Turning to the ECB's policy decisions, Table 5 shows that monetary policy surprises lead to less favorable reporting in the press. Two factors could potentially explain this result –

surprises could generally be considered undesirable by the press, or financial market analysts, who often are interviewed by journalists to comment on the decisions, feel a need to explain their forecasting mistake and therefore comment in a rather critical fashion. At the same time, and somewhat at odds with our priors, however, there is less press coverage in this case (Table 6). We will return to this issue in more detail in the subsequent section. By contrast, decisions to change interest rates are perceived well by the press – favorableness notches up, although only at low levels of statistical significance. And, as expected, there is a large and highly significant increase in the amount of reporting.

Moreover, we find a large positive effect of Governing Council meetings held outside Frankfurt on favorableness and coverage in the respective national media.[11] The results suggest that the tradition of the Governing Council to hold meetings outside Frankfurt substantially increases media attention in the respective country.

The extent to which a given decision is understood by the media is likely to depend on the explanation given by the ECB, i.e. its communication. To analyze how reporting responds to ECB communication, we first look at the role of communication on the meeting day through the Press Conference. We take the absolute return of long-term bonds during the about 45-minute long Press Conference as a proxy for the information content that is conveyed. The argument is that a larger reaction during the Press Conference implies that the public is able to extract more relevant information from it. The results of Tables 5 and 6 indicate that more information is beneficial for the favorableness with which the press reports, as well as for the amount of press coverage that the ECB can achieve. This finding is in line with the hypothesis that the information conveyed during the Press Conference allows the reporting press to better understand the rationale of the policy decision, thus inducing a more positive media assessment.

A closely linked factor relates to the communication of Governing Council members in the time prior to the meeting. We find that both favorableness and coverage respond to the number of statements that contain forward-looking information regarding monetary policy inclinations, suggesting that more communication ex ante will lead to a better understanding of the decision, and thus to a more favorable and more extensive reporting ex post. As this type of communication is, as a rule, consistent with subsequent monetary policy decisions (Ehrmann and Fratzscher 2006), it is likely to contribute to a better understanding of the decision by the public. Furthermore, a higher number of statements prior to Governing Council meetings might allow for a more interesting reporting on the ECB's policy decisions and the ensuing press conferences, as articles can relate to the earlier statements. Alternatively, a higher frequency of direct communication might increase the ECB's visibility before the meeting, leading to a higher incentive to cover the monetary policy decision. Interestingly, the media also appears to clearly differentiate between communication by the ECB president and other Governing Council members – the effect of the latter is substantially, and statistically significantly smaller than of the former.[12]

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[11] Beyond its effect on the national media, meetings outside Frankfurt do not generally affect coverage in the other countries.

[12] An alternative explanation that could be relevant for the amount of coverage, but less so for favorableness, is that intensified inter-meeting communication might itself be a reflection of a heightened need to communicate more on behalf of the Governing Council, for instance in times of increased uncertainty, which, in turn, could also explain the elevated interest of the press. Also note that the analysis is purely backward-looking. Accordingly, no implications can be drawn as to how different approaches to communication in the future could affect media coverage.

Finally, Models (2) and (3) contain a number of variables that reflect other communication types by the ECB. First, there is no discernible response of favorableness to the clarification of the ECB's monetary policy strategy in May 2003.[13] On the other hand, whenever the ECB releases additional relevant information during its press conferences, such as the reference value for M3 growth (released in the December press conferences from 1999 until 2002) or the staff projections for inflation and output growth (released quarterly since June 2004), opinions expressed in the press are clearly more approving. Interestingly, all these factors tend to decrease the amount of press coverage, albeit at different levels of statistical significance. Though at first puzzling, it could very well be that the provision of clear information makes journalists write less, as the news content is easier to convey to the readers, or that the focus on the special content induces journalists to report less on other, more complex information conveyed during the press conference.

To summarize, a number of factors that relate to the ECB's behavior, be it its decisions or its communication, substantially alter the opinions expressed in the press and the extent to which this is done. First, it is important to note that press coverage increases with the news content provided by the ECB. Second, communication, either through the press conference, or in the inter-meeting period, affects understanding and acceptance of a given policy decision, which in turn is reflected in improved favorableness. Third, the release of additional information that allows the public to better understand the ECB's monetary policy decisions, such as inflation projections or (until 2002) the reference value of M3 growth, are accordingly accompanied by positive press reports. Fourth, the occasional meetings outside Frankfurt have a significant and large effect on the national media in the visited country, by increasing awareness and even improving public opinion.

6.2 The economic environment

Turning to the effects of the economic environment within which a press conference takes place, there is clear evidence that press reporting is responsive to the most recent inflation figures. If euro area HICP inflation exceeds 2%, i.e. the ECB's definition of price stability, press coverage of individual decisions becomes more critical and intensifies.[14] Although reporting is also responsive to the business cycle in general, there are important differences to the way the press responds to inflation developments: if euro area industrial production exceeds its sample average, i.e. if the euro area economy does better than on average, there is more attention to the ECB's press conference, yet the opinion on the ECB's policy decisions is not affected.

At the same time, the ECB's decisions seem to be discussed in an international context, as there is a marked increase in press coverage if the US Federal Reserve has changed its policy rates in the two weeks preceding the ECB decision. Apparently, interest rate changes by the Federal Reserve attract journalists' attention to the actions of the ECB, possibly also because this allows the press to relate, and possibly contrast, a given decision with those of other central banks.[15] However, it is important to note that the opinions expressed are not affected

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[13] For more information, see http://www.ecb.int/press/pr/date/2003/html/pr030508_2.en.html.

[14] The same result is obtained for above-average inflation: reporting turns more negative and coverage increases if HICP inflation exceeds its sample mean.

[15] This is illustrated by newspaper headlines on November 3, 2005, i.e. one day prior to a Governing Council meeting: "Nach US-Zinserhöhung wartet Europa auf EZB-Entscheidung" ("Following the raise in US interest rates, Europe is now waiting for a decision by the ECB" – published in the Austrian newspaper *Der Standard*), or "Fed erhöht wieder Zinsen: Folgt EZB?" ("Fed raises interest rates again – will the ECB follow suit?" – published in the Austrian newspaper *Salzburger Nachrichten*).

in any sense, indicating that there is an unbiased discussion regardless of the actions of the Federal Reserve.

To summarize, these results suggest that the media critically discusses the ECB's policy decisions, leading to more critical remarks if the most recent inflation figures exceed the ECB's definition of price stability, and that the reporting is embedded in the euro area macroeconomic as well as in an international context.

6.3 Adding country-specific characteristics

In addition to the economic environment of the euro area as a whole, press reporting in individual countries may be influenced by the country-specific conditions of these countries. In order to test this hypothesis, we drop the country-fixed effects in Model (3) of Tables 5 and 6 in order to include and test for the importance of country-specific variables. As mentioned in Section 3, although differences over time dominate those across countries, it is nonetheless interesting to study which factors contribute to the observed country differences.

A first important result is that the various explanatory factors in Model (3) are considerably more important for the quantity with which the national media report than for favorableness. For instance, in countries where national inflation rates deviate relatively more from the euro area average (both up and down), the press reports more, but not more critically.[16] This is in line with the finding reported in Section 3, that favorableness varies considerably less across countries than coverage. One reason for more extensive reporting could be that a larger gap between the national and the euro area performance will require more efforts by journalists to explain to their national audience why a particular ECB decision has been taken, as it requires disentangling the euro area from the national context. It should come as good news for euro area policy makers that this is done without a change in the tone of the discussion, suggesting that the press makes unbiased efforts to explain the euro area perspective of the ECB's monetary policy to their national audience. One interpretation is that the national media play an important role in transmitting the ECB's policy intentions to their national audiences, and contribute to a homogeneous understanding and perception of the role of the ECB.

As to other country-specific conditions, we find that press coverage is substantially higher in large countries (i.e., in Germany, France and Italy as well as in the international press). This might reflect the fact that in large countries there is generally a wider range of newspapers to sample from. As a consequence, the press coverage index might cover more papers that cater to a relatively specialized audience with a higher interest in monetary matters.[17] Alternatively, it may reflect that larger countries have in some case been more autonomous in their conduct of monetary policy prior to monetary union, thus leading to a more extensive coverage of monetary policy-related issues in their media. A marginally significant increase in media attention can also be observed in the national press when one of the six members of the ECB's Executive Board is of the same nationality. Importantly, however, none of these issues affects the opinions expressed in the respective media. The only exception relates to the role of history. We find that countries that historically have had higher inflation report relatively

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[16] The favorableness of reports does not depend on the actual (as opposed to the absolute) deviations of national from euro area inflation rates either. Hence it is not the case that in countries with relatively high inflation rates the ECB's monetary policy decisions would be discussed more or less critically than in countries with relatively low inflation rates.

[17] Note that these results are based on a model that, in addition, controls for the number of journals as well as the presence and the number of specialized papers covered in the index per meeting and country.

more, as well as more critically, as higher average national inflation over a long time span from 1950-1998 lowers favorableness and increases coverage. However, the effect on favorableness is only marginally significant.

To summarize, we find that national factors play a role, but predominantly in relation to the quantity with which the press reports. The evidence is consistent with the notion that the national media indeed has an important role in explaining the ECB's decisions to their national audiences, in particular in times when national developments deviate more from the euro area average, and that this discussion is led in an unbiased fashion.

6.4 Robustness and marginal effects

We next turn to conducting various extensions and robustness tests of our findings. A first critical issue concerns the relationship between favorableness and the extent of media coverage outlined in Sections 2 and 5. In principle, if favorableness indeed is a determinant of news coverage, we can either include favorableness as an explanatory variable in the model for the quantity of press reporting. Alternatively, in what could be dubbed a reduced-form approach, we can include the set of variables determining favorableness in the model explaining ECB press coverage, adding the dummy variable indicating whether a given favorableness index has taken on a negative value as well as the residual from Model (3) for favorableness in the model for press coverage. This residual is the component of favorableness that cannot be accounted for by and thus is orthogonal to the common determinants of press favorableness and press coverage.[18] The reduced-form approach has the added advantage that it allows for variations in the set of explanatory variables across models (see above).

The first two rows of Table 6 show that favorableness, to the extent that it is not picked up by other variables in the model, indeed influences the extent of press coverage: extreme views, as measured as the absolute of the favorableness residual, will find more coverage in the media than less polarized views. There is, moreover, an important asymmetry in this relationship as negative views trigger significantly more media coverage than positive views. This implies that the costs of unfavorable reporting for the ECB are disproportionately larger in terms of coverage than the benefits from a favorable press.

Turning to modeling issues, our results prove remarkably robust along a number of dimensions. One interesting fact to note is that dropping the country-fixed effects in model (3), and replacing them with a few country-specific variables, hardly worsens the statistical fit of the model. The various pseudo-R^2 measures reported are either identical, or only marginally smaller than in the fixed-effect specification, and the BIC information criterion even weakly prefers model (3) over model (2).[19]

Allowing for seasonality in the extent of press coverage modifies our results as follows: The reductions in coverage for surprising decisions and for press conferences where the reference value of M3 growth is released are no longer statistically significant. Furthermore, we can no longer detect effects of rate changes by the Federal Reserve on the extent of reporting. All other results remain unchanged.

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[18] The residual has been estimated in the OLS regression of model (3) as reported in Table A3. All results are robust to dropping these two variables.

[19] See, for instance, Veall and Zimmermann (1996) for a discussion of the relative merits of the various pseudo-R^2 measures for models with qualitative dependent variables.

When using a random effects estimator, results are not only qualitatively, but also quantitatively remarkably similar.[20] The only important modification of the results is that the size of inflation differentials and the historical inflation experience are no longer a relevant determinant for national press coverage. Moreover, ignoring the fact that the press coverage index is an ordinal variable, and just estimating simple OLS, yields basically the same conclusions with regard to statistical significance and sign of the regressors.[21] This is reassuring, because, other than the ordered probit framework, the OLS model allows directly and unconditionally interpreting the average direction as well as the magnitude of the impact of the independent variables on ECB press coverage.

In addition, as we had to assign values to the international press for the country-specific variables in model (3) (e.g., for our measure of the historical inflation experience, we assigned it a neutral value at the euro area average), which might be somewhat arbitrary, we repeated the estimation of our models excluding the international press. Results are again in line with our baseline results,[22] suggesting that our findings are not driven by differences in the reporting of the national and the international press.

Finally, for expositional ease, our result tables show the parameter estimates for the underlying linear function of the independent variables, β, as described in equation (1). From these tables, it is, strictly speaking, not possible to make any inference regarding the actual values of the favorableness and press coverage indices, as these are only defined in relation with the various cut-points μ_i. The more interesting results are therefore the marginal effects of a change in an independent variable on the probability for a given outcome of the indices.[23] We have calculated these marginal effects separately for each possible outcome and for each variable (evaluated at the mean of the independent variable).

For instance, the marginal effect of a change in the variable "ECB monetary policy surprise" can be calculated for the value "1.0" of the favorableness index. It would then denote how the probability that the favorableness index takes the value of 1.0 changes if the ECB decision has been surprising, relative to the probability in the case of an anticipated decision. If we assume that a surprising decision reduces this probability, it must be the case that another value of the favorableness index results as more likely. In other words, if an increase in an independent variable lowers the probability of a particular outcome, it must increase the probability of some other outcome. Figures 3 and 4 show the entire set of marginal effects – in a separate plot for each of the independent variables, and for the different possible outcomes within each of the subplots (the possible outcomes of the indices are indicated on the x-axis, the marginal effects on the y-axis). Results are shown for model (3), along with 95% confidence bounds.

Figures 3 and 4

A number of interesting results emerge from these figures. That we see positive and negative marginal effects within each subplot merely reflects the fact that an increasing probability for some outcome must be matched by a decreasing probability of another outcome. Of greater interest is the interpretation of *where* a given variable increases the probability.

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[20] Tables A1 and A2 in the appendix show the results for the set of regressions introduced in Tables 5 and 6, estimated with random country effects.
[21] See Tables A3 and A4.
[22] See Tables A5 and A6.
[23] See Greene (1997), pp. 926-929, for an excellent exposition of these issues.

The most extreme case is the one of the meetings outside Frankfurt. This variable is defined as a dummy variable, such that the marginal effect denotes the first derivative of the probability of a given outcome for a discrete change of the explanatory variable from 0 to 1. Figure 4 shows that the probability of the most extreme value of the coverage index increases by nearly 100% for the outside meetings, suggesting that the value of four is basically reached in all cases of outside meetings, and hardly ever otherwise. Recollecting the definition of the index, a value of four implies very extensive reporting, such as headlines of four to six columns on the front page of newspapers. Hence, the tradition of the Governing Council to hold meetings outside Frankfurt substantially increases media attention in the respective country.

Most other variables with a significant impact tend to increase mainly the probability of more intermediate ranges of the two indices. For instance, for the press coverage index most factors increase the probability that the index takes a value of 3, with a corresponding reduction in probability mass at either the average value of 2.5 or at 2, i.e. just one or two notches up. Comparing Figures 3 and 4, it becomes apparent that the effects for coverage in Figure 4 are more spiked than those for favorableness in Figure 3, i.e. that changes in the explanatory variables tend to affect only one outcome positively and one negatively for coverage, whereas the effect is more spread across outcomes for the favorableness index. For instance, with euro area inflation being above the 2% threshold, the probability of all favorableness index values above 0.5 is significantly reduced, whereas all negative outcomes, and even the neutral 0, become significantly more probable.

7.   The Role of ECB Communication

The results reported in the previous section show that media reports are responsive to efforts by the ECB to explain the motivation behind a given decision – in particular through its communication on the occasion of the Press Conference and in the inter-meeting period. This section analyses in more depth the scope as well as the limitations of these effects .

A first important question is whether the acceptance of a given decision, which has been shown to depend on the economic environment and the nature of the decisions, is at the same time affected by the accompanying explanations. In particular, we have seen that policy surprises as well as periods of high euro area inflation trigger a more critical media reporting of ECB decisions. An interesting issue is to what extent the provision of information can lead to a better understanding of the public, and thus to a more favorable reporting. Table 7 addresses this issue based on our proxy for the informational content of the press conference, the reaction of long-term bonds. We interpret a large movement of interest rates during the press conference as implying that the informational content has been considerable, although it should be stressed that not all relevant information necessarily moves markets. However, it is not necessarily equivalent to "good" communication from the central bank's perspective. For instance, there might be cases where the market assessment does not need any updating, such that communication should aim to reconfirm the current level of interest rates and not to move them from their value prior to the press conference. In that sense, it is important to note that we consider our measure merely as a proxy for the informational content conveyed during the press conference, but not for the quality of the communication.

Table 7

The first set of results analyses whether media reporting responds to communication during the press conference depending on whether a given monetary policy decision has been surprising to markets or not. There are four different possibilities. The information content of a Press Conference can either be large or small, and this can be the case for a decision that was either surprising or anticipated. The benchmark for comparison in this test is the case where the market reaction is small and the decision has been well anticipated. The results for favorableness show that press reporting is significantly more critical in only one case: with a small market reaction in the context of a surprising decision. This latter scenario (2) is actually not only different from the benchmark scenario, but also significantly different from the two other possibilities (1) and (3), as indicated by the tests of equality. What these results suggest is that a surprising decision, if sufficiently well motivated during the Press Conference, receives supportive reports in the media.

A related test is conducted in the second set of results. In the preceding section, we had found that interest rate changes find a positive feedback in the press. Dissecting this finding further, it turns out that this originates from press conferences on days where interest rates were changed, and furthermore a large amount of informational content was conveyed. The impact on coverage is substantial in this case, as two enhancing factors are combined. There is more reporting about interest rate changes in general, and about press conferences with large accompanying market reactions, such that a combination of both factors in scenario (1) leads to more reporting than in any other scenario.

Third, looking at the economic environment, if inflation exceeds 2%, reporting tends to be critical of ECB actions, regardless of the market reaction during the press conference. Moreover, there continues to be no effect of national inflation developments on the favorableness of reports in the national media, regardless of the communication on the occasion of the press conference. These results underline the media's role as a critical observer of the independent central bank.

Fourth, another way for the ECB to motivate and explain its decisions, is to employ inter-meeting communication. Table 8 contains information on the role of inter-meeting communication depending on the monetary policy decision. In line with the results of Table 7, there is clear evidence that interest rate changes are seen positively by the press if they are prepared by complementary communication – if interest rates are changed, press reports are significantly more favorable if there has been a relatively large number of statements prior to the Governing Council meeting.

Table 8

Finally, Table 9 provides a more detailed analysis of policy decisions. If interest rates are changed, favorableness is unaffected by whether this change has been anticipated or came as a surprise. On the other hand, there is a large effect in case of unchanged interest rates. If the Governing Council decides to keep interest rates unchanged in the context of market expectations that rates will be changed, it will be faced with considerably more critical press reports than in all other scenarios.

Table 9

In summary, the findings indicate that efforts by the ECB to motivate, explain and prepare its decisions through the Press Conference and through inter-meeting communication, are

mirrored in the understanding and thus in the tone of subsequent press reports. However, the findings also underline clear limitations of this effect, as for instance a more critical discussion of ECB policy decisions prevails in the context of relatively high inflation.

8.   Conclusions

The dissemination of central bank communication through newspapers and mass media in general is important for a central bank, as it allows addressing the general public. Reaching the general public, and not only financial market participants, is important because it is the former whose inflation expectations eventually feed into the evolution of inflation through wage claims and savings, investment and consumption decisions, and thus affect how a central bank is able to achieve its policy objectives. This paper systematically assesses the coverage that the ECB receives in response to its monetary policy decisions in the international and national press. Based on a novel dataset that quantifies press coverage in the 12 countries of the euro area and the international press based on 57 newspapers reaching back to 1999, the paper identifies a large number of determinants for both the favorableness (reflecting the understanding of a given policy decision) and the intensity of press coverage of ECB monetary policy decisions.

The paper provides evidence of a link between favorableness and intensity, in the sense that stronger opinions expressed by journalists lead to more intense coverage. Furthermore, reporting intensifies in particular in the presence of critical views. The findings of the paper indicate that the assessment of ECB policy decisions in the media is influenced substantially by the nature of the decisions and the general economic environment. In particular, a less favorable reporting prevails if a decision is to some extent unanticipated, and if the most recent inflation figures stand above 2%, the ECB's definition of price stability.

In line with the hypothesis that clear communication will lead to a better understanding of policy decisions, and thus to a more favorable reporting in the media, the paper finds that the favorableness and the extent of media coverage are highly responsive to the type and content of ECB communication. For instance, we find that a policy surprise, which on average leads to more unfavorable reporting, receives as favorable a reporting by the media as a fully anticipated policy decision *if* it is sufficiently well explained during the press conference (measured through a proxy for its information content). A related finding suggests that the tone of the discussion turns more favorable, and thus reflects a better understanding in instances where the ECB releases relevant additional information beyond the regular economic and monetary analysis, such as the quarterly staff projections for future inflation and output growth. However, the empirical findings also underline that there are cases where a more critical discussion prevails, despite communication efforts to explain the motives behind a given decision. For instance, we find that the media reporting of ECB policy decisions is always more negative in tone when inflation is relatively high, even when communication is intense and the information content of press conferences is high.

In a multi-country currency union like the euro area, where monetary policy is conducted with the aim to achieve price stability for the entire area, national media have an important role in making the central bank actions and its objectives understood by the national audiences, which might otherwise evaluate the common monetary policy from a national perspective. The findings in this paper suggest that there is no role for a national bias in the discussion of the ECB's monetary policy decisions. On the contrary – in situations where the common monetary policy needs explaining more to a national audience, like in the case of deviations

of the national from the euro area inflation developments, the national media tend to write more extensively, but do not appear to have more biased views on the monetary policy decisions than the media in other countries. One interpretation is that the national media play an important role in transmitting the ECB's policy intentions to their national audiences, and to contribute to a homogeneous understanding and perception of the role of the ECB.

In sum, the paper has presented evidence that the media contributes to the transmission of the ECB's communication in a meaningful fashion. Given the novelty of the approach and the issue addressed in this paper, several questions remain unanswered. This paper has looked at the case of the ECB. Comparing the extent of press coverage across central banks might enable us to shed light on the efficiency of the different communication practices of different central banks. Other possible extensions include a separate analysis of generalized newspapers and the financial press, a broader analysis including also regional newspapers, which often have a very high circulation, and as such the potential to reach a large audience, or of mass media other than the printed press. Finally, we have limited ourselves to an analysis of the transmission of communication, leaving open the question how communication is actually received by the final addressee, the general public. We leave this for future research.

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Figure 1: Press Coverage of the ECB's Monetary Policy, Mean Across Countries
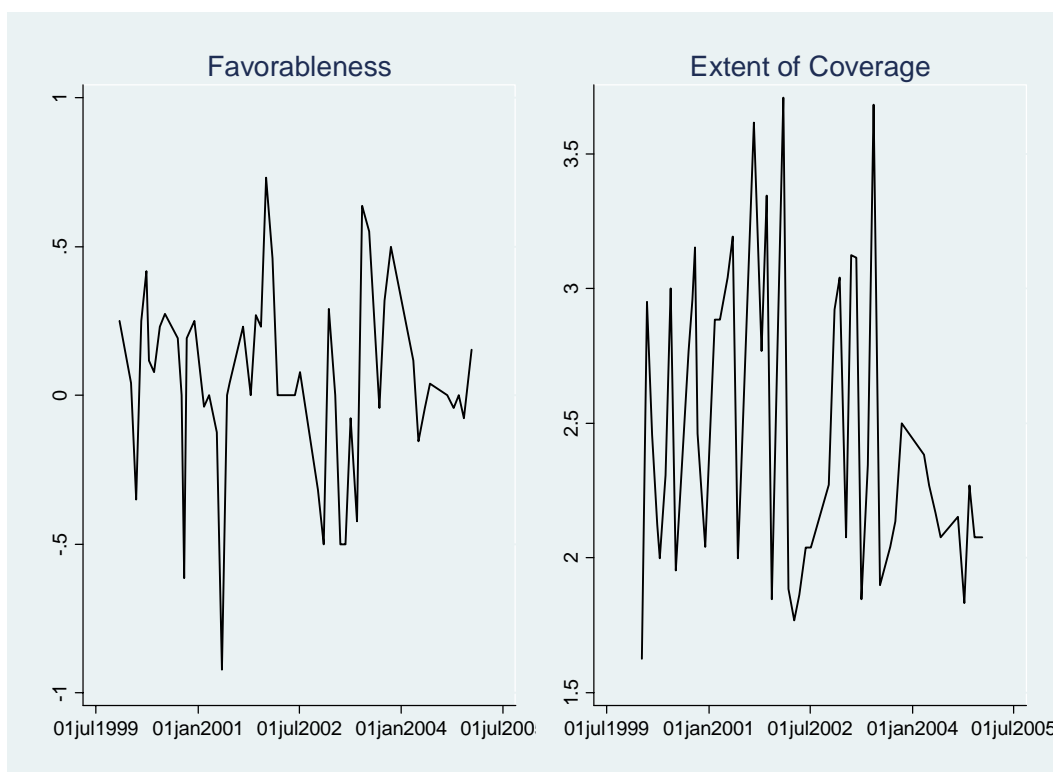
Notes: The chart plots the average value of the press indices for each Governing Council meeting.

Figure 2: Press Coverage of the ECB's Monetary Policy, Cross-Country Standard Deviation
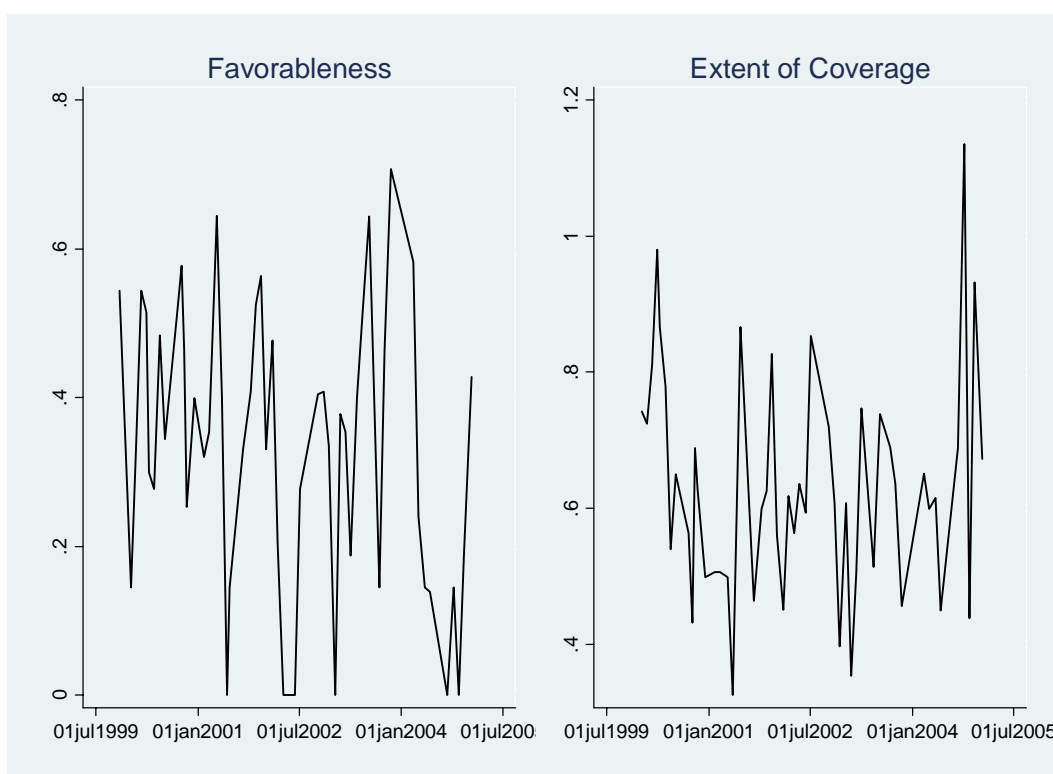
Notes: The chart plots the cross-country standard deviation of the press indices for each Governing Council meeting.

Figure 3: Determinants of Favorableness in Model (3), Marginal Effects Evaluated at the Different Outcomes
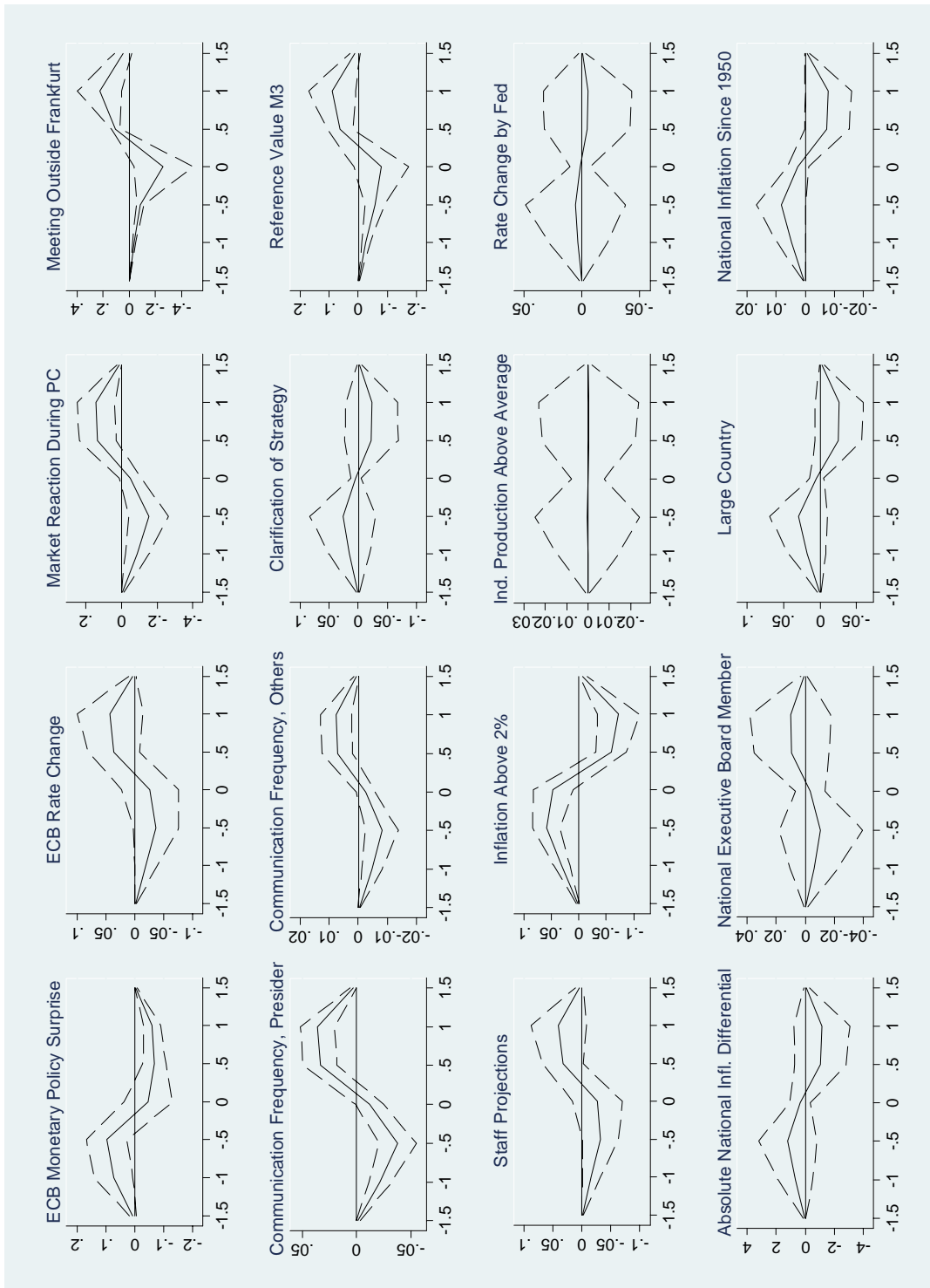
Notes: The solid lines in the Figure show the marginal effects of a change in the independent variables (evaluated at their means) on the probability for a given outcome of the favorableness index. Dotted lines denote 95% confidence bounds. Based on estimates of model (3).

Figure 4: Determinants of the Extent of Press Coverage in Model (3), Marginal Effects Evaluated at the Different Outcomes
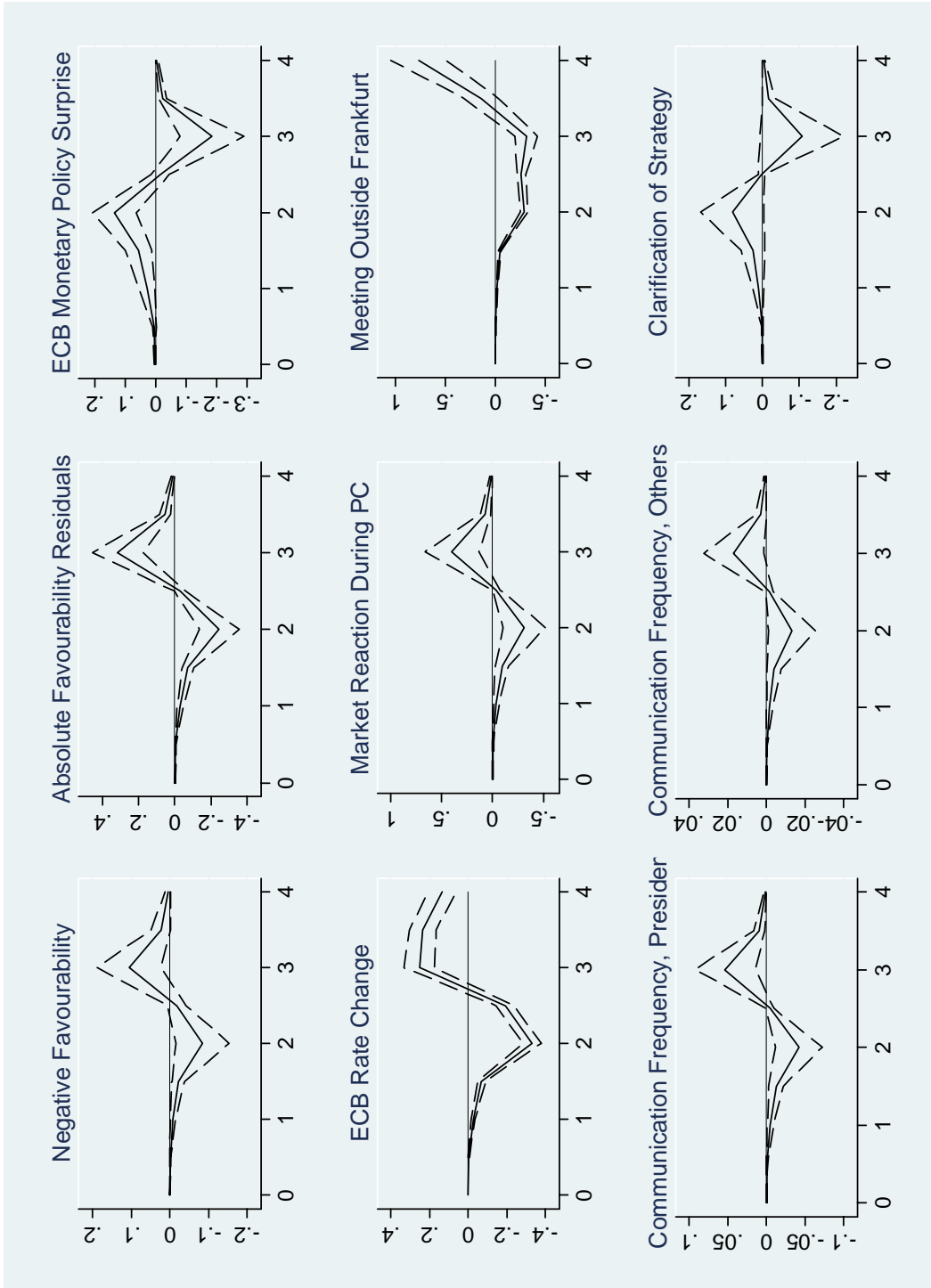
Notes: The solid lines in the Figure show the marginal effects of a change in the independent variables (evaluated at their means) on the probability for a given outcome of the press coverage index. Dotted lines denote 95% confidence bounds. Based on estimates of model (3).

Figure 4 (continued): Determinants of the Extent of Press Coverage in Model (3), Marginal Effects Evaluated at the Different Outcomes
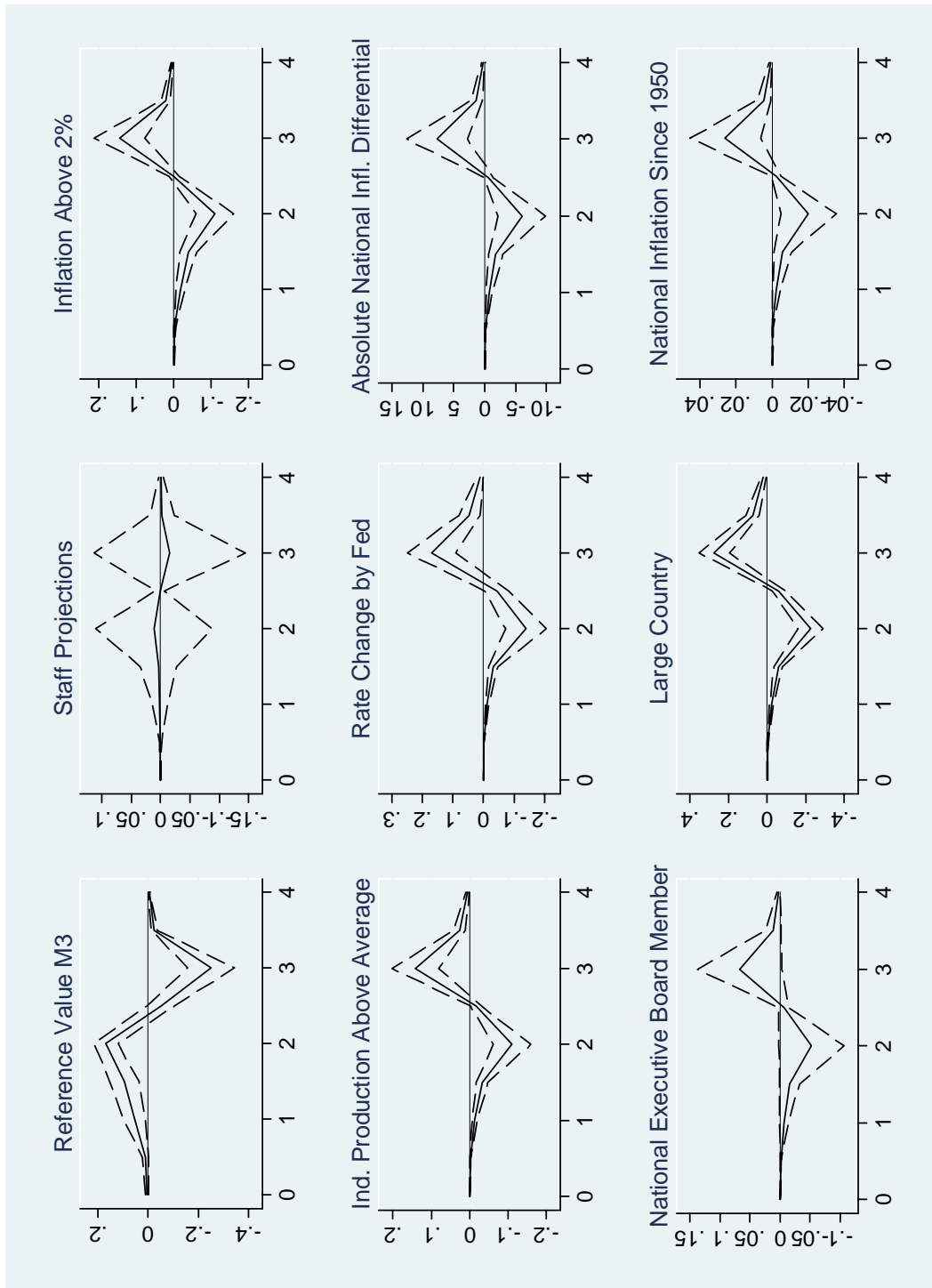
Notes: The solid lines in the Figure show the marginal effects of a change in the independent variables (evaluated at their means) on the probability for a given outcome of the press coverage index. Dotted lines denote 95% confidence bounds. Based on estimates of model (3).

Table 1: Sample of newspapers covered

Country	General Press	Specialized Press
International	International Herald Tribune, Neue Zürcher Zeitung	Financial Times, Wall Street Journal Europe
Austria	Die Presse, Salzburger Nachrichten, Der Standard	Wirtschaftsblatt
Belgium	De Standaard, *La Libre Belgique*	De Financieel Economische Tijd, L'Echo
Finland	Helsingin Sanomat	Kauppalehti, Taloussanomat
France	Le Monde, Le Figaro, Libération	La Tribune, Les Echos
Germany	Frankfurter Allgemeine Zeitung, Süddeutsche Zeitung, *Die Welt, Bildzeitung*	Börsen-Zeitung, Financial Times Deutschland, Handelsblatt
Greece	Eleftherotypia, Kathimerini, Ta Nea, *Imeresia, Kerdos*	Naftemporiki
Ireland	The Irish Independent, The Irish Times, *The Examiner*	
Italy	Corriere della Sera, La Repubblica, La Stampa, *Il Giornale, Il Messaggero*	Il Sole 24 Ore
Luxembourg	Luxemburger Wort, *La Voix de Luxembourg*	
The Netherlands	NRC Handelsblad, De Telegraaf, De Volkskrant	Het Financieele Dagblad
Portugal	Diário de Notícias, Público, *Correo da manha*	Diário Económico
Spain	El País, El Mundo, ABC	Cinco Días, Expansión

Notes: Newspapers in italics are rarely included in the sample.

Table 2: Summary statistics of the favorableness and press coverage indices

Country	Favorableness of Press Coverage					Extent of Press Coverage				
	Obser-vations	Mean	Standard deviation	Minimum	Maximum	Obser-vations	Mean	Standard deviation	Minimum	Maximum
International	53	0.028	0.532	-1.5	1.5	52	2.625	0.656	1.0	4.0
Austria	49	0.071	0.433	-1.0	1.5	48	1.958	1.071	0.0	4.0
Belgium	52	0.067	0.505	-1.0	1.0	51	2.500	0.707	1.0	4.0
Finland	53	-0.009	0.410	-1.0	1.0	52	2.269	0.668	0.5	3.5
France	54	-0.009	0.440	-1.0	1.0	53	2.792	0.639	1.5	4.0
Germany	53	0.066	0.555	-1.0	1.0	52	2.971	0.546	2.0	4.0
Greece	46	-0.076	0.537	-1.5	1.0	45	2.733	0.580	1.5	4.0
Ireland	49	-0.041	0.443	-1.0	1.5	48	2.479	0.857	1.0	4.0
Italy	50	-0.010	0.371	-1.0	1.5	48	2.875	0.541	2.0	4.0
Luxembourg	52	0.163	0.417	-0.5	1.5	51	1.922	0.796	0.0	4.0
The Netherlands	53	0.028	0.523	-1.5	1.0	51	2.157	0.919	0.5	4.0
Portugal	53	0.085	0.389	-1.0	1.5	52	2.154	0.814	0.5	4.0
Spain	54	0.148	0.501	-1.0	1.5	53	2.425	0.890	1.0	4.0
Total	671	0.041	0.470	-1.5	1.5	656	2.450	0.822	0.0	4.0

Table 3: Cross-country correlations of favorableness and press coverage indices

					Extent of Press Coverage							
	Intern.	Austria	Belgium	Finland	France	Germany	Greece	Ireland	Italy	Luxemb.	Netherl.	Portugal	Spain
Intern.	*1.000*	0.345	0.579	0.614	0.501	0.628	0.419	0.611	0.490	0.325	0.589	0.552	0.645
Austria	0.517	*1.000*	0.474	0.429	0.628	0.507	0.127	0.507	0.363	0.168	0.484	0.644	0.592
Belgium	0.531	0.515	*1.000*	0.337	0.664	0.632	0.265	0.403	0.488	0.044	0.676	0.496	0.611
Finland	0.437	0.271	0.380	*1.000*	0.477	0.566	0.431	0.677	0.476	0.251	0.579	0.574	0.544
France	0.642	0.427	0.295	0.529	*1.000*	0.504	0.313	0.673	0.539	-0.054	0.590	0.705	0.665
Germany	0.555	0.363	0.461	0.477	0.665	*1.000*	0.254	0.495	0.567	0.306	0.705	0.719	0.549
Greece	0.277	0.456	0.555	0.493	0.395	0.297	*1.000*	0.304	0.291	0.095	0.509	0.280	0.300
Ireland	0.660	0.117	0.442	0.512	0.316	0.421	0.278	*1.000*	0.560	0.113	0.656	0.724	0.566
Italy	0.750	0.217	0.602	0.538	0.411	0.593	0.458	0.799	*1.000*	0.216	0.630	0.629	0.597
Luxemb.	0.299	0.541	0.504	0.301	0.354	0.187	0.315	0.216	0.207	*1.000*	0.193	0.312	0.253
Netherl.	0.519	0.532	0.383	0.598	0.566	0.550	0.443	0.370	0.383	0.552	*1.000*	0.598	0.644
Portugal	0.557	0.174	0.168	0.244	0.397	0.321	0.228	0.241	0.302	0.139	0.342	*1.000*	0.620
Spain	0.383	0.465	0.445	0.185	0.174	0.340	0.373	0.255	0.459	0.366	0.337	-0.018	*1.000*

(Row labels grouped under: **Favorableness of Press Coverage**)

Notes: Correlations for the favorableness index are shown below the diagonal, for the press coverage above the diagonal.

Table 4: Favorableness as determinant for the extent of press coverage

	Model (1)		Model (2)		Model (3)	
	Coefficient	*Std. error*	Coefficient	*Std. error*	Coefficient	*Std. error*
Favorableness Factors						
Favorableness	0.010	*0.108*	-- --	--	-- --	--
Absolute Favorableness	-- --	--	1.229 ***	*0.146*	1.116 ***	*0.172*
Negative Favorableness	-- --	--	-- --	--	0.250 *	*0.138*
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for country effects	Fixed-effects		Fixed-effects		Fixed-effects	
Number of observations	656		656		656	
McFadden's adj. R^2	0.04		0.09		0.09	
Cragg-Uhler (Nagelkerke) adj. R^2	0.25		0.37		0.37	
McKelvey & Zavoina's R^2	0.37		0.46		0.47	
BIC	-1748.92		-1859.46		-1856.54	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors.

Table 5: Determinants of favorableness

	Model (1) Coefficient	Model (1) Std. error	Model (2) Coefficient	Model (2) Std. error	Model (3) Coefficient	Model (3) Std. error
ECB's Policy Decisions & Communication Tools						
Policy Decisions						
ECB Monetary Policy Surprise	-0.695 ***	0.206	-0.674 ***	0.232	-0.670 ***	0.230
ECB Rate Change	0.376 **	0.170	0.317 *	0.182	0.301 *	0.181
Meeting-Day Communication						
Market Reaction During Press Conference	0.828 *	0.426	1.124 ***	0.432	1.160 ***	0.432
Meeting Outside Frankfurt	0.852 ***	0.321	1.034 ***	0.316	1.082 ***	0.318
Inter-Meeting Communication						
Communication Frequency, President	0.291 ***	0.051	0.299 ***	0.061	0.290 ***	0.060
Communication Frequency, Others	0.057 ***	0.019	0.065 ***	0.022	0.062 ***	0.022
Other Communication						
Clarification of the ECB Strategy	--	--	-0.204	0.213	-0.198	0.209
Release of Reference Value of M3 Growth	--	--	0.525 ***	0.196	0.537 ***	0.197
Release of Staff Projections	--	--	0.283 *	0.145	0.276 *	0.146
Economic environment						
Euro Area Macro Conditions						
Inflation Above 2%	-0.375 ***	0.108	-0.524 ***	0.112	-0.498 ***	0.110
Industrial Production Above Average	-0.028	0.097	0.001	0.096	-0.002	0.096
Federal Reserve						
Fed Rate Change	--	--	-0.037	0.163	-0.041	0.164
Country-Specific Conditions						
Absolute National Inflation Differential	--	--	--	--	-9.126	7.818
National Executive Board Member	--	--	--	--	0.082	0.113
Large Country	--	--	--	--	-0.222	0.147
National Inflation Since 1950	--	--	--	--	-0.064 *	0.033
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for special events and changes	Yes		Yes		Yes	
Controls for country effects	Fixed effects		Fixed effects		None	
Number of observations	671		671		671	
McFadden's adj. R^2	0.02		0.03		0.03	
Cragg-Uhler (Nagelkerke) adj. R^2	0.18		0.23		0.22	
McKelvey & Zavoina's R^2	0.28		0.32		0.32	
BIC	-2600.83		-2582.07		-2620.58	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors.

Table 6: Determinants of the extent of press coverage

	Model (1)		Model (2)		Model (3)	
	Coefficient	*Std. error*	Coefficient	*Std. error*	Coefficient	*Std. error*
Favorableness Factors						
Negative Favorableness	0.324 **	*0.142*	0.363 **	*0.148*	0.340 **	*0.145*
Absolute Residual Favorableness	0.921 ***	*0.197*	0.943 ***	*0.211*	0.976 ***	*0.212*
ECB's Policy Decisions & Communication Tools						
Policy Decisions						
ECB Monetary Policy Surprise	-0.240	*0.166*	-0.601 ***	*0.194*	-0.590 ***	*0.186*
ECB Rate Change	1.782 ***	*0.156*	1.977 ***	*0.176*	1.917 ***	*0.166*
Meeting-Day Communication						
Market Reaction During Press Conference	0.723 *	*0.406*	1.249 ***	*0.440*	1.244 ***	*0.414*
Meeting Outside Frankfurt	3.175 ***	*0.462*	3.700 ***	*0.493*	3.493 ***	*0.474*
Inter-Meeting Communication						
Communication Frequency, President	0.332 ***	*0.061*	0.170 ***	*0.061*	0.166 ***	*0.061*
Communication Frequency, Others	0.013	*0.021*	0.055 **	*0.024*	0.053 **	*0.024*
Other Communication						
Clarification of the ECB Strategy	--	--	-0.319 *	*0.187*	-0.332 *	*0.182*
Release of Reference Value of M3 Growth	--	--	-0.807 ***	*0.202*	-0.856 ***	*0.201*
Release of Staff Projections	--	--	-0.041	*0.204*	-0.047	*0.203*
Economic environment						
Euro Area Macro Conditions						
Inflation Above 2%	0.565 ***	*0.102*	0.501 ***	*0.110*	0.453 ***	*0.108*
Industrial Production Above Average	0.359 ***	*0.092*	0.456 ***	*0.101*	0.447 ***	*0.098*
Federal Reserve						
Fed Rate Change	--	--	0.590 ***	*0.156*	0.581 ***	*0.155*
Country-Specific Conditions						
Absolute National Inflation Differential	--	--	--	--	23.916 ***	*7.596*
National Executive Board Member	--	--	--	--	0.209 *	*0.111*
Large Country	--	--	--	--	0.961 ***	*0.153*
National Inflation Since 1950	--	--	--	--	0.080 ***	*0.031*
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for special events and changes	Yes		Yes		Yes	
Controls for country effects	Fixed effects		Fixed effects		None	
Number of observations	656		656		656	
McFadden's adj. R^2	0.17		0.21		0.20	
Cragg-Uhler (Nagelkerke) adj. R^2	0.56		0.62		0.61	
McKelvey & Zavoina's R^2	0.63		0.68		0.68	
BIC	-2030.89		-2071.31		-2086.59	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors.

Table 7: The role of press conference communication

	Favorableness of Press Coverage				Extent of Press Coverage			
			test of equality				test of equality	
	Coefficient	Std. error	(2)	(3)	Coefficient	Std. error	(2)	(3)
Policy surprise:								
(1) **Large** market reaction in PC & policy surprise	-0.152	0.233	**0.003**	0.542	0.001	0.191	**0.000**	0.416
(2) **Small** market reaction in PC & policy surprise	-1.109 ***	0.319		**0.001**	-1.090 ***	0.233		**0.000**
(3) **Large** market reaction in PC & **no** policy surprise	0.001	0.108			0.173	0.115		
Policy change:								
(1) **Large** market reaction in PC & policy change	1.285 ***	0.282	**0.000**	**0.000**	2.593 ***	0.287	**0.003**	**0.000**
(2) **Small** market reaction in PC & policy change	-0.184	0.198		0.771	1.805 ***	0.185		**0.000**
(3) **Large** market reaction in PC & **no** policy change	-0.127	0.110			0.210 *	0.112		
Euro area inflation:								
(1) **Large** market reaction in PC & EA inflation **above** 2%	-0.341 **	0.163	0.234	**0.002**	0.780 ***	0.176	**0.043**	**0.015**
(2) **Small** market reaction in PC & EA inflation **above** 2%	-0.494 ***	0.160		**0.000**	0.522 ***	0.159		0.313
(3) **Large** market reaction in PC & EA inflation **below** 2%	0.184	0.193			0.377 *	0.199		
Country-specific inflation:								
(1) **Large** market reaction in PC & **large** country inflation diff. from EA	0.108	0.170	0.221	0.829	0.539 ***	0.153	**0.089**	0.171
(2) **Small** market reaction in PC & **large** country inflation diff. from EA	-0.100	0.120		0.113	0.267 *	0.124		0.746
(3) **Large** market reaction in PC & **small** country inflation diff. from EA	0.135	0.129			0.316 **	0.127		
Controls for newspaper coverage	Yes				Yes			
Controls for expert effects	Yes				Yes			
Controls for special events and changes	Yes				Yes			
Controls for country effects	None				None			
Number of observations	671				656			

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors. Numbers for tests of equality denote p-values; significant results at the 10% level are shown in bold.

Table 8: Frequency of inter-meeting communication and monetary policy changes

		Favorableness of Press Coverage				Extent of Press Coverage			
				test of equality				test of equality	
		Coefficient	*Std. error*	(2)	(3)	Coefficient	*Std. error*	(2)	(3)
(1)	**High** frequency & policy change	0.371 *	*0.216*	**0.001**	**0.073**	2.427 ***	*0.223*	**0.000**	**0.000**
(2)	**Low** frequency & policy change	-0.682 **	*0.308*		**0.019**	1.054 ***	*0.262*		**0.001**
(3)	**High** frequency & **no** policy change	0.013	*0.122*			0.276 **	*0.130*		
	Controls for newspaper coverage	Yes				Yes			
	Controls for expert effects	Yes				Yes			
	Controls for special events and changes	Yes				Yes			
	Controls for country effects	None				None			
	Number of observations	671				656			

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors. Numbers for tests of equality denote p-values; significant results at the 10% level are shown in bold.

Table 9: Monetary policy surprises and monetary policy changes

		Favorableness of Press Coverage				Extent of Press Coverage			
				test of equality				test of equality	
		Coefficient	*Std. error*	(2)	(3)	Coefficient	*Std. error*	(2)	(3)
(1)	Policy change & policy surprise	-0.318	*0.215*	0.106	**0.094**	1.140 ***	*0.177*	**0.000**	**0.000**
(2)	Policy change & **no** policy surprise	0.174	*0.221*		**0.004**	2.384 ***	*0.209*		**0.000**
(3)	**No** policy change & policy surprise	-0.900 ***	*0.322*			0.160	*0.241*		
	Controls for newspaper coverage	Yes				Yes			
	Controls for expert effects	Yes				Yes			
	Controls for special events and changes	Yes				Yes			
	Controls for country effects	None				None			
	Number of observations	671				656			

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors. Numbers for tests of equality denote p-values; significant results at the 10% level are shown in bold.

Appendix

Table A1: Determinants of favorableness, random effects model

	Model (1)		Model (2)		Model (3)	
	Coefficient	*Std. error*	Coefficient	*Std. error*	Coefficient	*Std. error*
ECB's Policy Decisions & Communication Tools						
Policy Decisions						
ECB Monetary Policy Surprise	-0.680 ***	*0.172*	-0.664 ***	*0.192*	-0.669 ***	*0.192*
ECB Rate Change	0.350 **	*0.145*	0.309 **	*0.155*	0.301 *	*0.155*
Meeting-Day Communication						
Market Reaction During Press Conference	0.729 *	*0.410*	1.143 ***	*0.435*	1.160 ***	*0.436*
Meeting Outside Frankfurt	0.865 **	*0.376*	1.080 ***	*0.382*	1.082 ***	*0.382*
Inter-Meeting Communication						
Communication Frequency, President	0.269 ***	*0.052*	0.293 ***	*0.065*	0.290 ***	*0.065*
Communication Frequency, Others	0.052 **	*0.022*	0.064 ***	*0.024*	0.062 ***	*0.024*
Other Communication						
Clarification of the ECB Strategy	--	--	-0.218	*0.193*	-0.198	*0.193*
Release of Reference Value of M3 Growth	--	--	0.529 **	*0.218*	0.537 **	*0.218*
Release of Staff Projections	--	--	0.278	*0.243*	0.275	*0.243*
Economic environment						
Euro Area Macro Conditions						
Inflation Above 2%	-0.383 ***	*0.108*	-0.515 ***	*0.116*	-0.498 ***	*0.117*
Industrial Production Above Average	-0.047	*0.101*	0.011	*0.106*	-0.002	*0.106*
Federal Reserve						
Fed Rate Change	--	--	-0.028	*0.147*	-0.041	*0.147*
Country-Specific Conditions						
Absolute National Inflation Differential	--	--	--	--	-9.124	*7.727*
National Executive Board Member	--	--	--	--	0.082	*0.113*
Large Country	--	--	--	--	-0.222	*0.160*
National Inflation Since 1950	--	--	--	--	-0.064 **	*0.032*
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for special events and changes	Yes		Yes		Yes	
Controls for country effects	Random effects		Random effects		Random effects	
Number of observations	671		671		671	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors. Models (1) through (3) use Frechette's (2001) Stata code.

Table A2: Determinants of the extent of press coverage, random effects model

	Model (1)		Model (2)		Model (3)	
	Coefficient	Std. error	Coefficient	Std. error	Coefficient	Std. error
Favorableness Factors						
Negative Favorableness	0.287 **	0.137	0.352 **	0.141	0.313 **	0.142
Absolute Residual Favorableness	0.894 ***	0.175	0.890 ***	0.184	0.939 ***	0.186
ECB's Policy Decisions & Communication Tools						
Policy Decisions						
ECB Monetary Policy Surprise	-0.222	0.173	-0.592 ***	0.193	-0.582 ***	0.194
ECB Rate Change	1.773 ***	0.159	1.961 ***	0.171	1.958 ***	0.172
Meeting-Day Communication						
Market Reaction During Press Conference	0.764 *	0.400	1.242 ***	0.422	1.255 ***	0.422
Meeting Outside Frankfurt	3.151 ***	0.400	3.629 ***	0.419	3.612 ***	0.418
Inter-Meeting Communication						
Communication Frequency, President	0.329 ***	0.051	0.164 ***	0.062	0.165 ***	0.062
Communication Frequency, Others	0.010	0.020	0.056 **	0.023	0.052 **	0.023
Other Communication						
Clarification of the ECB Strategy	--	--	-0.342 *	0.185	-0.324 *	0.185
Release of Reference Value of M3 Growth	--	--	-0.815 ***	0.210	-0.840 ***	0.210
Release of Staff Projections	--	--	-0.038	0.219	-0.050	0.219
Economic environment						
Euro Area Macro Conditions						
Inflation Above 2%	0.553 ***	0.105	0.451 ***	0.111	0.479 ***	0.112
Industrial Production Above Average	0.359 ***	0.096	0.435 ***	0.100	0.446 ***	0.100
Federal Reserve						
Fed Rate Change	--	--	0.578 ***	0.148	0.594 ***	0.149
Country-Specific Conditions						
Absolute National Inflation Differential	--	--	--	--	9.994	8.041
National Executive Board Member	--	--	--	--	0.265 **	0.108
Large Country	--	--	--	--	0.920 ***	0.155
National Inflation Since 1950	--	--	--	--	0.013	0.035
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for special events and changes	Yes		Yes		Yes	
Controls for country effects	Random effects		Random effects		Random effects	
Number of observations	656		656		656	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors. Models (1) through (3) use Frechette's (2001) Stata code.

Table A3: Determinants of favorableness, OLS

	Model (1)		Model (2)		Model (3)	
	Coefficient	Std. error	Coefficient	Std. error	Coefficient	Std. error
ECB's Policy Decisions & Communication Tools						
Policy Decisions						
ECB Monetary Policy Surprise	-0.268 ***	0.083	-0.255 ***	0.092	-0.255 ***	0.091
ECB Rate Change	0.146 **	0.069	0.119	0.073	0.115	0.072
Meeting-Day Communication						
Market Reaction During Press Conference	0.364 **	0.169	0.457 ***	0.164	0.470 ***	0.165
Meeting Outside Frankfurt	0.349 **	0.154	0.402 ***	0.146	0.420 ***	0.149
Inter-Meeting Communication						
Communication Frequency, President	0.116 ***	0.021	0.111 ***	0.025	0.108 ***	0.024
Communication Frequency, Others	0.024 ***	0.007	0.026 ***	0.008	0.025 ***	0.008
Other Communication						
Clarification of the ECB Strategy	--	--	-0.059	0.084	-0.057	0.082
Release of Reference Value of M3 Growth	--	--	0.173 **	0.080	0.181 **	0.080
Release of Staff Projections	--	--	0.105 *	0.054	0.102 *	0.054
Economic environment						
Euro Area Macro Conditions						
Inflation Above 2%	-0.145 ***	0.042	-0.195 ***	0.043	-0.187 ***	0.042
Industrial Production Above Average	-0.008	0.037	0.003	0.037	0.001	0.036
Federal Reserve						
Fed Rate Change	--	--	-0.010	0.066	-0.011	0.066
Country-Specific Conditions						
Absolute National Inflation Differential	--	--	--	--	-3.765	3.019
National Executive Board Member	--	--	--	--	0.033	0.043
Large Country	--	--	--	--	-0.098 *	0.056
National Inflation Since 1950	--	--	--	--	-0.024 *	0.013
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for special events and changes	Yes		Yes		Yes	
Controls for country effects	Fixed effects		Fixed effects		None	
Number of observations	671		671		671	
Adj. R^2	0.12		0.16		0.16	
BIC	-3322.02		-3303.93		-3349.48	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors.

Table A4: Determinants of the extent of press coverage, OLS

	Model (1) Coefficient	Model (1) Std. error	Model (2) Coefficient	Model (2) Std. error	Model (3) Coefficient	Model (3) Std. error
Favorableness Factors						
Negative Favorableness	0.170 **	0.074	0.178 **	0.072	0.167 **	0.071
Absolute Residual Favorableness	0.426 ***	0.103	0.382 ***	0.102	0.415 ***	0.104
ECB's Policy Decisions & Communication Tools						
Policy Decisions						
ECB Monetary Policy Surprise	-0.103	0.085	-0.249 ***	0.094	-0.250 ***	0.091
ECB Rate Change	0.878 ***	0.074	0.891 ***	0.078	0.885 ***	0.074
Meeting-Day Communication						
Market Reaction During Press Conference	0.348	0.218	0.571 ***	0.221	0.580 ***	0.213
Meeting Outside Frankfurt	1.501 ***	0.192	1.561 ***	0.188	1.527 ***	0.186
Inter-Meeting Communication						
Communication Frequency, President	0.167 ***	0.032	0.088 ***	0.030	0.087 ***	0.031
Communication Frequency, Others	0.005	0.012	0.021 *	0.013	0.020	0.013
Other Communication						
Clarification of the ECB Strategy	--	--	-0.142	0.096	-0.149	0.095
Release of Reference Value of M3 Growth	--	--	-0.351 ***	0.108	-0.385 ***	0.109
Release of Staff Projections	--	--	-0.033	0.114	-0.035	0.116
Economic environment						
Euro Area Macro Conditions						
Inflation Above 2%	0.301 ***	0.058	0.263 ***	0.059	0.248 ***	0.060
Industrial Production Above Average	0.185 ***	0.051	0.224 ***	0.052	0.226 ***	0.052
Federal Reserve						
Fed Rate Change	--	--	0.254 ***	0.075	0.258 ***	0.076
Country-Specific Conditions						
Absolute National Inflation Differential	--	--	--	--	11.682 ***	3.889
National Executive Board Member	--	--	--	--	0.107 *	0.058
Large Country	--	--	--	--	0.506 ***	0.079
National Inflation Since 1950	--	--	--	--	0.052 ***	0.016
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for special events and changes	Yes		Yes		Yes	
Controls for country effects	Fixed effects		Fixed effects		None	
Number of observations	656		656		656	
Adj. R^2	0.50		0.55		0.53	
BIC	-2852.28		-2871.13		-2895.86	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors.

Table A5: Determinants of favorableness, excluding international press

	Model (1) Coefficient	Model (1) Std. error	Model (2) Coefficient	Model (2) Std. error	Model (3) Coefficient	Model (3) Std. error
ECB's Policy Decisions & Communication Tools						
Policy Decisions						
ECB Monetary Policy Surprise	-0.643 ***	0.214	-0.654 ***	0.240	-0.648 ***	0.238
ECB Rate Change	0.364 **	0.174	0.329 *	0.188	0.307	0.188
Meeting-Day Communication						
Market Reaction During Press Conference	0.808 *	0.449	1.146 **	0.452	1.177 ***	0.453
Meeting Outside Frankfurt	0.842 ***	0.322	1.022 ***	0.321	1.068 ***	0.325
Inter-Meeting Communication						
Communication Frequency, President	0.321 ***	0.053	0.340 ***	0.063	0.327 ***	0.062
Communication Frequency, Others	0.062 ***	0.020	0.069 ***	0.023	0.067 ***	0.022
Other Communication						
Clarification of the ECB Strategy	--	--	-0.240	0.217	-0.233	0.214
Release of Reference Value of M3 Growth	--	--	0.468 **	0.205	0.495 **	0.210
Release of Staff Projections	--	--	0.319 **	0.154	0.310 **	0.154
Economic environment						
Euro Area Macro Conditions						
Inflation Above 2%	-0.381 ***	0.114	-0.519 ***	0.116	-0.479 ***	0.114
Industrial Production Above Average	-0.033	0.101	-0.001	0.101	0.000	0.100
Federal Reserve						
Fed Rate Change	--	--	-0.043	0.170	-0.038	0.170
Country-Specific Conditions						
Absolute National Inflation Differential	--	--	--	--	-11.875	8.122
National Executive Board Member	--	--	--	--	0.037	0.137
Large Country	--	--	--	--	-0.195	0.181
National Inflation Since 1950	--	--	--	--	-0.059	0.038
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for special events and changes	Yes		Yes		Yes	
Controls for country effects	Fixed effects		Fixed effects		None	
Number of observations	618		618		618	
McFadden's adj. R^2	0.01		0.02		0.02	
Cragg-Uhler (Nagelkerke) adj. R^2	0.17		0.21		0.20	
McKelvey & Zavoina's R^2	0.18		0.23		0.22	
BIC	-2334.33		-2313.52		-2346.19	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors.

Table A6: Determinants of the extent of press coverage, excluding international press

	Model (1) Coefficient	Std. error	Model (2) Coefficient	Std. error	Model (3) Coefficient	Std. error
Favorableness Factors						
Negative Favorableness	0.250 *	0.146	0.269 *	0.151	0.239	0.148
Absolute Residual Favorableness	0.959 ***	0.201	1.007 ***	0.214	1.039 ***	0.213
ECB's Policy Decisions & Communication Tools						
Policy Decisions						
ECB Monetary Policy Surprise	-0.240	0.170	-0.560 ***	0.198	-0.540 ***	0.191
ECB Rate Change	1.809 ***	0.159	1.988 ***	0.181	1.926 ***	0.172
Meeting-Day Communication						
Market Reaction During Press Conference	0.673	0.424	1.153 **	0.460	1.140 ***	0.436
Meeting Outside Frankfurt	3.137 ***	0.458	3.636 ***	0.489	3.413 ***	0.472
Inter-Meeting Communication						
Communication Frequency, President	0.317 ***	0.063	0.150 **	0.062	0.144 **	0.061
Communication Frequency, Others	0.009	0.022	0.049 *	0.025	0.046 *	0.025
Other Communication						
Clarification of the ECB Strategy	--	--	-0.238	0.192	-0.252	0.186
Release of Reference Value of M3 Growth	--	--	-0.830 ***	0.211	-0.883 ***	0.209
Release of Staff Projections	--	--	-0.044	0.214	-0.056	0.210
Economic environment						
Euro Area Macro Conditions						
Inflation Above 2%	0.566 ***	0.106	0.514 ***	0.112	0.460 ***	0.111
Industrial Production Above Average	0.341 ***	0.095	0.429 ***	0.104	0.425 ***	0.102
Federal Reserve						
Fed Rate Change	--	--	0.558 ***	0.159	0.548 ***	0.158
Country-Specific Conditions						
Absolute National Inflation Differential	--	--	--	--	21.937 ***	7.782
National Executive Board Member	--	--	--	--	0.136	0.130
Large Country	--	--	--	--	1.071 ***	0.189
National Inflation Since 1950	--	--	--	--	0.104 ***	0.037
Controls for newspaper coverage	Yes		Yes		Yes	
Controls for expert effects	Yes		Yes		Yes	
Controls for special events and changes	Yes		Yes		Yes	
Controls for country effects	Fixed effects		Fixed effects		None	
Number of observations	604		604		604	
McFadden's adj. R^2	0.17		0.20		0.19	
Cragg-Uhler (Nagelkerke) adj. R^2	0.56		0.62		0.60	
McKelvey & Zavoina's R^2	0.61		0.67		0.65	
BIC	-1791.90		-1823.39		-1832.98	

Notes: ***, **, and * indicate significance at the 99%, 95%, and 90% levels, respectively. Numbers in italics are standard errors.

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