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Monetary Policy Communication: Perspectives from Former Policy Makers at the ECB

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Abstract

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JEL Classification: E52, E58

Keywords: monetary policy, central bank communication, survey

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1. Introduction

In its response to the global financial crisis, the European sovereign debt crisis and more recently the COVID-19 pandemic, monetary policy has undergone profound changes. Central banks have deployed new monetary policy tools, which were often labelled "unconventional", but in the meantime have been recognised as not so unconventional after all. Many central banks have adopted new mandates, for instance related to micro- and macroprudential supervision. Also, globalisation and digitalisation have left their mark. Many of these changes have led to a controversial public debate about the role and limits of central banks, at times even challenging whether central bank independence is still warranted (Goodhart and Lastra 2018).

Accompanying these developments, central banks have also altered their communication practices, often in fundamental ways. New tools require more explanation – the central bank needs to communicate why and how it wants to use them, how they work, and how the various tools interact. New mandates also need explaining; for instance, the central bank needs to lay out why they were adopted, how they affect one another, and how it wants to ensure that they do not impede the earlier mandate of price stability. Broader mandates bring more accountability requirements, and the controversy in the public discourse also requires that the central bank actively explains its views and its actions.

As Blinder et al. (2017) put it, for many of these changes, necessity has been the mother of invention, in the sense that central banks had to act quickly under extreme time pressure in order to avert negative consequences of the various crises. It is therefore important to occasionally step back and assess whether all these changes have worked in the intended way, and monetary policy is fit for purpose. This is why several central banks have recently embarked on extensive strategy reviews, the European Central Bank (ECB) being one of them. The ECB launched its strategy review in January 2020 and over the course of 18 months had many internal discussions, also including the National Central Banks (NCBs) of the Eurosystem. In addition, it reached out to external counterparts, by means of listening events with the public as well as through conferences and roundtables with expert audiences (ECB 2021b). In the context of its review, the ECB has had extensive discussions of its communication practices (Assenmacher et al. 2021) and has adopted a number of changes as a result. For instance, as part of the new strategy that was announced in July 2021, it was decided to adapt the communication to reflect the new monetary policy strategy, to complement the communication with layered and visualised products that are more geared towards a general audience, and to regularly conduct outreach events with the public.

A systematic review of current practices can benefit from the expertise of former policy makers, as these are uniquely placed to provide a critical assessment: they possess inside knowledge about how central bank communication works in practice and – because they are no longer in office – might find it easier to speak freely. Such qualitative data can capture experts' judgement on different policies and thereby offer a useful complement to the quantitative data usually employed in the macroeconomic literature. For instance, past surveys have gathered information on communication objectives across central banks (Jeanneau 2009), the reasons for changes in communication strategies (Siklos 2018) and the evolution of central bank practices (Blinder et al.

2017). In the context of the strategy review of the US Federal Reserve, Cecchetti and Schoenholtz (2019) have also provided such an exercise. Through their in-depth interviews with former members of the Federal Open Market Committee (FOMC), they identify three objectives where further improvements in Fed communications could be useful, namely i) simplifying public statements; ii) clarifying how policy will react to changing conditions; and iii) highlighting uncertainty and risks.

For the ECB, this paper reports the results of a survey of former Governing Council members, covering their views on the main objectives of the ECB's monetary policy communication (the 'what' and the 'why'), the challenges with reaching relevant audiences (the 'who') and reflections on its future evolution (the 'how'). The survey asks detailed questions on different objectives and topics of monetary policy communication and allows us to capture and analyse the diversity in responses, an important aspect in a monetary union with 19 separate countries.

The 10 key findings are as follows:

- Enhancing credibility and trust is viewed as the most important objective of central bank communication.
- The central bank objective is widely seen as the most important topic for monetary policy communication.
- Several respondents perceived a need for clarification of the ECB's inflation aim, citing the ambiguity of the "below, but close to, 2%" formulation that had been in place at the time of the survey.
- The ECB's communication with more traditional target audiences (namely financial markets and experts) is viewed as extremely important, and generally effective.
- Substantial room for improvement is seen in communicating with the public, with a role for clear and targeted communication to reach a wider audience.
- Communication innovations in recent years, such as the publication of monetary policy accounts and the use of social media, should remain in place.
- As to the implementation of forward guidance, state-contingent guidance is favoured; in addition, a majority think that calendar-based guidance should no longer be part of the toolkit.
- The press conference is viewed positively, but room for improvement was seen in the press release on monetary policy decisions, the introductory statement, the monetary policy accounts, and blogs and tweets.
- NCB communication practices are also viewed as requiring improvement, but less representation of individual views is seen as preferable.
- While the survey allows differentiating across several respondent groups, pronounced differences are rare, suggesting that there is broad consensus on the various issues.

The paper proceeds as follows. Section 2 provides an overview of the survey, including the sample and the methodology; Section 3 summarises the results; and Section 4 concludes.

2. A survey among former Governing Council members

The ECB's monetary policy decision-making body is the Governing Council. It consists of the 6 members of the ECB's Executive Board (EB) and of the Governors of the NCBs of the euro area. Currently, with 19 Member States in the euro area, the Governing Council consists of 25 members. The number of members has varied over time. Initially, when the euro was introduced in 1999, there were 17 members (11 NCB Governors plus 6 EB members). Whenever a country joined the euro area, the Governing Council was enlarged to include the NCB Governors of the new Member States.

In November 2020, we invited all 46 surviving former Governing Council members to complete an online questionnaire. All respondents were assured that their responses would remain anonymous. The invitations were sent directly from the ECB to all former members of the EB, and via the NCBs to all former NCB Governors who had not also served on the EB. This way, all invitees received their invitation via familiar communication channels, which we believe has helped to signal that this was an authentic survey, where their views were being actively sought and they could have an impact on future monetary policy communication practices. An invitation to participate in the survey by current EB member Philip Lane accompanied the correspondence (see Appendix B).

The survey was open for participation between 17 November and 15 December 2020. To allow comparison of responses across broad groups, while at the same time ensuring anonymity, respondents were asked to provide the following information:

- i. whether they served on the Governing Council as an EB member, NCB Governor or both;
- ii. whether they were an active member of the Governing Council in the more recent period of unconventional monetary policy, by indicating whether they were in office when former ECB President Draghi delivered his "whatever it takes" speech in July 2012, and if not, whether their term had already expired or not yet started; and
- iii. whether they are a citizen of one of the countries characterised as "stressed" during the sovereign debt crisis.¹

The first distinction can help to understand whether being at the ECB makes for another perspective than being at an NCB, for instance with regard to how different views should be expressed in public, or whether communication should be done more centrally at the ECB or in a more decentralised manner at the NCBs. Accordingly, in what follows we classify every respondent as EB member if that person has ever served on the EB, i.e. also those respondents who had been an NCB Governor and an EB member. The second distinction can potentially be interesting in two dimensions. First, whether an active involvement in the design and implementation of unconventional policies and the surrounding communication changes the perspective of our respondents. Second, not having taken decisions for a longer time might make for a more critical or objective assessment, as there is no temptation to "defend" the ECB's recent policies. With the third distinction, we are interested in testing whether different exposures to the sovereign debt crisis have an impact on the responses.

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¹ Cyprus, Greece, Ireland, Italy, Portugal, Slovenia or Spain, following the classification used in European Central Bank (2014).

By the closing date, we had received 27 responses, making for a gratifying response rate of 59%,² which despite the overall small population enables proper statistical analysis.³ Importantly, the responses cover a representative share of the population of former Governing Council members, in various dimensions. First, 46% of invited participants had been in office in the more recent time period – during or since the "whatever it takes" speech. This compares to, and is very much in line with, 41% of respondents. Also, 33% of invited participants had been on the EB, the same share as those that responded. Finally, 46% of invited participants are from formerly stressed countries, as compared to 41% of respondents.

The survey consisted of a mixture of closed- and open-ended questions. Thirteen were closed questions accompanied by text boxes to allow for further elaboration, while two were open-ended.⁴ The questions are listed in Annex A and covered five topics:

- (i) why communicate;
- (ii) with whom to communicate;
- (iii) what to communicate;
- (iv) how to communicate; and
- (v) general reflections on communication challenges and the future evolution of monetary policy communication.

3. Summary of results

3.1 Why communicate

We started our questionnaire with very basic questions as to the objectives of central bank communication. We offered various objectives, drawing on an extensive literature. The first objective relates to "enhancing transparency". While a few decades ago, the general view of central banks was to "say as little as possible, and say it cryptically" (Blinder et al. 2008), by now transparency is the new norm in central banking (Geraats 2009; Issing 2019). In fact, a survey of 94 central banks by Fry et al. (2000) conducted between 1998-1999 revealed that 74 percent considered transparency to be a "vital" or "very important" component of their monetary policy frameworks. Transparency is expected to even increase going forward (Blinder 2018). These developments have been so wide-ranging that a discussion started on possible limits to transparency – how much more, it was asked, could central banks possibly communicate without going too far, e.g. by stifling the discussion in the committee, or by communicating more than the recipients could possibly digest (Cukierman 2009; Issing 2014). One of the drivers of increased transparency has been the – by now widely acknowledged – insight (see, e.g., Blinder 1998; Woodford 2001) that

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² This is nearly identical to the response rate of 58% which the survey among central bank governors by Blinder et al. (2017) reports.

³ The sample size allows for tests of differences across groups, but falls below reasonable recommendations for more detailed regression analysis (see, e.g., Cohen 1988 and Harris 1985).

⁴ For the thirteen closed questions, respondents were required to provide an answer; they could not skip them or leave them blank. Therefore, in all cases they were given an option to reply "Don't know / not sure". For all questions, respondents were also given the opportunity to comment on their responses; in questions 1, 4, 5 and 7 they could specify an "Other" response.

monetary policy is in large part about managing expectations, given that these link current overnight interest rates (which are under tight control of the central bank) to long-term rates (which ultimately affect much of economic behaviour, but are only indirectly controlled by monetary policy, via expectations about the future path of interest rates). Bernanke (2015) asserts that the ability to shape expectations through public statements is one of the most powerful tools available to central bankers and that "monetary policy is 98 percent talk and only two percent action". "Management of expectations" is therefore another objective we offered.

A third possible objective for communication is to "ensure the accountability" of an independent central bank – in particular if it enjoys a degree of independence as does the ECB (Draghi 2015; Mishkin 2007; Wyplosz 2019). Related to this, and against the background that the ECB has lost trust among its citizens since the global financial crisis (Bergbauer et al. 2020a), we also asked whether "enhancing credibility and trust" was seen as an important objective. Finally, in light of the discussions around threats to central bank independence (Goodhart and Lastra 2018), we added "safeguarding central bank independence" as another possible objective.

We asked respondents how important they view the various objectives. While these specific objectives were selected based on the literature, many are related and in fact reinforce one another. The survey design reflects this; rather than having respondents select one objective above all others, they were asked to score all separately. The first striking result is that all of them were seen as very important. Not a single "not important" answer was recorded, and for all objectives, at least 63% of respondents answered "very important" or "extremely important". But there is variation across the objectives. As can be seen in Figures 1 and A1, according to former Governing Council members, the most important objective of monetary policy communication is enhancing credibility and trust (70% of respondents felt this was "extremely important", another 22% answered "very important"), followed by expectations management and enhancing transparency (with 81% of respondents answering extremely or very important).⁵

In contrast, while still important in absolute terms, a substantially lower share of respondents considered ensuring accountability and safeguarding independence as extremely important (Figure A1 in Annex C). This result is in line with the results reported in Blinder et al. (2017), where central bankers were generally less concerned about threats to central bank independence than the academic respondents. It also corresponds with the view that the ECB is more independent than most other central banks and that there has been no recent perceptible deterioration in either its "de jure" or "de facto" independence (Dall'Orto Mas et al. 2020).

The table below Figure 1 reports the responses for the three different groups that the survey can distinguish. Despite the small sample that we analyse, we find some differences to be statistically significant. Respondents from formerly stressed countries put less emphasis on the objective of

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⁵ Figure 1 uses an index to facilitate comparison of response options. For most questions, participants were asked to rate response options on a certain scale. We calculate an index that aggregates the responses for each option using weights that correspond to the response scales. Such diffusion indices are a standard way of summarising qualitative survey information, applied for instance to consumer inflation expectations, consumer confidence, the ECB's bank lending survey or the ISM production index in the US and Markit Eurozone manufacturing PMI output index in the euro area. See, e.g., Pinto et al. (2020). Exact details for each index are provided in the figure notes.

safeguarding independence (for this group, the weighted index stands at 0.61, as compared to 0.80 for respondents from non-stressed countries, with the difference being statistically significant at the 5% level). We can only speculate about the underlying reasons – history could play a role here, as these countries saw their central banks become independent at a later point in time, and the issue of central bank independence might play a lesser role in the public opinion (Issing and Wieland 2013). It could also reflect that, while unconventional monetary policy measures were often particularly effective at easing financial market conditions in more stressed countries (Altavilla et al. 2016 and Corradin et al. 2021), they also prompted concerns about fiscal dominance and central bank independence in some of the other euro area countries (Siekmann and Wieland 2020).

Enhancing credibility and trust is also seen as less important in this group, whereas enhancing transparency is seen as somewhat more important. The significantly higher importance placed on enhancing trust by respondents from non-stressed countries may reflect that trust in the ECB was comparatively higher than trust in national governments in all euro area countries except Austria, Germany and Luxembourg (Bergbauer et al. 2020b). With regard to managing expectations, it is noteworthy that 100% of respondents that had served on the EB report that this is an extremely important objective (compared with 79% for those members that did not serve on the EB, with the difference being weakly significant at the 10% level).

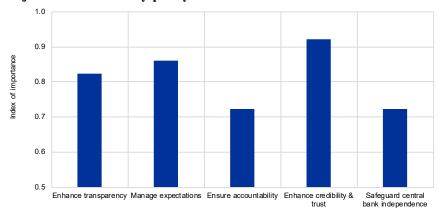


Figure 1: Objectives of monetary policy communication

| | Enhance transparency | | Manage expectations | | Ensure accountability | | Enhance credibility and trust | | Safeguard central bank independence | |
|-------------------|-------------------------|---------|---------------------|---------|--------------------------|---------|-------------------------------|---------|-------------------------------------|---------|
| | by group | p-value | by group | p-value | by group | p-value | by group | p-value | by group | p-value |
| All | 0.82 | | 0.86 | | 0.72 | | 0.92 | | 0.72 | |
| EB | 0.83 | 0.658 | 1.00 | 0.060 | 0.69 | 0.940 | 0.89 | 0.138 | 0.69 | 0.548 |
| Formerly stressed | 0.84 | 0.074 | 0.89 | 0.469 | 0.75 | 0.129 | 0.85 | 0.086 | 0.61 | 0.015 |
| Recent | 0.84 | 0.876 | 0.84 | 0.391 | 0.68 | 0.512 | 0.95 | 1.000 | 0.70 | 0.134 |

Notes: The figure shows the responses to Question 1 ("What do you see as the main objectives of monetary policy communication?"). The "Index of importance" is the percentage of respondents reporting on the importance of objectives weighted by the level of importance attached to each. If all respondents answered 'extremely important' the index would be 1; 'very important' the index would be 0.75; 'important' the index would be 0.5; 'somewhat important' the index would be 0.25; and if all respondents reported 'not important at all' the index would be 0. The table shows the "Index of importance" calculated for each group and the p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

Looking at cross-correlations of these answers with other responses in our survey (Table 1), we find a clear pattern that the objective of transparency, in our respondents' minds, relates mainly to communication about the economic outlook and future monetary policy, and to communication

with markets and experts. These are audiences for which central banks have traditionally exerted considerable efforts, and – as we will see subsequently – our respondents also think that current practices are already broadly adequate. In contrast, the objective of accountability is more related to providing the rationale for monetary policy, discussing the ECB's reaction function, and communicating with politicians, which are seen as a target audience where there is room for improvement in the ECB's communications.

Table 1: Cross-correlations, objectives of monetary policy communication

| | | Enhance | Manage | Ensure | Enhance credibility | Safeguard CB |
|-----------|---------------------------------|--------------|--------------|----------------|---------------------|--------------|
| | | transparency | expectations | accountability | + trust | independence |
| Objective | Enhance transparency | 1.000 | | | | |
| | Manage expectations | | 1.000 | | | |
| | Ensure accountability | | | 1.000 | | |
| | Enhance credibility + trust | | | | 1.000 | |
| | Safeguard CB independence | | | 0.530 | 0.438 | 1.000 |
| Audience | Financial markets | 0.437 | | | | |
| | Politicians | | | 0.460 | | |
| | General public | | | | | |
| | Price setters | | | | | |
| | Expert audiences | 0.332 | | | | |
| Topics | Central bank objective | | | | | |
| | Reaction function | | | 0.411 | | |
| | Economic outlook | 0.443 | | | | |
| | Uncertainty underlying outlook | 0.481 | 0.498 | | | |
| | Rationale for mon pol decisions | | | 0.394 | | |
| | Future path of mon pol | 0.506 | | | | 0.488 |
| | Interrel. mon pol + fin stab | | | | | |
| | Interrel. mon pol + fiscal pol | | | | | |
| | Interrel. mon pol + employment | | | | | |

Notes: The table shows Spearman rank correlation coefficients for the responses to questions 1, 2 and 4, excluding any don't know answers. Only coefficients that are significant at the 10% level are reported. Coefficients in bold are statistically significant at the 5% level, those in bold italics at the 1% level.

3.2 With whom to communicate

The next set of questions relates to the relevant audiences. Central banks have traditionally communicated extensively with financial markets and expert audiences. Recently, more emphasis has been given to communication with non-experts and the general public. This is a challenging task – communicating well with the general public requires "explanation, engagement and education", what Haldane et al. (2020) call the "3 E's of central bank communication with the public". Also, messages need to be simple and relatable if they are meant to affect beliefs or behaviours of non-experts (Bholat et al. 2019; Coibion et al. 2019; Kryvtsov and Petersen 2021). The question remains, however, whether central bank communication manages to get through to the general public (Ehrmann and Wabitsch 2021; Lamla and Vinogradov 2019), as we will also discuss later. These are formidable challenges, which led Blinder (2018) to predict that "central banks will keep trying to communicate with the general public, as they should. But for the most part, they will fail."

But what do our respondents think? We asked them first about the importance of different audiences for the effectiveness of monetary policy, and subsequently about the adequacy of communication with these different audiences to increase their understanding of monetary policy. The results are clear: more traditional target audiences are seen as most relevant, with respondents reporting that

communication with financial markets is most important for the effectiveness of monetary policy (Figure 2). Communication with experts closely followed with an index score of 0.83, as compared to 0.96 for financial markets. Nevertheless, some respondents commented on the risk that communication with financial markets can go too far, if market expectations dominate policy. The importance of avoiding privileged communication with financial markets was also stressed in the comments to this question.

Respondents consider communication with the general public and with price setters to be similarly important for the effectiveness of monetary policy (index score of 0.76 each). The relatively lower importance placed on communication with households and price setters as compared to financial markets likely reflects that central banks have traditionally focused more on financial market expectations in their economic analysis than they have on firms and households (Baumann et al. 2021). Finally, communication with politicians is overall considered to be slightly less important (0.72); this is in line with the lower importance given to increasing accountability (Table A1).

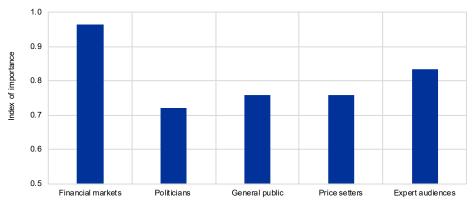
All respondent groups are in agreement on this, as shown by the test results reported in the table underneath Figure 2. Looking at the correlation results in Table 2, we find that those respondents who give importance to the general public put an emphasis on talking to the other non-expert groups (namely politicians and price setters). Importance attached to communication with the general public is also correlated with talking about the interrelationship between monetary policy and employment. This result is in line with the advice from the literature regarding relatable messages – employment concerns are something that consumers can easily relate to (see Candia et al. 2020 and Angeletos and Sastry 2021). This has been seen in the context of the ECB's listening events, where employment concerns featured prominently (ECB 2021a). Furthermore, importance given to communication with the general public is correlated with an emphasis on communication via social media, which suggests that our respondents would like to adapt the communication channels to ensure that central bank communication reaches the intended target groups.

The correlations also reveal that respondents who attach importance to talking to politicians emphasise accountability as an important objective of central bank communication, and see communication about the reaction function and about the interrelationship between monetary policy and financial stability as well as the interrelationship between monetary policy and fiscal policy as important.

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⁶ There is considerable overlap in the audiences that are deemed important. Only six respondents showed a clear preference for one audience above all others; of these, four scored financial markets higher than all others and two scored experts above all others.

Figure 2: The importance of different audiences for the effectiveness of monetary policy



| | Financial markets | | Politicians | | General public | | Price setters | | Expert audiences | |
|-------------------|-------------------|---------|-------------|---------|----------------|---------|---------------|---------|------------------|---------|
| | by group | p-value | by group | p-value | by group | p-value | by group | p-value | by group | p-value |
| All | 0.96 | | 0.72 | | 0.76 | | 0.76 | | 0.83 | |
| EB | 0.97 | 0.593 | 0.67 | 0.463 | 0.72 | 0.599 | 0.72 | 0.361 | 0.81 | 0.123 |
| Formerly stressed | 0.95 | 0.545 | 0.70 | 0.807 | 0.84 | 0.523 | 0.77 | 0.195 | 0.82 | 0.681 |
| Recent | 0.95 | 0.545 | 0.73 | 1.000 | 0.70 | 0.572 | 0.75 | 0.729 | 0.91 | 0.536 |

Notes: The figure shows the responses to Question 2 ("With regard to the effectiveness of monetary policy, how important is it to communicate with different audience groups?"). For an explanation of the figure and table, see notes to Figure 1.

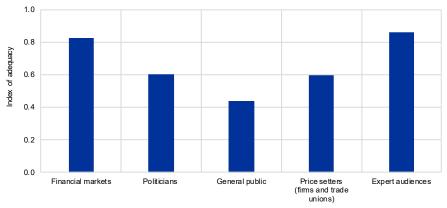
Table 2: Cross-correlations, target audiences

| | · | Financial markets | Politicians | General public | Price setters | Expert audiences |
|------------|---------------------------------|-------------------|-------------|----------------|---------------|------------------|
| Audience | Financial markets | 1.000 | | | | |
| | Politicians | | 1.000 | | | |
| | General public | | 0.336 | 1.000 | | |
| | Price setters | 0.417 | 0.513 | 0.453 | 1.000 | |
| | Expert audiences | | | | 0.462 | 1.000 |
| Topics | Central bank objective | | | | | |
| | Reaction function | | 0.423 | | | |
| | Economic outlook | | | | | 0.458 |
| | Uncertainty underlying outlook | | | | | 0.327 |
| | Rationale for mon pol decisions | | | | | 0.453 |
| | Future path of mon pol | | | | | 0.642 |
| | Interrel. mon pol + fin stab | | 0.349 | | | |
| | Interrel. mon pol + fiscal pol | | 0.376 | | | |
| | Interrel. mon pol + employment | | | 0.454 | | |
| Use of soc | ial media | | 0.333 | 0.386 | | |

Notes: The table shows Spearman rank correlation coefficients for the responses to questions 2, 4 and 11, excluding any don't know answers. Only coefficients that are significant at the 10% level are reported. Coefficients in bold are statistically significant at the 5% level, those in bold italics at the 1% level.

As to the assessment of the ECB's practices, communication with the more traditional target groups of experts and financial markets is considered adequate by an overwhelming majority (74%) of all respondents. In contrast, there is a view that there is substantial room for improvement in communication with the general public (Figure 3): only 22% think that communication with this audience is adequate, while 33% see a lot of room for improvement (Figure A3 in Annex C). There are no significant differences in responses across groups. In the comments, it was remarked that there might be too much communication that is not helpful in fostering an understanding of monetary policy.

Figure 3: Adequacy of communication with different audiences to increase their understanding of monetary policy



| | Financial markets | | Politic | Politicians | | General public | | Price setters | | Expert audiences | |
|-------------------|-------------------|---------|----------|-------------|----------|----------------|----------|---------------|----------|------------------|--|
| | by group | p-value | by group | p-value | by group | p-value | by group | p-value | by group | p-value | |
| All | 0.83 | | 0.60 | | 0.44 | | 0.60 | | 0.87 | | |
| EB | 0.94 | 0.777 | 0.69 | 0.829 | 0.39 | 0.443 | 0.72 | 0.395 | 0.94 | 0.752 | |
| Formerly stressed | 0.85 | 1.000 | 0.75 | 0.150 | 0.45 | 0.669 | 0.50 | 0.470 | 0.85 | 0.605 | |
| Recent | 0.86 | 1.000 | 0.55 | 0.679 | 0.45 | 0.887 | 0.55 | 0.866 | 0.82 | 0.783 | |

Notes: The figure shows the responses to Question 3 ("In terms of increasing understanding of monetary policy, how would you rate current communication with each audience in the euro area?"). The "Index of adequacy" is the percentage of respondents reporting on the importance of objectives weighted by the level of importance attached to each. If all respondents answered 'currently adequate' the index would be 1; 'some room for improvement' the index would be 0.5; and if all respondents reported 'a lot of room for improvement' the index would be 0. The table shows the index calculated for each group and the p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

3.3 What to communicate

Now that we have studied why and with whom to communicate, the next natural question is about the "what". We gave our respondents the opportunity to assign grades of importance to nine different topics. The clear "winner" was communication about the central bank objective (Figure 4), which 100% of former Governing Council members saw as either "very important" or as "extremely important" (Figure A4) – after all, clarity about the central bank objective is a necessary condition for all of the objectives of communication discussed in question 1 of our survey. It is also corroborated by D'Acunto et al. (2020), who emphasise the importance of communication on central bank objectives (relative to instruments) in building trust and in enhancing policy effectiveness. Moreover, using US household survey data, Coibion et al. (2019) find that communication on the central bank's targets and objectives can effectively steer expectations in the desired direction, particularly when transmitted directly and regularly.

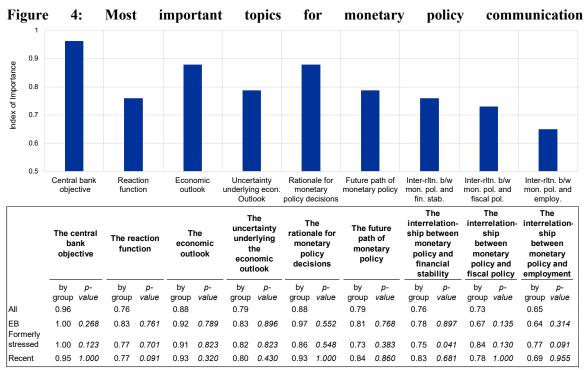
The "runners-up" are communication on the rationale for monetary policy decisions and on the economic outlook (with an index value of 0.88 each, as compared to 0.96 for the objective). These views are in line with a long-standing ECB tradition where, ever since its inception, monetary policy decisions are explained in detail in a press conference on the same day as they are announced, and the Governing Council's views regarding the economic outlook are outlined (Issing 1999). In addition, the ECB has published staff macroeconomic projections since December 2000, which were expanded to include additional information, e.g. with regard to employment, in June 2013 (Kedan and Stuart 2014). The literature on information effects (Jarocínski and Karadi 2020) has

highlighted that these form an important component of the ECB's communication, and exert substantial effects on financial markets. It would be interesting to see whether this assessment has changed over time, i.e. whether providing the rationale for monetary policy decisions is seen as more important nowadays, given that the ECB has embarked on a number of unconventional monetary policy measures. While recent members of the Governing Council attach slightly more importance to this topic, the difference with the earlier members is not statistically significant.

Communicating on uncertainty, the future path of policy and the reaction function are perceived as important, but less so than the other topics. In terms of communicating on the inter-relationship between monetary policy and other policy areas, financial stability and fiscal policy are overall considered slightly more important than communicating on employment. Respondents from formerly stressed countries tend to give higher importance to communicating on the inter-relationship with fiscal policy and employment, whereas the other respondents find communicating on financial stability relatively more important.

Looking at the correlation matrix in Table 3, two clusters appear. On the one hand, communication about the economic outlook, its uncertainty, the rationale for monetary policy decisions and the future path of monetary policy are all significantly correlated. On the other hand, the interrelationship between monetary policy and financial stability, fiscal policy and employment are also all significantly correlated, and are uncorrelated with the other topics. In general, there is quite some overlap across topics in terms of their perceived importance; only three respondents expressed a preference for one topic (the central bank objective) above all others.

As to the first cluster, a correlation between communication about the economic outlook and the future path of monetary policy is to be expected if the central bank conducts forward guidance in what has been labelled its "Delphic" form, i.e. by forecasting macroeconomic performance and likely monetary policy actions rather than by committing to a future path of policy (Campbell et al. 2012; Andrade and Ferroni 2021). Indeed, the empirical literature finds that cases of such committal, or "Odyssean" forward guidance, are rare (Sutherland 2020).



Notes: The figure shows the responses to Question 4 ("Which topics should be covered by monetary policy communication in the euro area?"). For an explanation of the figure and table, see notes to Figure 1.

Table 3: Cross-correlations, topics

| | Central bank objective | Reaction function | Economic outlook | Uncertainty underlying outlook | Rationale for mon pol decisions | Future path of mon pol | Interrel. mon pol + fin stab | Interrel. mon pol + fiscal pol | Interrel. mon pol + employment |
|---------------------------------|------------------------|----------------------|---------------------|--------------------------------------|---------------------------------------|------------------------|---------------------------------|-----------------------------------|--------------------------------------|
| Central bank objective | 1.000 | | | | | | | | |
| Reaction function | | 1.000 | | | | | | | |
| Economic outlook | | | 1.000 | | | | | | |
| Uncertainty underlying outlook | | | 0.386 | 1.000 | | | | | |
| Rationale for mon pol decisions | 0.380 | 0.485 | 0.326 | 0.498 | 1.000 | | | | |
| Future path of mon pol | | | 0.503 | 0.523 | 0.324 | 1.000 | | | |
| Interrel. mon pol + fin stab | | | | | | | 1.000 | | |
| Interrel. mon pol + fiscal pol | | | | | | | 0.585 | 1.000 | |
| Interrel. mon pol + employment | | | | | | | 0.344 | 0.526 | 1.000 |

Notes: The table shows Spearman rank correlation coefficients for the responses to question 4, excluding any don't know answers. Only coefficients that are significant at the 10% level are reported. Coefficients in bold are statistically significant at the 5% level, those in bold italics at the 1% level.

Question 4 had already asked about the importance of communicating about the future path of monetary policy. While it was not among the most important topics, 81% of respondents classified it as very or extremely important. One way of achieving such communication is by means of forward guidance (FG), which can influence real economic variables by effectively steering interest rate expectations (Hansen and McMahon 2016; Hubert and Labondance 2018; Bundick and Smith 2020).

The ECB has actively used FG since 2013, when it announced that "the Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time". This type of FG has often been classified as purely qualitative or open-ended, as it provides neither a time frame until which rates remain low, nor economic conditions that would trigger an increase in rates. The type of FG was changed in March 2016, to "the Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time, and well past the horizon of our net asset purchases" – which in turn, were "intended to run until the end of March

2017, or beyond, if necessary, and in any case until the Governing Council sees a sustained adjustment in the path of inflation consistent with its aim of achieving inflation rates below, but close to, 2% over the medium term." This revised FG can be characterised as calendar based (or "time contingent") as well as data based (or "state contingent"). Further alterations followed. Importantly, the calendar-based element was dropped and the ECB's FG on interest rates became purely state contingent in September 2019.

The various FG types have been found to exert different effects. Jain and Sutherland (2020) provide evidence that FG lowers interest rate forecast disagreement without reducing disagreement around macroeconomic forecasts. Ehrmann et al. (2019) show that this effect depends on the FG type – open-ended FG exerts few, if any effects, and calendar-based FG strongly anchors interest rate expectations if the FG horizon is long, but has a counterintuitive effect if the FG horizon is short, as forecasters start looking through the FG.

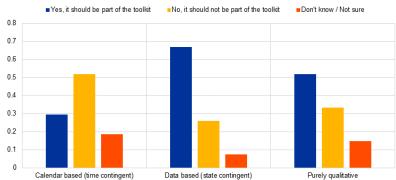
We asked our respondents about their views on the various types of FG. As Figure 5 shows, most respondents (67%) suggest that state-contingent FG should remain in the ECB's toolbox, just over half think that purely qualitative guidance should remain in use, and less than a third are supportive of calendar-based guidance. In fact, a very slight majority of respondents believe that calendar-based guidance should *not* be in the toolkit any longer. In comments to this question, a number of respondents note that the most appropriate type of FG (and whether FG should be given) depends on the situation. While the question did not ask specifically about combinations of guidance, one respondent did note in the comments that the different forms are not necessarily exclusive and that they can be combined (using the above-mentioned example of calendar-based and qualitative FG, which was used by the ECB after March 2016).

While there are some differences across groups, the only one that is marginally significant is that former EB members are more inclined to report that purely qualitative guidance should remain in the toolkit. Looking at correlations,⁷ we find that a preference for purely qualitative guidance is correlated with the view that the ECB's communication is overly complex. The proponents of purely qualitative guidance might therefore be attracted by the fact that it is easy to communicate.

We can contrast these findings with a very similar question asked in the survey by Blinder et al. (2017). There, a large majority of 68% of the academics chose state-contingent FG as their preferred type, and only around 10% opted for calendar-based FG. The central bank governors, in contrast, were often undecided, or otherwise preferred purely qualitative FG. The picture that emerges in our survey is much more in line with the assessment by the academics in the 2017 survey, with little support for calendar-based FG and a majority opting for state-contingent FG. Interestingly, these views are also in line with the ECB's current FG, which has abandoned the calendar-based component.

⁷ The correlations are not reported here for brevity – the numbers can be found in the full correlation matrix provided in Appendix Table A1.

Figure 5: Forward guidance in the euro area



| | | | It should be p | art of the toolki | t | |
|-------------------|----------|----------|----------------|-------------------|--------------------|---------|
| | Calenda | ar based | Data based | | Purely qualitative | |
| | by group | p-value | by group | p-value | by group | p-value |
| All | 0.36 | | 0.72 | | 0.61 | |
| EB | 0.44 | 0.662 | 0.67 | 0.673 | 0.88 | 0.086 |
| Formerly stressed | 0.22 | 0.380 | 0.80 | 0.659 | 0.56 | 1.000 |
| Recent | 0.50 | 0.386 | 0.80 | 0.659 | 0.64 | 1.000 |

Notes: The figure shows the responses to Question 5 ("For several years, the ECB has provided forward guidance, in different forms. Forward guidance is often classified as being either calendar based (or "time contingent"), data based (or "state contingent"), or purely qualitative (that is, providing neither a time frame nor economic conditions). Which type(s) of forward guidance do you believe should be part of the ECB toolkit?") and the proportion of respondents selecting each response option. The table shows the share of respondents answering that it should be part of the toolkit, excluding the respondents who replied "Don't know/Not sure". The p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

One of the outcomes of the ECB's strategy review was a revision of its inflation target, from "below, but close to, 2%" to a symmetric 2% target. The earlier formulation had received considerable criticism for being imprecise (Paloviita et al. 2021 estimate the de facto inflation target of the ECB to be between 1.6 and 1.8%) and as giving the impression of being asymmetric (Miles et al. 2017; Hartmann and Smets 2018). It has also been argued that the formulation served the ECB well in the years prior to the global financial crisis when inflation was relatively high, but less so subsequently, when monetary policy was constrained by the effective lower bound and the ECB struggled to bring inflation back up to target (Rostagno et al. 2019). Earlier surveys among households also made it apparent that knowledge about the ECB's inflation target is rather limited, but that consumers with better knowledge of the ECB's objective form superior inflation expectations (van der Cruijsen et al. 2015). In addition, higher trust in the ECB has been shown to contribute to better-anchored inflation expectations (Christelis et al. 2020).

Following this evidence, we asked the question if having a more precise inflation aim would lead to inflation expectations being more or less firmly anchored, or would not make any difference. Before the new strategy was announced in July 2021, the general expectation had been that the ECB would adopt a symmetric target of 2%. While the question did not explicitly specify whether a more precise target would be higher or lower, it is probably safe to assume that respondents had a (slightly higher) 2% target in mind. Only around 10% report that inflation expectations could be *less* firmly anchored with a more precise inflation aim (Figure 6), whereas the views were evenly split whether there could be a better anchoring or it would not make any difference, with each answer category receiving 41% of support. Interestingly, none of the respondents who reported that

⁸ See for instance, Demertzis (2021).

inflation would be less firmly anchored had served in more recent times (at the time or since President Draghi delivered his whatever it takes speech). These respondents had served during a period in which price shocks were almost always to the upside and the hard ceiling offered by the "below, but close to, 2%" inflation aim would have functioned as a key shock absorber (Rostagno et al., 2019).

It is perhaps surprising that a substantial share of respondents felt that a more precise target would not make a difference. Four of the eleven people that selected this response left comments that shed light on their thinking; two expressed a preference for a range rather than a precise target, while the other two felt that the phrase "below, but close to, 2%" was already perceived as a target or "number", regardless of the formulation.

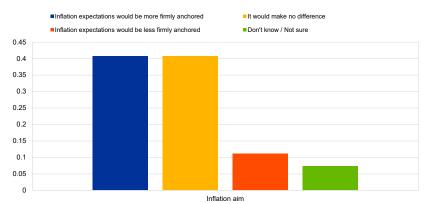


Figure 6: Communicating a more precise inflation aim

| | | Communicating a more precise | e inflation aim | |
|-------------------|--|--|--------------------------------|---------|
| | Inflation expectations would be more firmly anchored | Inflation expectations would be less firmly anchored | It would make no difference | |
| | by group | by group | by group | p-value |
| All | 0.44 | 0.12 | 0.44 | |
| EB | 0.33 | 0.22 | 0.44 | 0.62 |
| Formerly stressed | 0.70 | 0.10 | 0.20 | 0.14 |
| Recent | 0.50 | 0.00 | 0.50 | 0.34 |

Notes: The figure shows the responses to Question 6 ("The ECB has often been criticised that its inflation aim lacks precision. Do you feel that communicating a more precise inflation aim would mean that i) inflation expectations would be more firmly anchored; ii) it would make no difference; iii) inflation expectations would be less firmly anchored; or iv) don't know/not sure") and the proportion of respondents selecting each response option. The table shows the share of respondents excluding those who replied "Don't know/Not sure". The p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

There are notable differences according to the characteristics of respondents. A higher share of respondents from formerly stressed countries report that a more precise aim would lead to inflation expectations being more firmly anchored (70%), as compared to respondents that were not from formerly stressed countries (27%). While the differences are not significant when testing across all responses, they are significant if we test between respondents that said inflation would be more firmly anchored versus all other responses. Since a key outcome of the ECB strategy review was a more precise inflation aim, in time we will be able to judge which answer proves right. The ECB Survey of Monetary Analysts provides some initial, tentative evidence that the change in the inflation aim may have contributed to a slight upward shift in the distribution of euro area long-run

inflation expectations: the median bucket in the September 2021 survey shifted up, to a range of 1.8-2.0%, from 1.5-1.7% in the June survey (Figure 7).

Figure 7: Distribution of long-run headline inflation expectations

Source: ECB Survey of Monetary Analysts.

Notes: Average probability distribution. Percentages may not add up to 100 due to rounding. The number of respondents was 20 in June 2021 and 19 in September 2021.

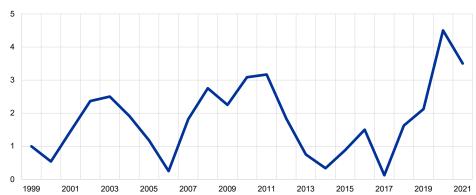
The last question in this block about the "what" relates to the ways to communicate uncertainty. Blinder et al. (2008) identified effective communication as communication that "creates news" and "reduces noise." A delicate issue in this regard is the potential means through which the central bank communicates about its own uncertainty. The central bank should not generate additional uncertainty, but it should also truthfully report to what extent its own assessments are uncertain. Such communication has been found to be important in moving long-run interest rates (Hansen et al. 2019).

The ECB communicates about uncertainty using different channels. The staff projections assess the uncertainty around the baseline projection through sensitivity analyses. These study alternative paths of key assumptions and assess the implications on the macroeconomic projections. Also, further to the point projections for HICP inflation and real GDP growth, the ECB provides ranges for these two key variables (ECB 2016a). Since June 2020, due to the extraordinary situation created by the COVID-19 pandemic, the staff projections no longer report ranges. As these are based on historical projection errors, they would not be able to provide a reliable indication of the unprecedented uncertainty surrounding the projections. Instead, alternative scenarios based on different assumptions regarding the future evolution of the COVID-19 pandemic and the associated containment measures are provided. In addition, the ECB's assessment of economic uncertainty is also conveyed explicitly in the press conference, as evident in the use of the words "uncertainty," "uncertainty" and "uncertainties" over time in the introductory statements (Figure 8). Another outlet for communication on uncertainty is the ECB Economic Bulletin, which always provides an overview of economic, financial and monetary developments, and – when particularly topical – special analyses on uncertainty.

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⁹ See for example ECB (2013), ECB (2016b) and Gieseck and Rujin (2020).

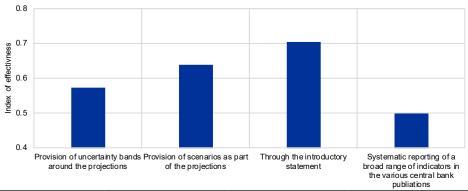
Figure 8: References to uncertainty in the ECB's introductory statement



Notes: The figure shows the number of references to "uncertainty", "uncertain" and "uncertainties" in the ECB's introductory statement. Numbers are averages per year. The data point for 2021 shows the average number of references up to and including the meeting of 10 June 2021.

Among these channels, according to our respondents the most effective way to communicate about uncertainty is through the introductory statement (Figure 9). Providing scenarios as part of the projection round is identified as the next most effective way (0.64 compared to 0.70 for the introductory statement). The usefulness of scenarios might be particularly pronounced in the context of the current unprecedented uncertainty due to the COVID-19 pandemic. Indeed, one respondent commented that scenarios should only be provided in extraordinary situations when the outlook is likely to be affected by "unknowns".

Figure 9: Means of communicating about uncertainty



| | Provis uncertain around the | • | Provis scenarios the proj | as part of | Through the introductory statement | | Systematic r a broad r indicator various cer publia | range of rs in the ntral bank |
|-------------------|-----------------------------------|---------|---------------------------------|------------|------------------------------------|---------|---|-------------------------------------|
| | by group | p-value | by group | p-value | by group | p-value | by group | p-value |
| All | 0.57 | | 0.64 | | 0.70 | | 0.50 | |
| EB | 0.50 | 0.829 | 0.56 | 0.780 | 0.81 | 0.493 | 0.47 | 0.968 |
| Formerly stressed | 0.73 | 0.343 | 0.75 | 0.236 | 0.68 | 0.721 | 0.52 | 1.000 |
| Recent | 0.57 | 0.796 | 0.73 | 0.053 | 0.82 | 0.286 | 0.61 | 0.218 |

Notes: The figure shows the responses to Question 7 ("Monetary policy always operates under uncertainty. How can the ECB effectively communicate about this uncertainty?"). The "Index of effectiveness" is the percentage of respondents reporting on the effectiveness of the different means weighted by the level of effectiveness attached to each. If all respondents answered 'extremely effective' the index would be 1; 'very effective' the index would be 0.75; 'effective' the index would be 0.5; somewhat effective' the index would be 0.25; and if all respondents reported 'not effective at all' the index would be 0. The table shows the "Index of effectiveness" calculated for each group and the p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

The provision of uncertainty bands around the projections was also seen as effective by a majority of respondents (0.57). Systematic reporting on a broad range of indicators in various central bank publications is indicated to be the least effective means of communicating about uncertainty, with less than 10% of respondents stating that this would be "extremely effective" (Figure A5).

The former Governing Council members who had been in office in the more recent period tend to be somewhat more supportive of the scenarios as a way to communicate about uncertainty. Otherwise, all respondent groups are in agreement on these issues; there are no further significant differences across groups in any of the categories.

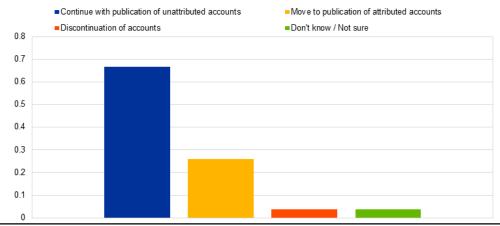
3.4 How to communicate

After having covered the "why" and "what", the last block of questions in our survey deals with the "how". That block covers many different aspects of communication. It started with a question about the publication of "monetary policy accounts". These have been published since early 2015 and provide a summary of the Governing Council's monetary policy deliberations. Whether or not such accounts should be published has been discussed extensively since the ECB's inception. The main arguments in favour and against are reported in the exchange between Willem Buiter (1999) and Otmar Issing (1999). Publication of accounts is seen as helpful for transparency and might aid central bank watchers to better understand the various views that are discussed in the policy meetings, therefore enhancing their understanding of the ECB's reaction function and improving the predictability of its decisions. At the same time, attributed accounts have been seen as problematic if there is too much emphasis on the views of individuals in a collective decisionmaking body, thereby reducing the clarity of the ECB's communication and the effectiveness of its monetary policy. Gersbach and Hahn (2009) argue that attributed accounts or voting records could leave the Governing Council members vulnerable to political interference and pressure to promote their national interests, which would be detrimental to the functioning of the monetary union. There is also evidence that attributed accounts might stifle the debate and lead committee members to rely more on prepared statements (Meade and Stasavage 2008; Swank et al. 2008; Hansen et al. 2017). The ECB's accounts are unattributed. 10 This policy is strongly supported by our respondents – where a large majority (67%) are in favour of continuing to publish unattributed accounts. In commenting, they pointed to concerns about attribution leading to less open discussions and reduced independence of NCB Governors. Still, there is some support to move to the publication of attributed accounts (26%, Figure 10), implying that this discussion is not settled. There is almost no support for discontinuing the accounts – only one respondent gave that answer. These opinions are widely shared, given that there are no significant differences in responses across groups.

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¹⁰Article 10.4 of the Statute of the ESCB and the ECB requires that the proceedings of the meetings shall be confidential, but that the Governing Council may decide to make the outcome of its deliberations public.

Figure 10: Monetary policy accounts



| | Continue with publication of unattributed accounts | Move to publication of attributed accounts | Discontinuation of accounts | |
|-------------------|--|--|-----------------------------|---------|
| | by group | by group | by group | p-value |
| All | 0.69 | 0.27 | 0.04 | |
| EB | 0.67 | 0.33 | 0.00 | 0.786 |
| Formerly stressed | 0.73 | 0.18 | 0.09 | 0.381 |
| Recent | 0.55 | 0.36 | 0.09 | 0.262 |

Notes: The figure shows the responses to Question 8 ("Since early 2015, the ECB has published "monetary policy accounts", which provide a summary of the Governing Council's monetary policy deliberations. In contrast to other central banks, the accounts are unattributed. Regarding the accounts, what in your view is the most effective means of communicating with the public about the content of the meetings?") and the proportion of respondents selecting each response option. The table shows the share of respondents excluding the respondents who replied "Don't know/Not sure". The p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

Taking the notion of attribution further, we asked more generally about the communication of individual views. Blinder (2007) has highlighted that by speaking with too many voices, central banks might confuse outside observers, up to the point that "a central bank that speaks with a cacophony of voices may, in effect, have no voice at all." He has also suggested that "the cacophony problem on monetary policy committees will not go away soon" (Blinder 2018). A contrasting view has been put forward by Bernanke (2004), suggesting that "the willingness of FOMC members to present their individual perspectives in speeches and other public forums provides the public with useful information about the diversity of views and the balance of opinion on the Committee."

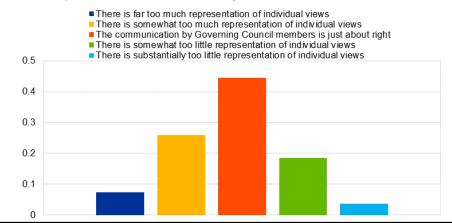
Where is the ECB located on this spectrum? Most respondents think that the ECB's monetary policy communication is about right in terms of how individual views are represented (Figure 11). However, a higher share of respondents believe that there is too much representation of individual views (33%) compared to those who believe that there is too little (22%). Although differences across groups are not significant, a higher share of EB members think that there is too much representation of individual views.

Looking at the correlation matrix, 11 we find – not surprisingly – that the answers on the diversity of views and the attribution of accounts are correlated: respondents who think that there should be more communication of diverse views also tend to be more in favour of publishing attributed

¹¹ Not reported here for brevity, see Appendix Table A.1

accounts. We also received one comment that made this link explicit, by suggesting that attributed accounts would help make the diversity of views more transparent. Another significant correlation points to proponents of the communication of diverse views also favouring that the balance of communication shifts more to the NCBs.

Figure 11: Diversity of views on the Governing Council



| | There is (somewhat or far) too much representation of individual views | The communication by Governing Council members is just about right | There is (somewhat or substantially) too little representation of individual views | |
|-------------------|---|--|---|---------|
| | by group | by group | by group | p-value |
| All | 0.33 | 0.44 | 0.22 | |
| EB | 0.44 | 0.44 | 0.11 | 0.602 |
| Formerly stressed | 0.27 | 0.45 | 0.27 | 0.885 |
| Recent | 0.36 | 0.36 | 0.27 | 0.783 |

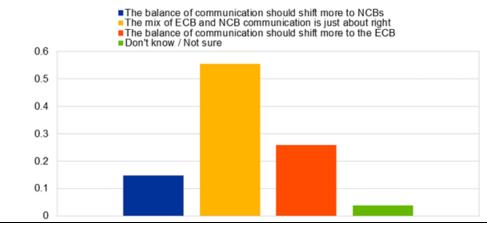
Notes: The figure shows the responses to Questions 9 ("In most central banks, monetary policy is set by a committee. Whereas some central banks encourage that the diversity of views on the committee is represented in the external communication, others have adopted a one-voice policy. Where, in your view, is the monetary policy communication by Governing Council members located along this spectrum?"). The table shows the share of respondents excluding the respondents who replied "Don't know/Not sure". The p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

Following this line of questioning, we proceeded to ask to what extent communication should be done by the ECB or by the NCBs. The particular communication challenges posed by a "multicultural" monetary union are long recognised and could imply an important role for national central banks (Issing 2000). Communication by NCB Governors can help "explain ECB decisions in the 19 countries of the eurozone, 'translating' what this means for local audiences, businesses, and citizens in their home countries" (Graeff 2019). The fact that the euro area is a multi-lingual currency area implies that it is important to have communicators who can speak in the respective national languages. At the same time, communication by both the ECB and NCBs on monetary policy has been shown to give rise to inconsistencies (Jansen and de Haan 2006), which can put the overall clarity of communication at risk. Hence, proponents of a one-voice communication policy might find it more attractive if relatively more of the communication is done by the ECB.

A majority of respondents believe that the balance of communication between the ECB and NCBs is currently about right (Figure 12). There is a higher share of respondents who believe the balance of communication should shift to the ECB (27%) compared to those who believe it should shift to

the NCBs (15%). Comments made by those who favoured a shift towards the ECB reveal some specific preferences. One respondent believes that NCBs should explain the decision of the ECB to national audiences, rather than communicating on the views of the respective governor. Another respondent clarified a desire to shift communication more to the ECB by referring to a number of perceived instances where public comments by individual members of the Governing Council conveyed mixed signals and provoked undesirable reactions in financial markets. The differences across groups are not statistically significant, but they are still intriguing: not a single respondent from the EB or from a formerly stressed country thinks that the balance of communication should shift to the NCBs.

Figure 12: Balance of communication between the ECB and NCBs



| | The balance of communication should shift more to NCBs | The mix of ECB and NCB communication is just about right | The balance of communication should shift more to the ECB | |
|-------------------|--|--|---|---------|
| | by group | by group | by group | p-value |
| All | 0.15 | 0.58 | 0.27 | |
| EB | 0.00 | 0.67 | 0.33 | 0.332 |
| Formerly stressed | 0.00 | 0.70 | 0.30 | 0.297 |
| Recent | 0.27 | 0.55 | 0.18 | 0.400 |

Notes: The figure shows the responses to Questions 10 ("How do you see the role of the ECB and the NCBs in shaping the Eurosystem's monetary policy-related communication; is the Eurosystem making best use of its decentralised communication structure?") and the proportion of respondents selecting each response option. The table shows the share of respondents excluding the respondents who replied "Don't know/Not sure". The p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

Traditionally, central bank communication has relied on the intermediation services of media to reach the general public. While experts might have chosen direct communication channels by, for example reviewing macroeconomic projections reports and reading speeches by policy makers on the central bank website, non-experts generally only learned about central bank issues via the media (ter Ellen et al. 2021). With the dramatic changes in the media landscape over recent years, central banks have more means to directly reach out to experts and non-experts in real time. Not surprisingly, many central banks have become active users of social media. Korhonen and Newby (2019) report that almost all central banks in Europe have institutional Twitter accounts, and Conti-Brown and Feinstein (2020) show that the Federal Reserve is more engaged on Twitter than other independent US agencies. Ehrmann and Wabitsch (2021) provide evidence that Twitter traffic is

responsive to the ECB's communication, also for non-experts. However, they also highlight potential issues with the usage of social media, as ECB-related tweets are more likely to get retweeted or liked if they express strong views or are more subjective, and more likely to get retweeted if they contain negative views.

Asked about the use of social media among the Eurosystem central banks, 48% of respondents believe that this should remain as is currently in place (Figure 13). Another 22% of respondents feel it should go further, whereas 26% believe that the use of social media should revert back. In comments to the question, some proponents noted that social media facilitate speedy reactions of the ECB, that presence in social media could contribute to countering possible misinformation, and that it might help promote an understanding of monetary policy across the euro area, especially among the general public. Differences in responses across groups are not significant, although a larger share of former EB members think the use of social media should revert back.

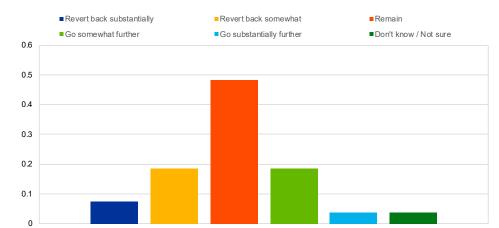


Figure 13: Use of social media

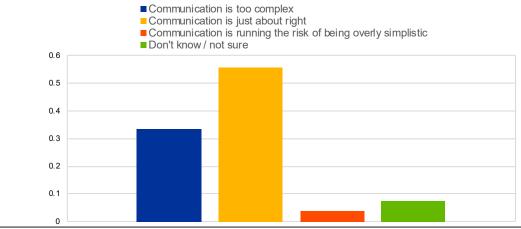
| | Revert Back | Remain | Go further | |
|-------------------|-------------|----------|------------|---------|
| | by group | by group | by group | p-value |
| All | 0.27 | 0.50 | 0.23 | |
| EB | 0.50 | 0.38 | 0.13 | 0.540 |
| Formerly stressed | 0.36 | 0.36 | 0.27 | 0.634 |
| Recent | 0.18 | 0.55 | 0.27 | 0.856 |

Notes: The figure shows the responses to Question 11 ("The central banks of the Eurosystem have become more active in their use of social media. Do you think these changes in communication should remain, be reversed or be taken even further going forward?") and the proportion of respondents selecting each response option. The table shows the share of respondents excluding the respondents who replied "Don't know/Not sure". The p-value is from a Fisher's exact test of independence by group, i.e. it tests whether the responses of the particular group are significantly different from the responses of respondents that are not part of that group (e.g. EB members relative to NCB governors).

If central banks want to get through to the general public, they need to communicate in simple and intelligible language, using relatable messages (Bholat et al. 2019; Coibion et al. 2019; Kryvtsov and Petersen 2021). Haldane (2016) has highlighted that central bank communication typically uses language that is unlikely to be accessible to the vast majority of the general public, as it is overly complex. While he used the example of the Bank of England, Coenen et al. (2017) show that, on average, a reader of the ECB and Federal Reserve monetary policy statements would need to have 13 to 15 years of formal education to understand the text. While this suggests that language is often extremely complex, central banks do face a trade-off in this regard: there is also a risk that simple

language might not do justice to the fact that central banks communicate about complex issues, operate under uncertainty and need to appropriately convey how they come to their conclusions. Haldane et al. (2020) acknowledge the risk that if communication is too simplified the public will develop a false sense of certainty about the future and may be disappointed when this simplified view of the world does not materialise. Central banks do therefore need to carefully choose their language to be neither overly complex, nor overly simplistic and must realise that simplified explanations alone, without rationalisation and education, may not build trust.

Figure 14: Complexity of communication

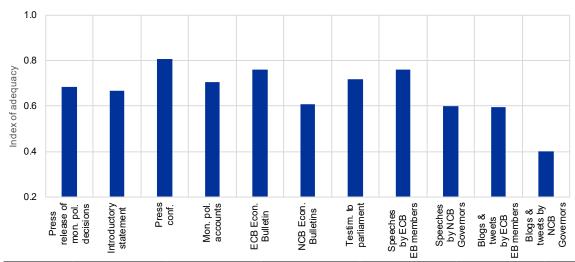


| | Communication is too complex | Communication is just about right | Communication is running the risk of being overly simplistic | |
|-------------------|------------------------------|-----------------------------------|--|---------|
| | by group | by group | by group | p-value |
| All | 0.36 | 0.60 | 0.04 | |
| EB | 0.33 | 0.67 | 0.00 | 1.000 |
| Formerly stressed | 0.56 | 0.33 | 0.11 | 0.059 |
| Recent | 0.40 | 0.60 | 0.00 | 1.000 |

Notes: The figure shows the responses to Question 12 ("Central bank communication has often been criticised for using overly complex language that is difficult to understand by the public. There have been attempts to address this, for instance by offering layered communication. In your view, which statement most accurately summarises your feelings on the current monetary policy communication in the euro area?") and the proportion of respondents selecting each response option. The table shows the share of respondents excluding the respondents who replied "Don't know/Not sure".

When asked about their assessment of the ECB in terms of balancing this trade-off, a majority of respondents think its communication is just about right (Figure 14). A substantial share believe that it is too complex (33%), while almost no one thinks that it runs the risk of being overly simplistic. However, a number of respondents who selected that communication is "about right" noted in the comments to the question that the answer depends on the audience and that probably for the general public, communication remains too complex, implying (in line with the results obtained for question 3) that there is room for improvement in the communication with this particular target group. Across groups, a larger share of respondents from formerly stressed countries believe that communication is too complex (56% compared to 25% of respondents from non-stressed countries), but the difference is only weakly significant at the 10% level.

Figure 15: Adequacy of communication channels



| | Press re monetar decis | y policy | Introd state | uctory ment | Press co | nference | | ry policy ounts | ECB Ec | | NCB Economic Bulletins | | | | |
|----------|------------------------------|----------|-------------------|----------------|-------------------|----------|---------------------------|--------------------------|------------------|---------|---------------------------|---------|--|--|--|
| All | by group 0.69 | p-value | by group 0.67 | p-value | by group 0.81 | p-value | by group 0.70 | p-value | by group 0.76 | p-value | by group 0.61 | p-value | | | |
| EB | 0.67 | 0.375 | 0.72 | 0.620 | 0.94 | 0.515 | 0.67 | 0.619 | 0.61 | 0.132 | 0.50 | 0.712 | | | |
| Stressed | 0.68 | 1.000 | 0.55 | 0.119 | 0.73 | 0.382 | 0.73 | 0.310 | 0.85 | 0.524 | 0.72 | 0.526 | | | |
| Recent | 0.64 | 0.844 | 0.64 | 0.856 | 0.80 | 1.000 | 0.77 | 0.818 | 0.77 | 0.320 | 0.55 | 0.861 | | | |
| | Testimonies to parliament | | Speeches EB me | • | s by NCB rnors | by EC | d tweets CB EB bers | Blogs an by N Gove | ICB | | | | | | |
| | by group | p-value | by group | p-value | by group | p-value | by group | p-value | by group | p-value | | | | | |
| All | 0.72 | | 0.76 | | 0.60 | | 0.59 | | 0.40 | | | | | | |
| EB | 0.88 | 0.338 | 0.72 | 0.618 | 0.50 | 0.427 | 0.50 | 0.784 | 0.30 | 0.535 | | | | | |
| Stressed | 0.72 | 1.000 | 0.85 | 0.524 | 0.65 | 0.865 | 0.71 | 0.431 | 0.42 | 1.000 | | | | | |
| Recent | 0.65 | 0.690 | 0.75 | 0.807 | 0.64 | 0.344 | 0.63 | 1.000 | 0.38 | 0.534 | | | | | |

Notes: The figure shows the responses to Question 13, "In terms of increasing understanding of monetary policy, how would you rate the following communication channels?". For an explanation of the figure and table, see notes to Figure 3.

In our last closed question, we asked respondents to assess the adequacy of the various ECB communication channels with regard to fostering a better understanding of monetary policy. Our respondents see room for improvement in virtually all of them. Only three channels, the press conference, the ECB Economic Bulletin and speeches by EB members were rated as "currently adequate" by a majority of respondents. Of these three, the press conference received the largest approval rate, with 67% of respondents answering "currently adequate", 22% "some room for improvement" and 7% "a lot of room for improvement" (Figure 15). Interestingly, despite this broad-based support, the press conference was changed considerably after the ECB's strategy review (ECB 2021b): the earlier "introductory statement" was relabelled "monetary policy statement", is written more as a piece that is read out loud, uses more accessible language, and is considerably shorter. This is in line with some of the comments received, namely that the introductory statement is repetitive, uses language that is too standardised and could be further streamlined.

Generally, NCB communication channels are judged to have more room for improvement than their corresponding ECB counterparts. This applies to Economic Bulletins, but also to speeches, blogs and tweets, respectively. This assessment is shared by former EB members and former NCB Governors alike – we don't find significant differences across the various respondent groups.

The most critical assessment was reported for the use of new media, where many respondents feel uncertain about the adequacy of blogs and tweets. Given the novelty of these communication channels, it might not be surprising that a large share of respondents selected the "Don't know/not sure" option.

3.5 General reflections on challenges and the future

In the last block of the survey, we asked two open-ended questions, namely "What do you see as the greatest challenges to monetary policy communication in the euro area?" and "How do you think monetary policy communication in the euro area should evolve over the next five to ten years?" Despite being located at the end of the survey, many answers were recorded – 23 for the questions on challenges and 21 for the future evolution, i.e. a large majority of the 27 respondents filed an answer.

With regard to the greatest challenges to monetary policy communication, the most-frequently cited issues relate to the inflation aim, the macroeconomic environment and the need to address diverse audiences. A perceived need for clarification of the inflation aim was mentioned by several respondents. Concerns were expressed about the ambiguity of the "below, but close to, 2%" inflation aim and the policy-relevant horizon, which were seen to raise questions about credibility. In this regard, several respondents suggested that an explicit numeric inflation aim would be preferable.

Respondents also noted the communication challenges posed by the current macroeconomic environment of low interest rates, low growth and high savings, which necessitated an expansion of the monetary policy toolkit. The importance of explaining that the current monetary policy constellation is due to the low interest rate environment, rather than the cause of it, was highlighted. In this context, it was also commented that observers may question the effectiveness of the ECB's monetary policy, and that it is important to generate trust in the ECB's ability to reach its inflation objective.

Another challenge cited by a number of respondents is the need to communicate with diverse audiences across countries where business cycles are not necessarily aligned. Other challenges mentioned include clarifying the responsibilities of the ECB vs. those of other policy actors, integrating financial stability issues into communication, and the role of economic and monetary analysis. With regard to the latter, it was suggested that an integrated assessment should inform policy, rather than using the monetary pillar to cross-check the signals coming from the economic analysis.

Turning to how monetary policy should evolve over the next five to ten years, simplification and clarity, greater involvement of NCBs and the need to avoid a cacophony of voices were the most-frequently noted factors. Less complex communication is seen as a means to reach a wider audience. In this context, the importance of clear and targeted communication was cited. Respondents also suggested greater involvement of NCBs in communication in order to engage with the public across the euro area. In addition, some respondents indicated a need to avoid contradictory communication, favouring a more coordinated, "one voice" approach.

4. Conclusions

Our survey sheds light on the views of former Governing Council members about the reasons for communication, as well as with whom, what and how to communicate. The respondents identify many important objectives of monetary policy communication, but give most importance to enhancing trust and credibility.

Financial markets are seen as the most relevant audience for the effectiveness of monetary policy, followed by experts. Communication practices are viewed as adequate for these traditional target groups, but at the time of the survey, respondents saw substantial room for improvement when it comes to communication with the general public.

Turning to the "what" of communication, the central bank objective is identified as the most important topic. With regard to communication on the future path of monetary policy, respondents strongly favour state-contingent FG; a majority even say calendar-based guidance should no longer be part of the toolkit.

Most respondents feel that changes introduced in recent years, such as the use of social media and the publication of monetary policy accounts, are just about right and should remain in place. Also with regard to the representation of individual views in the external communication and the balance of communication between the ECB and the NCBs, many respondents view the status quo as adequate. Among those proposing a change, a majority would like to see less emphasis on individual views and a shift of the balance towards the ECB. At the same time, in response to the open-ended question about how communication should evolve over the next five to ten years, some respondents highlight simplification and improved clarity as important.

The views expressed are generally similar across the different groups of respondents, pointing to a broad consensus on many issues.

Although not directly comparable given differences in the nature and conduct of the surveys, the overall views expressed by former Governing Council members about ECB communication practices are similar in spirit to the views of former FOMC members in response to the survey of Cecchetti and Schoenholtz (2019). For instance, also FOMC members identify the central bank reaction function as well as risk and uncertainty as important topics of communication. In addition, they highlight the need for clarity in communication and avoiding a cacophony of voices.

Several of the concerns raised by the respondents in our survey are related to the outcome of the ECB's strategy review. The inflation aim is now expressed as a symmetric 2% target, which might address the desire for a more precise aim reported by many respondents. In line with the preferences of some respondents, the formerly separate economic and monetary analyses conducted under the "two pillars" have been replaced by an integrated analysis which also takes into account risks to price stability from financial imbalances. The replacement of the introductory statement with a streamlined and more accessible monetary policy statement may alleviate the concerns of respondents about the complexity of communication and reaching a wider audience. Finally, the commitment in the strategy statement to use more layered communication to ensure greater understanding by the wider public aims to address the consensus reflected also in this survey that there is substantial room for improvement in communication with the wider public. The extent to

which these efforts will be successful remains to be seen and will require constant monitoring and assessment. What constitutes effective communication varies across audiences and is likely to evolve over time with changes in monetary policy, technology and the media landscape. Central banks will need to continue to adapt and adjust to these differences and changes.

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Annex A - the questionnaire

| Annex | A - the questionnaire |
|-------|---|
| Why | communicate? |
| Q1 | What do you see as the main objectives of monetary policy communication? |
| | (i) enhance transparency; (ii) manage expectations; (iii) ensure accountability; (iv) |
| | enhance credibility and trust; and (v) safeguard central bank independence. |
| | Please rate each option on a scale of 1 to 5, where 1 is "not important at all", 2 is |
| | "somewhat important", 3 is "important", 4 is "very important" and 5 is "extremely |
| | important". "Don't know/not sure" was also an answer option. |
| With | whom to communicate? |
| Q2 | With regard to the effectiveness of monetary policy, how important is it to communicate |
| | with different audience groups? |
| | (i) financial markets; (ii) politicians; (iii) general public; (iv) price setters (firms and trade |
| | unions); and (v) expert audiences. |
| | Please select one answer for each audience on a scale of 1 to 5, where 1 is "not important |
| | at all", 2 is "somewhat important", 3 is "important", 4 is "very important" and 5 is |
| | "extremely important". "Don't know/not sure" was also an answer option. |
| Q3 | In terms of increasing understanding of monetary policy, how would you rate current |
| | communication with each audience in the euro area? |
| | (i) financial markets; (ii) politicians; (iii) general public; (iv) price setters (firms and trade |
| | unions); and (v) expert audiences. |
| | Please select one answer for each audience: 1 is "a lot of room for improvement", 2 is |
| | "some room for improvement" and 3 is "currently adequate". "Don't know/not sure" |
| | was also an answer option. |
| What | to communicate? |
| Q4 | Which topics should be covered by monetary policy communication in the euro area? |
| | (i) the central bank objective; (ii) the reaction function; (iii) the economic outlook; (iv) |
| | the uncertainty underlying the economic outlook; (v) the rationale for monetary policy |
| | decisions; (vi) the future path of monetary policy; (vii) the interrelationship between |
| | monetary policy and financial stability; (viii) the interrelationship between monetary |
| | policy and fiscal policy; (ix) the interrelationship between monetary policy and |
| | employment |
| | Please rate each option on a scale of 1 to 5, where 1 is "not important at all", 2 is |
| | "somewhat important", 3 is "important", 4 is "very important" and 5 is "extremely |
| | important". "Don't know/not sure" was also an answer option. |
| Q5 | For several years, the ECB has provided forward guidance, in different forms. Forward |
| | guidance is often classified as being either calendar based (or "time contingent"), data |
| | based (or "state contingent"), or purely qualitative (that is, providing neither a time frame |
| | nor economic conditions). Which type(s) of forward guidance do you believe should be |
| | part of the ECB toolkit? |
| | (i) calendar based (time contingent); (ii) data based (state contingent); and (iii) purely |
| | qualitative (neither time nor state contingent) |
| | Please choose one of the following options where 1 is "yes, it should be part of the toolkit" |
| | or 2 is "no, it should not be part of the toolkit". "Don't know/not sure" was also an |
| 0(| answer option. |
| Q6 | The ECB has often been criticised that its inflation aim lacks precision. Do you feel that |
| | communicating a more precise inflation aim would mean that: |
| | Choose one of the following answers: inflation expectations would be more firmly |
| | anchored; it would make no difference; inflation expectations would be less firmly |
| Q7 | anchored; or don't know/not sure. Monetary policy always operates under uncertainty. How can the ECB effectively |
| ٧/ | communicate about this uncertainty? |
| | (i) provision of uncertainty bands around the projections; (ii) provision of scenarios as |
| | part of the projections; (iii) through the introductory statement; and (iv) systematic |
| | reporting of a broad range of indicators in the various central bank publications |
| L | reporting of a broad range of mulcators in the various central bank publications |

| | Please rate each option on a scale from 1 to 5, where 1 is "not effective at all", 2 is "compared to the factive", 2 is "effective" and 5 is "cuttomake. |
|------|--|
| | "somewhat effective", 3 is "effective", 4 is "very effective" and 5 is "extremely effective". "Don't know/not sure" was also an answer option. |
| Цот | to communicate? |
| Q8 | Since early 2015, the ECB has published "monetary policy accounts", which provide a |
| | summary of the Governing Council's monetary policy deliberations. In contrast to other central banks, the accounts are unattributed. Regarding the accounts, what in your view is the most effective means of communicating with the public about the content of the |
| | meetings? |
| | Choose one of the following answers: continue with publication of unattributed accounts; move to publication of attributed accounts; discontinuation of accounts; or don't know/not sure. |
| Q9 | In most central banks, monetary policy is set by a committee. Whereas some central banks |
| Ŷ | encourage that the diversity of views on the committee is represented in the external communication, others have adopted a one-voice policy. Where, in your view, is the monetary policy communication by Governing Council members located along this |
| | spectrum? |
| | Choose one of the following answers: there is far too much representation of individual |
| | views; there is somewhat too much representation of individual views; the communication by Governing Council members is just about right; there is somewhat too little representation of individual views; there is substantially too little representation of |
| 010 | individual views; or don't know/not sure. |
| Q10 | How do you see the role of the ECB and the NCBs in shaping the Eurosystem's monetary policy-related communication; is the Eurosystem making best use of its decentralised |
| | communication structure? |
| | Choose one of the following answers: the balance of communication should shift more to |
| | NCBs; the mix of ECB and NCB communication is just about right; the balance of communication should shift more to the ECB; or don't know/not sure. |
| Q11 | The central banks of the Eurosystem have become more active in their use of social media. |
| , | Do you think these changes in communication should remain, be reversed or be taken even further going forward? |
| | Choose one of the following answers: revert back substantially; revert back somewhat; remain; go somewhat further; go substantially further; or don't know/not sure. |
| Q12 | Central bank communication has often been criticised for using overly complex language |
| | that is difficult to understand by the public. There have been attempts to address this, for |
| | instance by offering layered communication. In your view, which statement most |
| | accurately summarises your feelings on the current monetary policy communication in |
| | the euro area? Choose one of the following answers: communication is too complex; communication is |
| | just about right; communication is running the risk of being overly complex; or don't |
| | know/not sure. |
| Q13 | In terms of increasing understanding of monetary policy, how would you rate the |
| | following communication channels? |
| | (i) press release of monetary policy decisions; (ii) introductory statement; (iii) press |
| | conference; (iv) monetary policy accounts; (v) ECB Economic Bulletin; (vi) NCB |
| | Economic Bulletins; (vii) testimonies to parliament; (viii) speeches by ECB Executive |
| | Board members; (ix) speeches by NCB governors; (x) blogs and tweets by ECB Executive Board members; (xi) blogs and tweets by NCB governors. |
| | Please choose 1 as "a lot of room for improvement", 2 as "some room for improvement" |
| | and 3 as "currently adequate". "Don't know/not sure" was also an answer option. |
| Gene | ral reflections |
| Q14 | What do you see as the greatest challenges to monetary policy communication in the euro |
| | area? |
| Q15 | How do you think monetary policy communication in the euro area should evolve over |
| | the next five to ten years? |

Annex B - the accompanying letter

Frankfurt, 17 November 2020

Dear colleague,

I am inviting you to participate in a survey that we are sending to all former Governing Council members to collect your views on the ECB's monetary policy strategy.

Your response would be appreciated by 30 November 2020.

You can access the survey under this link: [LINK REMOVED]

As you know, the last review of the ECB's monetary policy strategy took place some 18 years ago. Since then the euro area and world economies have undergone profound changes and the challenge the ECB is facing in terms of delivering on its mandate has evolved. President Lagarde recently laid out some preliminary considerations on the key issues that we are facing, while a description of the various work streams that are supporting the review is available here.

One of the work streams looks at our monetary policy communication. As part of this, we will take stock of the ECB communication practices since 2003 and evaluate them. This work draws on research and practical experience, including that of other major central banks. It will also be informed by various listening events with the general public, academics and journalists.

In addition, we want to hear your views and those of all other former members of the Governing Council. To this end, my colleagues Michael Ehrmann, Sarah Holton, Danielle Kedan and Gillian Phelan have designed a survey: your participation in this survey would be highly valuable in ensuring that our work on communication benefits from the wisdom of former Governing Council members. The survey only takes a few minutes to complete, but it also provides space to respond in detail.

The anonymised results of the survey will be reported to the current members of the Governing Council. In addition, the colleagues conducting the survey plan to publish a research paper based on the responses.

Information on the respondents will be treated as completely confidential. Respondents will not be named and the results will be reported only in summary format, with breakdowns by Governors versus Executive Board members, tenure period, and country-group background.

If you have any questions on the survey itself, please contact [EMAIL ADDRESS REMOVED]. Thank you,

Philip Lane

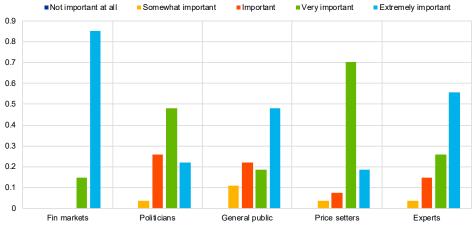
Annex C – Tables and Figures

Figure A1: What do you see as the main objective of monetary policy communication? (Q1)



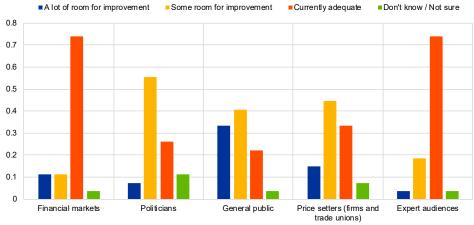
Source: Survey on Monetary Policy Communications.

Figure A2: With regards to the effectiveness of monetary policy, how important is it to communicate with different audience groups? (Q2)



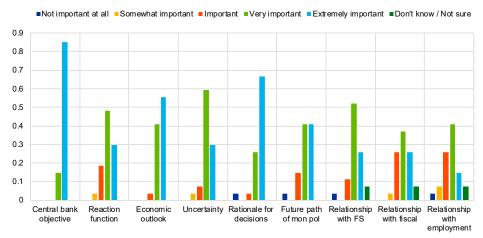
Source: Survey on Monetary Policy Communications.

Figure A3: In terms of increasing understanding of monetary policy, how would you rate current communication with each audience in the euro area? (Q3)



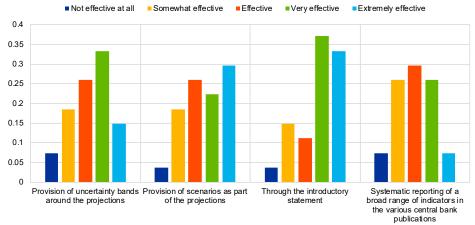
Source: Survey on Monetary Policy Communications.

Figure A4: Which topics should be covered by monetary policy communication in the euro area? (Q4)



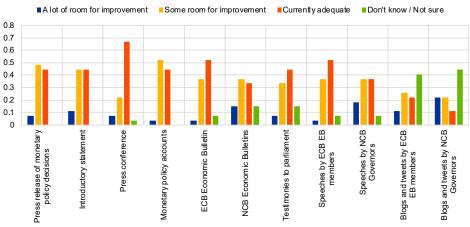
Source: Survey on Monetary Policy Communications.

Figure A5: Monetary policy always operates under uncertainty. How can the ECB effectively communicate about this uncertainty? (Q7)



Source: Survey on Monetary Policy Communications.

Figure A6: In terms of increasing understanding of monetary policy, how would you rate the following communication channels? (Q13)



Source: Survey on Monetary Policy Communications.

Table A1: Cross-correlations

| | | | •• | | 33 1 | COLI | CIA | uoi | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|------|-------|------|------|------|-------|-------|------|------------|--------|-------|---------|-------|-------|------|------|-------|-------|-------|------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|------|-------|-----------|---------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|---------|-------|
| | 1 | | | 1 | | | | 2 | 2 2 | | | 3 | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | 5 6 | | | | 7 | | 9 10 | | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | | 13 |
| _ | a | b | С | d | е | a | b | С | d e | | b | С | d | е | а | b | С | d | е | † | g | h | i | а | b | с а | а | b | С | d | а | a a | а | а | а | b | С | d | е | Ť | g | h | 1 | j | k |
| 1a | 1.00 | | | | | 0.44 | | | 0.3 | | | | | | | | 0.44 | | | 0.51 | | | | | | | | 0.51 | | | | | | -0.40 | | | | | | | | | | | |
| 1b | | 1.00 | | | | | | | | -0.3 | 9 | | | | | | | 0.50 | | | | | | | | | | | | | | | | -0.42 | | | | | -0.41 | -0.43 | | -0.54 | -0.68 | - | -0.49 |
| 1c | | | 1.00 | | 0.53 | | 0.46 | | | | | | | | | 0.41 | | | 0.39 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1d | | | | | 0.44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1e | | | 0.53 | 0.44 | 1.00 | | | | | | | 0.45 | | | | | | | | 0.49 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2a | 0.44 | | | | | 1.00 | | | 0.42 | | | | | | | | | | | | | | | | | | | | | | | | | | -0.45 | | 0.35 | | | | | | | | |
| 2b | | | 0.46 | i | | | | 0.34 | | | | | -0.38 | | | 0.42 | | | | | 0.35 | 0.38 | | | | | 0.36 | | | | | | 0.33 | | | 0.35 | | | | | | | | | |
| 2c | | | | | | | | 1.00 | | | | | | | | | | | | | | | 0.45 | | | | 0.35 | | | | | | 0.39 | | | | | | | | | 0.36 | 0.43 | | 0.50 |
| 2d | | | | | | 0.42 | 0.51 | 0.45 | 1.00 0.4 | | | 6 -0.35 | -0.46 | | | | | | | | | | | | | | 0.49 | | | | | | | | -0.41 | | | -0.36 | | | | | | | |
| 2e | 0.33 | | | | | | | | 0.46 1.0 | | -0.53 | 3 | | | | | 0.46 | 0.33 | | 0.64 | | | | | | | | | | 0.54 | | | | | | | | | | | | | | | |
| 3a | | -0.39 | | | | | | | | 1.00 |) | | | | | | | | 0.45 | | | | 0.38 | | | | 0.46 | | 0.35 | 0.40 | | | | | | 0.38 | | | | | | 0.44 | 0.63 | | |
| 3b | | | | | | | | | -0.46 -0.5 | 53 | 1.00 | 0.38 | | | 0.35 | | | | | | | | | | | | | | | | | 0.6 | 0 | | | | | 0.48 | | 0.49 | | | | | |
| 3c | | | | | 0.45 | | | | -0.35 | | 0.38 | 1.00 | 0.54 | | | | | | | | | | | | 0.38 | | | | | - | -0.37 | | -0.42 | | 0.52 | | 0.35 | 0.65 | 0.54 | 0.45 | 0.44 | | | | |
| 3d | | | | | | | -0.38 | | -0.46 | | | 0.54 | 1.00 | 0.43 | | | | | | | | -0.63 | -0.44 | | 0.67 | -0.43 | -0.40 |) | | | | -0.43 | -0.47 | | | | | | | | | | | | |
| 3e | | | | | | | | | | | | | 0.43 | 1.00 | | | | | | | | | | | | | | | | 0.42 | | | -0.43 | | | | | | | | | | | | |
| 4a | | | | | | | | | | | 0.35 | , | | 1 | 1.00 | | | | 0.38 | | | | | | | | | | | | | 0.4 | 10 | | | | | | | | | | | | |
| 4b | | | 0.41 | | | | 0.42 | | | | | | | | | 1.00 | | | 0.48 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4c | 0.44 | | | | | | | | 0.4 | 16 | | | | | | | 1.00 | 0.39 | 0.33 | 0.50 | | | | | | | | 0.36 | 0.55 | | | | | | | | | | | | | | | -0.51 - | -0.58 |
| 4d | 0.48 | 0.50 | | | | | | | 0.3 | 33 | | | | | | | 0.39 | 1.00 | 0.50 | 0.52 | | | | | | | | | | 0.34 | | | | | -0.34 | | | | | | | | | | |
| 4e | | | 0.39 | 1 | | | | | 0.4 | 15 0.4 | 5 | | | | 0.38 | 0.48 | 0.33 | 0.50 | 1.00 | 0.32 | | | | | | -0.37 | | | 0.54 | 0.55 | | | | | | | | | | | | | | | |
| 4f | 0.51 | | | | 0.49 | | | | 0.6 | 4 | | | | | | | 0.50 | 0.52 | 0.32 | 1.00 | | | | | | | | | 0.52 | 0.45 | | | | | | | | | | | | | | | |
| 4g | | | | | | | 0.35 | | | | | | | | | | | | | | 1.00 | 0.58 | 0.34 | | | 0.41 | | | | | | | | | -0.39 | | | | | | -0.43 | | | | |
| 4h | | | | | | | 0.38 | | | | | | -0.63 | | | | | | | | 0.58 | | | | | 0.76 | | | | | | | | -0.43 | | | | | | | | | | | |
| 4i | | | | | | | | 0.45 | | 0.3 | R | | -0.44 | | | | | | | | 0.34 | | | | | | | 0.37 | | | | | 0.40 | | -0.38 | | | | | | | 0.47 | 0.46 | | |
| 5a | | | | | | | | | | | | | | | | | | | | | | | | 1.00 | | | | 0.43 | | | -0.55 | | | | | | | | | | | | | | |
| 5b | | | | | | | | | | | | 0.38 | 0.67 | | | | | | | | | | | | 1.00 | | | | | | -0.37 | | | | | | | | | | | | | | |
| 5c | | | | | | | | | | | | 0.50 | -0.43 | | | | | | -0.37 | | 0.41 | 0.76 | | | | 1.00 | | | | | 0.57 | | | -0.53 | -0.48 | | | | | | | | | | |
| 6a | | | | | | | | | | | | | 0.45 | | | | | | 0.57 | | 0.11 | 0.70 | | | | 1.00 | , | | | | | | | 0.55 | 0.40 | | | | | | | -0.38 | | -0.64 | |
| 7a | | | | | | | 0.36 | 0.35 | 0.49 | 0.4 | 6 | | -0.40 | | | | | | | | | | | | | 2.00 | | 0.53 | 0.30 | | | 0.45 | | | | | | | | | | 0.50 | | 0.0-1 | |
| 7b | 0.51 | | | | | | 0.50 | 0.55 | 0.43 | 0.4 | | | 0.40 | | | | 0.36 | | | | | | 0.37 | 0.43 | | | | 1.00 | 0.33 | 0.41 | | 0.46 | | -0.42 | | | | | | | | | | | |
| 7c | 0.51 | | | | | | | | 0.6 | 8 0.3 | 5 | | | | | | 0.55 | | 0.54 | 0.52 | | | 0.57 | 0.43 | | | 0.39 | | 1.00 | | | 0.40 | | -0.42 | | | | | -0.37 | | | | | | |
| 7d | | | | | | | | | | 4 0.4 | | | | 0.42 | | | | 0.34 | | | | | | | | | 0.55 | | 0.37 | | | | | | | | | | 0.57 | | | | | | |
| 8a | | | | | | | | | 0.5 | 0 | • | -0.37 | | 0.42 | | | | 0.54 | 0.55 | 0.43 | | | | -0.55 | 0.27 | | | 0.41 | 0.57 | | 1.00 | 0.42 | | -0.40 | | | | | -0.51 | | | -0.37 | | | -0.55 |
| 9a | | | | | | | | | | | | -0.37 | -0.43 | | | | | | | | | | | -0.55 | -0.37 | | 0.45 | 0.46 | | | | 1.00 -0. | 15 0 42 | -0.40 | | | | | -0.51 | | | -0.37 | | | 0.55 |
| 10a | | | | | | | | | | | 0.60 | | -0.43 | | 0.40 | | | | | | | | | | | | 0.43 | 0.40 | | | | -0.45 1.0 | | | | | | | | | | | | | |
| 11a | | | | | | | 0.33 | 0.20 | | | 0.00 | | -0.47 | | 0.40 | | | | | | | | 0.40 | | | | | | | | | 0.43 -0.3 | | | -0.39 | | | 0.27 | -0.45 | | | | | | |
| 11a | | 0.42 | | | | | 0.55 | 0.59 | | | | -0.42 | -0.47 | -0.43 | | | | | | | | -0.43 | 0.40 | | | -0.53 | | -0.42 | | | -0.40 | U.43 -U. | 55 1.00 | 1 00 | 0.35 | 0.20 | | -0.5/ | -0.45 | | | | | | |
| | | -0.42 | | | | -0.45 | | | -0.41 | | | 0.52 | | | | | | -0.34 | | | -0.39 | -0.43 | -0.38 | | | -0.55 -0.48 | | -0.42 | | | -0.40 | | 0.20 | 0.35 | | | | 0.48 | 0.24 | | | | | | |
| 13a | | | | | | -0.45 | | | -0.41 | 0.3 | | 0.52 | | | | | | -0.34 | | | -0.39 | | -0.38 | | | -0.48 | | | | | | | -0.39 | | | | 0.40 | | | 0.26 | | | | | |
| 13b | | | | | | | 0.35 | | | 0.3 | 8 | | | | | | | | | | | | | | | | | | | | | | | 0.38 | 0.60 | 1.00 | | 0.41 | 0.34 | | | | | | |
| 13c | | | | | | 0.35 | | | | | | 0.35 | | | | | | | | | | | | | | | | | | | | | | | | 0.49 | 1.00 | | | 0.35 | 0.56 | | 0.36 | | |
| 13d | | | | | | | | | -0.36 | | 0.48 | 0.65 | | | | | | | | | | | | | | | | | | | | | -0.37 | | 0.48 | | | | 0.47 | | | | | | |
| 13e | | -0.41 | | | | | | | | | _ | 0.54 | | | | | | | | | | | | | | | | | -0.37 | | -0.51 | | -0.45 | ' | 0.34 | 0.34 | | | 1.00 | | | | | | |
| 13f | | -0.43 | | | | | | | | | 0.49 | 0.45 | | | | | | | | | | | | | | | | | | | | | | | | 0.36 | | 0.55 | 0.64 | 1.00 | | | 0.36 | | 0.46 |
| 13g | | | | | | | | | | | | 0.44 | | | | | | | | | -0.43 | | | | | | | | | | | | | | | | 0.56 | | | 0.37 | 1.00 | | | 0.48 | |
| 13h | | -0.54 | | | | | | 0.36 | | 0.4 | | | | | | | | | | | | | 0.47 | | | -0.38 | 3 | | | - | -0.37 | | | | | | | | | | | 1.00 | | | 0.51 |
| 13i | 1 | -0.68 | | | | | | 0.43 | | 0.63 | 3 | | | | | | | | | | | | 0.46 | | | | | | | | | | | | | | 0.36 | | | 0.36 | | 0.76 | | | |
| 13j | | | | | | | | | | | | | | | | | -0.51 | | | | | | | | | -0.64 | 1 | | | | | | | | | | | | | | 0.48 | | | 1.00 | |
| 13k | I | -0.49 | | | | | | 0.50 | | | | | | | | | -0.58 | | | | | | | | | | | | | - | -0.55 | | | | | | | | | 0.46 | 0.48 | 0.51 | 0.80 | 0.80 | 1.00 |