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One question at a time! A text mining analysis of the ECB Q&A session

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## Abstract

News media play a fundamental role in the communication between central banks and the public. Besides stimulating institutional transparency, the reporting of the news media on a central bank's activities is also the main source of information about the institution for most citizens. To better understand how this intermediation process works, this paper explores the Q&A session of the European Central Bank (ECB)'s press conferences, where journalists have an opportunity to set the discussion and inquire into the central bank's thinking. Using a structural topic model on a novel dataset consisting of all questions asked at ECB press conferences since May 2012, we conduct a systematic examination of the topics the ECB is questioned about and uncover differences in the focus of outlets from different geographical areas and with different types of audiences. We find that international outlets devote more attention to technical topics, relevant for market participants, while domestic media in the European Union (EU) dedicate greater focus to national affairs and the more political dimensions of the ECB's activities.

# Non-technical summary

The importance of communication for the work of a central bank has come to be widely appreciated. In recent years, and especially in the aftermath of the Global Financial Crisis, central banks around the world have become clearer and wider communicators. Increasingly, central banks like the European Central Bank (ECB) strive to reach out to, and be better understood by, the public. One rationale for doing so is to enhance accountability – since central banks act largely independently of government oversight, there are good reasons for them to communicate their actions transparently. A second, more instrumental, factor is the importance of expectations, whether those of consumers or financial markets, the latter of which are the main audience of the press conference. Theoretically, a better understanding of the central banks's role and actions can improve the effectiveness of policy.

Ordinary people, however, rarely engage with the direct communications of central banks. In the eyes of the public, these institutions are generally seen as remote from their daily lives and their actions highly complex. In lieu of this direct engagement, and to the extent that they are interested, a substantial part of the public's knowledge of central banks and their actions stems from the media.

Journalists, on behalf of the print or broadcast outlets they represent, report on central banks in a way that conveys valuable, condensed information but with the possible trade-off that the insights occur at the expense of the full picture central banks wish to convey. To better understand how the intermediation process works, we investigate the Question and Answer (Q&A) session of the ECB's regular press conferences. It is here where journalists get to ask the ECB's most senior officials about what they are doing and how they see the economy.

We posit that questions from journalists during the Q&A session are a proxy for the interest and preferences of their audiences. Media coverage and framing of news influence public attention; alternatively, media might act as representatives of their audience, inquiring and focusing on what they perceive is relevant to the public.

The main questions we explore are: what do journalists ask about during the Q&A session? Do journalists representing outlets from different parts of the European Union and the world ask about different topics? Is there a difference between questions from outlets tailored to general compared to expert audiences?

To answer these questions, we examine the content of the questions during the Q&A session using Structural Topic Modelling (STM). We find that international media are more likely to enquire about technical issues and angles relevant for market participants, while national outlets tend to lend more attention to national issues, including political ones, which are closer to the public's radar but less directly linked to the ECB's remit. This is especially the case for general audience outlets. Conversely, the interest of national publications targeting a more expert audience is more in line with the focus on international media.

Therefore, findings reveal a possible trade-off for the ECB. Granting questions to media targeting a specialised audience can help the ECB remain on topic, but at the cost of reaching a more limited public. On the other hand, visibility can be boosted by allowing questions from non-financial outlets, the risk being having to confront issues beyond the scope of its sphere of competence, for instance the national elections of Member States.

Our results also confirm the importance of issues related to the banking system for media from Southern European Union (EU) countries.

# 1   Introduction

> "So, I should thank you and the thanks are actually substantive […]. Communication has become a tool of monetary policy, so your interaction has been essential in our monetary policy decisions all throughout these eight years. The other thing, frankly, is that with your inquisitive questions, you have stimulated our striving towards greater transparency and greater candour. Again compare to the last 20 years – communication in central banks, and how it changed. I think it did change for a great part because of your role. I don't think that by themselves, central bankers would have changed communication, if left free to be opaque."
>
> Mario Draghi to journalists attending his last press conference
>
> 10 October 2019

The importance of communication for the effective transmission of a central bank's monetary policy has by now come to be widely appreciated. The sea change that has taken place since the turn of the century, but which started taking root already in the 1990s, has underscored the potency of central bank communication in guiding markets, as well as its role as a key pillar of legitimacy. As central banks have come to embrace a more transparent communications framework, the priority for these institutions has increasingly shifted towards connecting better with the wider public (Blinder et al., 2022; Ehrmann et al., 2021; Jeanneau, 2009).

Nevertheless, the public broadly lacks interest in central banks. Gardt et al. (2021) report that more than half of all euro area citizens are not interested in central bank policies. Sims' (2003) theory of rational inattention provides a valuable theoretical framework for explaining why this is the case. It stipulates that economic agents like households and firm owners, bound by cognitive limitations, do not collect and process the full range of available information, for example, with respect to the aggregate state of the economy, when taking decisions (Maćkowiak et al., 2021). This is likely the case for central bank policies, too.

It is therefore not surprising that the wider public seldom engages directly with the technical communications of a central bank.[1] Engagement with central bank messages is typically intermediated – and the etymology says it all – by news media.

For most people, the media can serve both as a generally cheap and reliable filter and an aggregator of the need-to-know information (Lamla and Sturm, 2013). In the case of the European Central Bank (ECB), across the euro area a far higher share of people obtains information about the ECB from broadcast or press sources rather than channels where the ECB communicates directly (Gardt et al., 2021). This is noteworthy because news media select and convey the key messages and takeaways from central bank

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[1]One exception being the communication via social media channels. Ehrmann and Wabitsch (2022) show that Twitter traffic by both experts and non-experts is responsive to ECB communications.

decisions and activities, often providing their interpretation alongside.

For these reasons, as Binder (2017a, p.192) writes, "media coverage of central banks might be especially important in determining how, and whether, the public thinks about monetary policy". It is therefore meaningful to put the spotlight on this intermediate layer.

Rather than focus on the central bank-to-media channel of communication, as done by previous research, this paper shines a light on communication in the opposite direction, namely from the media to the central bank. In particular, using a novel dataset and text mining techniques, we explore the Q&A session of the ECB's press conference where journalists have an opportunity to set the discussion and inquire into the central bank's thinking.

As former ECB President Mario Draghi recognised in the opening quote, interactions with journalists act as a push for transparency. In the words of Koop and Scotto di Vettimo (2022), media exercise a "soft account holding". Also, the Q&A session gives journalists the opportunity to seek clarity on complex issues, in turn helping to dispel uncertainty for financial market actors (Ehrmann and Fratzscher, 2007) and possibly to help the public better understand highly technical decisions. Beyond this role, we posit that questions from journalists during the Q&A session of the ECB press conference are a proxy for the interest and preferences of their audiences. On the one hand, media coverage and the framing of news influence public attention; on the other, media might act as representatives of their audience, inquiring and focusing on what they perceive is relevant to the public.

In this paper, we conduct a systematic examination of the topics the ECB is questioned about. Our approach will be deliberately narrow, as we will focus exclusively on the demand-side of the ECB's communication, remaining silent on how the ECB reacts to media enquiries. Our aim is to uncover whether media from different geographical spheres and audience sophistication exhibit differences in the lines of inquiry towards the ECB. According to our assumption, such differences in turn signal different priorities of the outlets' audiences.

We find that international media are more likely to enquire about the technical issues and angles relevant for market participants. These are namely asset purchases, inflation and the economic outlook, conventional monetary policy, and deflation and the zero-lower bound. Conversely, national outlets tend to lend more attention to national issues, including political ones, which are closer to the public's radar but less directly aligned with the ECB's remit. This is especially the case for general audience outlets, while the interest of national publications targeting a more expert audience is more in line with the focus of international media. Our results also confirm the salience of banking system issues - those related to credit markets, the health of banks, and financial regulation - for the media of Southern EU countries.

These results shed new light on media interest and contribute to a better understanding of this crucial layer in central bank communication. Importantly, it exposes the difficulties associated with communicating a coherent monetary policy message from the ECB's perspective. An important trade-off in this sense is revealed by the data. The ECB can boost its visibility and relevance to the public by

granting questions to general audience news outlets. To do so, however, it risks going off message by discussing topics outside of its area of expertise. The flip side of this coin is that the ECB can stay on message by prioritising specialised outlets; the potential cost is that it disinterests the wider public.

The paper is organised as follows. Section 2 reviews the relevant literature and frames the contribution of this paper. Section 3 describes the data and methodology employed in the analysis. In Section 4 the analysis and the results are presented, while Section 5 concludes.

## 2  Literature Review

For central banks, communication and engagement with the wider public is playing an increasingly integral role in their overall policy. The ECB's recent strategy review, for instance, stresses that "the better monetary policy is understood, not only by experts but also by the general public, the more effective it will be" (ECB, 2021, p.15). Reasons for the emphasis on communication are viewed as twofold: policy effectiveness and legitimacy.

Effective and clear communication, especially with households, has the potential to serve a practical role in enhancing the transmission of monetary policy (Binder, 2017b; Blinder et al., 2022). However, the challenge associated with achieving the objective of reaching the wider public is generally viewed as 'easier said than done' (Blinder, 2018). Public knowledge of the objectives and competences of central banks is low (Haldane and McMahon, 2018; Van der Cruijsen, Jansen and De Haan, 2015). Data from the ECB's own public attitudes survey (the Knowledge & Attitudes Survey) shows that though a majority of respondents in the euro area have heard of the ECB, less than 50% are aware of its responsibility for keeping prices stable – its core mandate (Gardt et al., 2021). These data also show that only a small share of respondents is interested in the policies of the central bank. Exploring the UK context, Haldane and McMahon (2018) find that low knowledge of monetary policy structures has remained "largely immune" to the proliferation of the more open central bank communication which has characterised recent years.

While there is some evidence that the provision of information to the public can impact their economic decisions (Coibion et al., 2019; Kryvtsov and Petersen, 2020), there is also research showing that it is rarely the case for people to directly look towards central bank communication - even among firm owners (Kumar et al., 2015).

Most people hear about central banks via the filter of news media, which are a cost-effective way to gather relevant information (see Bennani, 2018, and Lamla and Sturm, 2013). And while the wider public can still be unreactive to central bank news experienced via the news media (Coibion et al., 2020), works like Lewis et al. (2019) and Doms and Morin (2004) show that media coverage can influence consumer expectations. In this context, news media play a fundamental link in the transmission of monetary policy.

The second rationale for central bank communication with the wider public relates to good governance, namely that it is imperative to strengthen the accountability of central banks through being more

easily understood. The obligation to provide transparent communication is crucial given the unique independence of most central banks,[2] which insulates them to a large degree from elected officials and the scrutiny of voters (Stiglitz, 1998). As Ferrara et al. (2021, p. 3) put it, "independence creates its own demand for accountability."

Accountability becomes even more important when the central bank mandate and toolkit expand, as has happened in the aftermath of the Global Financial Crisis[3] (Assenmacher et al., 2021). Finally, accountability for the ECB is especially important given its diffuse nature, whereby it rests not only in the hands of its 20 Member States, but also with supranational executive and legislative institutions (the European Commission and European Parliament, respectively).

Over time the ECB has strengthened its accountability framework vis á vis the European Parliament, in line with an increasing demand for accountability (Fraccaroli et al., 2018). For instance, Fraccaroli et al. (2022) shows that the ECB uses parliamentary hearings to discuss and elaborate on topics that are less covered in press conferences. Civil society organisations have also contributed to the debate on accountability (ibid.). News media provide an additional channel of scrutiny, fundamental in modern democracies. They are a fully-fledged part of the accountability mechanism of the ECB and its push for transparency, ever more so in light of the scarce knowledge of the public towards central banking activities.

Our paper builds on three strands of literature. The first one investigates the relationship between central banks and news media and concentrates primarily on showing how media coverage reacts to central bank activities. Papers like Bennani (2018), Berger et al. (2011), and Lamla and Sturm (2013) consider the tone of ECB-related coverage, while Binder (2017a) looks at the Fed and its Chairman's prominence in the media. Focusing on accountability in the case of the Bank of England, Koop and Scotto di Vettimo (2022) show that the central bank is held accountable by the media for policy outcomes, especially when its mandate expands and its activities become very salient. Other works focus on how features of central bank communications influence coverage volumes (Ferrara and Angino, 2021; Munday and Brookes, 2021). Focusing on media usage instead, Hayo and Neuenkirch (2014) find that higher media usage has a significant negative influence on public trust in the ECB.

Substantively closer to our paper, Ehrmann and Fratzscher (2007) consider, among other things, the Q&A sessions of the ECB press conference. The authors examine financial market movements leading up to and during the press conference and find that, while the Q&A session does not systematically add information beyond that presented in the Introductory Statement, it has a clarifying role especially when there is elevated uncertainty among market participants. What our paper offers is a deeper look at the

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[2]Since the 1990s, many central banks have operated with a high degree of independence, including in autocratic states. This trend has come under pressure, however, in the aftermath of the Global Financial Crisis (Dall'Orto Mas et al., 2020).

[3]For the ECB, this has included the creation of unconventional monetary policy tools and the implementation of macroprudential and microprudential supervision.

content and nature of questions posed by journalists during the Q&A session.

Our work also relates to the literature analysing the communication of external stakeholders towards central banks. The bulk of this line of research is parliamentary hearings. The evidence shows that, across different constituencies, politicians tend to steer the conversation away from price stability to hold central banks accountable for a broader set of related but non-core central banks topics. These works also show that the salience of price stability relative to other aspects of economic performance, like unemployment, is influenced by how the economy is doing, especially at the national level (Ferrara et al., 2021; Fraccaroli et al., 2020; Schonhardt-Bailey, 2013). In this paper, we move the spotlight on the news media, which also play a role in making the ECB transparent and accountable vis á vis the public with their questions.

Third, this work adds to the rapidly expanding field of text mining applied to central bank communication. Existing papers have mainly focused on the character and substance of central bank communication products such as speeches (Ferrara, 2020; Hansen et al., 2019; Küsters, 2022) and monetary policy statements (Ehrmann and Talmi, 2020; Hubert and Fabien, 2017). Other papers have taken into consideration discussions about the central bank, for instance on social media (Ehrmann and Wabitsch, 2022; Masciandaro et al., 2021) and in the news (Munday and Brookes, 2021), besides parliamentary hearings, as previously discussed. To the best of our knowledge, only Tillmann (2021) and Pavelkova (2022) have analysed quantitatively the content of the Q&A session of the press conference. Tillman builds an index of dissent in the ECB Governing Council looking at the frequency of specific words in the answers provided by the ECB President, while Pavelkova shows that the Q&A session provides space for a broader set of topics than those present in the Introductory Statement[4]. In contrast, the present paper focuses entirely on journalists' questions.

# 3 Data and descriptive statistics

## 3.1 Distribution of questions

The ECB regularly offers one occasion during which media can address questions directly: the press conference. Eight times a year – immediately after the policy meetings of the Governing Council - the ECB President and the Vice-President are available to answer questions from journalists. These Q&A sessions last usually for around 30 to 45 minutes. Once journalists get the floor, they are free to ask what they consider appropriate and most interesting. It is customary to ask a maximum of two questions, without the possibility for follow-ups, as is the case, for example, in the Fed press conferences.

For our study, we build a dataset with all questions asked by journalists during the Q&A session of the ECB press conference under the presidencies of Mario Draghi and Christine Lagarde. In a few instances, this also includes responses given by the Vice President (Vítor Constâncio or Luis de Guindos).

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[4]The Introductory Statement is Monetary Policy Statement since July 2021, when the results of the ECB Strategy Review were presented.

The sample spans 10 years starting from 3 May 2012 to 21 July 2022[5].

For each question we add information on the media outlet the journalist represents. We did so by first identifying the journalist posing a given question through watching recordings of the press conference Q&A sessions (which are available on the ECB's YouTube channel). We subsequently ascribed an affiliation based on the ECB's internal records. We also identify the outlet audience, which can be either "general" or "specialised" in economics and financial matters, and code the country of the outlet's headquarters.

The resulting sample consists of 2,166 questions asked by 266 journalists from 124 media outlets. About 70% of questions come from outlets with a specialised audience. Geographically, the questions span 28 countries. Top countries according to the number of questions asked are the USA, UK and Germany, with Italy following close behind, as shown in Figure 1.

Figure 1: Top 10 countries by number of questions in the Q&A sessions
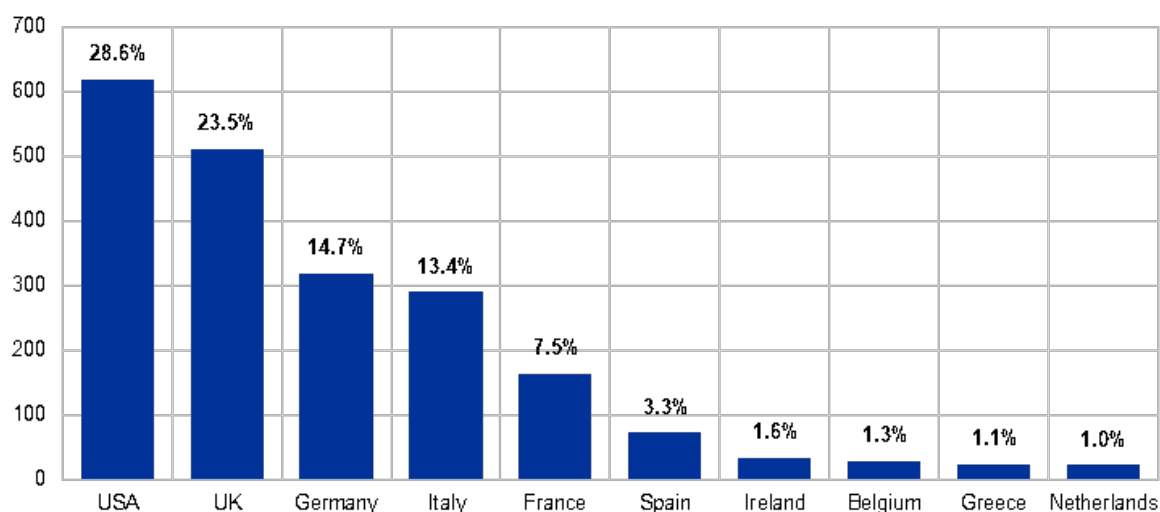


Notes: y-axis - total number of questions.

For the purpose of our analysis, we group outlets into one of four regions: Northern EU, Southern EU, Eastern EU and International. The names should be broadly self-explanatory. The only exception is the categorisation of questions from Irish outlets, which we include in the Southern EU category. Ireland was affected by the sovereign debt crisis in a way that, in many respects, was similar to Southern EU member states, and the 34 questions from Irish journalists all occurred between 2012 and 2014. We expect therefore the focus of Irish journalists to be somewhat in line with southern European ones. The exact country classification can be found in the Appendix.

The bulk of the International category consists of UK and US outlets geared towards a specialised audience: in the first five positions we find the Financial Times, Bloomberg, CNBC, Reuters, and The Wall Street Journal. These outlets account for 75% of media questions in the International category.

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[5]For press conferences before May 2012 we have no exact information on the journalists asking questions.

Among EU outlets instead, the most represented ones are Il Sole 24 Ore (Italy), followed by Börsen-Zeitung (Germany), Les Echos (France), Handelsblatt (Germany) and AFP (France). These five outlets make up for 45% of questions of EU outlets. It is worth noting that many of the ECB correspondents of the outlets we examine are physically based in the city of Frankfurt. Prior to the COVID- 19 pandemic, having a physical presence in the city would influence the attendance of press conferences and, accordingly, the probability of being offered questions in the Q&A sessions.

Figure 2 shows the number of questions granted to outlets from each region by audience type. Almost 50% of questions come from international outlets that, as we have seen, are mostly newswires and specialised publications, confirming that the press conference aims at targeting predominantly financial markets. Northern and Southern EU outlets, meanwhile, receive roughly equal space between themselves in the Q&A session. Only around 1% of questions come from Eastern EU media.[6] In the text analysis that follows, therefore, we exclude the latter group, as the sample is too small for a meaningful analysis.

Figure 2: Number of questions asked by region and audience type
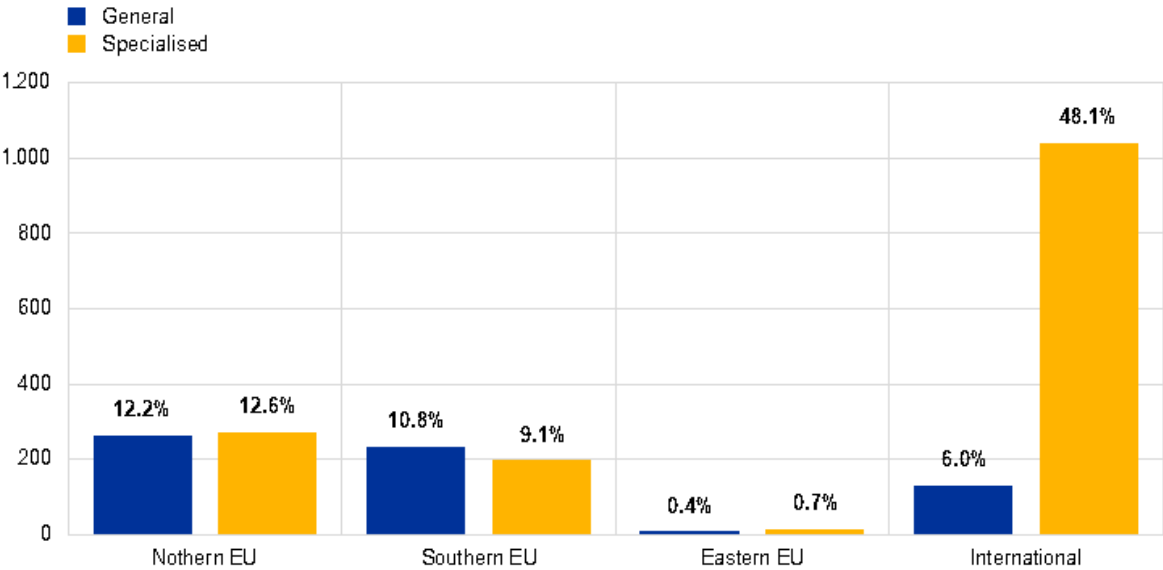


Notes: y-axis - number of questions.

When considering the average number of questions received during a press conference, a notable distinction between 2019 and 2020 is revealed in Figure 3, which plots the share of questions by region. Closer inspection of the data reveals that the decrease in the average number of questions received is linked to the change at the helm of the institution: on average, Mario Draghi faced 25 questions per press conference while President Lagarde, who started her term in November 2019, answers 18. This, in turn,

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[6]Note on sample growth: It is worth noting that the number of Eastern euro area Member States grew during the period of our sample, specifically with the addition of Latvia and Lithuania in 2014 and 2015, respectively.

is due to the fact that President Lagarde's answers tend to be longer than her predecessor's (her answers average to 219 words compared to Mario Draghi's 143).[7]

The share of questions by region does not exhibit any specific trend, as shown in Figure 4. The relatively high value for Northern EU outlets in 2017 could be linked to inflation jumping to levels close to 2%. Consequently, the ECB may have deliberately granted more questions to the euro area Member States where public opinion has been historically more sensitive about this topic.

Figure 3: Average number of questions asked over time and percentage by region
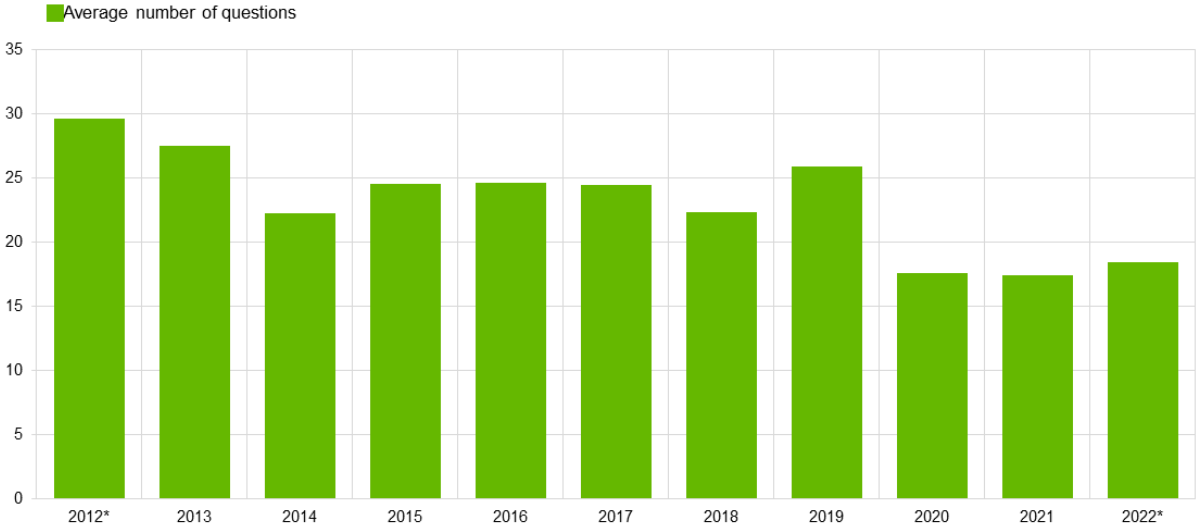


Notes: The asterisk marks years for which not all press conferences are available.

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[7]There is no difference in the length of the questions received. The average number of words among questions posed to President Lagarde is 55, whereas for Mr Draghi it was 54.

Figure 4:   Share of questions asked over time by region
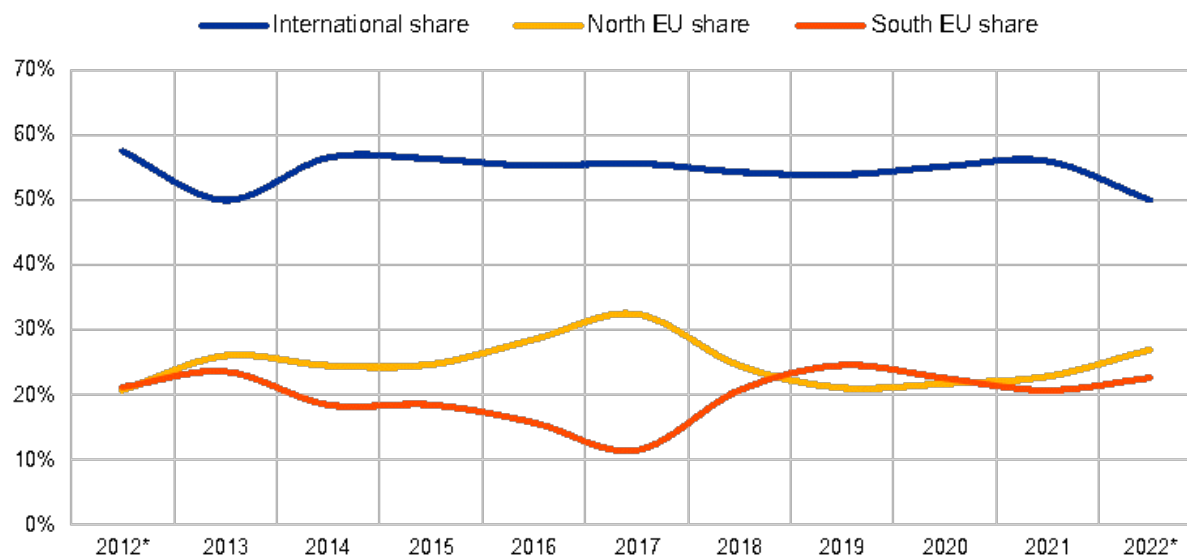


Notes: The asterisk marks years for which not all press conferences are available.

Finally, the characteristics of the outlets being granted the first question might be especially interesting to consider, as this question is likely to be the most burning one. Almost 90% of first questions are granted to international outlets. Of the remaining 10%, 6% is granted to Southern EU outlets (almost always a specialised one), 4% to Nothern EU outlets, evenly divided between general and specialised audience ones.

## 3.2   Text analysis

We now turn to the content of the questions. Using the quanteda package in R (Benoit et al., 2018), we run routine pre-processing operations like lowercasing, stemming words, the removal of punctuation and stop words (words that are commonly used but carry little useful information). Given the context, we augment the usual list of stop words with others which invariably appear in journalists' questions, like "first", "question", "tell" and "Lagarde". We also identify common expressions in the central bank discourse and compound the words constituting them; for instance, "monetary policy", "central banks", "euro area" and "Governing Council" are considered as single tokens.[8]

To get a first idea of the content of journalists' questions, we plot the most frequent (stemmed) words by region in Figure 5. Some patterns are already visible. The word cloud for Southern EU outlets appears to some extent different from the other two, with words like "bank" and "country" being more prominent.

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[8]These bigrams are identified using an iterative process when tokenising the corpus.

This suggests that banking issues and the national level could be particularly important for this media sphere. The Northern EU and International word clouds share the focus on inflation (almost invisible in the Southern EU one) and on the Governing Council discussion, with international outlets often using the word "market".

Figure 5: Most frequent words by region
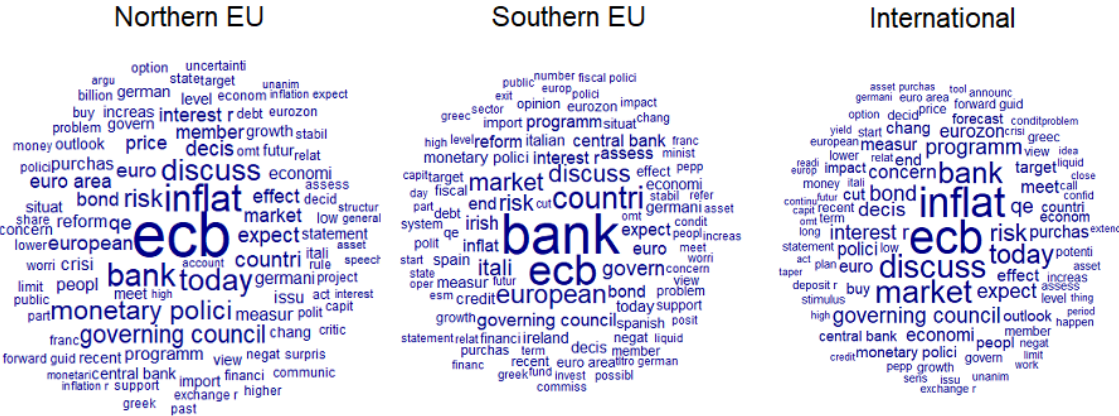


Note: the size of the stemmed words are proportional to the frequency within each region.

We further discard those words that only appear in less than 0.25% of questions (Grimmer and Stewart, 2013), enhancing the efficiency of the next steps in the analysis, namely Structural Topic Modelling (STM).

STM is an unsupervised method developed by Roberts et. al (2014) that allows analysts to uncover topics or themes within bodies of text in the form of word clusters. Each document – each question, in our case – is to be considered as a mixture over a certain number of topics. For each question in our sample, therefore, the STM model will not return a categorisation under a single topic, but rather the proportion of each question attributable to each topic.

Distinct from Latent Dirichlet Allocation (LDA), STM exploits document-level variables to improve the topic estimation and their interpretability (see Ferrara et al., 2021). The model we employ includes information on the region and audience of the journalists' outlets. In particular, we consider five groups: "Northern EU – general audience", "Northern EU – specialised audience", "Southern EU – general audience", "Southern EU – specialised audience", and "International". We do not distinguish, therefore, between international outlets with a general or specialised audience. As the vast majority of questions within this category come from financial (specialised) outlets, we prefer not to overcomplicate the analysis by including too many groups to compare and contrast. In the STM we also include information about the year of the press conference.

STM requires the researcher to establish ex-ante the number of topics to identify in the corpus. Two criteria can help make the decision somewhat less arbitrary: semantic coherence and topic exclusivity. In models that are semantically coherent, the words which are most probable under a topic should co-occur within the same document. In models with good topic exclusivity, words which are most probable under a topic should not appear as top words for other topics. As semantic coherence usually improves with a small number of topics while the opposite occurs with topic exclusivity, the researcher should balance these two aspects in the analysis (Roberts, Stewart and Tingley, 2019). To do so, we run several structural topic models with different numbers of topics, from 5 to 30 and choose the one which best balances the two.

We set the number of topics to 9, as suggested by Figure 8 in the Appendix, which plots the exclusivity and semantic coherence dimensions of the different model specifications. [9] This is enough to get a good sense of the discourse without creating redundant topics that are difficult to discern. Manual inspection further confirms that the resulting topics are easily interpretable, a point which is emphasised in Chang et al. (2009) (see also Ferrara et al., 2021).

# 4    Analysis and results

## 4.1    Topic description

The results generated by our preferred model are presented in Table 1. We name topics examining the most relevant and frequent words corresponding to each of them, as well as qualitatively inspecting the documents that are more representative for each cluster. The table includes top words, meaning stemmed words which are most likely to occur in each topic, and exclusive words, meaning the top words that are likely to be seen in that specific topic only. Word clouds and the most representative questions for each topic are included in the Appendix.

The various purchase programmes and their technical features are captured by the topic "Purchase programmes". Terms pertaining to conventional monetary policy tools (a very prominent one is "interest r[ate]") fall under the topic "Conventional monetary policy". "Inflation and economic outlook" focuses on the growth outlook and on the different facets of inflation: among the top words we find "target", "outlook" and "forecast". Words related to the danger of low inflation and the challenges of monetary policy at the zero lower bound are captured by another topic, "Deflation and ZLB".

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[9]What emerges is a fairly evident trade-off between exclusivity and coherence, as just discussed. Four models are located on the semantic coherence-exclusivity "frontier" (Roberts et al., 2014), including the 9-topic model.

Table 1: STM results

| Topic | Most probable terms | Exclusive terms |
|---|---|---|
| Purchase programmes | bond, programm, qe, purchas, ecb, end, market | bond, programm, qe, purchas, buy, limit, asset purchas |
| Governance | discuss, today, governing council, decis, meet, member, polici | discuss, governing council, decis, meet, member, unanim, discuss today |
| Inflation and economic outlook | inflat, risk, target, outlook, price, forecast, growth | inflat, target, outlook, price, forecast, exchange r, project |
| Banking system | bank, european, govern, central bank, money, financi, system | bank, european, govern, financi, spain, fund, irish |
| Conventional monetary policy | expect, interest r, monetary polici, economi, eurozon, cut, concern | interest r, economi, condit, tool, real, expect, cut |
| National affairs | ecb, countri, peopl, germani, reform, euro area, crisi | countri, peopl, germani, reform, crisi, europ, import |
| Deflation and ZLB | market, measur, effect, negat, low, lower, term | measur, low, lower, deposit r, long, period, side |
| Sovereign debt crisis and EMU | euro, itali, situat, debt, greec, relat, greek | itali, greec, greek, italian, financ, day, ireland |
| Communications | chang, forward guid, announc, decid, recoveri, posit, communic | forward guid, posit, communic, correct, debat, minut, stanc |

"Sovereign debt crisis and EMU" refers to both past and potential crises threatening the existence of the monetary union. The prevalence of terms relating to euro area Member States at the centre of the economic crisis is visible in Table 1: among the most probable and exclusive terms are "itali", "greec", "ireland". In the corresponding word cloud words such as "esm" and "ela" are also visible. Deeper inspection of the representative questions for this topic shows that it also captures questions about the reversibility of the euro.

"National affairs" relates to the economic, financial, and often political affairs of Member States. It captures enquiries about structural reforms and fiscal policy, but also about national elections, referendums, and other issues on which the ECB cannot comment.

"Banking system" revolves around the state of the banking union and the ECB banking supervision, but also around more specific banking issues (for instance, the non-performing loans (NPL), or even the situation of individual banks) as well as bank lending conditions.

We also find two topics relating more directly to the internal processes of the ECB. The first among these is "Governance", which is mainly connected to the Governing Council deliberations, including the unanimity, or lack thereof, in their decisions. Other issues captured by this topic are legal ones, for instance the rulings of the German Federal Constitutional court on various ECB programmes (like in 2013 or in 2020). The second operational topic is "Communications". This notably includes references to forward guidance, but also comprises words like "announcement", "signal" and "minutes".

The evolution of the topic proportion over time, displayed in Figure 6, contributes to the validation exercise. For instance, the topic "Purchase programmes" accounts for a sizeable portion of journalists' questions between 2014 and 2018 and rises again in 2020-2021 in line with the creation of the Pandemic Emergency Purchase Programme (PEPP). The topic revolving around the "inflation and economic outlook" unsurprisingly grows in prominence steeply from 2021 onwards. Not coincidentally, euro area – and global – inflation during this time rose substantially, marking a decisive break from the three-decade long period of the 'great moderation'.

Discussion of the "Sovereign debt crisis" topic was elevated between 2012 and 2015. Spikes in coverage occur in parallel with the ECB's confrontation, along with the European Commission and IMF, of huge differentials in euro area government bond spreads and financial meltdown in Europe's South. 2012, for instance, saw rescue packages agreed for Spain and Cyprus in June, former President Mario Draghi's "whatever it takes" remarks in July, and the announcement of the Outright Monetary Transactions (OMT) programme in August (Rostagno et al., 2019). 2015 – the second peak for the topic – saw, between June and July, the Greek government announce and hold a referendum on whether to adopt a third bailout and, despite the vote failing, subsequently agree a deal with European authorities at a summit between the 12th and 13th of July (ibid.). The prominence of the topic declined soon after and has remained relatively low since.

Figure 6: Estimated topic proportions over time
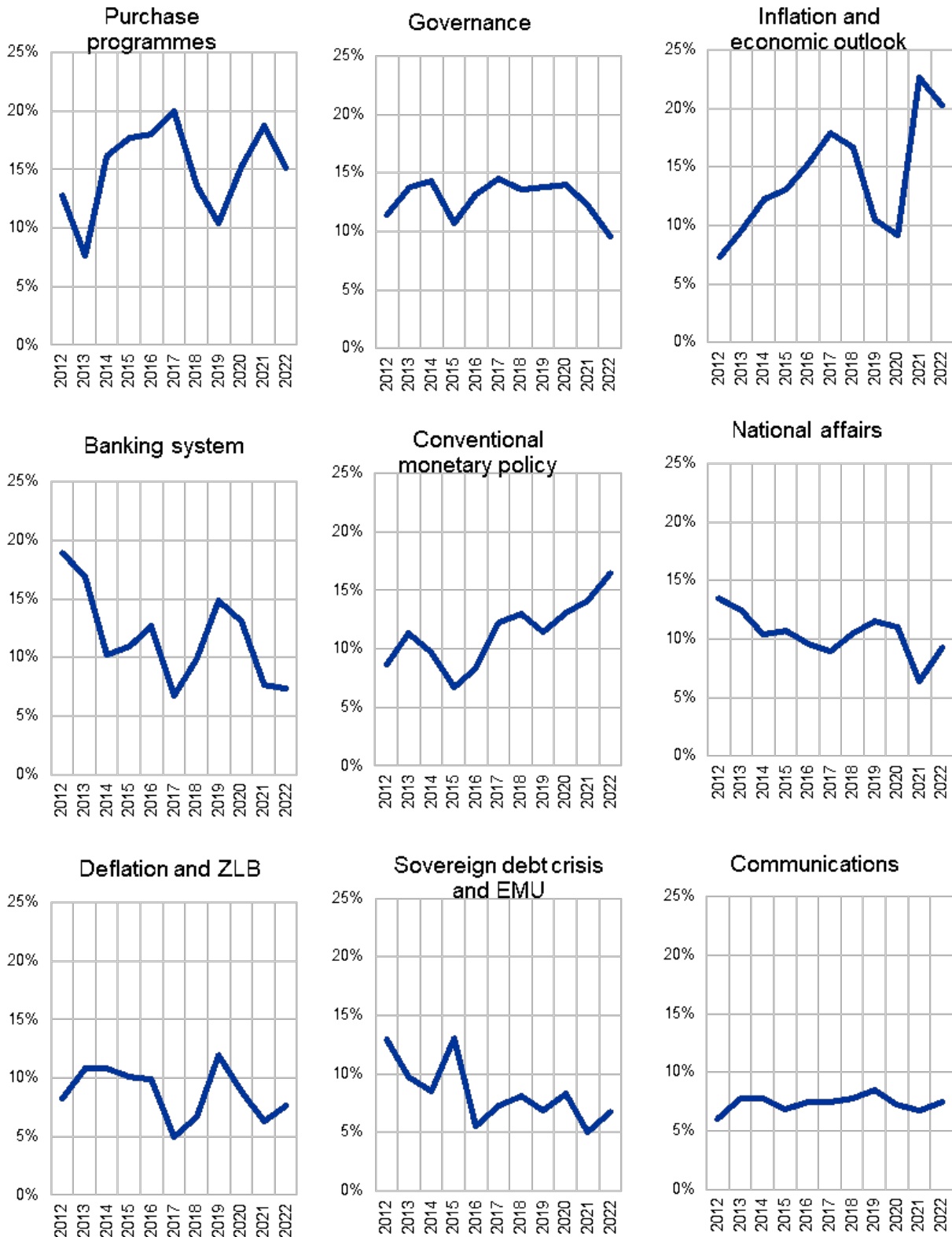
In a similar vein, the prominence of discussion of the euro area banking system was at its highest at the beginning of the sample in 2012, the year in which the decision was made to assign euro area banking supervision to the ECB under the framework of the Single Supervisory Mechanism.

The presence of other topics such as "Governance" and "Communications" is somewhat more stable over time. One reason for this may be that, given their operational nature, they are a routine feature of the ECB's activities compared to less predictable interventions in the case of economic crises and national affairs.

## 4.2    Topic prominence by outlet type

Does the prominence of the topics identified change depending on the geographical area and the type of audience of the outlets the journalists work for? Figure 7 shows the estimated topic proportions per each outlet group, which provides a first overview of the main features of their enquiries.

Figure 7:   Estimated topic proportions by geographical area and type of audience
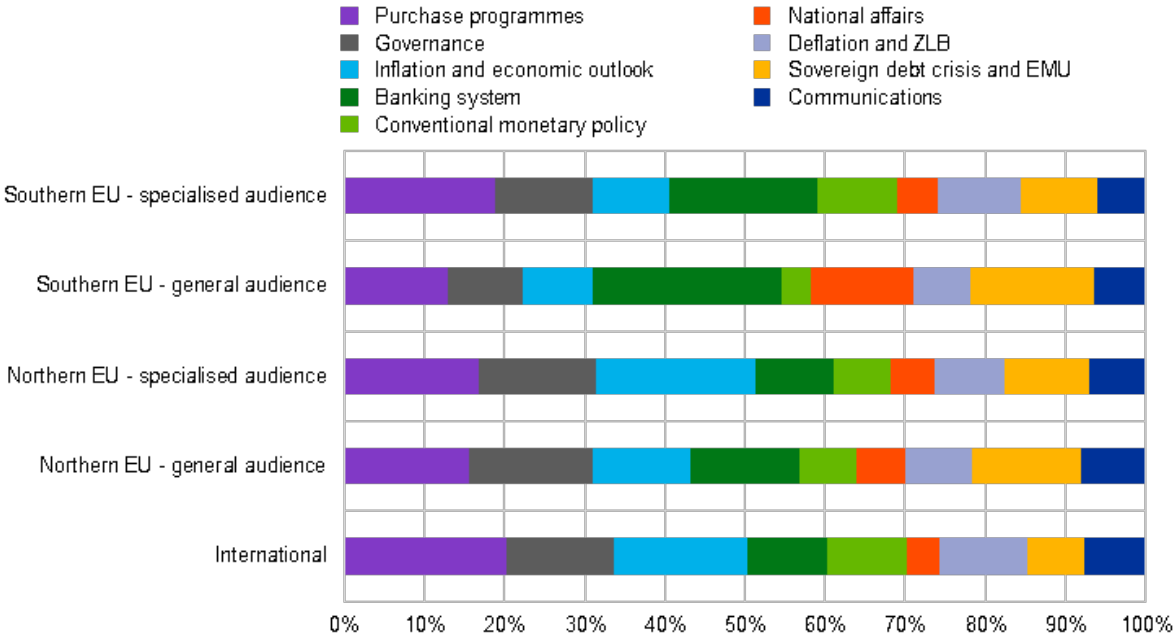


Before commenting on these results, in order to check the statistical significance of the differences visible in Figure 7, we run a series of regressions. For any given topic t, our dependent variable is the proportion of each document, i.e. question, attributable to that topic. The regressors are the geographical region of the outlet of the journalist who asked the question, the International category being the reference one, and the interaction with the outlet audience type. We also control for the year of the press conference was held via a set of dummy variables, the baseline being 2012. Using press conference fixed effects does

not alter the results.

The regression equation is the following:

$$topicproportion_{i,t} = \alpha + \beta_1\ NorthEU_i + \beta_2\ NorthEU_i \times specialised_i +$$

$$\beta_3\ SouthEU_i + \beta_4\ SouthEU_i \times specialised_i + \theta year_i + u_i \quad (1)$$

As the dependent variable is the result of the STM model, we employ the function estimateEffect in the stm package, which allows us to incorporate the estimation uncertainty.[10] Results are displayed in Table 2.

Table 2: Regression results

|  | Purchase pro-grammes | Governance | Inflation and economic outlook | Banking system | Convent. monetary policy | National affairs | Deflation and ZLB | Sovereign debt crisis and EMU | Comms. |
|---|---|---|---|---|---|---|---|---|---|
| Northern EU | -0.048** | 0.019 | -0.043** | 0.037** | 0.021** | 0.067*** | -0.027*** | 0.021** | 0.003 |
|  | (-3.191) | (1.621) | (-3.248) | (3.416) | (2.763) | (8.622) | (-3.708) | (2.763) | (0.554) |
| Northern EU x spec. | 0.012 | -0.007 | 0.076*** | -0.039* | -0.006 | -0.032** | 0.005 | -0.006 | -0.010 |
|  | (0.672) | (-0.478) | (4.147) | (2.878) | (-0.583) | (-3.068) | (0.522) | (-0.583) | (-1.245) |
| Southern EU | -0.073*** | -0.042*** | -0.078*** | 0.137** | 0.087*** | 0.086*** | -0.040*** | 0.087*** | -0.014* |
|  | (-5.198) | (-3.500) | (-5.857) | (1.039) | (9.482) | (9.713) | (-4.692) | (9.482) | (-2.269) |
| Southern EU x spec. | 0.058** | 0.030 | 0.008 | -0.052* | -0.076*** | -0.060*** | 0.033** | -0.076*** | -0.003 |
|  | (2.805) | (1.782) | (0.432) | (2.945) | (-6.706) | (-5.697) | (2.807) | (-6.706) | (-0.362) |
| Intercept | 0.150*** | 0.117*** | 0.091*** | 0.161** | 0.110*** | 0.107*** | 0.095*** | 0.110*** | 0.064*** |
|  | (10.725) | (10.982) | (7.494) | (2.539) | (13.772) | (12.709) | (12.226) | (13.772) | (11.422) |

Notes: t-statistics in parentheses. ***, **, * denote significance at 0.1%, 1% and 5% level, respectively.

Technical topics related to monetary policy are generally more prominent in questions from international outlets compared to national outlets. The difference is even starker when comparing international and national general audience outlets. This is illustrated by the fact that the topics "Purchase programmes", "Conventional monetary policy", and "Deflation and ZLB" feature significantly less prevalently for both Northern and Southern domestic outlets with a general audience compared to the international baseline. The "Inflation and economic outlook" topic is also less salient for national outlets compared to international ones, with the exception of Northern EU specialised outlets. For the latter

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[10]We employ the Global method, which uses an approximation of the average covariance matrix formed using the global parameters of the STM mode. Compared to not including the first stage uncertainty at all, our standard errors are around 1.3-1.6 times larger.

group, the inflation and economic outlook topic makes up for 20% of questions, making it the most prominent one.

On the contrary, national outlets, especially those targeting a general audience, devote more attention to national affairs than international outlets. Journalists from Northern and Southern EU general media devote 7% and 9% more of their questions to this topic than international ones, respectively. It is perhaps the case that for general audiences, national affairs provoke more interest than comparatively abstract and technical areas of the ECB's activities, like unconventional monetary policy.

The sovereign debt crisis also features more prominently in the questions of general audience outlets compared to the rest of the sample, especially from those in the Southern EU oriented towards a general audience.

Another significant difference between questions from Southern EU outlets and other media spheres is the salience attributed to banking system issues. Southern EU outlets devote a much higher proportion of questions to this topic (between 8 and 14% more than the other two media spheres). This result pairs with the descriptive evidence in Gardt et al. (2021), which shows that the share of media coverage devoted to banking supervision is higher in Spain, Italy and Greece compared to France, Germany, and the Netherlands.

The proportion of the "Governance" and "Communications" topics does not change substantially across media spheres. Mirroring the trend across time, the explanation for this may relate once again to the routineness or procedural element of these features in the ECB's actions in contrast to more variable elements of the ECB toolkit, like a particular asset purchase programme. Notably, however, the "Governance" topic in particular features somewhat less for Southern EU outlets with a general audience than for other types.

Differences between general and specialised audience outlets questions are especially sizeable and statistically significant in the Southern EU group. Specialised outlets in this media sphere tend to be aligned more with international outlets than general ones – meaning that, for technical topics, the coefficient on the interaction are usually positive and significant, while for less core monetary policy topics, like national affairs and the banking system, the coefficients are negative - counteracting therefore domestic specificities. In the Northern EU group, as previously mentioned, the most sizeable difference concerns the "Inflation and economic outlook" topic: prominence in specialised audience outlets is 8% higher than for general ones.

We have conducted a number of robustness checks. First, traditionally at least one press conference a year was held outside of Frankfurt, in one of the euro area Member States - a practice which came to a halt during the Covid-19 Pandemic and resumed only in 2022. It is possible that, during these press conferences, local outlets are given the floor more often and that they tend to ask about specific topics. Therefore we added a dummy taking value 1 for press conferences held outside of Frankfurt. The related coefficient is never significant: it comes only close to significance for the national affairs topic (12% level),

where it results positive. Results for the different outlets group are unchanged.

As mentioned in the previous section, the first question of the press conference might be particularly relevant as it inquires about the most pressing issue or point to clarify. When a dummy on the first question is added to the regressions, the coefficient is not significant for almost all topics. There are two notable exceptions: "National affairs" and (almost to the 5% significance level) "Banking Supervision". Both coefficients are negative, suggesting that the first question does not usually touch upon these two topics. Once again, results on the geographical provenance and audience type of the outlets remain practically unchanged. Similar results hold when the dummy captures both the first and the second questions of the press conference.

## 5  Conclusions

In this paper, we provide new evidence regarding one of the most crucial stakeholder groups for the ECB - the news media. This group acts as the point of contact between the institution and most of the wider public and as an informal yet crucial cog in the accountability mechanism of the Central Bank. While previous research has shown how media coverage reacts to the ECB's activities, our paper puts the spotlight directly on the communication channel from the media to the central bank in the form of questions during the press conference Q&A session. Our first set of findings shows that, while a vast proportion of the questions deal with the economic outlook and core monetary policy issues, an equally sizeable proportion focuses on other themes. For instance, journalists consistently ask about the Governing Council deliberations and about issues related to the banking system. A topic revolving around communication also emerged, adding to the evidence of the increasing importance of central bank communications. Questions about the state of the EMU and the risks to its integrity also continue to be present even after the tough years of the sovereign debt crisis.

We also show how the topics journalists inquire about are characterised by different themes depending on the geographical sphere their outlet belongs to and on the type of audience they report for. Compared to international media, we find that national media are less likely to enquire about core monetary policy issues and more likely to ask about country affairs, closer to citizens' radars. This is especially the case for questions coming from general audience media. However, the ECB can hardly comment on national affairs: a qualitative inspection of the answers to such questions confirms that the ECB President avoids answering directly to country-specific questions and does not comment on many of them. Under the hypothesis that media attention proxies and/or shapes the public's interest, this result underscores once again the challenge of communicating about central banking with the wider public across 20 countries.

Our results also confirm that the salience of the banking system for Southern EU outlets is high. For general audience outlets in this region, this is the top topic, making up nearly one quarter of questions.

Finally, the large presence of international, specialised media in the Q&A session – accounting for

over 50% of questions – highlights the scope of the challenge surrounding the push for connecting better to the wider public. Our findings reinforce the notion that the press conference continues to be heavily oriented towards communicating to experts and the financial markets. In this vein, the study outlines a trade-off for the ECB. In granting questions to media targeting a specialised audience, the Bank can be fairly confident that the substance of these questions will be pertinent. The technicality of the exchange, however, might imply that its reach is limited to a public of experts. By contrast, when it allows questions to outlets with a general focus, the ECB potentially expands the scale of the audience as well as the relevance for the general public. The risk is that such questions relate to issues beyond the scope of a central bank's sphere of competence, for instance the national elections of Member States.

In the present paper we focused exclusively on the question-side of the press conference. At the same time, for an effective communication of monetary policy decisions, the nature of the responses provided also matters. An avenue for future research could therefore be investigating whether the ECB President responds in a different style depending on the audience of the outlets posing the questions. The congruence in topics between questions and answers would also deserve further examination. Another aspect worth analysing is the link between the Q&A session and the resulting media coverage, given the significant role the latter plays in shaping public perception of monetary policy and the central bank. Furthermore, the period investigated in this analysis has very much been characterised by crisis. In 2012 the euro area was in the midst of the sovereign debt crisis, while the end of the sample encompasses the Covid-19 Pandemic and the as of yet ongoing War in Ukraine and associated energy crisis. In light of this fairly exceptional context, it would be interesting to learn how the character of the Q&A session changes with shifts in the wider economy and, perhaps, the return of a more conventional monetary policy approach.

Fundamentally, media is at the heart of the wider public's interactions with central banks. A deeper understanding of the ways in which this channel operates is crucial for enhancing their engagement with central banks and, by extension, the effectiveness of monetary policy.

# Appendix

Table 3:  Regional classification

| Region | Countries |
|---|---|
| Northern EU | Austria, Belgium, Denmark, France, Germany, the Netherlands, Sweden |
| Southern EU | Cyprus, Greece, Ireland, Italy, Malta, Portugal, Spain |
| Eastern EU | Bulgaria, Estonia, Latvia, Lithuania, Slovakia, Slovenia |
| International | Chile, China, Hong Kong, Japan, Russia, Switzerland, United Kingdom, United States of America |

Notes: the table only includes the countries which appear in the sample. Across our sample, for instance, no Finnish outlets have asked a question at the Q&A session.

Figure 8:  Selection of number of topics for STM
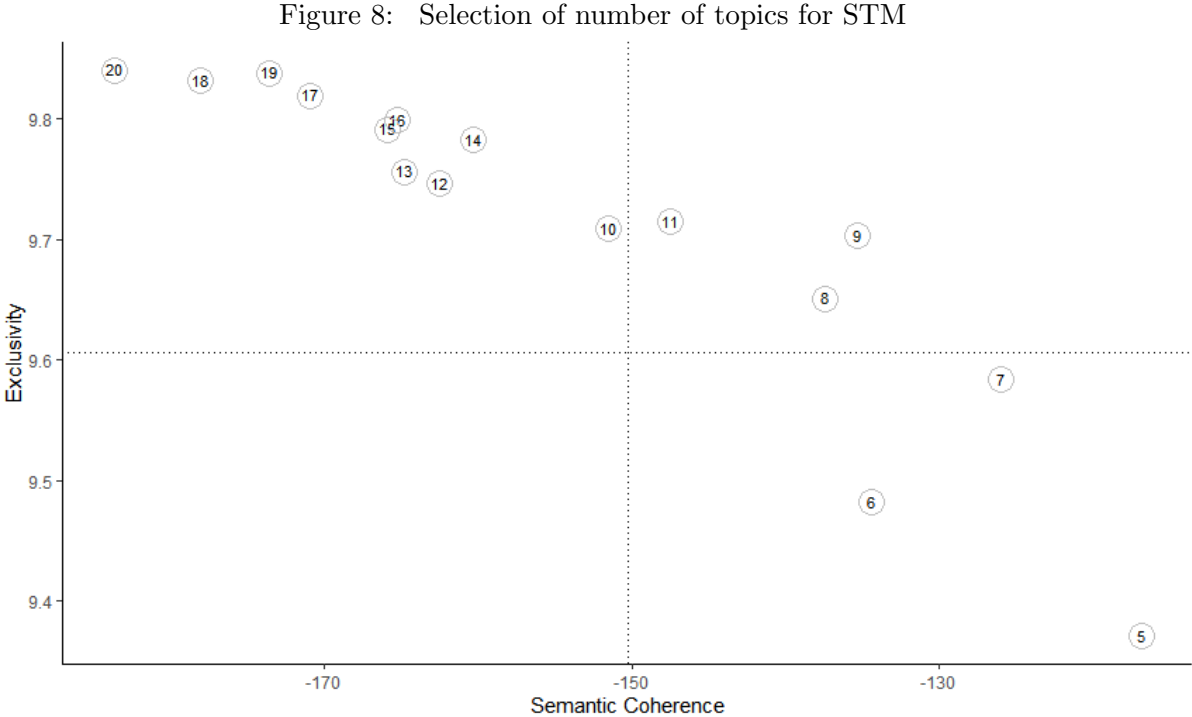
Figure 9: Word clouds per topic
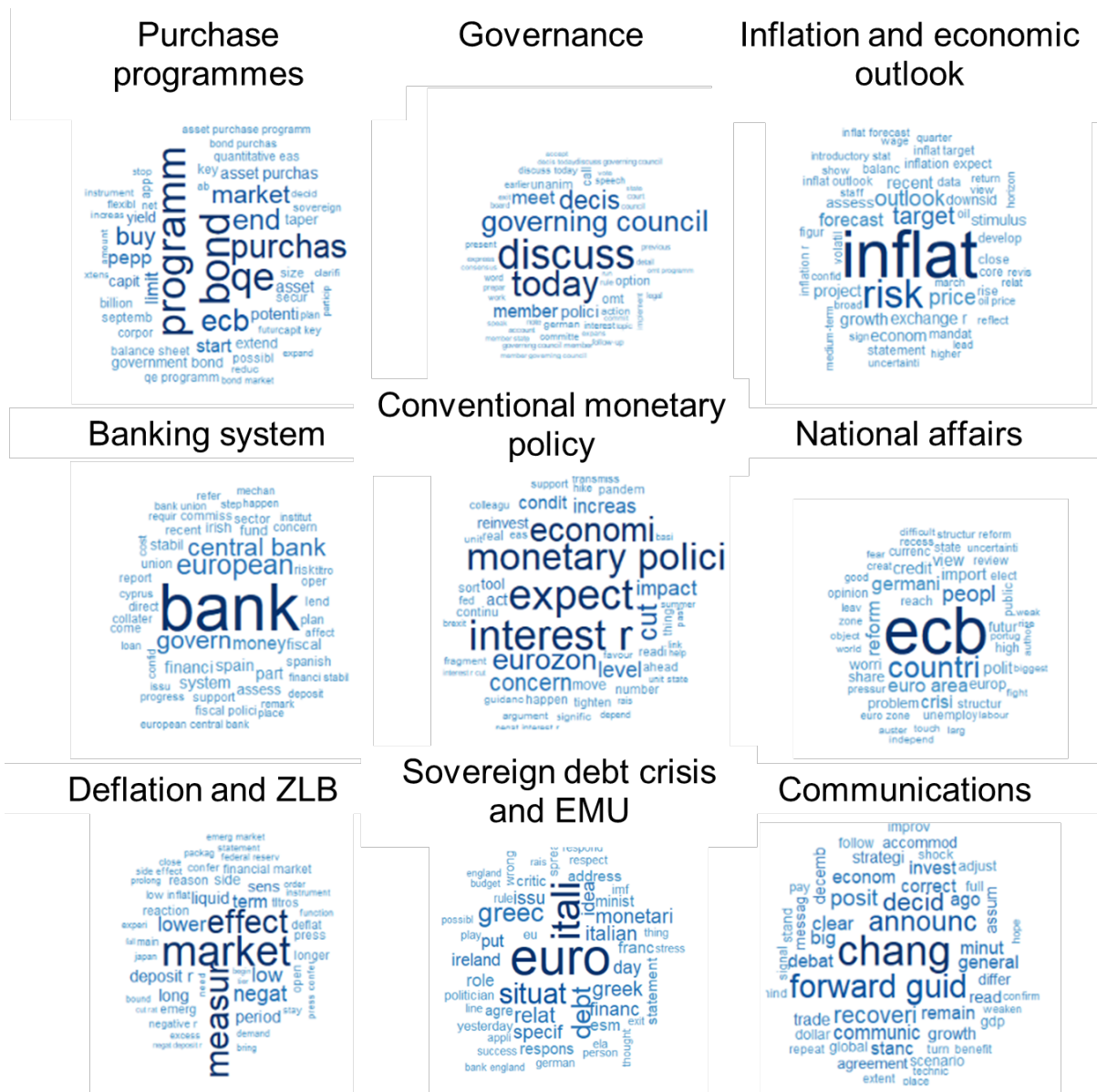
Table 5: Representative texts

| Topic | Representative texts |
|---|---|
| Purchase programmes | By how much do you estimate that the adjustment of the issue and issuer limit and the inclusion of corporate bonds into the QE programme boosts the universe of QE-eligible assets? And how confident are you that this will be big enough now that you can comfortably implement the programme without either running into constraints or having to adjust the parameters of the QE programme again? |
| | Could you quantify the impact of your purchases in the municipal bond market, just how big this market potentially is for the ECB? And in the future, there are very many other securities which are potentially there to be bought: could you perhaps shed some light on other potential areas where the asset purchase programme could be extended to? For example, in the area of non-performing loans, there would be the possibility of extending asset-backed security purchases to instruments that would include at least some element of non-performing loans in the future, perhaps. |
| Governance | You said you haven't asked the committees yet to prepare options for an exit. What are the chances that are your next policy meeting you actually have concrete options on the table that you could discuss and take a decision on? Or would you only task committees to prepare options after your initial discussions on a possible exit in the autumn? |
| | The second question is about the German constitutional court's ruling, and I wonder if you've discussed this at all. You've of course said that you fall under the jurisdiction of the ECJ, but Ms Schnabel said that the ECB can be constructive in this process. So what precisely does constructive mean in this context? What are you prepared to do? Are you prepared to take a fresh Governing Council decision as the constitutional court is asking you to do? |

| | |
|---|---|
| Inflation and economic outlook | My first question is on your growth and inflation outlook. You describe your growth outlook as broadly balanced. What about the outlook for inflation; is this also broadly balanced, or is it to the downside or to the upside?<br><br>My second question: you've emphasised in the opening statement and also in some of your remarks to Mr Speciale's question that the incoming data hasn't been so good and that the threats to the outlook are on the rise. Yet you still say that the risks to the outlook are broadly balanced, so that's somewhat surprising I think to a lot of economists out there. What exactly are the upside risks? What would it take to have a revision of that to emphasise that the balance is now shifted towards the downside? |
| Banking system | On the question about Anglo Irish Bank, you mentioned that the details should be left to the Irish government, but was this part of a careful choreography that was worked out with the Irish government? Last night we had the Irish parliament rushing through legislation, and we had the Irish President flying back from your own country to sign legislation. Was this part of choreography with the ECB?<br><br>The second question is: a European government has attacked the vigilance of the European Central Bank, saying it is not impartial. How does the European Central Bank comment? |
| Conventional monetary policy | The second question was on the possibility of cutting interest rates. It seems as though most of the focus has been on the PEPP and how that would be the main tool if you needed to provide more stimulus. But could an interest rate cut be helpful? I think investors are pricing a small interest rate cut. Do you think that could be helpful to support the economy in the shorter term?<br><br>President Lagarde, I have a question regarding the favourable financing conditions. You've been elaborating on the tightening of financial conditions in Europe, bank lending surveys, so how concerned are you about that tightening, and if that tightening were to continue, would that mean that the financing conditions are no longer favourable? |

| | |
|---|---|
| National affairs | In the last two weeks, we saw two very important elections: one in Austria and one in Germany. And in both elections, in very stable countries, we saw "anti-Euro" parties growing very quickly, Also in Germany. I mean even if the Alternative für Deutschland didn't reach the 5% hurdle, it's on 4.7% and it's a very, very important result. Are you worried about the "anti-Euro" growing everywhere in Europe now and what to be done against this? <br><br> Back to the Italian elections: aren't you worried about the fact that in one of the most pro-European countries traditionally, the anti-European forces have gained more than 50% of the votes? What does this mean for the European project? Don't you think that it could jeopardise even the euro area reforms? It's the third biggest country in Europe, in the eurozone. |
| Deflation and ZLB | And secondly, in terms of other non-standard measures, there is lots of speculation in the market that we might see further LTROs – I know, I know, you are not going to tell us anything about that – but how temporary is temporary in terms of some of the measures that we have seen? <br><br> First of all I would like to ask you a question on what you said on the deposit rate, that it could be lowered further. Could you explain a bit more the reasoning behind these discussions, how it could work? And also you had said that the rates were effectively at the lower bound, so how would this measure up? How would you explain this move to the market? |
| Sovereign debt crisis and EMU | You said that the euro is strong and irreversible, but still many populist parties have a big success in the country and doubting the euro, and also in Italy, which is the third-biggest country. What do you respond to these people that doubt the euro? Why do you think this political message is still very strong to put the euro in doubt? <br><br> My second question is about the fact that it is irreversible. There has been a discussion among German economists that ask that there should be the possibility to exit the euro. Very, very important economists like Clemens Fuest say if you have the possibility to exit the EU, why shouldn't you have the possibility to exit the euro in a better way? |

| | |
|---|---|
| Communications | Mr Draghi, I noticed that, in your introductory statement, you have changed the language a bit to place greater emphasis on the accommodative nature of your monetary policy stance. You emphasise this accommodative nature, and you firmly reiterate your forward guidance. Might this change in language signal that you consider the recent rise in money market rates unwarranted? Or could you perhaps explain what might have prompted that change? |
| | My second question is regarding forward guidance. You have just confirmed the forward guidance you gave in July, and the market impact you had in July has fizzled out by now. It had an impact, but then the impact weakened. Now, other central banks started off like the ECB – they had a vague form of forward guidance and then progressed further and introduced a more explicit form of forward guidance. I would like to ask you whether you would rule out that the ECB could go down a similar path. |

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