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Central bank communication and public trust: The case of ECB speeches[☆]

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ABSTRACT

Does communication influence trust in the central bank? We examine this question using survey data covering 488,000 Eurozone citizens from 1999 to 2019. We find compelling evidence that more communication, as measured by the number of speeches made by Eurosystem representatives, negatively impacts citizens' trust in the ECB. This holds for speeches as a whole and for different groups of speakers. This effect was exacerbated during the global financial and European sovereign debt crises. We do detect a positive result from more speeches in the form of increased informedness on the ECB and the EU. However, the overall negative effect prevails.

1. Introduction

“Love all, trust a few ...be checked for silence, but never taxed for speech.”

(William Shakespeare, All's Well That Ends Well)

Over the past two decades, central banks have become more transparent and begun to communicate more intensively than in the past. In the aftermath of the global financial crisis (GFC), with policy rates constrained by the effective lower bound (ELB), central banks intensified their use of communication as a policy tool (Blinder (2018)). Informing society became particularly important after the introduction of controversial unconventional monetary policy instruments and the broadening of central bank mandates (Blinder et al. (2017)). The functioning of new policy measures is complex, and their relationship to central banks' mandates is not always straightforward. Complexity often fuels suspicion and mistrust.

However, effective communication requires trust. Trust in the central bank is an indispensable foundation for the success of a central bank because it enhances political legitimacy of the central bank (Bordo and Jonung (1999)). It is particularly essential in times of crisis, when economic uncertainty increases and policymakers need flexibility to take unpleasant actions (Blinder (2000)).

^{*} The views expressed in this paper are those of the author(s) and do not necessarily reflect those of the Bank of Korea, the Swiss Financial Market Supervisory Authority FINMA or the Swiss National Bank (SNB).

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Trust also generates broad acceptance of central banks' independence and provides protection against political interference. The website of the ECB, for instance, states that "communication helps people to better understand what we do. And this also helps to build trust. Trust means that people have confidence in what we say and do. That makes our monetary policy more effective. But not only that: trust is especially important because we are an independent institution. We need to explain in very clear terms what we are doing to achieve our goal so that we can be held to account by the people and their elected representatives."²

However, research into the effect of central bank communication on trust in the central bank is scant (Blinder et al. (2023)). We contribute to filling this gap by examining whether the quantity of Eurosystem member speeches, which represent an important form of communication with a wide audience, is reflected in citizens' trust in the ECB. We focus on the Eurosystem because of the uniqueness of detailed micro data provided by the Eurobarometer survey. The sample period for these data stretches from 1999 to 2019.

The main message of our study, which is based on (i) individual-level linear probability models, (ii) country-level fixed effect models, and (iii) the GMM estimator, is that a greater number of speeches consistently reduces trust. This result holds not only for Eurosystem speeches as a whole but also for different groups of speakers. Importantly, we provide compelling evidence that more speeches imply a stronger presence of the ECB in society through the intermediation of the media. The results remain unchanged after we control for macroeconomic, financial and socioeconomic variables and run robustness checks by examining the stability of the speech influence over time up to 2020 using recursive estimation, applying random effect, probit and Heckman selection models, doing unit root tests, and eliminating potentially careless survey responses. The long-run negative effect of 100 additional speeches per year on trust varies in magnitude by between 6 and 11 percentage points. During the GFC and the European sovereign debt crisis, the effect size even strengthened relative to the magnitudes observed during noncrisis periods.

Exploiting the great richness of socioeconomic details included in the Eurobarometer provides additional insights. Above all, speeches raise the number of individuals who have heard about the ECB and increase knowledge of the EU. This is important because the negative response on trust that speeches elicit is weaker for individuals with a higher education level and greater knowledge of the EU. Our further results on sociodemographic variables are mostly in line with previous work, lending further reliability to our findings, and partly provide a new perspective on this issue.

The remainder of the paper is organized as follows. In Section 2, we discuss the related literature. In Section 3, we present the Eurobarometer survey that serves as our endogenous variable and the explanatory variables. In Section 4 and Section 5, we present our method and the results of a series of panel regressions, corroborated by robustness tests in Section 6. In Section 7, we embed our findings in a broader context and draw some policy implications. Concluding remarks are presented in Section 8. Further results are summarized in the Appendix.

2. Literature

Our paper relates to three growing branches of literature. The first is concerned with support for the ECB and EU institutions, the second with central bank communication and transparency in general, and the third with communication with nonexpert audiences.

2.1. Trust in the ECB and EU Institutions

A large and rapidly expanding literature uses survey data to analyze the drivers of public trust in central banks. Most research in this context has been conducted on the ECB, given the readily available Eurobarometer survey data published by the European Commission. Fischer and Hahn (2008) studied the determinants of public trust in the ECB during the start-up phase from 1999 to 2004 combined with aggregate explanatory factors and found that lower inflation and higher national income increased trust whereas unemployment played a neutral role. Gros and Roth (2010) matched Eurobarometer data with macroeconomic data during the GFC and observed that citizens blamed the ECB for the economic downturn caused by this crisis.

In general, these early studies did not control for heterogeneity among households with different characteristics, nor did they shed light on the mechanisms underlying the trust-building process. Extending the analysis along such lines, Farvaque et al. (2017) documented that the political orientation and education of individuals and the perception of future economic developments play an important role in the level of trust in the ECB. Other authors found that greater knowledge of the ECB's mandate and tasks strengthens trust (Van der Crujssen and Eijffinger (2010)). Similarly, Mellina and Schmidt (2018) concluded from a survey conducted among individuals living in Germany that factual knowledge plays a crucial role in boosting the level of trust in the ECB and the Bundesbank. According to Horvath and Katuscakova (2016), citizens' perception of the ECB's monetary policy transparency has a positive nonlinear effect on their level of trust. Ehrmann et al. (2013) found a decline in trust in the ECB following the GFC and the sovereign debt crisis. Baerg et al. (2020) reported that respondents more skeptical of the ECB were less likely to incorporate the information that it conveyed to them.

2.2. Central bank transparency/communication and the cacophony problem

The second body of research to which our paper contributes is on central bank transparency and communication. The bulk of the

² <https://www.ecb.europa.eu/home/search/review/html/monpol-communication.en.html>, retrieved on 23 June 2023.

literature concludes that more transparency and communication have beneficial effects. However, it is relatively silent on the effects of diverging communication.³ A particular problem arises from communication by members of a monetary policy committee (MPC). While an MPC reduces the adoption of extreme positions and provides less volatile decision-making (Blinder (2004)), it may devolve into “groupthink” (Sibert (2006)), and encounter disagreements that inhibit the development of a common framework to communicate effectively. Blinder (2004) offered a typology for thinking about what sorts of MPCs a central bank can have, distinguishing individualistic committees and collegial ones, whereby the latter can be of either a genuinely collegial or an autocratically collegial type. In an individualistic MPC, the group’s decision is made by literal majority vote. A highly individualistic committee may manage to reach a decision but then find it difficult to agree on the analysis and reasoning behind it, raising the danger of a cacophony of voices confusing outside observers. In contrast, members of a genuinely collegial MPC may argue for their own positions behind closed doors but ultimately compromise on a group decision. According to Blinder (2007), the ECB’s Governing Council appears to function as a genuinely collegial MPC.⁴

Lustenberger and Rossi (2020) provided evidence of a negative effect of a higher quantity of central bank speeches on the precision and dispersion of professional forecasts. They interpreted their results on forecast imprecision and dispersion from speeches as a cacophony problem arguably resulting from MPC members making inconsistent statements. The same mechanism may explain the differences documented in Hwang et al. (2021), who found that while governors’ speeches positively affect business managers’ opinion of central banks’ economic impact, speeches by other board members draw negative responses. Tillmann and Walter (2019) examined the divergences in tone of more than 900 speeches given by the presidents of the ECB and the Bundesbank and found that a wider tone divergence leads to an elevated level of policy uncertainty, additional market volatility and higher risk premia in the Eurozone.

2.3. Communication with nonexperts

While there is an extensive literature studying how monetary policy affects the expectations of financial market participants and professional forecasters, evidence for the effects on households and firms is more limited.⁵ The main message that emerges from this line of research is that simple and relatable communication can improve people’s knowledge and affect their expectations and behavior more powerfully.⁶ Some studies suggest more nuanced conclusions about the effectiveness of central banks reaching their audience. For example, Hayo and Neumeier (2020) report that despite being exposed to almost 30 years of inflation targeting, less than 10% of New Zealanders actually know the Reserve Bank’s inflation target.

The paper most closely related to ours is that by Brouwer and de Haan (2022a), who examined the effect of communication on trust in the ECB and inflation expectations. In contrast to our approach, the authors base their analysis on data collected using the Dutch Household Survey (DHS) and perform a random controlled trial (RCT). Regarding the effect of communication on trust in the ECB, the authors found that communication about its instruments does not affect Dutch households’ average trust in the ECB, unlike their inflation expectations.

While an RCT offers the advantage of strong identification, the authors acknowledged an important caveat. While their approach ensured that participants were exposed to a specific message, in real life, the public seems to be relatively inattentive to information about monetary policy and inflation dynamics. The main drawback specific to the DHS dataset is that it is not longitudinal, preventing the use of time series for macroeconomic variables.

Our paper deviates from Brouwer and de Haan (2022a) along several dimensions. First, we employ the Eurobarometer surveys, covering 19 Eurozone countries and hence widening the view beyond a single country. Second, we do not rely on an experimental set-up but focus on actual communication, as proxied by the quantity of ECB speeches. Third, we examine the effects of communication not over a limited period of time but since the creation of the euro.

3. Data

This section lays out the data used in the empirical analysis. The first dataset that we draw on is the Eurobarometer surveys of the European Commission, which have provided trust data since the inception of the euro. The second dataset includes speeches of central bank officials, and the third other explanatory variables.

3.1. Dependent variable: trust

Public trust in the ECB is our main endogenous variable. It is derived from biannual opinion polls conducted with representative samples of respondents in every Eurozone country and in some other countries and collected in the Eurobarometer survey. We used both, the spring and autumn waves of the survey. For the country-level analysis (share of trust in the ECB), we aggregated the results of the spring and autumn waves and calculated the share at the annual level. Similarly, for the individual-level analysis, responses of both

³ For a review of the older literature of central bank communication, see Blinder et al. (2008).

⁴ An anonymous referee doubts that this interpretation still holds up after the GFC, as there appears to be a substantial rift going through the Governing Council and some of the controversial positions seem to be purposefully leaked to the media.

⁵ See, for example, Coibion et al. (2020), Coibion et al. (2022), D’Acunto et al. (2022), Coibion et al. (2023). For a recent survey on communication with the general public, see Blinder et al. (2023).

⁶ See Bholat et al. (2019), D’Acunto et al. (2021), and Kryvtsov and Petersen (2021).

waves of a given year were used and matched by the year's macroeconomic variables (The model is based on annual observations). We mainly use clustered standard errors clustered at biannual level for the individual-level analysis, considering potential correlations between responses collected in the same wave of the survey. The survey is unique in that it is the only publicly available data source worldwide that regularly collects information on public trust in the central bank. It provides additional information on a wide range of topics including perceptions about political institutions, national governments and parliaments, and the EU and its institutions. The standard Eurobarometer was established in 1973, and each survey consists of approximately 1000 face-to-face interviews per country. The survey is published biannually in the spring and fall of each year. The field work for the spring wave is generally done in May-June, while that for the fall wave is done in October-November.

Our measure for trust in the ECB uses responses to the following items: "Please tell me if you tend to trust it or tend not to trust it: The European Central Bank". The possible answers from which the respondents can choose are "Tend to trust", "Tend not to trust", and "DK – Don't know". We treat the latter answers as missing.⁷ However, we show in the robustness analysis that the results are similar to those from a Heckman selection model that uses the "Don't know" answers and controls for potential nonresponse bias. Using this question, we build a measure of trust in the ECB. Our main sample comprises Eurobarometer EB 51.0 to Eurobarometer EB 92.3. An extended sample covering up to the first half of 2020 (EB 93.1) is used in the robustness analysis.

The results are presented in Fig. 1. The solid line displays the share (%) of aggregate responses from citizens in all member countries of the Eurozone. The overall trend is in line with the fact that public trust in institutions, and central banks in particular, has generally declined over the past few years (Haldane (2017), Istrefi and Piloïu (2020), Hwang (2023)). Trust in the ECB weakened due to the GFC, the European sovereign debt crisis and Brexit, as Executive Board member Schnabel (2020) noted. Schnabel (2020) also argued that the challenges are particularly pronounced for the ECB, which has to gain public trust in 19 member states, some of which have very different expectations about monetary policy. These difficulties are regularly thematized in the press.⁸ The ECB benefited from relatively high and stable levels of public trust from its establishment until 2008, followed by a declining trend until 2014. The economic recovery triggered an upturn in trust. However, trust has never reached pre-GFC levels, and in the first half of 2020, it again declined slightly. In addition, Fig. 1 exhibits support for the euro (dotted line), also from Eurobarometer. In contrast to trust in the ECB, support for the euro has been stable and has even increased in the past few years.⁹

3.2. Number of central bank speeches

Following Lustenberger and Rossi (2020) and Hwang et al. (2021), we compiled the number of Eurosystem speeches from the BIS central bankers' speeches database, which covers years since 1997 and has increasingly become more complete. Crucially, as explained in Lustenberger and Rossi (2020), there is no endogeneity problem associated with this communication measure. Not only are central bank speeches announced months in advance, but also their main thrust, including their titles, are communicated well ahead of the event itself, making the number of speeches a well-defined exogenous variable. In contrast, speeches' content, which is not examined in this paper, is more likely to be endogenous, reflecting recent economic and social developments.

The best example to illustrate this point is the famous speech given by then ECB President Mario Draghi on July 26, 2012 in London at a Global Investment Conference. This event was pre-scheduled but the essential message was not. Mody (2018), p. 310f., recounts this episode in great detail. Draghi began his speech by emphasizing that the euro is like a bumblebee and the euro area were much, much stronger than people acknowledged. But he realized that his words were failing to charm his skeptical and restless audience. Unusually for a central bank chief, Draghi spoke without a prepared text, adding "There is another message I want to tell you". "Within our mandate the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough." Mody (2018) adds that Tim Geithner, the former US Treasury secretary, wrote in his memoirs that Draghi had not planned to say this, but was so alarmed by the darkness expressed by hedge funds and bankers that he ad-libbed an unequivocal commitment to defend Europe. Draghi had made a promise, but according to Geithner the ECB and European authorities had no clear idea what they were actually prepared to do. The assumption was that the ECB would buy, or promise to buy, euro-area government bonds to prevent interest rates from rising too high. But it was not clear that Draghi would have the political support to deliver on his promise. While on the day after Draghi's speech the Bundesbank announced its opposition to any ECB commitment to buy government bonds, Angela Merkel gave Draghi her instant support.

Nevertheless, we performed robustness analyses in which we relaxed the assumption that the number of speeches is exogenous. We analyzed country-level longitudinal rather than just cross-sectional data and confirmed the causality running from the number of speeches to trust by applying the GMM estimator.

Fig. 2 plots the number of Eurosystem speeches in comparison with the evolution of other central bankers' speeches as collected by

⁷ There is a similar question on trust in the national government.

⁸ As an example, the headline of an article in the Financial Times on July 23, 2021, read "ECB divisions open over shift in inflation and rate-setting stance – Bond buying strategy to go on – More tolerance of price growth – Policy hawks voice dissent." The next day, the summary of an article in the Frankfurter Allgemeine Zeitung für Deutschland (FAZ) stated that "Bundesbank President Jens Weidmann explains why he did not agree with the Council's decisions" taken on Thursday, July 22. An article in the FAZ on July 31 alluded to a bitter controversy within the Governing Council about the duration of forward guidance.

⁹ Jonung and Roth (2020) and Roth and Jonung (2020) noted that before the GFC, public support for the euro and trust in the ECB were stable and strongly correlated at a high level, but from 2008 to 2013, a period characterized by rising unemployment, trust in the ECB fell sharply, while support for the euro declined only slightly.

(Percent share of respondents)

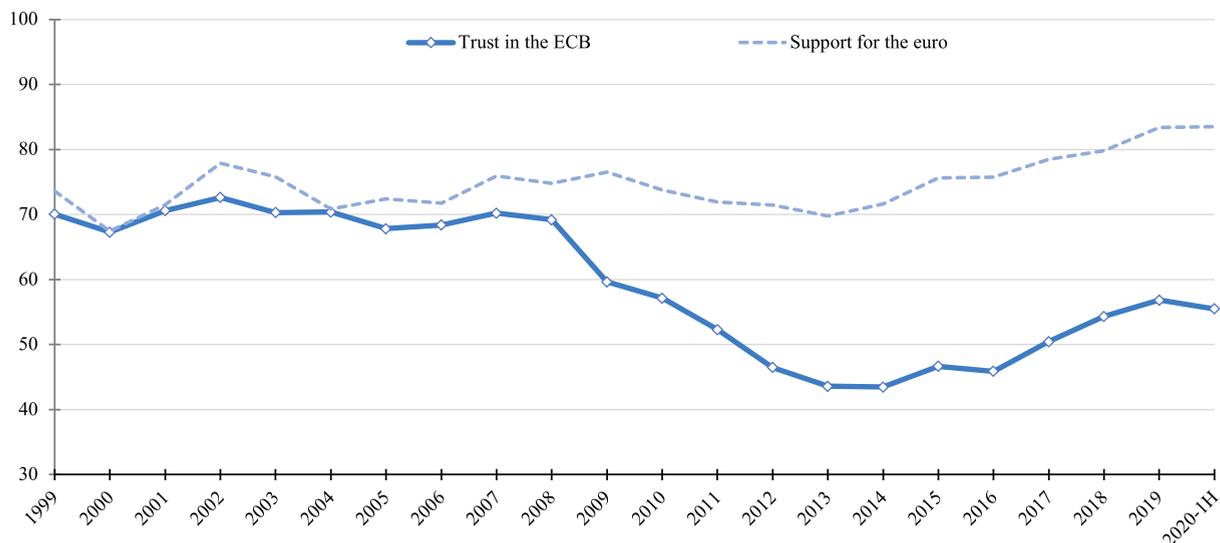


Fig. 1. Share of trust in the ECB and support for the euro.

the BIS. The figure covers the period from the introduction of the euro in 1999 until 2021. It illustrates that central banks began intensifying their speaking activities before the GFC, a process sped up by the crisis. However, this process seems to have reached an upper boundary around 2013. It is also apparent that far fewer speeches were given in the last two years, arguably due to the COVID-19 restrictions imposed on public events.

The increase in Eurosystem speeches is in line with the global trend. From this evolution, we infer that the increase in speaking activities is mainly a reflection of central banks' intention to inform more and less the result of particular economic circumstances or changing mandates calling for more explanations. This conjecture is corroborated by the fact that the frequency of Eurosystem speeches is not related to the Eurozone's business cycle. We also note that there is no connection with times of heightened financial instability as captured by the ECB's composite indicator of systemic stress (CISS).

In addition to the total number of Eurosystem speeches, which we abbreviate as "Speeches_all", we divide the data into four main groups of speakers. A synopsis is given in Fig. 3. The first group is represented by the number of ECB presidents' speeches, which we denote as "Speeches_ECB_President". The second subtracts the number of ECB presidents' speeches from the total, yielding the number of speeches given by all other Eurosystem speakers, which we denote as "Speeches_Others". The third group encompasses the number of speeches of the Executive Board (ECB president and five Executive Board members), shortened as "Speeches_President_Board". Finally, subtracting from the total the speeches of the Executive Board gives the number of speeches of speakers not located at the Frankfurt headquarters. We denote this group "Speeches_Nonboard".

Fig. 4 illustrates the evolution of the quantity of speeches by group. Panel A displays the first two groups (presidents' and all others' speeches), and Panel B plots the other two groups (the Executive Board's and the other representatives' speeches). Visual inspection of Panel A indicates that until the GFC, the share of presidents' speeches was high but has diminished vis-à-vis the share of other speeches since. Similarly, Panel B suggests a high share of speeches by the Executive Board in comparison with the share of other speeches until the GFC and a relative reduction since then.

Speeches are a vital ingredient of the presence of the ECB (or any central bank for that matter) in society, that includes financial market participants, firms' executives, professional forecasters and laypeople. A single speech need not be read to elicit attention and reaction. The headline will do the trick. This is particularly true for laypeople, the audience we have mainly in mind in this paper. Although people certainly do not count the number of speeches, their number affects the presence of the ECB in society through the media, which in turn influences people's trust in the ECB.¹⁰ We provide evidence that more speeches imply a stronger presence of the ECB in society through the intermediation of the media. We did this in two steps.

First, we show that Executive Board speeches (Speeches_President_Board) do reach the media. As seen in Fig. 5, the number of newswire reports (Reuters News, Dow Jones Newswires, etc.) on Executive Board speeches increased when their number increased and decreased when the number of related speeches decreased. We identified newswire reports related to these speeches by entering a couple of English and German search words in Factiva, a Global News Monitoring & Search Engine.¹¹ The entries are "ECB", "European Central Bank", "EZB", or "Europäische Zentralbank"; "Speech", "Rede" or "Vortrag"; and "Member of the Executive Board" or

¹⁰ See also the results of Table C.8 and Table C.9 in the Online Appendix.

¹¹ Factiva has been used in previous studies on central bank communication by, for example, Rinaldo and Rossi (2010) and Ferrara and Angino (2022).

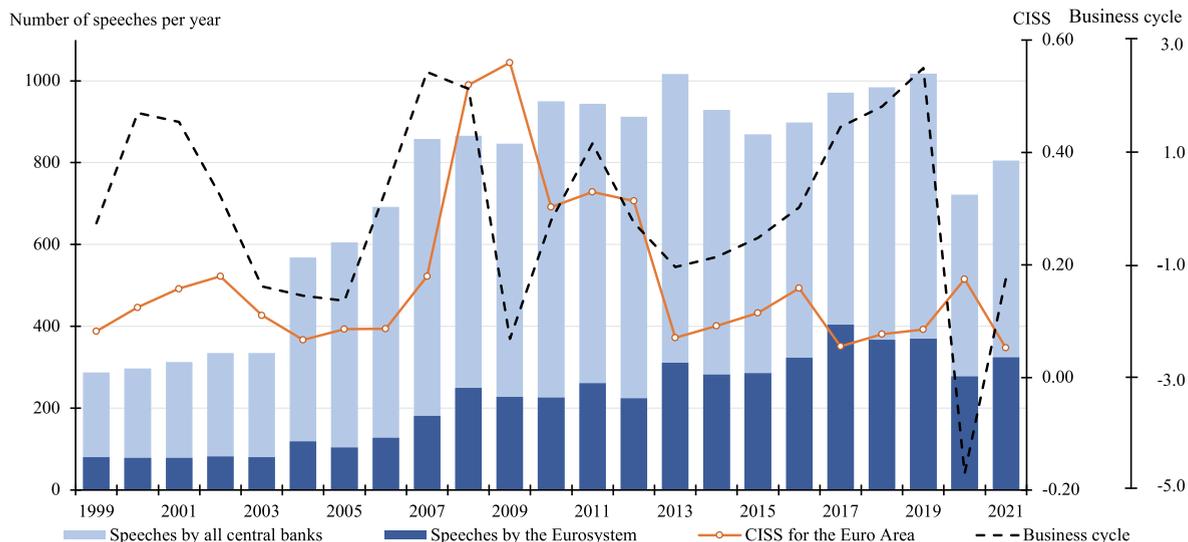


Fig. 2. Number of speeches per year, CISS, and Eurozone business cycles. Note: Business cycles are based on the GDP growth cycle as a percentage deviation from the trend. Source: Eurostat. <https://ec.europa.eu/eurostat/cache/bcc/bcc.html>.

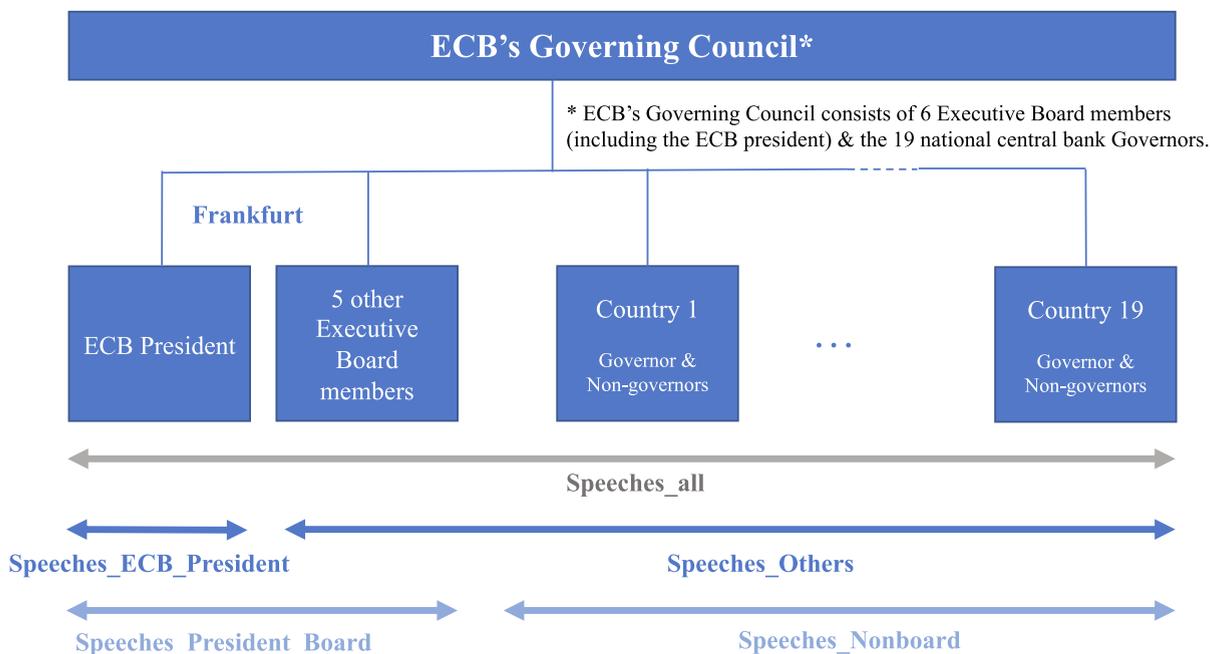


Fig. 3. Synopsis of speeches.

“Executive Board Member”. We also added a specification that restricted the search output to newswire reports. On average, eight newswire reports were found per speech. The correlation coefficient between the number of speeches and associated newswire reports is 0.80.

Second, and more importantly, an increase in speeches by the Executive Board is associated with a higher media presence of the ECB in the non-specialized media. To measure the latter, we performed a simple search query using the keyword “ECB” in Factiva, restricting sources to non-newswire reports so that the results are based on the coverage by traditional media such as The Times, The Guardian, The Daily Telegraph, etc. We restricted languages to either English or Eurozone languages. As presented in Fig. 6, we obtained a highly (at the 1% level) significant correlation coefficient between the log of the number of articles mentioning the ECB in the non-specialized media and Speeches_President_Board of +0.81, and +0.80 for Speeches_all. This suggests that speeches do indeed reach the public in the Eurozone through the intermediation of the media.

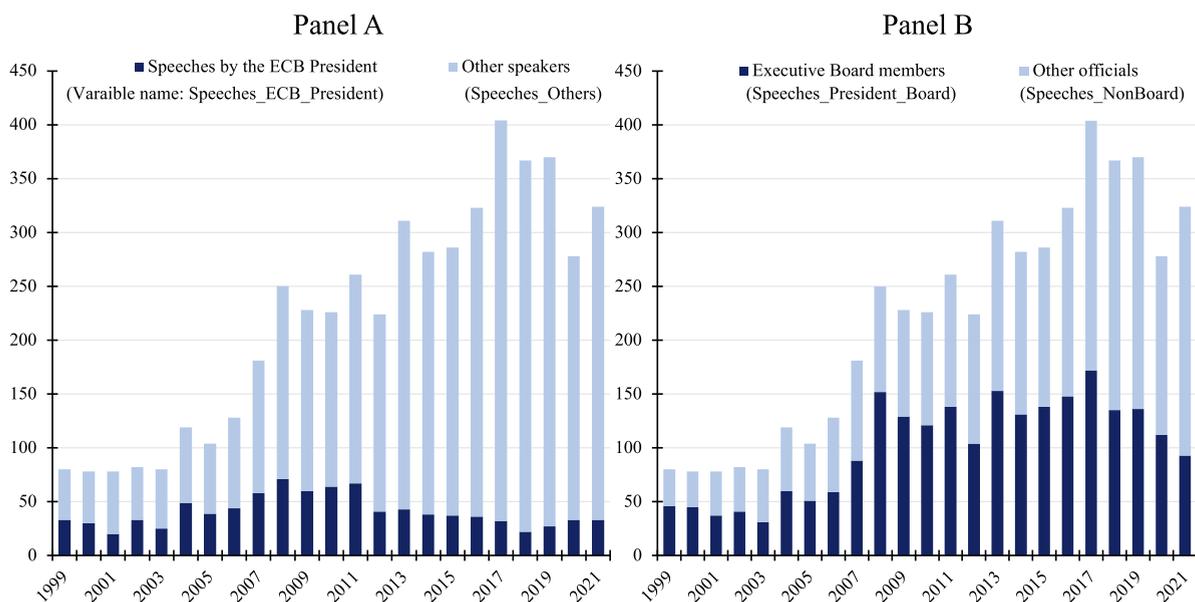


Fig. 4. Number of speeches per year by different groups of speakers.

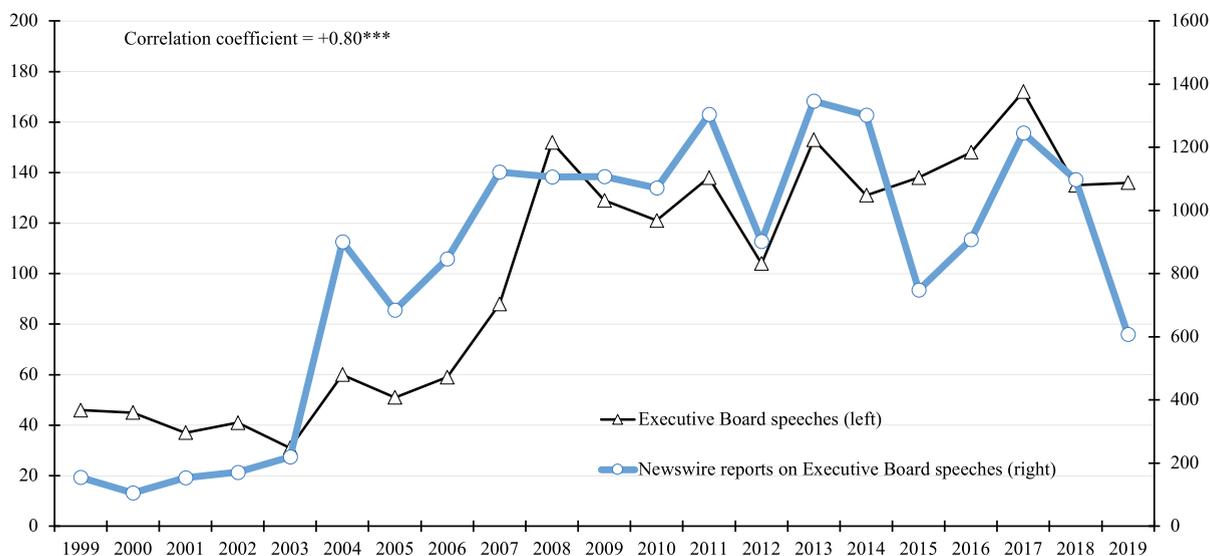


Fig. 5. Executive Board speeches and related newswire reports. Note: This figure shows that an increase in Executive Board speeches leads to an increase in newswire coverage of these speeches. Newswire reports were identified by entering search words in Factiva.

3.3. Other explanatory variables

In this section, we present variables other than speeches that may potentially influence peoples' trust in the ECB.

3.3.1. Variables related to the mandate

Price Stability Given that price stability is the overriding objective of the ECB, this is the first variable with a potential bearing on trust; we measure it by country-level inflation rates based on the harmonized index of consumer prices (HICP).

Employment and Growth As outlined above, according to the Treaty on the Functioning of the EU, the Eurosystem is also tasked with supporting the general economic policies in the EU with a view to contributing to the achievement of full employment and

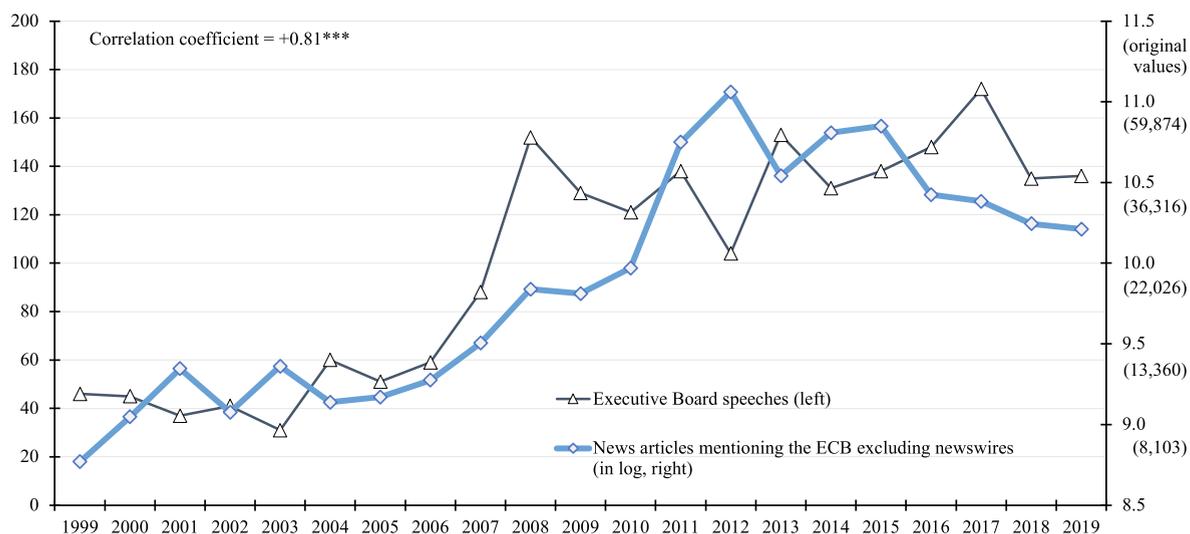


Fig. 6. Executive Board speeches and news articles mentioning the ECB. Note: This figure shows that an increase in Executive Board speeches leads to a higher media presence of the ECB in the non-specialized media. The latter is based on a simple search query using the keyword "ECB" in Factiva, restricting sources to non-newswire reports in English or all Eurozone languages.

balanced economic growth. We use three country-level variables to proxy the evolution of the real economy: GDP growth, a measure of the output gap, and the unemployment rate according to the International Labour Organization (ILO).

Financial Stability and Crisis Periods The ECB has two main tasks in the field of financial stability, one being the identification of risks to financial stability and the other the assessment of these risks.¹² A crisis can undermine trust by inducing the belief either that the central bank is responsible for the crisis or that it responded to it inappropriately.¹³ Both reduce the effectiveness of central bankers' communication. We construct a dummy variable intended to capture the GFC and European sovereign debt crisis and set it equal to one from 2008 to 2012 and zero otherwise. In addition, we use country-level crisis dummy variables based on Laeven and Valencia (2020) to capture banking, currency and sovereign debt crises.

3.3.2. Central bank transparency

Transparency is expected to enhance the effectiveness of central banks and increase their democratic legitimacy. The ECB, for example, maintains a web page headed "Transparency" stating that "the ECB gives a high priority to communicating effectively with the public. Transparency helps the public to understand the ECB's monetary policy. Better public understanding makes the policy more credible and effective. Transparency means that the ECB explains how it interprets its mandate and that it is forthcoming about its policy goals." Thus, transparency should be reflected in higher public trust. We proxy transparency by the updated index of Dincer et al. (2022), which is based on the classification introduced by Eijffinger and Geraats (2006) and is available up to 2019.

3.3.3. Convergence

As required by its founding treaties, the EU aims to reduce "disparities between the levels of development of the various regions and the backwardness of the least favoured regions." Increasing convergence has been a target of many policy proposals (Dolls et al. (2018)). Given its importance as a prerequisite for a stable Eurozone in the long term, economic convergence is likely to increase trust in the ECB. We measure economic convergence by five measures of distance to the eurozone's average. The first is given by the absolute difference in yields on long-term government bonds, the second by CPI inflation differentials, the third by unemployment rates, the fourth by differences in GDP growth, and the fifth by per capita Gross National Income (GNI) in 2015 USD.

3.3.4. Other financial and macroeconomic variables

Along with the *policy rate*, that is, the main refinancing operations rate, we include the *government debt ratio* (GovtDebtRatio) as measured by the ratio of general government gross debt to GDP. The European sovereign debt crisis and the ensuing discussions about monetization of public debts is likely to have taken a toll on trust in European institutions. In the same vein, we include *yields* (GovtBondYields) as measured by government 10-year benchmark rates, motivated by the (heated) discussions on yield spreads, which were imbued with the momentousness of a potential breakup of the Economic and Monetary Union (EMU) during the sovereign debt crisis, with likely repercussions on citizens' trust.

¹² <https://www.ecb.europa.eu/ecb/tasks/stability/tasks/html/index.en.html>

¹³ There is no developed theory predicting the behavior of trust in the central bank during a crisis. The vast majority of papers providing theoretical support for nonstandard monetary policy measures assume that crises and the ELB do not affect trust in the central bank (Levin et al. (2010)).

Following Ehrmann et al. (2013), we account for country-level *average stock prices* (Avg_Stock_Price). A well-performing stock market may be attributable, at least in part, to the central bank's successful steering of the economy and help build trust. Moreover, we take *broad money growth* (moneygr_euro) into account since overall liquidity in the economy affects citizens' financial situation and also consider the *exchange rate and its volatility* based on the domestic exchange rate to the U.S. dollar (exrate), its variance (var_exrate) and the coefficient of variance (var_coef_exrate). Further, we control for *market uncertainty*. Financial stress may reduce confidence in the ECB, as the ECB's tasks include safeguarding financial stability. We include a measure of financial stress, the country-level CISS (CISS_etry), which includes 15 raw, mainly market-based financial stress measures, which are split equally into five categories: the financial intermediaries sector, money markets, equity markets, bond markets and foreign exchange markets (Holló et al. (2012)).

3.4. Summary statistics

Table B.1 in the Online Appendix exhibits summary statistics of the variables used in this study, which covers the period 1999–2019. We limit our sample period to 2019 because the survey results in 2020 were affected by the COVID-19 pandemic.¹⁴ Panel A shows individual-level variables and Panel B country-level variables. The Eurobarometer survey that we rely on has about 488,000 observations. Details of individual-level variables are explained in Appendix A. Panel B shows mainly the number of Eurosystem speeches as well as summary statistics for macroeconomic variables. On average, more than 200 speeches per year were given by members of the Eurosystem ("Speeches_all"), approximately 40 by ECB presidents and approximately 100 each by the Executive Board ("Speeches_President_Board") and by members outside the Executive Board ("Speeches_Nonboard"). HICP inflation was on average 1.8%, close to the ECB's price stability objective. We further gather an unemployment rate (Unemp_ILO) of 8.7% on average but with a range from 1.8% to 27.5%. GDP growth averaged 2.1% but also exhibited large variation from −10.1% to 25.2%. The policy rate was on average 1.5%, while the debt ratio averaged 70.3% with a standard deviation of 36.4%. Government bonds yielded on average 3.7%, albeit with a wide variation between −0.2% and 22.5%. The CISS amounts to 0.19 and displays a standard deviation of 0.21. Overall, the data suggest quite large variations in macroeconomic variables.

Correlation matrices are also presented in the Online Appendix. As can be seen in Table C.10, the correlations among the individual-level variables are low. In contrast, Table C.11 exhibits high correlation coefficients among the macro variables, a common finding in the literature. Further analyses of our main regression results (Table 2) based on variance inflation factors (VIFs) indicate that multicollinearity is not an issue.

4. Regression analysis

For individual-level data, which is repeated cross-section data (that is, the respondents change in each survey wave), we estimate a linear probability model (LPM) at annual frequency (t). The overall structure is similar to that in Ehrmann et al. (2013). We use annual data because biannual macroeconomic data, coinciding with the frequency of trust data, are rarely used in everyday life or economic policy. We conjecture that citizens make their decisions about their trust in the ECB based on its annual performance.

$$Trust_{ijt} = \alpha_0 + \alpha_1 \cdot W_{ijt} + \alpha_2 \cdot Speech_{t-1} + \alpha_3 \cdot X_{jt-1} + c_j + year_t + \epsilon_{ijt} \quad (1)$$

$Trust_{ijt}$ is an indicator variable for whether respondent i in country j trusts the ECB. W_{ijt} captures individual-level control variables such as age, gender, marital status, employment status, years of education, political orientation, and the degree of life satisfaction. For macro variables, we use time-lagged values to alleviate the potential simultaneity problem. $Speech_{t-1}$ is the number of Eurosystem speeches in the previous year.¹⁵ X_{jt-1} is a vector of country-level macro variables such as HICP inflation and unemployment rates, and ϵ_{ijt} exhibits the error term. We further add country dummy variables (c_j) and survey year dummy variables ($year_t$) in Table 1 and Table 3. We mainly use clustered standard errors clustered at the country-period (biannual) level, which are in line with the frequency of trust data and robust to a heteroskedasticity issue. In the robustness analysis, we show that the estimated coefficients of LPM are nearly identical to the average marginal probabilities of a probit model.

For country-level data, we estimate the following fixed effect (FE) panel model.

$$Share\ of\ Trust_{jt} = \beta_0 + \beta_1 \cdot X_{jt-1} + \beta_2 \cdot Speech_{t-1} + c_j + u_{jt} \quad (2)$$

$Share\ of\ Trust_{jt}$ is the percent share of respondents trusting the ECB. X_{jt-1} is country-level macro variables lagged by one year. c_j is the unobserved time-invariant country effect, and u_{jt} represents the error term. While we use the above FE model as a baseline, in the robustness analysis, we add year fixed effects ($Year_t$) and also estimate a random effect (RE) model to check whether the results are similar to those of the baseline model.

5. Results

This section is divided into three subsections. In the first two subsections, we present our main and additional results. The third

¹⁴ In the robustness check, we show that the main picture remains unchanged if we extend the sample to 2020.

¹⁵ Our speech variable with country level variation (i.e. $Speech_{jt-1}$) in Table C.3 in the Online Appendix (variable Speeches_Baord_plus_Country).

Table 1
Trust and speeches.

	Trust in the ECB x 100 (Individual-level LPM)			Share of trust in the ECB (Country-level FE panel)	
	(1)	(2)	(3)	(4)	(5)
L.Speeches_all	-0.076*** (0.001)	-0.081*** (0.001)	-0.055*** (0.001)	-0.077*** (0.013)	-0.079*** (0.020)
Country FEs	No	Yes	Yes	Yes	Yes
Year dummies	No	No	Yes	No	Yes
Observations	488,183	488,183	488,183	317	317
Countries	19 (Eurozone)	19 (Eurozone)	19 (Eurozone)	19 (Eurozone)	19 (Eurozone)
R-squared	0.0241	0.067	0.0865	0.223	0.382

Notes: Standard errors clustered at the country-time (biannual) level in parentheses for columns (1) to (3) (Other types of robust standard errors give similar results). Heteroskedasticity and autocorrelation consistent robust standard errors in parentheses in column (4) and (5). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Constants are not reported.

The dependent variable of columns (1)–(3) is Trust in the ECB x 100. Share of trust in the ECB has a 0–100 scale. We take into account the changing country composition in the Eurozone over time. “L.” indicates that the variable is lagged by one year.

The notes of Table B.1 in the Online Appendix present the changes in the country composition of the Eurozone over time.

subsection looks into the effect of speeches during the GFC. All macro variables on the right-hand side are lagged by one year.¹⁶

5.1. Main results

Table 1 summarizes the evidence from regressions of the trust variable on the overall speech variable. In the first three columns the dependent variable is trust in the ECB x 100. In column (4) it measures the share of trust in the ECB. The results are unambiguous: More speeches from members of the Eurosystem lead to a significant reduction of trust in the ECB. The result in column (1) indicates that 100 additional speeches decrease the probability of trusting the ECB by 7.6 percentage points. The result in column (4), which is based on country-level data, similarly suggests that 100 additional speeches reduce the share of those expressing trust in the ECB by 7.7 percentage points. Even when based on different datasets and models (individual- vs. country-level data, LPM vs. FE model), the results are qualitatively identical. Column (3) and (5) show that adding country fixed effects (FEs) and year dummies does not change the qualitative result. Similar to Ehrmann et al. (2013), we do not correct for population or survey weights. Results of weighted regressions, however, show qualitatively similar outcomes.¹⁷

Table 2 reports the evidence for the different groups of speakers. Columns (1) to (3) represent the benchmark regressions. Columns (4) to (9) include additional macroeconomic and financial variables. As can unambiguously be seen, accounting for several other variables that could potentially influence the trust-building process does not change the main message. An increase in the number of speeches as a whole, those by the ECB presidents, those by the rest of Eurosystem speakers, and those of the Executive Board diminishes trust. The only speeches that do not exhibit this relationship are those by non-board members (those outside of the ECB’s headquarters). Further, trust in the EU Commission,¹⁸ more growth (partly)¹⁹, higher ECB transparency and a higher policy rate induce more trust, whereas higher public debt ratios and financial instability (CISS) reduce trust. Interestingly, the inflation record does not influence people’s trust. Results are similar when HICP inflation rates are replaced by CPI inflation rates. CPI inflation is also insignificant in all columns and the other coefficients remain virtually unchanged.²⁰ The improvement in the R2 from adding speeches is substantial. The overall R2 in column (1) is 0.622, larger than without the speech term (0.450), and the adjusted overall R2 in column (1) is 0.730 and also larger than without the speech term (0.666).²¹

The next set of regressions includes socioeconomic (micro) variables. Ehrmann et al. (2013) and Hayo and Neuenkirch (2014)

¹⁶ The results are similar when current-year macro variables are used. When current-year variables are used to explain trust surveyed in the second half of each year, the results are as follows: $\text{Trust_ECBx100} = -0.094^{***} \times \text{Speeches_all} + \text{constant}$ ($N = 237,401$; $R^2 = 0.040$). When individual-level characteristics are controlled for, the results are as follows: $\text{Trust_ECBx100} = -0.038^{***} \times \text{Speeches_all} - 0.176^* \times \text{HICP_inflation} - 0.729^{***} \times \text{Unemp_ILO} - 0.041^{***} \times \text{GovtDebtRatio} - 0.00003 \times \text{Avg_Stock_Price} - 1.928^{***} \times \text{Female} + \dots + \text{constant}$ ($N = 102,037$; $R^2 = 0.506$). Details are available upon request.

¹⁷ For example, results of column (2) of Table 1 change from -0.081^{***} to -0.096^{***} when population weights are applied. Results are available upon request.

¹⁸ Ehrmann et al. (2013) also noted a link between general support for EU institutions and trust in the ECB. We interpret trust in the EU Commission as trust in EU institutions in line with Ehrmann et al. (2013). Hayo and Neuenkirch (2014) based on a survey of German households and Hayo and Neumeier (2021) using a New Zealand survey raise the critical observation that measuring trust in specific institutions is not independent of their trust in other institutions.

¹⁹ The results are similar when Irish GDP data, which are known to have large variation, are dropped from the sample. The results are available upon request.

²⁰ Results with CPI inflation are available upon request.

²¹ Regressions without speeches are available upon request.

Table 2
Share of trust in the ECB (country-level FE panel, Eurozone with changing composition).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
L.HICP_Inflation	-0.156 (0.338)	0.134 (0.380)	-0.008 (0.367)	-0.327 (0.300)	-0.375 (0.351)	-0.379 (0.379)	-0.545 (0.358)	-0.379 (0.562)	-0.278 (0.547)
L.Unemp_ILO	-0.890* (0.507)	-0.757 (0.502)	-0.724 (0.489)	-0.684 (0.468)	-0.442 (0.484)	-0.346 (0.453)	-0.304 (0.447)	0.003 (0.363)	0.028 (0.349)
L.GovtDebtRatio	-0.267*** (0.065)	-0.304*** (0.063)	-0.301*** (0.061)	-0.167** (0.068)	-0.085 (0.065)	-0.126** (0.051)	-0.119** (0.055)	-0.156*** (0.034)	-0.148*** (0.039)
L.GDP_GrowthRate	0.599** (0.227)	0.441* (0.214)	0.373* (0.195)	0.625*** (0.186)	0.297 (0.173)	0.144 (0.107)	0.061 (0.125)	0.082 (0.235)	-0.014 (0.254)
L.Speeches_all	-0.040*** (0.009)			-0.024** (0.009)	-0.025** (0.009)			-0.037** (0.015)	-0.037** (0.016)
L.Speeches_ECB_President		-0.134*** (0.031)				-0.177*** (0.034)			
L.Speeches_Others		-0.033*** (0.009)				-0.006 (0.010)			
L.Speeches_President_Board			-0.122*** (0.020)				-0.115*** (0.018)		
L.Speeches_NonBoard			0.024* (0.014)				0.079*** (0.017)		
L.TRUST_EUCOM				0.362*** (0.110)	0.403*** (0.113)	0.463*** (0.113)	0.479*** (0.108)	0.442*** (0.109)	0.434*** (0.107)
L.Transparency_Index					1.870** (0.705)	1.920** (0.665)	0.363 (0.699)	-0.213 (1.260)	0.012 (1.302)
L.Policy_Rate					2.891*** (0.751)	3.236*** (0.668)	2.878*** (0.721)	0.737 (0.855)	1.150 (1.059)
L.GovtBondYields					-0.769 (0.463)	-0.279 (0.293)	-0.457 (0.297)	0.298 (0.229)	0.308 (0.242)
L.exrate								-3.837 (5.968)	-5.522 (6.426)
L.var_exrate								2.669 (4.150)	3.838 (4.468)
L.coef_of_var_exrate								-18.26 (26.95)	-19.21 (30.34)
L.moneygr_euro								0.360* (0.197)	0.315 (0.207)
L.output_gap								0.062 (0.221)	-0.040 (0.208)
L.CISS_ctry								-11.95** (4.06)	-13.78*** (4.29)
Crisis dummy (Country level)	No	No	No	No	No	No	No	No	Yes
N	317	317	317	306	283	283	283	154	154
Countries	19	19	19	19	17	17	17	11	11
R2 overall	0.622	0.608	0.616	0.740	0.781	0.801	0.806	0.790	0.794

Notes: Heteroskedasticity and autocorrelation consistent robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Constants are not reported.

Share of trust in the ECB has a 0–100 scale. “L.” indicates that the variable is lagged by one year. The results are similar after replacing HICP inflation rates by national CPI inflation rates which are also insignificant as HICP inflation exhibited in the table. Results with CPI inflation rates are available upon request. The notes of [Table B.1](#) in the Online Appendix present the changes in the country composition of the Eurozone over time.

showed that subjective and objective knowledge about the ECB is positively correlated with trust and credibility while trust in the ECB is related to trust in other European institutions. Likewise, ideology (Farvaque et al. (2017)) is reported to be related to trust in the ECB. Moreover, following Ehrmann et al. (2013), Farvaque et al. (2017), and Brouwer and de Haan (2022b) we examine the effect on ECB trust from people trusting in other European institutions.

As summarized in Table 3, the main message remains the same. Four different groups of speeches enter with a negative and highly significant coefficient. As in Table 2, presidents' and Executive Board members' speeches elicit a stronger reaction than those of other speakers. Speeches as a whole show a negative impact even after we control for country-level macroeconomic variables (column (6)) and individual-level expectation variables (column (7)). However, the positive interaction terms in column (7) indicate that the negative effect of speeches is reduced among individuals who believe that (i) their country's interests are respected and (ii) their voices count in the EU and who (iii) express satisfaction with democracy. By contrast, speeches from non-board members are no longer significant. The variable speeches from non-board members is the only speech variable that seems to be unstable.²² The other four speech variables are stable and convey the same message.²³

Table 3 further shows that older, married, more educated, politically more right leaning and more satisfied interviewees tend to trust the ECB. Trusting the EU Commission, having a positive image of the EU, having heard about the ECB, having knowledge of the EU, holding higher expectations for one's country's economy, expressing support for the euro, having the impression of one's voice counting in the EU and expressing satisfaction with its democratic processes also contribute to increasing trust in the ECB. In contrast, female, unemployed and retired respondents tend to have a more mistrustful attitude.

Finally, the results reported in column (8) of Table 3 include time dummies and country fixed effects. Results do not change.²⁴

Fig. 7 visualizes the regression result and corroborates the message conveyed in Table 3 by the fitted probability of trusting the ECB based on the first column of Table 3. An increase in the quantity of speeches per year steadily lowers citizens' probability of trust. While 100 speeches per year correspond to a trusting probability of approximately 70% (68.9%), 400 speeches per year lead to a drop in this probability to below 50% (47.1%). For this calculation, values other than speeches are held constant at the values of the median Eurozone respondent: a 48-year-old married and working female with 11 years of education, a political orientation of 2 (center), and degree of life satisfaction of 3 (fairly satisfied). The interval of the number of speeches is based on the descriptive statistics of Table B.1 in the Online Appendix (min=78, mean=233, max=404). The 95% confidence interval is very narrow because the regression is based on large number of observations (330,879), which drastically reduces the standard errors.²⁵

Table B.2 in the Appendix suggests that speeches produce a weaker negative effect on trust among individuals with a high education level, who arguably are more informed about central bank practices. Still, the overall impact is negative, as can be seen for example in column (1), where the sum of the two coefficients yields -0.036 . From these results, we surmise that it might not be sufficient to raise the education level to achieve the intended effect of raising the level of trust. A similar conclusion holds for knowledge on the EU. The better informed individuals are about the EU, the lower is the negative effect of Eurosystem speeches on trust, although, in sum, trust again suffers from more speeches. A similar result emerges from columns (5)–(8) in Table 3. Even when knowledge of the EU and awareness of the ECB (Heard_ECB) are controlled for, speeches have a significant negative sign, implying that speeches have channels through which they impact trust other than knowledge. The socioeconomic variables exhibit the same relationship with trust as in Table 3.

Hayo and Neuenkirch (2014) provided evidence that education may have a positive but nonlinear relationship with trust in the central bank. We account for this possibility by adding the square of years of education. Table C.7 in the Appendix shows a statistically significant nonlinear effect captured by the coefficient on the squared term. However, this effect can be well approximated by a linear relationship.²⁶

5.2. Speeches and knowledge of the ECB and EU

The Eurobarometer data provide a rather general proxy for knowledge about the ECB, namely, whether respondents have heard of the ECB. Research by Van der Cruijssen et al. (2015) and Brouwer and de Haan (2022a) showed that the public has very low objective knowledge about the ECB that has not changed over time. Therefore, the next question is whether the number of speeches in the five different groups of speakers impacts (i) people's knowledge of the ECB and (ii) their knowledge of the EU: The number of all Eurosystem speeches, speeches by the ECB presidents, speeches by other speakers excluding ECB presidents, speeches by the Executive Board's and speeches by non-board members. The results are reported in Table 4. The effect is the opposite of that on trust. In columns (1) to (4), all five different groups of speeches raise the number of individuals who have heard of the ECB. In addition, presidents' and

²² As can be seen in Table C.4, and Table C.6, Table C.7, Table C.8 and Table C.9 in the Online Appendix, the coefficient changes sign and significance.

²³ The coefficients relating to Speeches_all shown in Table 2 and Table 3 exhibit a range between -0.024^{***} and -0.08^{***} . Moreover, the range of these coefficients exhibited in Table 3 show partly a considerable variation. However, all are highly significant.

²⁴ Brouwer and de Haan (2022b) check how robust findings reported in the literature are.

²⁵ While the slope of Fig. 7 (-0.07) is based on column (1) of Table 3, other regressions exhibit similar coefficients on speeches, specifically columns (1) and (2) in Table 1 (-0.08), column (7) in Table 3 (-0.08), and the GMM estimation in Table B.4 in the Online Appendix (long-run effects on the percent (%) share: $-0.06 \sim -0.11$).

²⁶ The overall effect of education on trust based on column (1) is as follows: $1.68 \times \text{Education_Years} - 2.53 \times \text{Education_Years}^2/100$. The shape of this quadratic function within the sample range of years of education (2–27 years) is similar to a linear line.

Table 3
Trust in the ECB (individual-level LPM, Eurozone with changing composition).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	-2.40*** (0.24)	-2.40*** (0.24)	-2.41*** (0.24)	-2.41*** (0.20)	-1.71*** (0.20)	-1.74*** (0.20)	-1.47*** (0.27)	-1.45*** (0.24)
Age	0.03** (0.01)	0.03** (0.01)	0.02** (0.01)	0.08*** (0.01)	0.07*** (0.01)	0.05*** (0.01)	0.06*** (0.01)	0.04*** (0.01)
Married	1.25*** (0.26)	1.26*** (0.26)	1.32*** (0.27)	0.73*** (0.17)	0.38** (0.18)	0.87*** (0.17)	0.80*** (0.24)	1.01*** (0.23)
Education_Years	0.77*** (0.04)	0.76*** (0.04)	0.75*** (0.04)	0.37*** (0.03)	0.27*** (0.03)	0.23*** (0.03)	0.18*** (0.04)	0.01 (0.03)
Unemployed	-8.51*** (0.49)	-8.50*** (0.49)	-8.32*** (0.48)	-2.45*** (0.34)	-2.27*** (0.37)	-1.79*** (0.34)	-1.80*** (0.48)	-1.61*** (0.46)
Retired	-0.84** (0.37)	-0.83** (0.37)	-0.78** (0.37)	-0.88*** (0.28)	-0.70** (0.31)	-0.84*** (0.30)	-1.20*** (0.41)	-1.19*** (0.33)
Political_Orientation	2.67*** (0.30)	2.68*** (0.30)	2.71*** (0.30)	1.90*** (0.14)	1.99*** (0.16)	1.93*** (0.15)	2.25*** (0.20)	1.79*** (0.17)
Life_Satisfaction	10.95*** (0.38)	10.94*** (0.38)	10.86*** (0.38)	3.24*** (0.23)	2.96*** (0.26)	1.77*** (0.19)	0.51* (0.26)	0.48** (0.20)
L.Speeches_all	-0.07*** (0.005)			-0.04*** (0.003)	-0.05*** (0.004)	-0.04*** (0.004)	-0.08*** (0.011)	-0.06*** (0.009)
L.Speeches_ECB_President		-0.09*** (0.031)						
L.Speeches_Others		-0.07*** (0.005)						
L.Speeches_President_Board			-0.16*** (0.020)					
L.Speeches_NonBoard			-0.01 (0.015)					
TRUST_EuCommission				59.01*** (0.74)	59.01*** (0.83)	57.91*** (0.82)	53.83*** (1.05)	52.21*** (1.05)
Positive_EU_Image				5.91*** (0.18)	5.77*** (0.20)	5.78*** (0.19)	2.61*** (0.23)	3.31*** (0.20)
Heard_ECB					13.73*** (0.50)	13.58*** (0.47)	13.40*** (0.64)	13.73*** (0.60)
EU_KnowledgeScore					0.82*** (0.16)	1.06*** (0.15)	0.56*** (0.19)	1.13*** (0.17)
L.HICP_Inflation						0.47 (0.32)	1.38*** (0.44)	0.17 (0.41)
L.Unemp_ILO						-0.38*** (0.11)	-0.14 (0.15)	0.66*** (0.21)
L.GovtDebtRatio						-0.06*** (0.01)	-0.06*** (0.01)	-0.07* (0.04)
L.Avg_Stock_Price						0.00004 (0.0001)	-0.00003 (0.0001)	-0.00009 (0.0002)
Expectation_CountryEconomy							2.27*** (0.30)	2.05*** (0.23)
Expectation_PersonalJobSituation							-0.05 (0.28)	0.27 (0.27)
Expectation_FinancialSituation							-0.19 (0.30)	-0.15 (0.27)
Support_Euro							5.28*** (0.48)	5.16*** (0.43)
CountryInterest_Respected							-0.26 (1.32)	2.54*** (0.90)
MyVoiceCounts_inEU							1.64 (1.02)	1.04 (0.74)
DemocracySatisfaction_EU							1.88** (0.76)	2.80*** (0.59)
CountryInterest_Respected x L.Speeches_all							0.01*** (0.004)	0.01** (0.003)
MyVoiceCounts_inEU x L.Speeches_all							0.01* (0.003)	0.01*** (0.003)
DemocracySatisfaction_EU x L.Speeches_all							0.01*** (0.003)	0.01*** (0.002)
Year dummies & Country FEs								Yes
Observations	330,879	330,879	330,879	297,493	243,094	240,116	121,230	121,230
R-squared	0.0685	0.0685	0.0705	0.473	0.485	0.489	0.496	0.510

Notes: Standard errors clustered at the country-time (biannual) level in parentheses (Other types of robust standard errors give similar results). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Constants are not reported.

“L.” indicates a country-level variable lagged by one year. The dependent variable is Trust in the ECB x 100. Speeches have a negative outcome even when country-level macroeconomic variables (column (6)) and individual-level expectation variables (column (7)) are controlled for. The positive interaction terms in column (7) indicate that the negative effect of speeches is smaller among those who believe that their country's interests are respected in the EU and that their voices count in the EU and are satisfied with democracy in the EU.

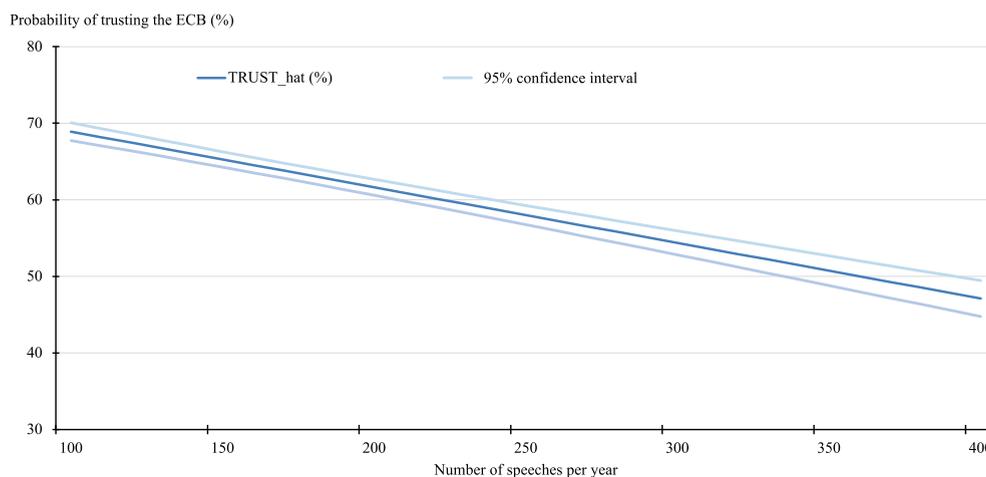


Fig. 7. Number of speeches per year and trust. Note: Confidence intervals are based on clustered standard errors clustered at the country-period (biannual) level. (Other types of standard errors give us narrower confidence intervals).

Executive Board members' speeches have a stronger positive effect than the other speeches. The level of knowledge about the EU also benefits from more speeches, as summarized in columns (5) to (8), with one exception: Speeches by representatives outside the headquarters in Frankfurt lower the EU knowledge score (column (8)). This is akin to the differential pattern of this group of speeches observable in Table 2.

Another result is that presidents' speeches again have a stronger effect than the other speeches, and speeches by the Executive Board elicit a stronger response than non-board members' speeches. One possible interpretation is that speeches by presidents and the Executive Board are more noticed in society than the other speeches. In this sense, they catch peoples' attention. All the same, these officials' message does not seem to be convincing and even tends to produce adverse reactions. We also note that socioeconomic variables play a similar role as in the regressions on trust, with two exceptions: While retired people are less likely to have heard of the ECB, retirement plays no role in the EU knowledge score. Similarly, voters on the political right are less likely to having heard of the ECB, whereas the political orientation does not influence the EU knowledge score.

5.3. Results with crisis dummy variable

The next question is about whether speeches during the GFC and European sovereign debt crisis affected trust beyond the baseline effect in normal periods. Table B.3 in the Online Appendix summarizes the evidence. Both speeches and their interaction with our crisis dummy (capturing the years 2008–2012) are significantly negative, implying that speeches had a negative impact in normal times that even strengthened during this crisis period.²⁷ Specifically, according to column (1), the inclusion of the crisis dummy variable in the regression on the benchmark macro variables leaves the negative relationship between speeches and trust unaltered. In columns (2) to (4), we additionally consider the interaction between the crisis dummy variable and the speech variable. The interaction terms exhibit a highly significant negative sign in columns (2) and (3), suggesting that the negative impact of speeches was stronger during the crisis period. This result is confirmed in column (4), which adds further regressors, although the effect is less significant but for a reduced number of countries.²⁸

6. Robustness analysis

Following Lustenberger and Rossi (2020) and Hwang et al. (2021), we argue that the number of speeches is a well-defined exogenous variable. For robustness, we relax this argument and employ the Arellano and Bover (1995, 1998) system GMM estimator. The system GMM estimator is an augmented form of Arellano and Bond (1991)'s difference GMM estimator, developed to resolve endogeneity problems of dynamic regressions, which uses lagged values of the explanatory variables as instruments. Moreover, the GMM estimator is a dynamic panel-data estimator allowing to control for possible persistence of trust. The regression writes

²⁷ Alternative dating of the crisis period yields similar results. They are available upon request.

²⁸ The estimated value of the crisis dummy variable is significantly positive in columns (2) to (4). However, this does not mean that the level of trust went up during the crisis. First, the estimated constant term decreases when the interaction terms are added. For example, the constant in column (1) without the interaction is 93.882, while the constant in column (3), which includes the interaction terms, is 86.053. Second, the crisis interaction terms are mostly negative (with one exception) and significant, which may mechanically push up the estimated value of the crisis dummy variable.

Table 4

Effect of speeches on "Heard of ECB" and "Knowledge of the EU" (Individual-level LPM, Eurozone with changing composition).

	Heard_ECB x 100				EU_KnowledgeScore			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
L.Speeches_all	0.04*** (0.0005)	0.03*** (0.0005)			0.0014*** (0.00001)	0.0013*** (0.00002)		
L.Speeches_ECB_President			0.06*** (0.004)				0.0101*** (0.0001)	
L.Speeches_Others			0.03*** (0.0005)				0.0016*** (0.00002)	
L.Speeches_President_Board				0.07*** (0.002)				0.0060*** (0.00007)
L.Speeches_NonBoard				0.003** (0.002)				-0.0019*** (0.00005)
Female		-5.30*** (0.11)	-5.30*** (0.11)	-5.29*** (0.11)		-0.2121*** (0.0033)	-0.2099*** (0.0032)	-0.2098*** (0.0032)
Age		0.07*** (0.005)	0.07*** (0.005)	0.07*** (0.005)		0.0029*** (0.0001)	0.0031*** (0.0001)	0.0031*** (0.0001)
Married		2.76*** (0.11)	2.75*** (0.11)	2.73*** (0.11)		0.0921*** (0.0034)	0.0873*** (0.0034)	0.0881*** (0.0034)
Education_Years		0.75*** (0.01)	0.75*** (0.01)	0.75*** (0.01)		0.0220*** (0.0004)	0.0227*** (0.0004)	0.0224*** (0.0004)
Unemployed		-2.11*** (0.25)	-2.13*** (0.25)	-2.20*** (0.25)		-0.0467*** (0.0070)	-0.0505*** (0.0070)	-0.0556*** (0.0069)
Retired		-1.82*** (0.17)	-1.82*** (0.17)	-1.84*** (0.17)		-0.0076 (0.0051)	-0.0083 (0.0051)	-0.0098* (0.0051)
Political_Orientation		-0.19*** (0.07)	-0.20*** (0.07)	-0.21*** (0.07)		-0.0010 (0.0022)	-0.0020 (0.0022)	-0.0024 (0.0022)
Life_Satisfaction		1.92*** (0.08)	1.92*** (0.08)	1.93*** (0.08)		0.0171*** (0.0024)	0.0197*** (0.0024)	0.0204*** (0.0024)
Positive_EU_Image		1.34*** (0.06)	1.35*** (0.06)	1.39*** (0.06)		0.0695*** (0.0018)	0.0727*** (0.0018)	0.0757*** (0.0018)
Observations	552,488	339,613	339,613	339,613	481,382	312,317	312,317	312,317
R-squared	0.0127	0.0444	0.0445	0.0452	0.0183	0.0633	0.0776	0.0782

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Constants are not reported.

This tables indicates that speeches increase Heard_ECB and EU_KnowledgeScore. Heard_ECB is an indicator variable. EU_KnowledgeScore (0–1–2–3 scale) is based on the number of correct answers to general questions about the EU. See Appendix A for details.

$$\Delta \text{Share of Trust}_{jt} = \gamma_1 \cdot \Delta \text{Share of Trust}_{jt-1} + \gamma_2 \cdot \Delta \text{Speech}_{t-1} + \gamma_3 \cdot \Delta X_{jt-1} + \Delta v_{jt} \quad (3)$$

The dependent variable is the first-differenced term of the share of trust. X_{jt-1} is a set of explanatory variables other than the number of ECB speeches. The term v_{jt} captures the error term. To resolve the endogeneity problem caused by the correlation between X_{jt-1} and Δv_{jt} , Arellano and Bover (1995) and Blundell and Bond (1998) proposed using X_{jt-3} and ΔX_{jt-3} as instruments for ΔX_{jt-1} , given that there is no second-order serial correlation in v_{jt} . The validity of the instrumental variable approach further requires orthogonality conditions, which can be tested by (difference) Hansen J tests.

Although in the GMM estimation we assume that the number of speeches is not exogenous as in the main analysis but endogenous, the GMM estimation results in Table B.4 in the Online Appendix confirm our findings from the main analysis in Section 5: Eurosystem speeches are a nontrivial factor weighing negatively on the trust-building process among citizens. A lower policy rate also leads to people reducing their trust placed in the ECB.

From these results, we can calculate the long-run effect of speeches on trust in the ECB. According to column (1), we obtain a value of -0.060 ($-0.016/(1-0.734)$), implying that 100 more speeches per year may decrease the share (%) of respondents expressing trust by 6 percentage points. From column (2), we derive a value of -0.114 ($-0.025/(1-0.780)$), which implies that 100 more speeches per year may decrease the share (%) of respondents expressing trust by 11 percentage points. From column (3), we obtain a value of -0.104 ($-0.049/(1-0.529)$). This means that 100 more speeches per year may decrease the share (%) of trust by 10 percentage points.²⁹ When a different type of dynamic panel model is estimated – a bias corrected dynamic model –, we again obtain a significant negative effect of speeches on trust.³⁰

Further corroborating results are provided in Appendix C.

²⁹ The difference in the coefficients seems to be related to differences in sample sizes.

³⁰ Results are available upon request.

7. Discussion and policy implications

The message of our paper is that giving fewer central bank speeches is material to the trust-building process in the Eurozone. However, what drives this result is not clear.

One possibility is that the growing complexity in policymaking and greater disagreement in the conduct of monetary policy after the GFC led to longer central banks' statements and the use of more difficult language, breeding mistrust (Coenen et al. (2017)). However, our results show that Eurosystem speeches have negatively affected trust throughout the last two decades (see Fig. C.1 in the Online Appendix) and the interaction terms between speeches and the Economic Policy Uncertainty Index are insignificant (see Table C.2 in the Online Appendix).

Another possibility is that communication was not tailored to the general public. Schnabel (2020) pointed to difficulties arising in the ECB's communication due to the complexity of its decisions and the fact that its communication has focused on market participants and monetary policy experts. In line with this conjecture we found that speeches produce a weaker negative effect on trust among individuals with high education level, suggesting that communication tailored to less educated strata of society may prove beneficial. Overall, though, more speaking activities causes a loss of trust even among more educated individuals. Interestingly, we found that more ECB speeches lead not only to a downgrade of public (households') trust but also draw negative responses among the business community in particular.³¹ This leads us to conclude that it is probably neither the language nor the complexity of issues treated in a speech that drive the results.

The most plausible account for our findings is simply the quantity of speeches which captures a central bank's presence in society. This gives rise to two related problems. On the one hand, more information disclosure may induce not more but less clarity and common understanding and "weaken support for a central bank" (Mishkin (2004)), as the amount of information that can be digested effectively is limited (Kahneman (2003), Sims (2003)). On the other hand, increasing the number of speeches bears the risk of cacophony, causing conveyed messages to be misinterpreted. This hypothesis is backed by the results for the total number of Eurosystem speeches, which exhibit the most stable and robust coefficients throughout this paper. The policy implication would be an improved coordination of speaking activities among various speakers. However, there are limits to this coordination. Country representatives are held accountable to their governments, parliaments and citizens. A tradeoff might arise between transparency, which is essential for a high degree of trust, and the alignment of views across countries.

8. Conclusion

After initially focusing on experts, central banks have more recently started to tailor their communications toward a more general audience. Central banks' process of widening and deepening their engagement with society through their communications has been instrumental for building trust in central banks and their credibility during good times and protecting their legitimacy and independence in bad times (Haldane (2017)). However, in recent years, trust in central banks has eroded despite a lot more communication effort. As emphasized by Haldane and McMahon (2018), with research on the impact of central bank communication on the public still in its infancy, further investigations would be valuable to establish its benefits and feasibility.

We add to this line of research by focusing on the role that central bank speeches, as one of a variety of central bank communication tools, play in affecting peoples' trust in the ECB, drawing on the Eurobarometer survey. We show first that more speeches imply a stronger presence of the ECB in society through the intermediation of the media. Second, and more importantly, we provide evidence that increasing the quantity of public speeches harms the trust-building process. What causes this effect is not clear. The most plausible explanation is people's limited capacity to process large amounts of information in a small amount of time combined with the problem of creating a cacophony of messages. This suggests that there is a need to coordinate both the *quantity* and content of central bankers' talks. Since we have focused on the quantity of speeches, the next important direction for future research is the analysis of their content. However, content analysis leads to a potential endogeneity problem which needs to be handled with due care. More research is called for if we want to improve our understanding of the underlying mechanisms that produce the unintended effects found in this study and help central banks achieve the objective of being "never taxed for speech".

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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³¹ See the working paper version of this study.

Appendices. Supplementary data

Appendix A, Appendix B and Appendix C can be found online at <https://doi.org/10.1016/j.jimonfin.2023.102916>.

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