

Central Bank Communication with the General Public

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Abstract

This paper surveys the literature on the role and effects of central bank communication with the general public, particularly regarding the formation of macroeconomic expectations. It starts by giving a brief overview of the recent “communication revolution” in central bank communication. The challenges for central bank communication with the public are outlined by surveying the evidence about low average knowledge on inflation and monetary policy in the population. Next, I evaluate the effects of direct communication, distinguishing between challenges to getting the attention of the public and effects of information on the public’s inflation expectations once attention is gained. Finally, I review the role of the media as transmitter of central bank communication to the public.

Acknowledgements

I thank Michael Ehrmann, Laetitia Lenel and one anonymous referee for insightful comments and Luca Strickrodt for excellent research assistance.

Keywords

Central bank communication, consumers, households, literature survey, RCT studies.

JEL Codes

E52, E58, D84.

1. Introduction

Central banks face a difficult task. Their mandate is to maintain price stability and, in some countries, to stabilize the economy over the business cycle. Since the global financial crisis of 2008, many central banks have been entrusted with additional tasks, such as the micro- and macroprudential supervision of banks (Gardt, et al., 2021). Moreover, in recent years central banks across the world have had to address multiple crises, from the global financial crisis to the recent surge in inflation. In order to fulfil their mandate faced with a limited set of monetary policy instruments, central banks use communication to guide and manage the economic expectations of the relevant agents in the economy.

The idea that communication with the aim of affecting economic expectations is a vital part of monetary policy-making emerged in the 1990s first in academia, and shortly thereafter started to be a part of monetary policy practice (Blinder, et al., 2008; Binder, 2017). This approach can be regarded as orthogonal to the previous view that central banks should be obscure and opaque in their communication. Therefore, the change in central banks' approach to communication has been termed a "*revolution in thinking*" (Blinder, et al., 2008, p. 1) or a "*communication revolution*" (Haldane, et al., 2021, p. 1).

Who are the relevant economic agents targeted by central banks' communication efforts? Before the financial crisis of 2008, central banks mostly focused their communication on financial market participants (Blinder, et al., 2008). These professionals follow central bank communication attentively, with asset prices reacting instantaneously to central banks' statements. Since the financial crisis of 2008, many central banks have increased their efforts to communicate with the general public, that is with firm managers and households (Blinder, et al., 2023). These agents act as price-setters, wage negotiators and consumers or savers and thereby shape both aggregate demand and inflation. However, and in contrast to financial market participants, members of the public tend to be less informed about macroeconomic relationships in general and about monetary policy in particular.¹ Thus, their expectations on future macroeconomic variables, such as inflation, are typically not formed in line with the rational expectations paradigm, instead being more heterogeneous and persistent.

So, can central bank communication achieve the goal of guiding and managing expectations in the face of an uninformed, and potentially uninterested, public? And should central banks aim for fine-tuning expectations or focus on communicating their targets more generally? This paper evaluates the challenges faced by central banks in this regard, pointing out the interlinkages between potential effects of central bank communication and the formation of macroeconomic expectations in the general public. In the second section, I discuss the theoretical interdependence between communication by the central bank and the formation of macroeconomic expectations by agents in the economy. In section 3, I give a brief overview of the historical evolution of central bank communication since the 1980s. Section 4 surveys the empirical literature on consumers' and firm managers' knowledge about inflation and monetary policy. Section 5 discusses the challenges faced by central banks in getting the attention of the public, and the evidence for potential effects of direct central bank communication with the public. Section 6 reviews the role of the media as transmitter of information between the central bank and the public, followed by the conclusion.

2. Theoretical Interdependence between Central Bank Communication and the Formation of Macroeconomic Expectations

In order for central bank communication with the general public to have any role in the transmission of policy impulses to the economy, we need at least two assumptions: First, we have to assume imperfect competition in goods and labour markets, such that firms gain price-setting power and wages are negotiated by employers and employees, rather than set by the market. Second, we have to assume price rigidity, such that firms setting prices have to form expectations about future macroeconomic outcomes. Both assumptions are confirmed in the data and included in New Keynesian macroeconomic models, which have become the workhorse model in both academia and central banks since the late 1990s (Clarida, et al., 1999).

Under imperfect competition and price rigidity, macroeconomic expectations then take on a crucial role for both current and future macroeconomic outcomes. A central question, also for the effectiveness of economic policy changes, then concerns the formation of macroeconomic expectations. Most macroeconomic models, including the New Keynesian baseline model, assume that economic agents form expectations rationally, that is under full information, agreeing on one correct macroeconomic model – including full knowledge about the central bank’s policy rule – and with the ability to use both for their macroeconomic forecasts. As discussed in Braun (2015) and Lenel (2023), communication by central banks about their objectives and their instruments, such as the policy rate, provided the informational basis necessary for the formation of rational expectations in the first place.

However, as pointed out by Blinder, et al. (2008) as well as Braun (2015), in a stationary economy with only stochastic shocks and a central bank credibly committed to an unchanging and publicly known policy rule, any further central bank communication would be superfluous if agents had rational expectations, because any central bank reaction would already be fully anticipated. The discussion about the potential merits of central bank communication is thus contingent on the formation of macroeconomic expectations by the agents in the economy, thus, by the general public.

The empirical evidence in this area consistently rejects the rationality of macroeconomic forecasts by consumers or firm managers even with detailed information about monetary policy widely available (see, amongst many others, Souleles, 2004, Coibion & Gorodnichenko, 2012 and Coibion, et al., 2018). Consumers as well as firm managers display large heterogeneity in their inflation expectations and are often uninformed about monetary policy (Coibion & Gorodnichenko, 2012; Kumar, et al., 2015). Even professional forecasters are prone to behavioural biases, such as herding, which cause deviations from full rationality in their expectations (Pons-Novell, 2003).

Instead, there seems to be evidence in favour of macroeconomic expectation formation under imperfect information (Coibion & Gorodnichenko, 2012; Dräger & Lamla, 2012; Dräger & Lamla, 2017), in line with theories of rational inattention (Sims, 2003; Maćkowiak & Wiederholt, 2009; Maćkowiak, et al., 2023). Under rational inattention, economic agents do not have full information, but must choose where to allocate their attention due to a limited capacity for processing information. Particularly in times of low and stable inflation, there is little benefit from devoting precious attention to aggregate inflation. But this may change either when inflation is high or when information is more easily obtained. Evidence from

survey experiments supports this theory, since both consumers and firm managers tend to adjust their inflation expectations towards the information provided when they are presented with information treatments on current or projected inflation or the inflation target (Kumar, et al., 2015; Binder & Rodrigue, 2018; Coibion, et al., 2022; Dräger, et al., 2023).

With macroeconomic expectations formed under rational inattention, central banks can influence the macroeconomic expectations of economic agents by explaining the central bank's objectives and its views on the current macroeconomic stance and by providing information on the monetary policy path. In that sense, successful communication could remove (part of) the attention friction and, thereby, move macroeconomic expectations closer to the rational expectations benchmark. This may help to increase the speed of an otherwise notoriously slow transmission process from monetary policy impulses to the real economy: If central banks communicate the path of monetary policy rates in advance, interest rates on financial markets will adjust faster, leading to a faster adjustment in aggregate demand and, ultimately, inflation. However, this channel hinges crucially on the communication reaching the intended audience and on the audience's understanding of the message. Moreover, as pointed out by Blinder, et al. (2023), attempting to guide the macroeconomic expectations of the public using forward guidance carries the danger of having to revert on the previously announced policy path if the central bank's projections are not realized. This could harm the public's trust in the central bank and its credibility.

Another important aspect of central bank communication focuses on explaining the general objectives of monetary policy and aims at anchoring inflation expectations close to the inflation target by informing about and credibly committing to the target. If the central bank's inflation target is credible, economic agents' medium-run inflation expectations remain anchored at the target even if the economy is hit by transitory supply shocks, such as energy or food price hikes. Trust in the institution may be an important aspect in this regard. Finally, as pointed out by Gardt, et al. (2021), central bank independency without direct democratic control calls for more central bank transparency and communication as a means of remaining accountable to the general public.

3. The historical evolution of central bank communication

Historically, central banks communicated only in opaque ways with the aim of maintaining degrees of freedom by remaining obscure about the monetary policy targets as well as the instruments. For instance, the Federal Reserve (Fed) started only in February 1994 to publish its target for the federal funds rate, its main refinancing rate. This approach to central bank communication is demonstrated by the famous quote from Alan Greenspan, chairman of the Federal Reserve from 1987-2006: *"If I seem unduly clear to you, you probably misunderstood what I said."* (Greenspan, 1987, as quoted in the Guardian on November 4, 2005).

The move towards a more transparent communication started in many central banks in the 1990s (Binder, 2017). As described by Blinder, et al., (2008), the change in central bank communication was motivated by the emerging new consensus that a more transparent communication would enhance the efficiency of monetary policy. At the same time, this increased the accountability of the institution, an important aspect of independent central

banks (Blinder, et al., 2023). Major central banks across the world introduced communication instruments such as the publication of central banks' forecasts, publication of votes in monetary policy meetings, publication of statements explaining the monetary policy decision, forward guidance on future policy rates, press conferences after policy meetings, and the publication of numerical inflation targets. However, central bank communication was solely targeted at expert audiences, such as financial market participants or professional forecasters (Blinder, et al., 2008). These experts follow every monetary policy decision or statement attentively, leading to instantaneous effects on asset prices when policy decisions are announced.

After the large economic disruptions caused by the global financial crisis in 2008/09, another major change in central bank communication emerged: Central banks increasingly aimed their communication efforts at the general public, that is laypersons as opposed to experts. As pointed out by Binder (2017) and Blinder, et al., (2023), this had several reasons: First, the economic crises moved central banks into the public debate, making it necessary to explain policy actions also to a non-expert public. Second, unconventional instruments used by central banks when nominal interest rates were close to zero (the so-called effective lower bound for interest rates) made monetary policy more complex and more controversial, thus calling for more communication to convince the public that central banks were acting within their mandate. Third, at the effective lower bound and with inflation below target in many countries after the financial crisis², using communication to steer the inflation expectations of consumers and firms in theory becomes a potential way to increase aggregate demand, and thereby actual inflation (Clarida, et al., 1999): With nominal interest rates at zero and inflation below target, convincing the public that monetary policy will bring inflation back to target in the future, increases inflation expectations, leading to a fall in the real interest rate. This raises aggregate demand, which in turn will fuel inflation.

Communicating with the general public necessarily needs to address the different aspects of monetary policy as an economic and a policy institution and, consequently, the different roles of members of the public as both economic actors and citizen. The following quotes from central bankers demonstrate their willingness to communicate with the public and address these different roles:

“The effects of monetary policy depend critically on the public getting the message about what policy will do months or years in the future.”

(Janet Yellen as Chairwoman of the Fed, 2013, in a speech at the Society of American Business Editors and Writers' 50th Anniversary Conference)

“The ECB needs to be understood by the markets that transmit its policy, but it also needs to be understood by the people whom it ultimately serves. People need to know that it is their central bank, and making its policy with their interests at heart.”

(Christine Lagarde as president of the European Central Bank (ECB), 2019, in her Opening Statement to the Economic and Monetary Affairs Committee of the European Parliament)

Communicating with the general public, however, poses several new challenges: First, other than experts, households and firms usually do not listen attentively when the central bank talks. Monetary policy and inflation are typically not top priorities in people's daily life decisions, even though they affect important economic outcomes, such as the real returns of

private retirement provisions or real interest rates on mortgages. For instance, on average between January 1980 and January 2023, only 5% of the economic and business news from the last three months recalled by US consumers surveyed in the University of Michigan’s Survey of Consumers is related to prices and inflation. Including news about other monetary variables, such as credit, interest rates or the dollar value, this share increases to 15% on average (see Figure 1). However, the degree of (in)attention changes dramatically when inflation increases strongly: When inflation accelerated in most industrial economies at the end of 2021, indexed google searches for “inflation” spiked in Germany, the US and Canada (Blinder, et al., 2023). Similarly, the share of consumers reporting having heard news about prices or inflation in the University of Michigan’s Survey of Consumers reached a local maximum of 29% when recent US inflation peaked in June 2022.

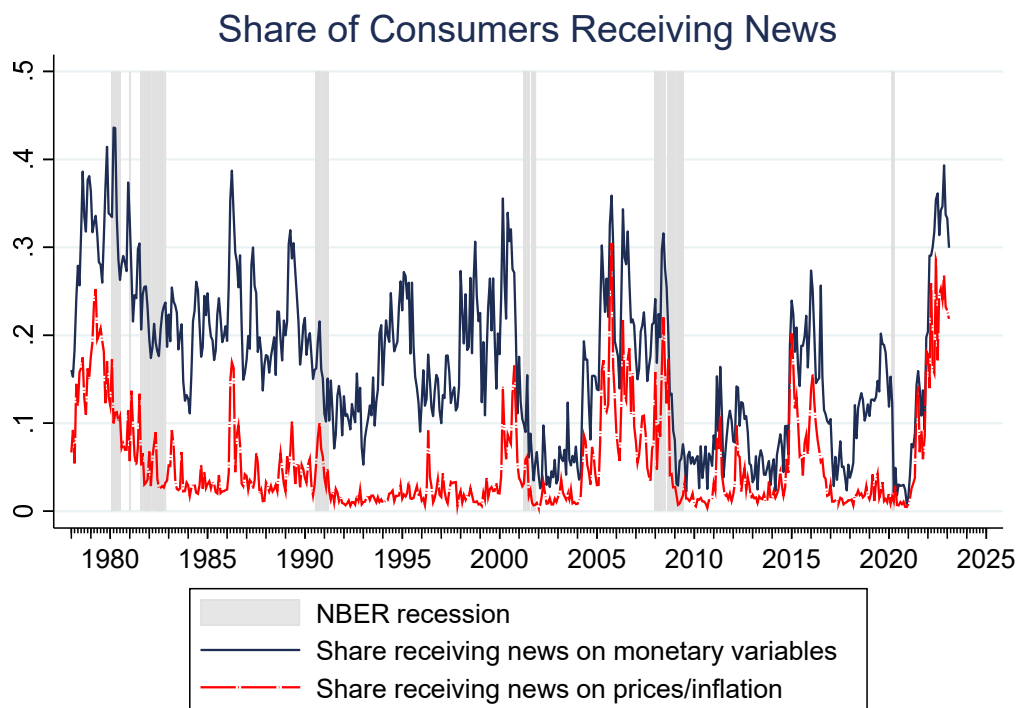


Figure 1. Share of respondents in the University of Michigan Survey of Consumers reporting having heard news on monetary variables or on prices and inflation, author’s own calculations.

Second, even if a message by the central bank is received by the public, laypersons often have difficulties understanding it. The workings of monetary policy and the transmission of its impulses on the macroeconomy are complex. Average knowledge about both the concept of inflation and about the targets and instruments of monetary policy in the population tends to be low (Blanchflower & Kelly, 2008; Candia, et al., 2020; Dräger & Nghiem, 2023). On top of that, typical central bank publications like inflation reports require very advanced reading abilities. For instance, the readability of ECB speeches, as measured by the Flesch-Kincaid Grade Level score indicating how many years of formal schooling are required to understand the text, has fallen only slightly over time and remains high at a score of about 11 years (Gardt, et al., 2021; Ferrara & Angino, 2022). Similar evidence exists for the Fed and the Bank of England publications (Binder, 2017; Haldane & McMahon, 2018; Haldane, et al., 2021). As Andrew Haldane, then Chief Economist at the Bank of England, said in a speech in

2018: “around 95% of all the words central banks utter are inaccessible to around 95% of the population.” Central bankers thus have to find new ways of communicating with laypeople that differ from the established communication with experts.

In order to intensify their communication efforts with the general public, central banks across the world introduced new forms of communication (Blinder, et al., 2023): Almost all central banks have a website including information targeted at layperson audiences, and often publish educational material on monetary policy and inflation for use in schools. Some central banks, such as the Bank of England and the ECB, have started to publish so-called “layered communication”, where monetary policy changes are explained in simple terms and using graphical illustrations for the public, with more detailed information available for experts. Central bankers give more speeches and interviews at diverse institutions or for diverse media outlets, including online media and podcasts, and publish them on their websites (Gardt, et al., 2021). In addition, many central banks are active on social media, mainly on Twitter and YouTube.

Moreover, the ECB, the Bank of England and the Fed introduced so-called “listening events”, such as the Bank of England’s “Citizens Panels”. In these events, members of the public meet with central bankers to discuss their views on monetary policy or how they are affected by certain shocks, such as the COVID-19 pandemic. The ECB and the Fed subsequently incorporated this feedback into their recent strategy review processes. Haldane, et al. (2021) discuss tentative evidence that this form of direct engagement with the public may boost trust in the central bank in addition to fostering an understanding of monetary policy and the central bank as an institution. At the same time, the authors stress the potential danger that this type of event may generate exaggerated expectations that the central bank may take the public’s feedback into account in their policy decisions and subsequent disappointment and loss in trust when this is not the case.

4. What does the general public know about inflation and monetary policy?

This section surveys the empirical evidence about households’ or firm managers’ knowledge about inflation, central banks and monetary policy. Overall, the verdict is clear and seems discouraging for any central bank aiming to communicate with the general public: On average, both consumers and firm managers display low knowledge about the concept of inflation or recent inflation rates, the current central bank’s monetary policy committee and its leaders, the inflation target or the way that interest rates affect inflation (Blanchflower & Kelly, 2008; van der Cruijssen, et al., 2015; Kumar, et al., 2015; Coibion, et al., 2018; Binder & Rodrigue, 2018; Hayo & Neumeier, 2020; Haldane, et al., 2021; Candia, et al., 2021; Coibion, et al., 2022; Dräger & Nghiem, 2023).

For instance, in a Dutch consumer survey, on average only 45% of a set of knowledge questions about monetary policy were answered correctly (van der Cruijssen, et al., 2015). Moreover, consumers often think they know more about inflation and monetary policy than they actually do (van der Cruijssen, et al., 2015; Mellina & Schmidt, 2018; Binder & Rodrigue, 2018). Similarly, consumers are uninformed about monetary policy objectives and frequently think inflation targeting central banks are in fact targeting the exchange rate or financing the government (Mellina & Schmidt, 2018; Coibion, et al., 2023a). Surveying US

firm managers, Candia, et al. (2021) report that only one third of managers answered the question about the Fed's inflation target, and of these only 50% correctly identified the target as being in the range between 1.5-2.5%. Firm managers in New Zealand seem similarly uninformed about their country's inflation target, despite New Zealand being the first country to adopt a strategy of inflation targeting including an official inflation target (Kumar, et al., 2015; Coibion, et al., 2018). Dräger, et al. (2016) show that about 52% of US consumers correctly distinguish between real and nominal income expectations, but only 30-40% form macroeconomic expectations in line with a Phillips curve or a Taylor rule (the latter being in line with evidence in Carvalho & Nechio, 2014). Moreover, Dräger, et al. (2022) present evidence that consumers with the same level of inflation or interest rate expectations disagree strongly whether the expected rate is appropriate for the economy or whether higher or lower rates would be preferable.

In line with the persistent heterogeneity in consumers' inflation expectations across socio-demographic groups that is discussed in many studies³, knowledge about inflation and monetary policy also varies across socio-demographic characteristics (Blanchflower & Kelly, 2008; Burke & Manz, 2014; van der Cruijssen, et al., 2015). Not surprisingly, the groups that typically perform worse in predicting inflation, such as females, those with lower income or education or those with lower social status, also display lower knowledge about inflation and monetary policy in general.

While knowledge is generally low, the majority of respondents in consumer surveys also expresses a low desire to be informed about monetary policy and states that they inform themselves only rarely or never (Hayo & Neuenkirch, 2014; van der Cruijssen, et al., 2015). Low attentiveness towards inflation or monetary policy seems to be a stable result, at least during times of low and stable inflation rates. For instance, Binder (2017) reports that the share of "don't know" answers to the question about quantitative long-run inflation expectations in University of Michigan Survey of Consumers in the US was roughly constant around 12-15% between 1985-2016.

So, why should central banks bother to communicate with a public that clearly has little interest in being informed? In other words, should central banks aim to overcome the inattention of the public, even if it may be "rational" in the sense that the majority shows little desire to become better informed? First, as pointed out by Haldane, et al. (2021), informing the public about its monetary policy decisions is an important part of the accountability of an independent central bank that is not directly subject to democratic votes. Indeed, there is evidence in several studies that better knowledge about the central bank or monetary policy coincides with a stronger trust in the central bank: Hayo & Neuenkirch (2014) report a positive correlation between German consumers' trust in the ECB and their knowledge about monetary policy as well as their desire to be informed about it. Hayo & Neumeier (2020) find that consumers in New Zealand, who are better informed about the institutional set-up of monetary policy, are more likely to support central bank independence. Similarly, Jost (2017), Haldane & McMahon (2018) as well as Haldane, et al. (2021) report that better knowledge about monetary policy in the Bank of England's Inflation Attitude Survey coincides with higher satisfaction with the Bank's policies. In a survey experiment, Dräger & Nghiem (2023) show that randomly providing German survey participants with general information about inflation and monetary policy leads to a significant increase in trust in both the ECB and the German Bundesbank. However, as pointed out by van der Cruijssen, et al.

(2023), maintaining trust in the central bank has become more difficult with the recent high inflation rates hurting consumers' purchasing power.

Second, the correlation between literacy and trust in the central bank is important not just because of accountability or credibility reasons, but also because both literacy and trust in turn correlate with inflation expectations: Better informed consumers or firm managers on average give more accurate inflation predictions (Blanchflower & Kelly, 2008; van der Crujisen, et al., 2015; Mellina & Schmidt, 2018; Kumar, et al., 2015; Haldane & McMahon, 2018) and are better able to incorporate information provided in an incentivized lab experiments into their forecasts (Burke & Manz, 2014). Some caution to this result is given by the survey experiment conducted by Dräger and Nghiem (2023): Treating a random subsample with general information about inflation and monetary policy is found to significantly raise those respondents' knowledge as well as trust in the central bank. Moreover, it increases the likelihood of providing inflation forecasts, but does not affect the level of forecasts relative to the control group. At the same time, learning that current inflation is high, lowers trust in the central bank more for those who received the general information.

In a recent survey covering several large euro area economies, Stanislawska and Paloviita (2021) find that medium-run inflation expectations 3 years ahead are less responsive to changes in short-run inflation expectations 12 months ahead, thus more "anchored", if respondents display high levels of trust in the ECB. Analysing data from a survey among consumers in all euro area countries, Farvaque, et al. (2017) report individual inflation expectations to be a main factor determining trust in the ECB. Similarly, Rumler and Valderrama (2020) show that inflation expectations by Austrian consumers correlate both with knowledge about inflation and with trust in the central bank. Haldane & McMahon (2018) as well as Haldane, et al. (2021) point out that the relationship between trust and inflation expectations is non-linear, implying that the highest gains in terms of more accurate inflation expectations could be realised by targeting those with the lowest trust.

Third, both consumers and firm managers adjust their inflation forecasts towards quantitative information provided in survey experiments, such as information about current or projected inflation or on the inflation target (Kumar, et al., 2015; Binder & Rodrigue, 2018; Coibion, et al., 2022; Dräger, et al., 2023). This suggests that if central banks manage to gain the public's attention, guiding their inflation expectations would be possible.

Finally, even uninformed consumers or firm managers may react to their inflation expectations when forming decisions on consumption and saving (Dräger & Nghiem, 2021; Duca-Radu, et al., 2021; Crump, et al., 2022; Coibion, et al., 2023b) at the household level or on employment and investment at the firm level (Coibion, et al., 2018; Coibion, et al., 2020).

Overall, thus, the evidence suggests that potentially much could be gained from central bank communication with the general public, but also that many challenges exist to overcome existing illiteracy and inattention.

5. The channels of central bank communication with the general public

The high levels of illiteracy and inattention discussed in the previous section cause severe problems for central banks aiming to communicate with the general public, the so-called "receiving end" of central bank communication (Gardt, et al., 2021; Blinder, et al., 2023).

Nevertheless, reaching the public is crucial for central banks to address the observed “twin deficit” of trust and understanding, as argued by Haldane & McMahon (2018).

In this section, I thus review the empirical literature on direct central bank communication with the public, distinguishing between the evidence on how to raise attention in the public, and the evidence on the effect of information communicated, once attention is generated.

5.1 The “attention” channel of central bank communication

With the recent intensification of central banks’ attempts to communicate with the general public, can we observe that monetary policy institutions are able to reach the public? Lamla and Vinogradov (2019, 2021) survey representative samples of US and British consumers in the two days before and after each country’s central bank’s press conference following a policy meeting. The authors report that, on average, respondents surveyed after the press conference do not give significantly different predictions of current and future inflation or interest rates. In that sense, central bank communication does not seem to be able to generate sufficient attention in the general public, or present sufficiently new information, to affect inflation expectations. This result is confirmed by De Fiore, et al. (2021) in a similar analysis using the New York Fed’s Survey of Consumers’ Expectations. The authors do report, however, that consumers’ interest rate expectations adjust significantly after monetary policy announcements. A potential problem might be the large observation window of 21 days before and after announcements in their analysis, which makes it more difficult to claim causal effects from policy announcements. Enders, et al. (2019) conduct a related study on German manufacturing firms, which are surveyed in the four-working-day-window around the monetary policy announcement. Their study focuses on monetary policy surprises and shows that firms significantly adjust expectations regarding their own production and prices after small monetary policy shocks, but not after large shocks.

While Lamla & Vinogradov (2019, 2021) find no effect from monetary policy announcements on average inflation expectations, the authors report for both the US and the UK surveys that consumers are significantly more likely to report having heard news about the central bank after the policy meeting. Those that did receive the news communicated by the central bank, consequently gave more accurate inflation predictions and were more confident in their forecast. In that sense, central banks were able to have an effect on consumers’ macroeconomic expectations, provided that the hurdle of getting their attention was overcome. Moreover, Lewis, et al. (2020) report in a different daily survey that surprises to the Federal Funds target rate between 2008-2017 have instantaneous and persistent effects on consumers’ beliefs about the current and future state of the economy, thus suggesting that a sufficiently large fraction of households is attentive to changes in monetary policy instruments. It should be noted, however, that the authors’ measure of consumer confidence relates to very broad and qualitative beliefs, rather than quantitative forecasts.

Coibion, et al. (2023) evaluate the impact of the announcement of the Fed’s change to the new monetary policy strategy of “average inflation targeting” (AIT) on August 27, 2020, on US consumers using a daily survey administered by the Federal Reserve Bank of Cleveland.⁴ The evidence presented by the authors seems discouraging: Even though the new monetary policy strategy was widely reported in the media, the share of consumers who reported having heard news about the Federal Reserve rose only slightly on the day of the announcement. Importantly, those that do report hearing news are not more likely to correctly

identify the new strategy and do not form different macroeconomic expectations. Even after one year, the share correctly identifying the strategy as AIT rises from 23% after the announcement to only 30%. By contrast, Hoffmann, et al. (2023) conduct a similar, but hypothetical, experiment about AIT with German consumers and report significant differences in posterior inflation forecasts when consumers are asked to assume different monetary policy strategies, where the sign of the differences suggests that participants understand the dynamics of inflation under AIT.

A potential means of direct communication between central banks and the general public is the use of social media. Indeed, most central banks are nowadays active on social media channels such as Twitter or YouTube. Ehrmann & Wabitsch (2022) evaluate both English and German ECB-related traffic on Twitter (now called X). The authors identify experts and non-experts active on Twitter and show that different types of ECB communication is able to generate some attention in social media, also with respect to the non-expert audience. Importantly, those non-experts that do react to ECB communication, subsequently write more factual tweets about the topic. However, attention is generally relatively low and short-lived, with the exception of press conferences after policy meetings and especially the famous “whatever it takes” speech by former ECB-president Dr. Mario Draghi delivered at the height of the European Sovereign Debt crisis, which generated a pronounced and longer-lived discussion on Twitter.⁵ Haldane, et al. (2021) show that the introduction of the simpler “Visual Summary” in the Bank of England’s new “layered communication” strategy reporting on its inflation report increased traffic on its website by 100%. At the same time, tweets about the Bank’s inflation report increased and the Twitter network of the Bank of England became more dispersed. These optimistic results are somewhat dampened by the findings in Lamla & Vinogradov (2021), who report that only a small fraction of British consumers in their survey states that they follow the Bank of England on Twitter. Even though these consumers express a higher confidence in their forecasts, they actually provide less accurate expectations, suggesting overconfidence in this sub-group.

Complementary to these results, Ferrara & Angino (2022) present evidence that clearer ECB communication in terms of readability is reflected in more media coverage and a higher Twitter engagement rate. In line with the evidence presented by Tillmann & Walter (2019), there is some difference in tone in the Twitter discussion after the “whatever it takes” speech in English and German Twitter traffic. Analysing the tone of speeches by the ECB and the Bundesbank presidents, Tillmann & Walter (2019) show that divergences in tone between negatively vs. positively connotated speeches can persist within the Eurosystem. This “cacophony problem” may endanger the clarity of central bank communication and is found to affect policy uncertainty and macroeconomic dynamics.

Overall, the empirical studies discussed reiterate on the problems central banks face in reaching the general public. On a more hopeful note, there is evidence that central banks are successful in raising a certain degree of attention.

5.2 The “information” channel of central bank communication

Once attention is generated, which type of communication or information is best able to guide macroeconomic expectations in the general public? This is the research question evaluated by a large literature, often using survey experiments with randomly provided information treatments (randomized control trial, RCT) to generate causal evidence. Due to

the inherent endogeneity of all macroeconomic relationships, causal effects of monetary policy communication on macroeconomic outcomes can only be identified under theoretical assumptions. By contrast, survey experiments provide a method to measure the causal effect of central bank communication pieces, which are randomly provided to a treatment group within a representative sample of the public, on respondents' beliefs and their stated economic choices regarding consumption and saving. These RCT studies thus identify the immediate effect of communication. By following-up with respondents some months after the experiment, the persistence of communication effects can be measured.

An early contribution by Armantier, et al. (2015) shows that the survey-based inflation expectations by participants are largely consistent with their choices between a fixed-payment investment and an inflation-indexed investment in an incentivised experiment, and that inconsistent choices are more likely for participants with low education.

Survey experiments with randomized information treatments test the effect of different types of information on respondents' updates of their posterior macroeconomic expectations relative to their prior expectations measured before the treatment. Throughout the literature, studies find that participating consumers adjust their inflation expectations towards the information provided, often with economically significant adjustments around 1-2 percentage points (Binder & Rodrigue, 2018; Coibion, et al., 2022; Coibion, et al., 2023b; Dräger, et al., 2023). Together with the observed large heterogeneity in expectations prior to the information treatments, and in line with the evidence in Armantier, et al. (2015), this gives further support to theories of expectation formation with limited capacity to absorb and process information. In that sense, providing members of the public with relevant information affects their macroeconomic expectations, even if they did not actively search for the information. However, many studies find that communication effects on beliefs are rather short-lived (with the exception of the study by Dräger, et al., 2023).

The adjustments are particularly large when respondents are provided with simple, numerical information at relatively short horizons: Coibion, et al. (2022) report strong adjustments in US consumers' inflation expectations after being treated with information about current inflation, inflation projections or the Fed's inflation target. Providing households with the full Federal Open Market Committee's (FOMC) monetary policy statement, published after each policy meeting, has about the same effect on expectations. Surprisingly, a shorter, and easier to read summary of the FOMC statement as published in the newspaper *USA Today* leads to adjustments in expectations of only half the size of the effect from the full statement. This leads the authors to suggest that central bank communication via the media might significantly reduce the effects of that information, at least if the media is viewed as less trustworthy by the public. Coibion, et al. (2023) present results testing different ways of forward guidance and find that information about interest rates and/or inflation affects expectations of both variables, particularly if the information is about short horizons, i.e. current rates or rates in the near future. This is in contrast to studies evaluating financial market participants, who pay more attention to information about interest rates farther in the future.

While the former studies were conducted during a period with low and stable inflation rates, Dräger, et al. (2023) test which type of information may prevent rising inflation to spill over into inflation expectations. In line with the previous evidence, the authors find that participants adjust their expectations towards the information provided, in this case meaning

an *upwards* shift in expectations once participants are made aware of rising current inflation. This shift can be mitigated by different types of additional, forward-looking information, where the strongest effects are found for numerical inflation projections that predict inflation to fall again in the near future. The authors find that inflation expectations across all horizons are affected by the information treatments. Interestingly, this study finds that information treatments matter also up to six months after the treatment: As inflation continued to rise strongly in the months after the experiment, participants who received numerical forecasts predicting a fall in inflation in the near future started to again rely more on their initial prior expectations, as it became clear that the forecast was misguided. This result could be regarded as a warning against attempting to mitigate a spillover from rising inflation to inflation expectations with forecasts, which may turn out to be biased in the future.

A counter-example to the larger impact of numerical information is provided by D'Acunto, et al. (2020). In their RCT study, the authors compare the effect on Finnish consumers' income expectation of Twitter communication by the Governor of the Bank of Finland stressing that the ECB is doing whatever is necessary to minimise the impact of the COVID-19 crisis on households (termed "target communication" by the authors) to a tweet about the launch of the 750 billion Euro Pandemic Emergency Purchase Programme by the ECB ("instrument communication"). The authors show that the non-numerical target-based communication significantly increases respondents' expectation of household income, while there is no significant effect from the instrument-based communication. Arguably, this result does not carry over to all target- vs. instrument-based communications, since in this example the instrument-based communication was significantly more technical and its implications for household income much harder to understand than the non-numerical target-based communication.

In addition to the question which type of information has the strongest impact on macroeconomic expectations in the general public, researchers and central banks alike discuss the question how diverse audiences might be best addressed (Gardt, et al., 2021; D'Acunto, et al., 2021; Haldane & McMahon, 2018; Bholat, et al., 2019). D'Acunto, et al. (2021) study how diversity within monetary policy committees may affect consumers' macroeconomic expectations. In an RCT study, the authors present the same Fed projection on unemployment or inflation accompanied by a picture of either a white male, a white female or a black male FOMC member. The authors find improvements in the accuracy of unemployment expectations and trust in the Fed for female or black respondents treated with either the female or the black FOMC member. Importantly, there are no negative effects on white male respondents in these treatments. Haldane & McMahon (2018) as well as Bholat, et al. (2019) evaluate the impact of the layered communication design recently adopted by the Bank of England on consumers' comprehension of monetary policy, their inflation expectations, and their trust in the central bank. These papers thus focus on how central bank communication may address diversity with respect to education and ability. Both studies experimentally test the impact of the simplified version of the monetary policy statement within the "layered" communication, the so-called "Visual Summary". This is a text similar in length to the original policy statement, but using simpler language and accompanied by charts and graphics. Both studies find that the simpler content leads to an improvement in comprehension of monetary policy and in trust in the central bank. As pointed out by Haldane & McMahon (2018), this improvement is larger than the initial difference in comprehension between their sample of the general public and their sample of post-graduate economics

students. For the public sample, providing the Visual Summary also leads to a higher likelihood of inflation expectations being in line with the BoE projections. Bholat, et al. (2019) further test versions of the Visual Summary, which are shorter or more relatable to people's daily lives, and find that this further improves both comprehension and trust. The challenge when using "layered" communication is to ensure the consistency of the simplified and the in-depth information, and to avoid over-simplification in the layer aimed at the public.

Taken together, the studies discussed in this section highlight the challenges that remain for central bank's communication with the general public. It seems that the greatest challenge lies in getting the attention of the public, which has low prior knowledge about inflation or monetary policy as well as low interest in being informed. Once attention is achieved, however, the experiments with information treatments show that large adjustments in expectations can be generated by providing simple, numerical information. This speaks to large potential gains from communication by alleviating (potentially rational) inattention. These effects can be even larger if the communication takes into consideration the diversity of the audience and targets underrepresented groups.

6. The role of the media for central bank communication with the general public

The bridge between "getting the public's attention" and the "message sent" by central banks is often closed by the media, acting as transmitter of information between the "sender" (the central bank) and the "receiver" (the public). In this section, I discuss the empirical evidence on the role of the media in transmitting central bank communication to the general public.

The media are found to have a mixed effect: On the one hand, television and newspapers remain the most important news sources about economic policy in general and monetary policy in particular cited by households, followed by the online press (Blinder & Krueger, 2004; van der Crujisen, et al., 2015; Conrad, et al., 2022). More generally, media news can be an independent source of aggregate business cycle fluctuations, for instance when sectoral news receives disproportionate news coverage (Chahrour, et al., 2021). Lamla & Lein (2014) show that more media coverage on inflation reduces the gap between households' and experts' inflation expectations, while Lamla & Vinogradov (2019, 2021) report that those consumers, who did report hearing news after policy meetings, consequently gave more accurate inflation forecasts. This would call for central banks aiming at high media coverage for their message to be broadcast widely to consumers and firm managers. Ferrara & Angino (2022) show that readability and clarity of speeches and press statements is important in this regard, presenting evidence that clearer communication is reflected in more media coverage.

On the other hand, the media are not necessarily neutral agents simply interested in transmitting the message given to them by central banks. Instead, they may add interpretation or critique and shape the message following their own agenda. This may in turn influence the views and expectations by the general public, thus biasing the communication. Soroka (2006) presents evidence that the media report more on negative economic developments than on positive ones and that in turn public views on the state of the economy correlate more with negative news reports as well as negative economic outcomes, rather than with positive ones. Similarly, Lamla & Lein (2014, 2015) demonstrate an asymmetric effect of news on rising

versus falling inflation on consumers' inflation expectations. A higher share of "negative" news on rising inflation is negatively correlated with consumers' forecast accuracy, thus biasing consumers' expectations. The same effect is reported for news from TV broadcasts, while no bias is found for news from newspaper sources or news on falling inflation. A similar asymmetric relationship is found by Pinter & Kocenda (2022). Dräger (2015) as well as Dräger, et al. (2016) also report asymmetric media effects on consumers' macroeconomic expectations in Sweden and the US. For instance, a higher share of news reports about inflation correlates negatively with the share of consumers forming macroeconomic expectations consistent with a Phillips curve or the Taylor rule in Dräger, et al. (2016), and this effect seems to be driven by consumers remembering news about high prices or price increases, rather than about low or falling prices.

If asymmetric media reports about inflation or monetary policy threaten to bias consumers' inflation expectations, can central banks influence the favourableness of media reports about its policy? This question is evaluated by Berger, et al. (2011) for media reports about the ECB's monetary policy throughout euro area news outlets. On the one hand, the authors present evidence that the media take on a monitoring role in the sense that reports are more critical if monetary policy decisions came as a surprise to financial markets or if inflation in the euro area is higher. On the other hand, there is evidence that the ECB in turn can influence the favourableness of media reports by explaining well the policy decision in its statement or by issuing more statements by the ECB president in the intermeeting period. Explanation and engagement, to name two of the 3 E's in Haldane, et al.'s (2021) paper, thus help to convey the central bank's message via the media without the media adding a critical interpretation.

The importance of the relationship between central bank communication and the media for the transmission of the central bank's message to the public is further analysed in a recent literature using textual analysis. Pinter & Kocenda (2022) as well as ter Ellen, et al. (2022) emphasise that central bank communication via the media displays shocks that are orthogonal to standard monetary policy shocks identified in financial market interest rate data. For instance, Pinter & Kocenda (2022) present evidence from France that in their sample, 85% of monetary policy shocks measured in overnight-index-swaps for short-run interest rates during the week of a monetary policy event are not described as a surprise in the media or are even discussed with the opposite sign (i.e., a shock that is perceived as restrictive by the market might be described as expansive in the media). Similarly, ter Ellen, et al. (2022) construct a measure of "narrative monetary policy shocks", which is constructed from differences in topics identified in textual analysis of central bank policy statements and economic media reports prior to the policy meeting. These "narrative shocks" are not correlated with monetary policy shocks derived from financial market data. Importantly, the authors show that narrative monetary policy shocks lead to more media coverage and correlate positively with interest rates, stock markets, house prices, consumer confidence and industrial production. Finally, Munday & Brookes (2021) use textual analysis to identify how central bank communication should be constructed to maximise media coverage, evaluating news coverage in British media during the 1.5-day windows around Bank of England's communication events. In line with the results in Berger, et al. (2011), the authors report that the interaction between the state of the economy and the textual features of central bank communication are important to explain the pass-through from central bank communication to media coverage. In general, the results suggest that simple texts that engage the reader

personally and include facts and figures or refer to prominent central bank staff are found to influence news coverage the most.

7. Conclusion

This paper surveys the recent empirical literature on central bank communication with the general public, relating the findings to theories of macroeconomic expectation formation. As the empirical literature shows, macroeconomic expectations by firm managers and consumers are typically not formed under the full rationality benchmark, as they display persistence and large cross-sectional heterogeneity (Souleles, 2004, Coibion & Gorodnichenko, 2012 and Coibion, et al., 2018). While other behavioural biases may also play a role, the heterogeneity and dynamics in the macroeconomic expectations of firm managers and households may be well explained with theories of expectation formation under rational inattention (Kumar, et al., 2015; Binder & Rodrigue, 2018; Coibion, et al., 2022; Dräger, et al., 2023). This theory supposes that agents are rational in principle, but face constraints on their ability to absorb and process information, thus staying rationally inattentive towards some information. For instance, as long as inflation is low and stable, it is rational for most agents to know little about monetary policy and the processes affecting inflation.

Nevertheless, both firm managers and households form beliefs about future macroeconomic outcomes, such as inflation, and changes in these beliefs in turn affect their economic choices regarding investment or consumption spending (see, for instance, Dräger, et al. (2023), Coibion, et al., 2020, Coibion, et al., 2023a,b). Communication by central banks about their policy objectives thus enables the formation of more informed, and thereby more “rational”, expectations. Moreover, in a period with, first, inflation below target and interest rates close to the effective lower bound, and then rapidly rising inflation, central banks today face the difficult task of explaining their policy to the population. This is crucial to maintain central banks’ accountability as institutions guarding price stability and the public’s trust therein.

The challenges in this endeavour are manifold. First, ordinary consumers or firm managers are typically not well informed about what central banks do, what their targets are or even about the concept of inflation. Second, they show little interest in learning more about these issues and often do not listen when the central bank talks. During the “Great Moderation” period, when inflation was low and stable over several decades, this could even be regarded as a sign of a successful monetary policy, where the public had little reason to think about inflation. However, the public discussion surrounding unconventional monetary policy in the aftermath of the financial crisis of 2008 shows that it becomes more important to engage the public in times with frequent economic crises and high economic uncertainty.

An important aspect in this regard is trust in the central bank. Average trust in the ECB fell after the financial crisis and recovered only slowly afterwards (Wälti, 2012; Blinder, et al., 2023). With recent high inflation rates hurting the purchasing power of consumers and firm managers, trust in the ECB has again fallen strongly (van der Crujssen, et al., 2023). Moreover, trust is lower for consumers with lower knowledge about inflation and monetary policy, and higher trust correlates with higher accuracy in their inflation expectations (Rumler & Valderrama, 2020; Haldane, et al., 2021). At the same time, informing consumers about general facts on inflation and how monetary policy affects the economy, may cause a

rise in trust (Dräger & Nghiem, 2023). Similarly, addressing diversity in terms of gender, race or ability in central bank communication raises trust in the institution (Haldane & McMahon, 2018; Bholat, et al., 2019; D’Acunto, et al., 2021). In this regard, the three E’s discussed by Haldane, et al. (2021) – *Explanation, Engagement, and Education* – could be important elements for central banks aiming to build trust by using communication. In fact, enhancing credibility and trust is named as the most important objective in a recent survey among former members of the ECB Governing Council (Ehrmann, et al., 2023).

Once attention of the general public is achieved, the literature using survey experiments with information treatments finds that consumers’ and firm managers’ inflation expectations can be guided effectively by providing simple and numerical information, for instance about the inflation target, the most recent inflation rate or about inflation projections (Binder & Rodrigue, 2018; Coibion, et al., 2022; Coibion, et al., 2023b; Dräger, et al., 2023). Moreover, the message sent by central banks is easier to get across if communication uses simple, short texts that relate to people’s daily lives (Bholat, et al., 2019). In that regard, using “layered” communication that offers simple summaries of monetary policy decisions for the general public, and more in-depth content for experts, seems a promising route, provided that the layers convey the information consistently and that the simple layer avoids creating a false sense of certainty.

Finally, the traditional media remain the most important transmitter of central bank communication to the general public (van der Cruysen, et al., 2015; Gardt, et al., 2021; Conrad, et al., 2022). However, the media may add critique and interpretation to the central bank’s message, which in turn could bias consumers’ inflation expectations (Lamla & Lein, 2014; Lamla & Lein, 2015; Pinter & Kocenda, 2022). To avoid this and to ensure that news coverage of central bank communication is maximised, studies find that statements explaining the policy decision in relation to the current state of the economy, that engage the reader personally and include facts or figures are more likely to receive media coverage and less likely to be reported on critically (Berger, et al., 2011; Munday & Brookes, 2021).

Overall, it seems that central banks would do well to practice engaging more personally, and less technically, with the general public in order to reap the gains in terms of trust and credibility. At the same time, this could overcome some of the hurdles in gaining the attention, and thereby overcoming parts of the “rational” inattention, of the public. This paper shows that much has been learned in this regard in recent years, but at the same time much remains to be done.

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¹ As we discuss in detail below (see, for instance, section 3), this applies to both firm managers and households.

² In the euro area, the ECB policy rates stayed at 0% from March 2016 to July 2022.

³ See, for instance, Jonung (1981) and D'Acunto, et al. (2021).

⁴ Contrary to a monetary policy strategy of *inflation targeting*, where a central bank targets a numerical inflation target, say 2%, a strategy of *average inflation targeting* implies that the inflation target should be fulfilled on average over a certain time horizon. This means that if inflation stays below target over some time, the central bank will then allow inflation above target over some period.

⁵ In this speech, delivered at the Global Investment Conference in London on July 26, 2021, Dr. Draghi pledged that “*within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough.*”, which at the time immediately led to falling spreads of government bonds in European countries affected by the debt crisis.