EUROPEAN CENTRAL BANK
EUROSYSTEM

Working Paper Series

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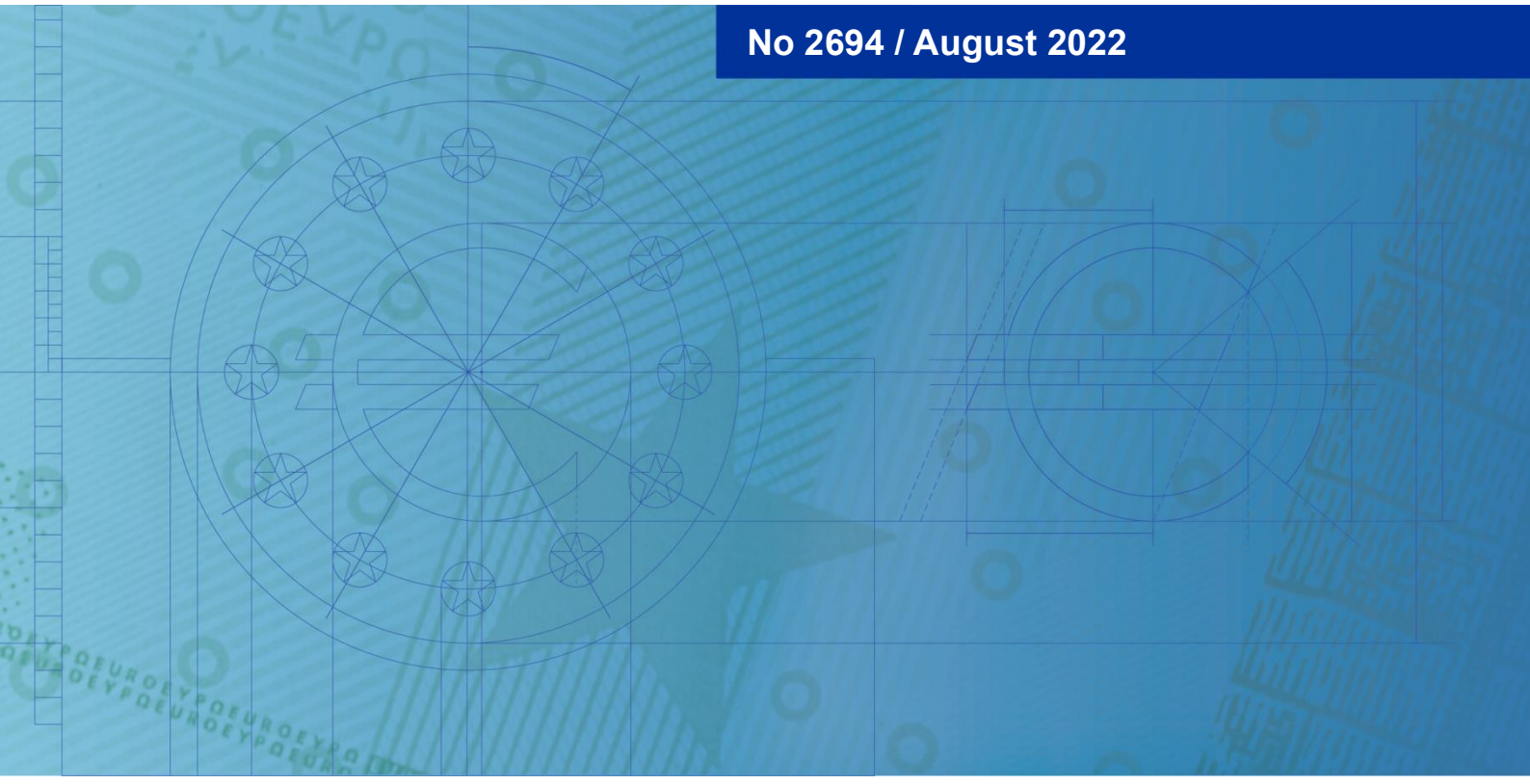
Central Bank communication with the general public: promise or false hope?

No 2694 / August 2022



Central banks are increasingly reaching out to the general public to motivate and explain their monetary policy actions. One major aim of this outreach is to guide inflation expectations; another is to ensure accountability and create trust. This article surveys a rapidly-growing literature on central bank communication with the public. We first discuss why and how such communication is more challenging than communicating with expert audiences. Then we survey the empirical evidence on the extent to which this new outreach does in fact affect inflation expectations and trust. On balance, we see some promise in the potential to inform the public better, but many challenges along the way.

Keywords: communication, central bank, general public, monetary policy
JEL Classification: D12, D84, E52, E58, G53

Non-technical summary

When central bankers talk, financial markets listen—intently. For financial experts, who dote on every word, information on monetary policy is now available in abundance. Many central banks publish detailed inflation reports, release minutes of meetings, hold press conferences, give interviews and public speeches, and appear before parliamentary committees. Communications have intensified since the financial crisis, and are likely to go even further. However, almost all of these communication efforts have been targeted toward the traditional audiences of central banks: the financial markets and other expert groups. A new element, still in its early stages, is the focus of this survey: outreach to the general public. This article surveys the rapidly-growing literature on central bank communication with the public.

Recent efforts to communicate with a broader audience were triggered by several developments. First, the prominence and visibility of central bank operations in both the financial crisis and the Covid-19 recession pushed central banks into the limelight. Second, changes in central bank mandates and the use of new and more complex monetary policy tools required more explanation. Third, some of these changes are controversial, which has thrust monetary policy decisions squarely into the public debate. All of these developments made central bank communication with the general public imperative. Realizing this, central banks around the world have increased their efforts in this domain. They have strengthened (or began) their presence on social media, provided multi-layered communication that explains the content at different levels of complexity, broadened their provision of educational resources, e.g., via websites, and organized "listening events."

Aiming central bank communication at the general public raises a host of challenges that are not present when communication is designed for the financial markets. For one thing, communication requires both a sender and a receiver, and non-experts often are not listening. Even when they are, they may not receive the signals correctly.

Better communication with the public *could* provide central banks with an additional tool for the conduct of monetary policy. It can enhance effectiveness, transparency, and accountability. However, getting it right is far from easy. We have much more to learn about how the public's expectations are formed and how central bank communications influence that process. But we already know that one challenge for central banks is to improve the clarity of their communications so as to avoid misinterpretation and unwanted reactions—

whether economic or political. Another challenge is to develop a layered communication strategy, with some communications targeted at experts and others targeted at non-experts—while keeping them consistent. Perhaps the largest benefits from central bank communication with the general public accrue when the central bank explains its role clearly and clarifies its objectives. We argue that this is where central banks should focus first—and might have some success.

1. Introduction

When central bankers talk, financial markets listen—intently. About 15 years ago, we concluded that central bank communication was already a powerful part of central bankers' toolkits (Blinder, Ehrmann, Fratzscher, de Haan, and Jansen 2008). Since then, the use of communication by central banks has intensified enormously. For financial experts, who dote on every word, information on monetary policy is now available in abundance. Many central banks publish detailed inflation reports, release minutes of meetings, hold press conferences, give interviews and public speeches, and appear before parliamentary committees. In a 2016 survey, more than 80% of central bank governors indicated that their communications had intensified since the financial crisis, and a clear majority expected these changes in communication practices to remain or go further (Blinder, Ehrmann, de Haan, and Jansen 2017).

However, almost all of these communication efforts have been targeted toward the traditional audiences of central banks: the financial markets and other expert groups. A new element, still in its early stages, is the focus of this survey: outreach to the general public.

Recent efforts to communicate with a broader audience were triggered by several developments. First, the prominence and visibility of central bank operations in both the financial crisis and the Covid-19 recession pushed central banks into the limelight. Second, changes in central bank mandates and the use of new and more complex monetary policy tools required more explanation. Third, some of these changes are controversial, which has thrust monetary policy decisions squarely into the public debate. All of these developments made central bank communication with the general public imperative. Realizing this, central banks around the world have increased their efforts in this domain. They have strengthened (or began) their presence on social media, provided multi-layered communication that explains the content at different levels of complexity, broadened their provision of educational resources, e.g., via websites, and organized "listening events."

Aiming central bank communication at the general public raises a host of challenges that are not present when communication is designed for the financial markets. For one thing, communication requires both a sender and a receiver, and non-experts often are not listening. Even when they are, they may not receive the signals correctly—especially if the central bank speaks in market-tested code words. It is precisely this problem that led one of us to predict several years ago that "central banks will keep trying to communicate with the

general public, as they should. But for the most part, they will fail." (Blinder 2018: 569) The empirical evidence presented here suggests that Blinder's prediction has been more correct than incorrect—at least so far. But this survey also looks for, and finds, some glimmers of hope.

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2. How do central banks reach out to the public?

We start by documenting *how* central banks reach out to the general public. New forms of communication embrace various approaches, such as outreach on web sites, focusing on financial and economic education, presence on social media, and organizing listening events. Figure 1 illustrates how widespread these new types of central bank outreach have become, using a sample of 75 central banks.[2]

[2] These banks are the 63 members of the Bank of International Settlements (BIS) and the twelve US regional Federal Reserve Banks. We collected the data for Figure 1 in December 2021.

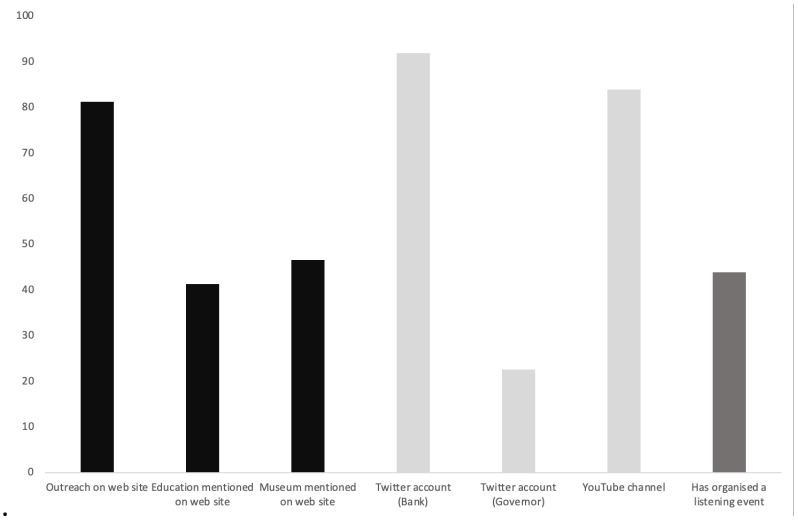

Figure 1. Central bank outreach to the public

Note: Based on data for December 2021. The first three bars indicate whether the central bank web site has, respectively, any form of outreach, an explicit mention to education, or an explicit mention of a central bank museum or visitor center. The second three bars indicate whether, respectively, the central bank has a Twitter account, the governor has a Twitter account, or whether the central bank has its own YouTube channel. The last bar indicates whether the central bank has organized a listening event. Note, however, that only a few central banks outside the Federal Reserve System and the Eurosystem organized listening events. The sample consists of the 63 members of the Bank for International Settlements and the 12 US regional Federal Reserve banks.

A central bank's website often serves as the first point of contact for members of the public who wish to learn something about monetary policy. Plekhanov (2020) documents that, since 2010, virtually all central banks maintain a website. While much of the material found on these websites caters to specialized audiences, more than 80% of the institutions covered in Figure 1 include some form of outreach to the general public on the home page of their website (Figure 1, first bar). For instance, the Bank of England website uses layered communication, through which members of the public can choose to read about monetary policy in simple terms, leaving the more complex material for experts. Quite a few institutions, such as the Reserve Bank of New Zealand (RBNZ), offer so-called inflation calculators on their home page, which allow people to calculate the change in purchasing power of an amount of money between two dates. Many monetary policy authorities, including Norway's central bank (Norges Bank) and the European Central Bank (ECB), use so-called explainers, which are short, clear pieces of text on specific issues related to their tasks and activities.

Many central banks also engage actively in financial education. One simple indicator is the large number of direct references to education on the institutions' web sites. Various regional Federal Reserve banks have direct links to educational material on their home pages. Others, such as the German Bundesbank, the Swiss National Bank and the Reserve Bank of

India mention opportunities to visit a money museum or the central bank's visitor center. Another way to reach the public is via presence on social media. Twitter is easily the most popular platform for central banks; nearly all of the 75 central banks in our sample have an official Twitter account. The People's Bank of China is notably absent from this list, but it communicates regularly through Weibo, China's equivalent of Twitter. In quite a few cases—including some of the regional Feds, the South African Reserve Bank, the ECB, and De Nederlandsche Bank (the central bank of The Netherlands)—the central bank governor has his or her own Twitter account as well. In addition, more than 80% of the central banks in our sample have their own YouTube channel (Figure 1, bars four to six). Certainly, a large share of the followers of these accounts are interested for professional reasons. But social media channels nonetheless offer substantial *potential* for reaching the general public. In total, the Federal Reserve System had close to 2 million followers by the end of 2021, the Reserve Bank of India had close to 1.5 million, and the Banco de Mexico and the Banco Central do Brasil each had close to 800.000.

Central banks differ widely in Twitter usage. Some, such as the Bank of Japan, tend to share links to economic releases, while others, such as the ECB, also engage with their audience more actively by participating in Q&As (#AsktheECB#). Korhonen and Newby (2019) find that disseminating official statements was the most common motivation for central banks to use Twitter, followed by promoting publications and research, media appearances, and announcing job openings. Emerging market central banks, particularly those from Latin America, appear to be the most active on Twitter, with the central banks of El Salvador, Mexico, Ecuador, Argentina and Costa Rica all in the top 10 in terms of frequency of tweets (Kyriakopoulou and Ortlieb, 2019).

A few central banks use social media quite creatively. The Bank of Jamaica may be the most imaginative: It uses music videos to help explain its inflation targeting policy, and all the material showcased on its social media accounts uses language that people can relate to their everyday lives. One example: "Low, stable and predictable inflation is to the economy what the bassline is to reggae music." The Bank of Jamaica even produces and airs on national television a series of shows called "Centrally Speaking," which explain the central bank and related matters to laypersons.[3]

[3] The series, which began in 2019, can be found on YouTube under "centrally speaking."

Lastly, central banks have started hosting events where policymakers interact directly with the public (Figure 1, last bar). The Bank of England has held a number of Future Forums, where members of the public share ideas, views, or concerns. The Bank of Canada also holds consultations with the public in connection with its regular renewal of the monetary policy framework. Both the Federal Reserve and the Eurosystem—including the ECB and the national central banks of countries in the euro area—have organized so-called listening events as part of their recent monetary policy strategy reviews.

Research on how to rate the effectiveness of these various efforts is scarce. An initial cross-country analysis for nine advanced-economy central banks is provided by Gardt, Bitterlich, and Glöckler (2021). They calculate an index that encompasses a range of communication efforts, considering how central banks inform and educate the wider public on their actions as well as central banks' consultation and collaboration efforts with citizens. Most of the heterogeneity across these nine banks come in the latter criteria. "Consultation" encompasses central banks' efforts in gathering views and feedback from the wider public. "Collaboration" analyzes whether central banks have two-way engagement initiatives via partnerships, joint campaigns with citizens, non-governmental organizations or universities, and the like. The constructed index ranks the Bank of Canada and the Bank of England relatively high in terms of reaching out to the public, while Sveriges Riksbank and the Reserve Bank of New Zealand rank relatively low.

3. *Does central bank communication actually reach the public?*

If a central bank wants to communicate effectively with its broad public, a first step is seeing to it that at least some of its signals reach their intended recipients. This is a necessary, but certainly not sufficient, condition for success. The signal must also be processed appropriately (the topic of Section 4), and the information that is transmitted needs to affect beliefs or behaviors (the topics of Sections 5 and 6). Despite its importance, the extent to which central banks actually manage to reach the general public has barely been studied.

The basic communication problem is simple, though its solution isn't. Households and firms have a low desire to be informed about monetary policy and are relatively inattentive to news about it. The contrast with the traditional counterparties to central bank communication could not be starker. Experts, especially financial market participants, are well known to listen to central bank communications intently. As Blinder (2018: 569) put it: "… the

part of central bank communication that matters most is the way policymakers communicate with markets—and for a simple reason: market participants listen." So central banks tend to draft every word in their official communications carefully and to modify the text only incrementally (Ehrmann and Talmi 2020).

The influences of central bank communication are typically seen in financial markets quickly. This speed allows event studies with small windows to focus on how a certain piece of communication moves markets. But it can also lead to echo chamber effects, whereby the central bank can no longer observe independent signals about the state of the economy from financial markets, but instead mainly sees the mirror image of its own communications (Morris and Shin 2018). It is even possible that experts might attach too much weight to central bank communications, as Morris and Shin (2002) pointed out years ago.

None of these complications arise in communication with the general public, which may not listen at all, and may not react to the communication in any visible way that allows the central bank to understand whether and how its signals are received—such as by moving market prices. The failure to listen could well reflect rational inattention by ordinary households and nonfinancial businesses.

In line with this, households and firms have been found to pay more attention to monetary policy communication if they believe it will benefit them (net of any costs) by, for example, making better decisions. Coibion, Gorodnichenko and Kumar (2018) report evidence for New Zealand firms which is consistent with this view: While firm managers systematically overestimate inflation on average, there is substantial cross-sectional disagreement. Firms are better informed about inflation if they face more competition, if a price adjustment is imminent, or if they have more steeply sloped profit functions. Similarly, households and firms will be less attentive if they do not understand what the central bank aims for, or how its policies affect economic conditions, or how these conditions affect them personally (Binder 2017; van der Cruijsen, Jansen, and de Haan 2015). All of these gaps in understanding are, of course, common.

Ironically, successful monetary policy itself breeds inattention, as pointed out by Coibion, Gorodnichenko, Kumar and Pedemonte (2020). Economic agents in countries with long histories of low and stable inflation have little incentive to track inflation and monetary policy closely. They just believe it will all be fine. Consistent with that, Cavallo, Cruces, and Perez-Truglia (2017) find that individuals living with low inflation have significantly weaker

priors about the inflation rate, in the sense that they are more willing to adjust their inflation expectations when provided with information about inflation or prices of specific products. The longer agents live in a low inflation environment, the stronger this effect seems to become. For example, the proportion of UK households answering "no idea" when asked about their one-year ahead inflation expectations nearly doubled from around 10% in the early 2000s to nearly 20% by 2019 (Tenreyro 2019). What does it matter, after all, if inflation is 1.5% or 2%?

But such inattention might quickly reverse if inflation picks up—as happened, for example, in several advanced economies in late 2021. Figure 2 plots the number of Google searches for the term "Inflation" in Germany, Canada, and the United States from 2005 through March 2022. While there are differences across countries, two general patterns stand out. First, public interest in inflation rose substantially at the end of the sample, when actual inflation rates started increasing rapidly. Second, there was little public interest in inflation over most of the time period covered in the chart, even though inflation was persistently *below* the central banks' targets. This stark contrast suggests—unsurprisingly—that high inflation is more of a concern to the wider public than low inflation. It is also consistent with evidence that households take a *stagflationary* view of inflation, interpreting higher inflation as bad news about their real incomes. Coibion, Georgarakos, Gorodnichenko, and van Rooij (2022) find this to be true for Dutch households. Candia, Coibion, and Gorodnichenko (2020) find the same for U.S. and euro area households.

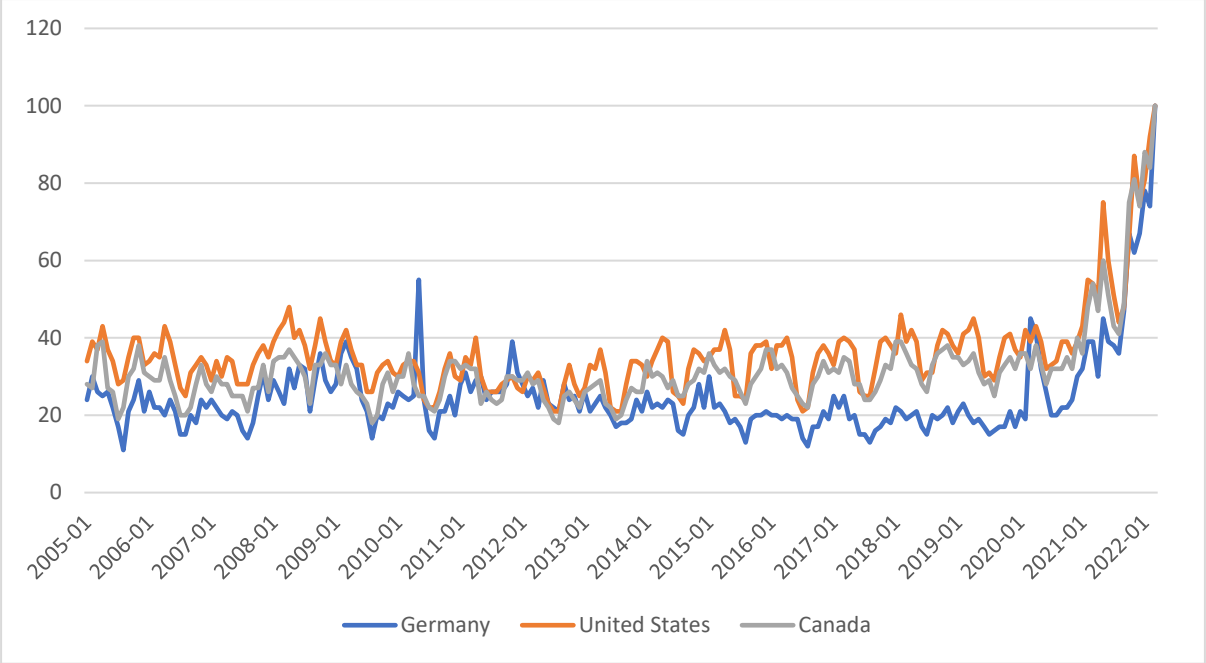

Figure 2: Searches for inflation on Google trends

Source: Google trends. The chart reports the number of searches on Google for the term Inflation, originating in the different countries. The data for each country are normalized to 100 at the country-specific peak. Sample period: January 2005 – March 2022.

If ordinary people have little desire to be informed about inflation and monetary policy, they will not actively search for information. They might still acquire it, however, if the information gets delivered to them "for free." One potentially important example is media reporting: The more reporting there is, the lower the cost of acquiring information and the higher the likelihood that people hear or see relevant information. Media exposure is particularly important for reaching the broad public, which tends to receive its information (if at all) through intermediated channels, especially television and newspapers (Blinder and Krueger 2004). Blinder and Krueger's (2004) survey might be thought archaic by now, given the explosion of online sources. But Figure 3, based on data collected in 2021, shows that the traditional media, especially television and the printed press, still remain the two most important sources of information about the ECB for euro area households. Online press ranks third, but direct sources such as the ECB's website are used by few households. Once more, this stands in stark contrast to expert audiences, which are much more likely to get their information directly from the source (Lamla and Maag 2012).

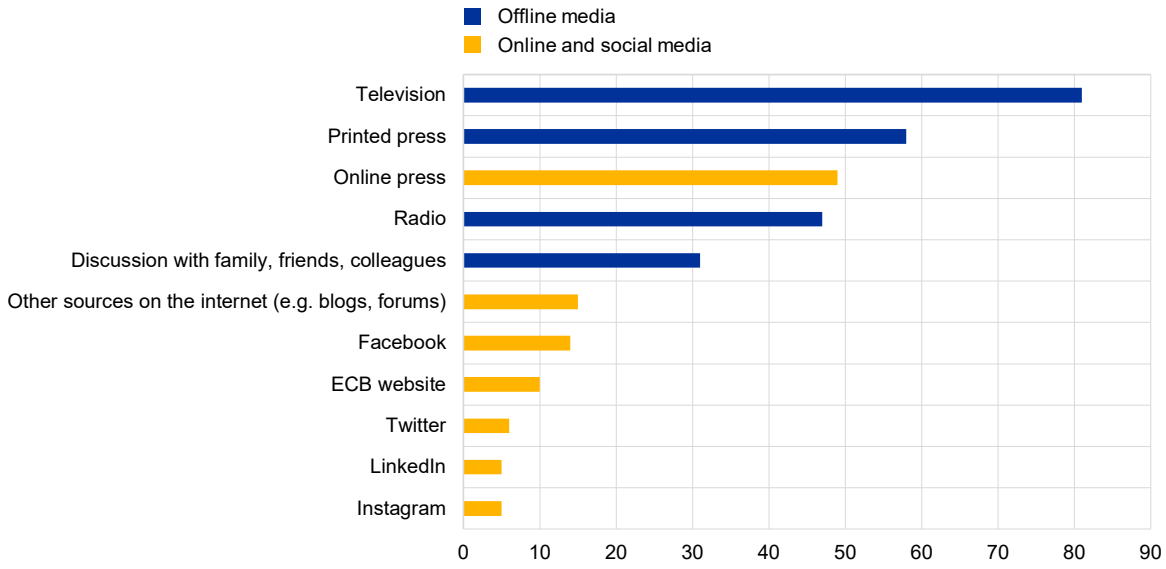

Figure 3. Households' information channels about the ECB

Source: Reproduced from Gardt, Angino, Mee, and Glöckler (2022). The chart reports results from the ECB Knowledge and Attitudes Survey, May 2021. Respondents were asked the following question: "Where have you heard of the ECB?". Respondents were able to pick more than one answer.

The dominance of intermediated channels implies that central banks must communicate with the wider public largely via the media. But this does not mean that the central bank cannot shape the message. Even if consumers show no particular interest in acquiring information about the central bank or its policies *directly*, they are likely to be exposed to media reports on related and relevant topics, such as inflation. In that regard, ter Ellen, Larsen, and Thorsrud (2020) provide evidence that central bank communication has the potential to affect media coverage, and thus expectations, even if households know little about monetary policy *per se*. This finding is corroborated by Munday and Brookes (2021), who show that it is less the state of the economy, and more the way the central bank drafts its communications, that determines media reporting about central bank issues.

Such evidence suggests that the tone and content of media reporting can be influenced by central banks that take more care in drafting. But there is also an additional, independent role for the media due to well-known biases in reporting. Mullainathan and Shleifer (2005) show that newspapers are likely to slant stories toward the views of their readers and, in the presence of heterogeneous views, slant them toward extreme positions.The media have also been found to overemphasize negative news (Hamilton, 2004; Fogarty 2005). Berger, Ehrmann, and Fratzscher (2011) test these general hypotheses on

newspaper reporting about the ECB. They find that the ECB's communication influences the tone of the media reporting, but that the media also assesses the ECB's performance critically.

Perhaps surprisingly, the benefits from direct central bank communication may be enhanced by having a diversity of speakers. D'Acunto, Fuster, and Weber (2021) provide experimental evidence that diverse policy committees reach different segments of the population better. For instance, they show that women who receive information from a female official are subsequently more likely to acquire information about the Federal Reserve. That said, messaging is more complex if there are multiple statements from individual policy makers which differ in tone or content—the cacophony problem (Blinder, 2007). Tutino (2016) and Hwang, Lustenberger, and Rossi (2021) therefore argue that it is important to reconsider the number of speeches that central banks give, and to ensure that each communication provides a focused, cohesive and concise message.

An additional factor that complicates information acquisition by the wider public is the tendency of central banks to use complex language. In an early contribution, Jansen (2011) studied the readability of congressional testimonies by the Federal Reserve chair. Based on the Flesch-Kincaid grade level, a standard measure of readability, he concluded that the Fed's language was often difficult for the average citizen to follow. Understanding these testimonies would require college-level reading ability. Similar levels of complexity were subsequently reported for inflation reports and press statements of several central banks by Bulíř, Čihák, and Jansen (2013), and by Coenen, Ehrmann, Gaballo, Hoffmann, Nakov, Nardelli, Persson, and Strasser (2017). This complexity issue has been recognized by several central banks, and some have taken measures to ameliorate it. The ECB, for example has announced as part of its strategy review that it will try to reduce the length and the complexity of its statements. Some reduction in complexity and length is already evident in Figure 4.

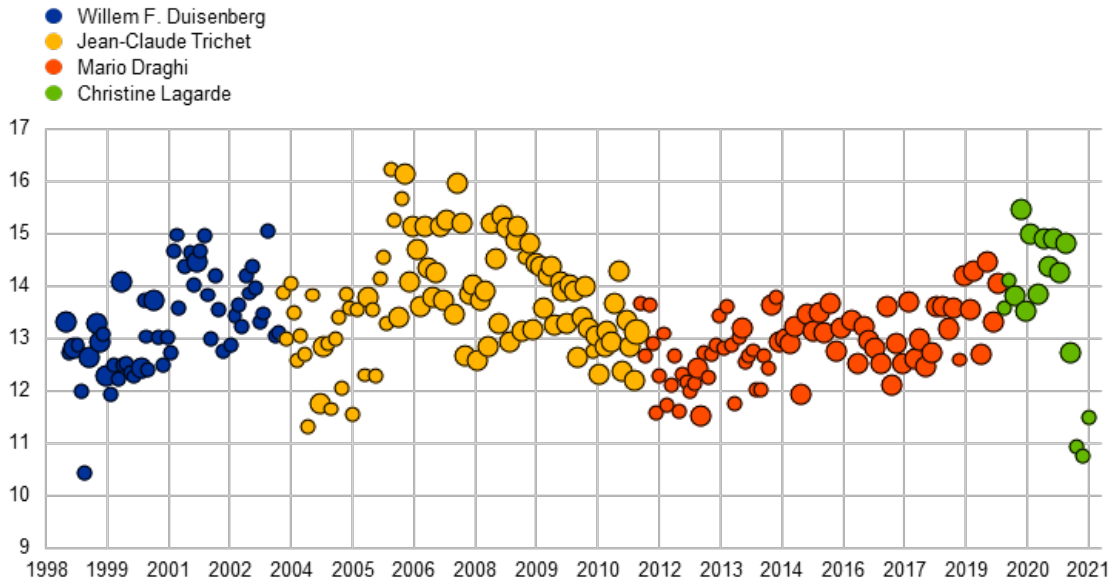

Figure 4. Complexity of ECB monetary policy statements

Source: Updated data from Coenen, Ehrmann, Gaballo, Hoffmann, Nakov, Nardelli, Persson and Strasser (2017). The figure depicts the length and the complexity of the ECB's introductory statements. The length is measured by the number of words (indicated by circle size). The difficulty of the language employed is measured using the Flesch-Kincaid Grade Level score, which indicates how many years of formal training are required to understand the text, based on the length of its sentences and words.

What does the empirical evidence tell us about the success (or failure) of outreach by central banks? Much of the literature on central bank communication with the broad public uses randomized control trials (RCTs) in surveys or laboratory experiments to identify causal effects of central bank communication on agents' beliefs or actions. This would seem to be the gold standard. However, the set-up of these studies ensures that *all* "treated" participants are exposed to the communication, which is not at all close to the situation in real life. It thus assumes away what may be the biggest part of the problem—getting the message received. One might expect that more salient announcements are more likely to be noticed. But salience with the broad public and salience with, say, market participants are two different things.

As mentioned in Section 2, several central banks have recently conducted strategy reviews and subsequently informed the public about the outcome of these reviews. The Federal Reserve announced in 2020, *inter alia*, that it would switch to *average* inflation targeting (over an unspecified interval). The ECB's 2021 announcement contained, among other things, a change in its inflation target. These announcements were widely reported upon, but did they reach households and nonfinancial businesses? Coibion, Gorodnichenko, Knotek, and Schoenle (2020) come to a pessimistic, though hardly surprising, conclusion. In their survey of U.S. consumers, only a few respondents report having heard news about

monetary policy on the day of the Fed's announcement. What is more, this effect was not long lasting. Within a few days, it started to fade. Similarly, a survey of euro area households conducted by Ehrmann, Georgarakos, and Kenny (2022) concluded that a majority of households did not hear about the ECB in the two months following its strategy review announcement, and that many of those few who heard did not recall what they had heard.

A far more salient event, surely noticed by a broader audience, was the famous "whatever it takes" statement by then-ECB President Mario Draghi in July 2012. Prior to this statement, financial markets had started pricing in risk that several distressed euro area countries might have to exit from the currency union. Draghi dispelled those beliefs by stating, "Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough."[4] That statement and the announcement of a potential asset purchase program calmed the markets immediately, and the ECB never had to activate the purchase program. It is clear that Draghi's memorable statement reached a broad audience. Ehrmann and Wabitsch (2022) show that it generated elevated traffic on Twitter among non-experts for a prolonged period. The discussion at the time differentiated between Draghi himself and the ECB as an institution: Tweets about Mario Draghi became more subjective, more diverse, and expressed stronger views; sentiment in tweets about the ECB did not change much.

Another instance of salient news about central banks were tweets posted by U.S. president Donald Trump, who criticized the Federal Reserve numerous times in 2017-2019. These tweets, several of which carried a threatening tone, did not go unnoticed by the general public. In fact, Conti-Brown and Feinstein (2021) report that they elicited a larger, more favorable response than Trump's other tweets. They may even have affected inflationary expectations. In an RCT, Binder (2021a) exposed some respondents to such critical tweets and found that their long-run inflation expectations subsequently moved further away from the Fed's inflation target.

What about regular monetary policy announcements, which are not nearly as salient but do get into the news? Lamla and Vinogradov (2019, 2021) note that consumers in the U.S. and U.K. are more likely to have heard news about their respective central bank following monetary policy announcements. The probability of hearing such news about the Fed

[4] See https://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html.

increases by almost 10 percentage points on announcement days; for the Bank of England, it's a 20 percentage-point increase. However, it matters which communication channels the central bank uses. Lamla and Vinogradov (2019, 2021) report that U.S. announcements *without* press conferences do not affect the probability of hearing monetary policy news, and that the share of informed consumers in the United Kingdom is higher among Twitter users.

Finally, there is promising evidence that the current efforts by many central banks to speak in clearer prose might pay off. For instance, the Bank of England's *Inflation Report* has been augmented with new layers of content aimed explicitly at general audiences since November 2017. Haldane and McMahon (2018) find that this change has triggered a substantial increase in website activity, mainly related to the new content. Consistent with this, Ferrara and Angino (2021) show that the clarity of ECB communications is a strong predictor of subsequent social media engagement on Twitter.

What does all this add up to? The research to date suggests that the wider public is *potentially* reachable by central banks. But more effective outreach requires that central banks make it less costly to acquire the relevant information, such as by using more accessible language, by increasing their presence on television and other channels that reach the public, and/or by engaging more in direct communication—e.g., via social media. It also helps if the public has a better understanding of the benefits of being better informed about central banking issues, perhaps via enhanced economic and financial literacy—if we can do it (see Section 7). Periods of heightened attention to central banks, such as the recent increase in inflation in several advanced economies, require more communication by central banks, anyway. But they may also provide useful opportunities to reach out while people are listening. For communication to be *successful*, however, the central bank signals must be understood. That is the next question.

4. *Does the public understand what central banks say?*

Assuming that some central bank signals *do* reach the public, what happens next? Do people actually process this information correctly? And does this processing increase their knowledge about monetary policy or, more generally, about the economy? If that is so, better knowledge would make it more likely that central bank signals affect expectations, trust, or both—the subjects of Sections 5 and 6.

At first sight, the empirical evidence is not good news. A range of survey-based studies indicates that public knowledge about key aspects of monetary policy is fragmentary at best. One early example of such a survey is the 2009 study of Dutch households by van der Cruijsen, Jansen, and de Haan (2015). Their questionnaire included, among other things, eleven statements on the main objective of the ECB, only four of which were true. (Example: "*The main objective of the ECB is price stability*.") For each such statement, respondents were asked to indicate whether they believed it to be true or false. On average, people identified fewer than five of the eleven answers correctly.

This limited knowledge is hardly unique to the Dutch. The average British person displays both limited factual knowledge of central banking (such as who sets the interest rate) and limited conceptual knowledge (e.g., what happens to inflation when interest rates rise). Furthermore, there is no evidence of improvement since the early 2000s (Jost 2017, Haldane, Macauly, and McMahon 2020). The same applies to the United States. Binder's (2017) overview of U.S. consumer surveys since the late 1970s shows that the level of consumer knowledge of basic facts—such as who is the current Fed chair—has been and remains limited. The situation is no different in the euro area, with especially sobering evidence for Italy, where many households think the main objective of the ECB's monetary policy is economic growth and few know the ECB's inflation target (Bottone, Tagliabracci, and Zevi 2021). Similarly, only 6% of German respondents were able to answer correctly three simple multiple-choice questions about the ECB (example: "what is the main objective") (Hayo and Neuenkirch 2018). Even in New Zealand, the home of inflation targeting, most firm managers know neither who heads the central bank nor what the bank's objectives are (Afrouzi, Kumar, Coibion, and Gorodnichenko 2015). And knowledge about inflation among the general public is limited (Hayo and Neumeier 2020).

Simple factual knowledge about central banking is one thing. Understanding the basic macroeconomic ideas relevant to monetary policy poses a far sterner test. Andre, Pizzinelli, Roth, and Wohlfart (2021) find that U.S. households think that increases in the federal funds target rate will *raise* inflation. They suggest that this elementary error stems from what they call the "good-bad heuristic": Individuals who perceive two variables as both good or both bad tend to predict that these variables will move in the same direction. Respondents probably consider both higher inflation and higher interest rates as bad. Carvalho and Nechio (2014) use questions about future inflation, unemployment, and interest rates from the

Michigan Survey to see whether people believe that the marginal effects of inflation and unemployment on the Fed's interest rate decisions are consistent with the basic principles underlying the Taylor rule. Happily, they do find indications that some U.S. households actually think of monetary policy roughly that way. Similarly, Drager, Lamla, and Pfajfar (2016) report that more than 40% of U.S. consumers have expectations that are consistent with the Taylor rule. While they also find that only 6% of consumers have expectations that are consistent with all three of the Taylor rule, the Phillips curve, and the Fisher equation, that is surely asking a lot.

The picture of monetary policy knowledge that emerges is therefore one of partial knowledge at best and negligible knowledge at worst. However, several important nuances in these and other studies may suggest possible routes to improved understanding.

One relevant factor is socioeconomic background. Several papers explore heterogeneity across such dimensions as gender, age, education, and income. Figure 5 summarizes results for ten sociodemographic factors from 13 sets of regressions reported in nine papers. For each factor, the figure displays the percentage of cases with a significantly negative correlation, an insignificant correlation, or a significantly positive correlation with monetary policy knowledge. (The dashed bars indicate the percentage of regressions that excluded that particular factor.) A number of findings stand out. Every study considered in Figure 5 uses education as a regressor, and increased education correlates with better monetary policy knowledge in 85% of the cases. Income also has a positive correlation with monetary policy knowledge, in 69% of the cases. The same 69% of regressions indicate that men have better knowledge of monetary policy than women. There is also some evidence, though not as conclusive, that older people have higher levels of knowledge. Last, a few papers report positive correlations with monetary policy knowledge for factors such as job status, homeownership, or wealth.

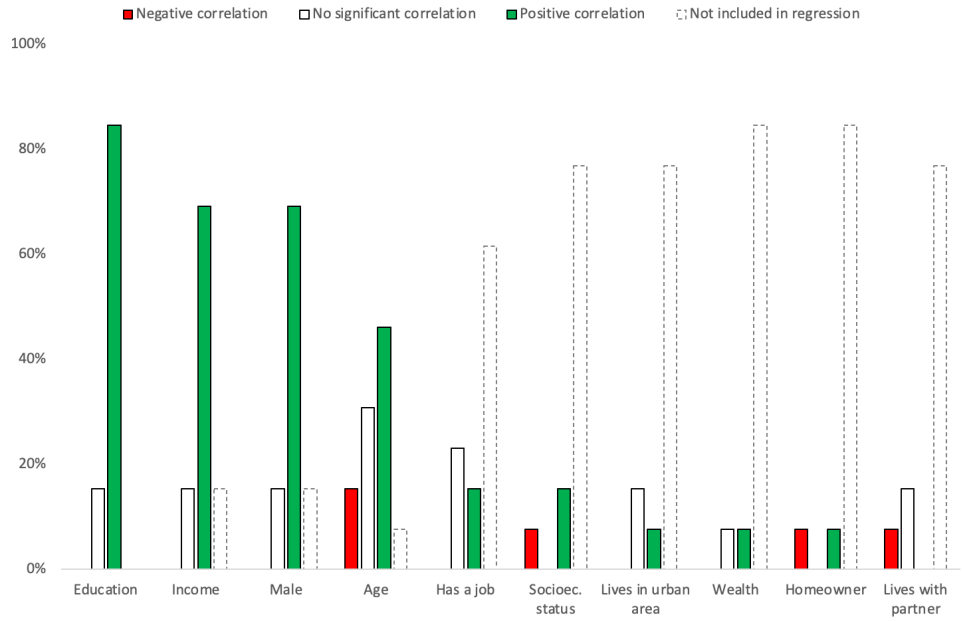

Figure 5. Monetary policy knowledge and sociodemographic factors

Note: Distribution of findings reported in Bottone et al. (2021), Brouwer and De Haan (2021), Carvalho and Nechio (2014), Draeger et al. (2016), Hayo and Neuenkirch (2018), Jost (2017), Kumar et al. (2015), Mellina and Schmidt (2018), and van der Cruijsen et al. (2015). For each of the ten factors listed on the horizontal axis, the vertical axis reports the percentage of regressions reporting, respectively, a negative correlation (in red), insignificant correlations (in white), or a positive correlation (in green) with monetary policy knowledge. The dashed bars indicate the percentage of regressions that did not include that particular factor.

What is the message here for central banks? A defeatist interpretation would be that some groups are unreachable, with efforts best concentrated on, say, the better-educated. A more constructive take-away might be that communications should be tailored to the groups with the lowest levels of knowledge, in the hope of raising their understanding a bit.

What about the role of media in enhancing the public's knowledge? As discussed in Section 2, extensive media coverage—especially on television and in newspapers—makes it easier for the public to pay at least some attention to central banking matters. But no one should think that central bank outreach to the general public via traditional media channels is straightforward. For example, Jansen and Neuenkirch (2018), using Dutch inflation surveys, find no real support for the hypothesis that members of the general public have a better understanding of inflation if they are informed more often via popular newspapers. In fact, more frequent receipt of information is associated with slightly *larger* errors in inflation perceptions. In addition, central bank communication intermediated by the media might have less impact than direct communication by the bank. Coibion, Gorodnichenko, and Weber (2022) show that, if U.S. consumers learn about the Federal Reserve's inflation target or read

an FOMC statement, the effect on inflation expectations is about twice as large as when they merely read a news article about an FOMC meeting.

This evidence suggests that affecting inflation expectations via the media is hard. Still, people who receive their information via television and newspapers do have a more complete understanding of monetary policy (van der Cruijsen, Jansen, and de Haan 2015; Hayo and Neuenkirch 2018). Extending central banks' presence in these two channels is therefore a promising tool for enhancing public knowledge about monetary policy. In doing so, however, it is essential to keep in mind the point made earlier about the complexity of language. Complex statements, even if they reach the public, might not be understood.

Finally, it is worth asking whether direct engagement can enhance understanding of monetary policy—a question the literature has barely touched upon. Bholat, Broughton, Ter Meer, and Walczak (2019) provide some encouraging evidence. They ran three large-scale online experiments in which they presented information from the summary of the Bank of England's *Inflation Report* to participants in different ways. They found that visual representation improved comprehension more than providing the full summary. Digging deeper, they concluded that this improvement came more from using simpler language, rather than from the visuals themselves. They also found that public comprehension was improved by relating monetary policy messages to people's lives. For example, tying the cost of holidays abroad to the value of the pound helped to explain why the pound depreciated after the Brexit vote in 2016.

Haldane, Macauly, and McMahon (2020) argue that simplifying the prose is not enough. While it may increase comprehension, there is also a risk that the public will be disappointed if the central bank cannot deliver on its forecasts. They suggest direct engagement as one way for central banks to increase both trust and knowledge. And they propose that central banks invest in what they call the three E's: Explanation, Engagement, and Education, even reporting some supportive evidence (Haldane and McMahon, 2018). As mentioned in Section 2, the Bank of England's new, layered set-up of the *Inflation Report* both attracted more attention among the general public and improved understanding.

5. *Does central bank communication influence the public's inflation expectations?*

Stabilizing or moving inflationary expectations is surely among the chief objectives of central bank communication, whether with experts or with the general public. The monetary

authority will normally want to *anchor* long-term expected inflation near its target rate. But it may also want to *reduce* short-term expected inflation when it is tightening and *increase* it when it is easing. It is relatively straightforward to "read" the expected inflation rates of financial market participants from asset prices. But the expectations of households, workers, and nonfinancial businesses are harder to assess—and probably harder for the central bank to influence. This section takes up, first, anchoring expected inflation and, then, moving it.

Virtually all central banks these days emphasize the importance of well-anchored long-term inflation expectations. Among other virtues, they help the authorities maintain price stability and stabilize unemployment. Federal Reserve Chairman Jerome Powell (2018) put it this way (p. 8):

> "Anchored expectations give a central bank greater flexibility to stabilize both unemployment and inflation. When a central bank acts to stimulate the economy to bring down unemployment, inflation might push above the bank's inflation target. With expectations anchored, people expect the central bank to pursue policies that bring inflation back down, and longer-term inflation expectations do not rise. Thus, policy can be a bit more accommodative than if policymakers had to offset a rise in longer-term expectations."

Long-term inflation expectations are well-anchored if they (a) are in line with the inflation objective of the central bank and (b) do not respond much to macroeconomic surprises or short-term developments—in other words, if economic agents are confident that the central bank can and will react to shocks in order to return inflation to its target over the relevant horizon (Corsello, Neri, and Tagliabracci, 2021).

Professional forecasters' expectations about long-term inflation seem to align well with central banks' inflation targets (Coibion, Gorodnichenko, Kumar, and Pedemonte, 2020), but central banks may be less successful in anchoring the expectations of non-specialists.[5] This is not surprising. Consumer expectations are known to be biased and inefficient. Forecast errors are systematically correlated with demographic characteristics and are affected by the

[5] We leave aside the many problems that researchers face if they measure inflation expectation through surveys, such as the design of questions and response options. Bruine de Bruin, van der Klaauw, van Rooij, Teppa, and de Vos (2017) observe that responses can be markedly different depending on whether the question refers to 'prices in general', 'inflation', or 'prices you pay', while response rates also depend on the wording of the question. Hayo and Méon (2021) show that letting respondents choose a number without giving them any guidance decreases the response rate compared to asking them to choose from a predefined range of answers. Furthermore, respondents report a relatively lower past inflation and a relatively higher expected inflation rate if asked for a number instead of letting them choose from a list of predefined intervals.

prices of frequently purchased items (such as gasoline), by consumers' attitudes about their economic or financial situation or about the macroeconomy more generally, and by media coverage of inflation (Ehrmann, Pfajfar, and Santoro, 2017).

Miyajima and Yetman (2018) report that inflation anchors of businesses and trade unions in South Africa are consistently *above* the central bank's inflation target range; by contrast, the inflation anchors of analysts generally lie within it. Coleman and Nautz (2021) find that in the 2019-2021 period only between 20% and 29% percent of German households had inflation expectations that were consistent with the ECB's inflation target; most respondents expected higher inflation even though the ECB had undershot its target in those years. Likewise, Galati, Moessner, and van Rooij (2021) show that during the COVID-19 pandemic, euro area consumers' long-term inflation expectations have been de-anchored on the upside rather than on the downside. In a similar vein, Candia, Coibion, and Gorodnichenko (2020; 2021) conclude that the inflation expectations of U.S. firms and households are not well anchored and are higher than those of market participants. According to a survey of New Zealanders performed by Afrouzi, Kumar, Coibion, and Gorodnichenko (2015), business managers have large inflation forecast errors at both short-run and long-run horizons; their inflation expectations are generally above actual inflation rates. Finally, based on data from several countries, Coibion, Gorodnichenko and Kumar (2018) document that managers who believe that inflation has been high in the last year are also much more likely to expect high inflation in the future.

That said, does central bank communication with the general public help anchor inflation expectations? Several studies report that it does—specifically, that inflation expectations shift toward the central bank's inflation target when people receive information about (a) the target (Binder, 2017; Binder and Rodrigue, 2018; Coibion, Gorodnichenko, and Kumar, 2018; Coibion, Gorodnichenko, and Weber, 2022; Baerg, Duell, and, Lowe, 2020; Binder, 2021a), (b) the bank's inflation forecasts (Coibion, Gorodnichenko, and Weber, 2022); and (c) its policy instruments (Coibion, Georgarakos, Gorodnichenko, and Weber 2020). Since the public's perceptions of actual inflation are often too high (Binder 2017; Cavallo, Cruces, and Perez-Truglia, 2017),[6] providing information on actual inflation is also reported to move

[6] To illustrate: Arioli, Bates, Dieden, Duca, Friz, Gayer, Kenny, Meyler and Pavlova (2017) find that between 2004 and 2015, the mean perceived inflation rate of the public in the euro area was 9.5%, considerably above the actual average inflation rate over the same period of 1.8%.

inflation expectations closer to the central bank's target (Coibion, Gorodnichenko, and Weber, 2022; Binder and Rodrigue, 2018; Rumler and Valderama, 2020; Binder, 2021a)—that is, down. All that is good news for would-be communicators.

Explanations also matter. For example, Ehrmann, Georgarakos, and Kenny (2022) find that providing survey respondents with information about the ECB's new inflation objective affected both expected inflation and the confidence that the ECB would deliver price stability. However, this effect was markedly stronger if the communication was accompanied by some explanation of the objective and of the role of monetary policy.

To illustrate what this line of research often unearths, Figure 6 summarizes the main findings of Coibion, Gorodnichenko, and Weber (2022), showing how inflation expectations change in response to several experimental treatments. Their findings led the authors to conclude (p. 2) that:

> "providing households with simple statistics about inflation, such as the most recent rate of inflation, the Fed's inflation target or the FOMC's inflation forecast, has statistically and economically significant effects on inflation expectations: this type of information reduces households' average forecast of inflation by 1.0-1.2 percentage points. The implied change in the perceived real interest rate from this adjustment of inflation expectations dwarfs the estimated effects of quantitative easing or forward guidance on nominal (as well as real) interest rates."

More good news, we suppose. But unfortunately, the effect of communication on households' inflation expectations seems to dissipate quickly; it typically has vanished after six months (see again Figure 6).

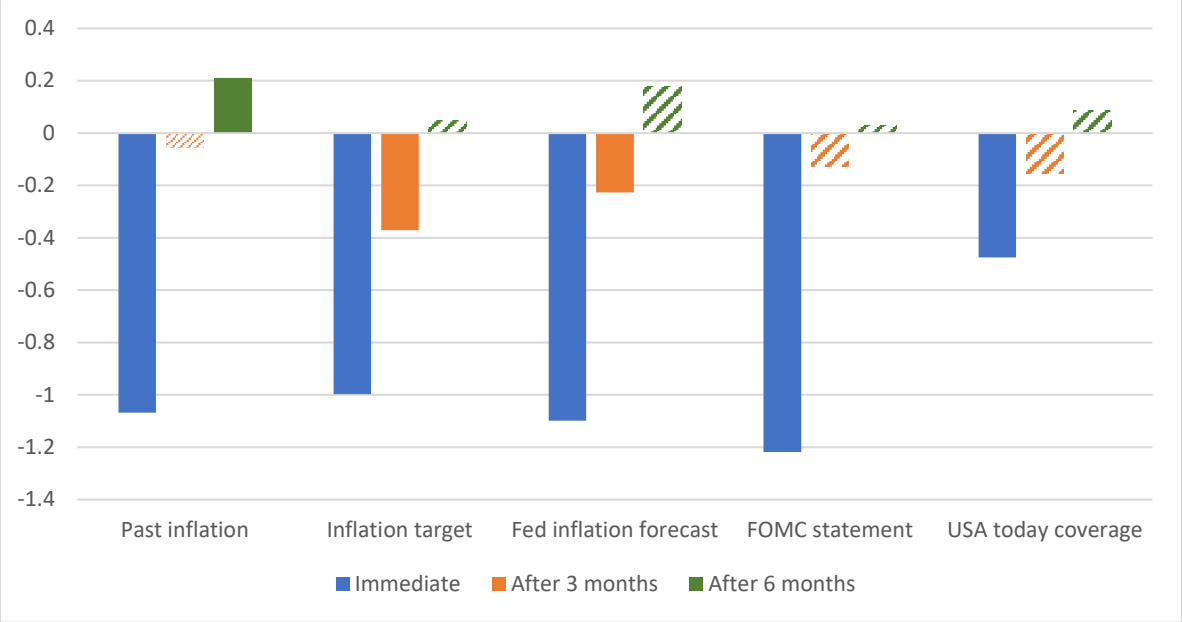

Figure 6. Change in inflation expectations following information treatments

Source: Coibion, Gorodnichenko, and Weber (2022), Table 2.
Notes: The figure reports the average change in inflation expectations of individuals in different treatment groups relative to those in the control. The treatments considered are: the actual CPI inflation rate over the last twelve months; the inflation target of the Federal Reserve; the FOMC forecast for inflation in 2018; the most recent FOMC statement; and the coverage of the most recent FOMC decision in USA Today. In each case, differences in beliefs are measured relative to initial beliefs measured before all treatments. Coefficients that are statistically significant at least at the 5% significance levels are plotted solidly, insignificant coefficients with stripes.

If communication about such basic issues as the inflation target is so difficult, it is probably not surprising that communication about specific policy actions has even less impact. In a survey of U.S. households, Coibion, Gorodnichenko, and Weber (2020) found that households *lowered* their inflation expectations when they were informed that the Federal Reserve *reduced* interest rates in response to the COVID-19 pandemic. So, they moved in the wrong direction? Maybe not. When respondents were also informed that COVID-19 is not as bad as they thought, the effect on expected inflation largely vanished. Binder (2020) examined the impact of the Fed's March 2020 rate cuts. She found that inflation expectations did not respond to being informed: The median was 2% both pre-treatment and post-treatment. Medians mask heterogeneity, however. There was a clear difference between respondents who became more optimistic about unemployment (most of them revised their inflation expectations down) and those who became more pessimistic (most revised their inflation expectations up).

Most of the evidence referred to above is based on RCTs, which have important *ceteris paribus* virtues but*, by design,* ensure that the central bank's signal is always received. Reality, of course, is not like that. Central banks send communications, but much of it falls on deaf ears. It is not surprising, therefore, that the conclusions of studies that rely on other methodologies are weaker. For example, Lamla and Vinogradov (2019, 2021) find that both U.S. and U.K. consumers are more likely to have heard about their central banks following policy announcements—as discussed in Section 3. However, these announcements apparently exert little effect on consumers' perceptions and expectations of either inflation or interest rates. De Fiore, Lombardi, and Schuffels (2021) conclude that monetary policy decisions by the Federal Reserve do affect interest rate expectations of U.S. consumers, but do not affect inflation expectations—not even for the most publicized monetary policy decisions. Likewise, Enders, Hünnekes, and Müller (2019) find that surprises about the ECB's unconventional monetary policy easings hardly affected the expectations of German manufacturing firms; and to the extent they did, they *lowered* expectations of their own prices and production. In contrast, Lewis, Makridis, and Mertens (2019) find that U.S. consumers react to *some* policy developments: An unexpected increase in the interest rate leads to an immediate and robust decline in household confidence, unlike news about forward guidance and asset purchases.

Communication with the general public can conceivably be used as a distinct tool of monetary policy when traditional policy tools are constrained—and therefore have limited impacts on the public's short-term inflation expectations (Coibion, Gorodnichenko, Kumar, and Pedemonte, 2020). When nominal interest rates are stuck at their effective lower bound, a higher rate of expected inflation will of course reduce the real rate of interest—a change the central bank will presumably welcome because lower real rates should incentivize more investment spending.

What about consumer spending? For higher expected inflation to influence consumers, households would have to act on their inflation beliefs by increasing current consumption. Do they? Apparently not in the United States. Bachmann, Berg, and Sims (2015) find that when U.S. consumers expect higher inflation, they express *less* willingness to spend on durables; Breitenlechner, Geiger, and Scharler (2022) show that this pattern is particularly prevalent when interest rates are at the effective lower bound. Likewise, Coibion, Georgarakos, Gorodnichenko, and van Rooij (2022) report experimental evidence for Dutch

households showing that consumers who revise their inflation expectations upwards tend to *reduce* their spending on durables, at least in the short term. Incidentally, Coibion, Gorodnichenko, and Ropele (2020) report in their experiment that higher inflation expectations lead Italian firms to significantly *reduce* their employment and investment.

What explains this behavior? Candia, Coibion, and Gorodnichenko (2020) argue that many agents associate higher inflation with worse economic outcomes—the stagflationary model mentioned earlier. As a result, households that expect higher inflation may lower their spending rather than raise it. In contrast, van der Cruijsen and Samarina (2021) report that European consumers with higher inflation expectations are more likely to *increase* their household spending. Duca-Radu, Kenny, and Reuter (2021) also report a positive response in the readiness to spend from an increase in inflation expectations for euro area consumers. In total, it is probably fair to say that the verdict is out on the direction of the effect of expected inflation on consumption.

Our discussion so far has focused on the *average* impact of central bank communication. We close this section by briefly discussing two elements of *heterogeneity*: cognitive abilities and financial literacy.[7] Several studies report that cognitive limitations affect inflation expectations. For instance, D'Acunto, Hoang, Paloviita, and Weber (2019a) conclude that arithmetic, verbal, and visuospatial abilities are all relevant in explaining the absolute forecast error for inflation in a representative population of Finnish men. D'Acunto, Hoang, Paloviita, and Weber (2019b) find that individuals with mid-to-low IQ levels have absolute forecast errors for 12-month-ahead inflation rates that are 2.5 times as large as individuals with high IQ levels. There is also evidence suggesting that the inflation expectations of more financially literate individuals are more realistic, more accurate, and more in line with the central bank's target (Rumler and Valderrama, 2020). None of these results, however, directly address the question of how central bank communications move inflation expectations.

Incidentally, financial literacy also seems to be related to trust in the central bank (Mellina and Schmidt, 2018; Brouwer and de Haan, 2021). That association is relevant here because the inflation expectations of individuals who trust central banks tend to be closer to the central bank's inflation target (Christelis, Georgarakos, Jappelli, and van Rooij, 2020;

[7] We are not aware of studies examining the potential impact of both factors simultaneously. This is an interesting avenue for future research.

Rumler and Valderama, 2020; Binder, 2021a). Furthermore, Stanisławska and Paloviita (2021) find that consumers who trust the central bank adjust their inflation expectations less in response to transitory economic developments than consumers who distrust the central bank. So, if central bank communication can increase trust, it may also help anchor inflation expectations. Trust, however, is important in a wider context than that. We turn to trust now.

6. Does central bank communication enhance public trust in the central bank?

Long ago, Milton Friedman (1962: 180) argued against central bank independence, questioning whether "it [is] really tolerable in a democracy to have so much power concentrated in a body free of democratic control". He was not alone. However, a consensus has now emerged "that the goals of monetary policy should be established by the political authorities, but that the conduct of monetary policy in pursuit of those goals should be free from political control" (Bernanke, 2010). That is, central banks should have instrument independence but not goal independence.[8] This division of authority, in turn, requires that the central bank be accountable for its actions. Thus, accountability is a corollary of central bank independence (Issing 2014). Of course, accountability requires transparency and communication, otherwise to what can central banks be held to account? In fact, a 2007 BIS survey found that accountability was central banks' principal motive for communicating with the public (Jeanneau, 2009).

But to whom is the central bank accountable? One obvious answer is the *legislature*. Thus Bernanke (2007) observed that accountability implies that central banks provide "elected representatives a full and compelling rationale for the decisions they make". After all, the legislature decides on the mandate of the central bank and may change it from time to time. Legislators in most countries can also change the laws governing the central bank. All this, of course, implies that politicians are a key target audience of central bank communications. Draghi (2014) argues, however, that the central bank should be accountable to the *general public* as the ultimate sovereign: "A transparent central bank serves the general public, by improving understanding of its actions and accountability for its decisions."

Several recent developments have led to changes in the accountability practices of central banks. As a general matter, expanded mandates, new tools, and new roles require

[8] That does not imply that politicians do not try to influence monetary policy. As discussed in more detail in Binder (2021b), political pressure on central banks is prevalent in many countries regardless of legal central bank independence.

more explanation and more accountability to the legislature. But Binder (2021b) argues that dissatisfaction with representative democracy plus the growth of online digital technologies has generated pressure on central banks to be more directly responsive to the public. The ECB, for instance, has indeed changed its communications in two (consistent) ways: to reflect an increasing number of references to the political will of the people of Europe (Lokdam 2020) and to strengthen accountability to the European Parliament (Fraccaroli, Giovannini, and Jamet 2018).

Popular support can help the central bank defend itself against political influence (Berger and de Haan, 1999; Ehrmann and Fratzscher, 2011). Perhaps because they recognize this, central banks increasingly refer to public *trust* to motivate their communications with the general public. Indeed, a recent survey of former ECB policymakers finds that enhancing credibility and trust is seen as the main objective of monetary policy communication (Ehrmann, Holton, Kedan, and Phelan 2021). The ECB's current president, Christine Lagarde, even views the general public as the "new frontier" for central bank communication, arguing that: "Central banks have to be understood by the people whom they ultimately serve. This is a key to rebuilding trust."[9]

Ehrmann, Soudan, and Stracca (2013: 782) define citizens' trust in the central bank as "belief that the central bank, as the agent in a principal-agent relationship, will deliver on its stated goals—in the case of the European Central Bank (ECB), price stability—to its principal (i.e., citizens)."[10] Trust in the ECB declined substantially after the global financial crisis and recovered only slowly (Bergbauer, Hernborg, Jamet, and Persson 2020). Likewise, Istrefi and Piloiu (2020) observe a negative trend in the net satisfaction of British citizens with the Bank of England, which started to improve again in late 2012. In contrast, these authors find that public confidence in the Bank of Japan started from very low levels in 2004 but has been trending upward ever since. A recent Axios-Ipsos survey, however, suggests that trust in the Federal Reserve is low. At the beginning of 2021, slightly less than 40 percent of Americans had a great deal or a fair amount of trust in the U.S. central bank.[11]

[9] See https://www.europarl.europa.eu/doceo/document/A-9-2019-0008_EN.html#title.

[10] The concept of trust is closely related to but not the same as credibility. Blinder (1999, p. 64-65) defines credibility as "... that your pronouncements are believed – even though you are bound by no rule and may have an incentive to renege." He goes on to add: "...it is ... built up by a history of matching deeds to words." In empirical research, credibility is often proxied by the extent to which long-term inflation expectations are anchored at the central bank's target (Kril, Leiser, and Spivak 2016; see also Coleman and Nautz 2021). So, the evidence in section 5 that trust leads to better anchored inflation expectations implies that trust enhances credibility.

[11] https://news.yahoo.com/poll-trust-federal-remains-negative-130330182.html.

Low trust can have important repercussions for the central bank. On strictly macroeconomic grounds, Bursian and Faia (2018) show that lower trust amplifies macroeconomic fluctuations and steepens the sacrifice ratio. Thinking more broadly, low trust in government has been related to the rise of populism (Algan, Guriev, Papaioannou, and Passari 2017), which in turn could have ramifications for central bank independence (Goodhart and Lastra 2018). Consistent with that, Ehrmann and Fratzscher (2011) have shown that lower public trust in the ECB increases the likelihood that domestic politicians will comment on the ECB's policy from a national perspective rather than from a euro area perspective--a situation that poses several risks. Not only is it important to ensure that the ECB's policy is assessed in the context of the economic performance of the euro area as a whole, but there is also ample evidence that political commentaries influence policy rate expectations (cf. Bianchi, Kind, and Kung, 2019; Demiralp, King, and Scotti, 2019).

A large and rapidly expanding literature uses survey data to analyze the drivers of public trust in central banks. Most of this research has been conducted for the case of the ECB, based on readily available survey data from the Eurobarometer.[12] An early analysis of the drop in trust following the global financial crisis and the European sovereign debt crisis by Ehrmann, Soudan, and Stracca (2013) showed that the fall reflected the deterioration of the economic situation, a more generalized decline of trust in European institutions in the wake of the crisis, and the severity of the banking sector's problems—to which the ECB was associated in the public mind.

Other studies examining trust in the ECB include Wälti (2012), Hayo and Neuenkirch (2014), Bursian and Fürth (2015), Farvaque, Hayat, and Mihailov (2017), Mellina and Schmidt (2018), and van der Cruijsen and Samarina (2021). This research suggests that, apart from macroeconomic factors and trust in other European institutions, trust in the ECB also varies with the characteristics of individual survey respondents. For instance, both Farvaque, Hayat, and Mihailov (2017) and Bursian and Fürth (2015) report that respondents' political orientation, their education level, and their employment status are all key factors explaining trust in the ECB. Angino, Ferrara, and Secola (2021) find that individuals living in regions where people do not trust other people systematically exhibit less trust in the ECB.

[12] Questions used in surveys to measure trust in different countries differ substantially, making it hard to compare public trust across central banks. For instance, in the Eurobarometer survey, the possible answers from which the respondents can choose are: "Tend to trust", "Tend not to trust" and "Don't know". In the DNB Dutch Household Survey, respondents are asked to indicate their trust in the ECB on a ten-point scale, whereas Hayo and Neumeier (2021) use a five-point scale.

The importance of socio-demographic characteristics in shaping trust in the central bank is not limited to the euro area. Hayo and Neumeier (2021) report that respondents place more trust in the RBNZ if they are older, self-employed, financially satisfied, have more knowledge of the RBNZ, and have higher trust in government institutions in general. Similarly, Farrell, Fry, and Fry (2021) report that older people, more educated people, and people residing in London show higher levels of trust in the Bank of England.

Some of the factors influencing trust in the central bank can be influenced by the bank. Albinowski, Ciżkowicz, and Rzońca (2014) report that aggressive cuts in interest rates by the ECB have an adverse effect on trust in the central bank when households have pessimistic expectations. Istrefi and Piloiu (2020) stress that more economic policy uncertainty reduces public trust in the central bank—and that it takes a long time for trust to recover. According to Haldane (2017), central banks face a "twin deficits" problem—a deficit of public understanding and a deficit of public trust. The two are related. Substantial evidence suggests that better knowledge of the central bank enhances trust (Hayo and Neuenkirch 2014; Mellina and Schmidt 2018; Haldane and McMahon 2018; Hayo and Neumeier 2021, and van der Cruijsen and Samarina 2021). If so, informing the general public about monetary policy may be a promising way to increase trust in the central bank, as long as communication with the public *increases* their knowledge (the topic of Section 3).

In view of the importance that central banks attach to public trust, there is remarkably little research on the effect of transparency and communication on trust. The few studies that do exist suggest, though not unequivocally, that transparency enhances trust in the central bank. Van der Cruijsen and Eijffinger (2010) find that higher perceived transparency is positively associated with trust, but the link between *perceived* and *actual* transparency is rather weak. Horvath and Katuscakova (2016) examine the effect of actual central bank transparency on trust in the ECB, controlling for factors that prior studies reported to shape the level of trust. They conclude that greater transparency improves citizens' trust, but only up to a point; too much transparency is not conducive to trust. Finally, Kril, Leiser, and Spivak (2016), based on a survey of Israelis, report that transparency is positively related to trust in the Bank of Israel, but not to confidence in the Bank's forecasting abilities.

According to the ECB (2021: 44), "trust can be built through clear, transparent communication". However, the few studies that analyze the impact of central bank communication on trust report mixed results. We have already discussed (in Section 3) Bholat,

Broughton, Ter Meer, and Walczak's (2019) paper on experiments using the Bank of England's *Inflation Report*. They show that relatable content increases the public's trust and improves people's perceptions of the central bank. However, as pointed out by Istrefi (2021), the authors did not consider respondents' perceptions about the Bank of England *before* the experiment; a before and after comparison would have been more compelling. That is precisely what Brouwer and de Haan (2021) provide for the ECB, and their results suggest that providing information about how the ECB tries to achieve price stability has no impact on trust.

Studies of trust in the central bank usually use surveys. But the details of how those surveys are conducted might affect the responses. For example, in an experiment using the ECB's Knowledge and Attitudes survey, Angino and Secola (2021) find that the position of the trust question in the questionnaire mattered. Respondents who got asked this question later in the survey, after they had a chance to reflect on the institution, were more likely to report a lower level of trust.

Taken together, these results suggest that, while trust matters, it is not straightforward for central bankers to foster trust in their institutions. Trust is *inter alia* determined by factors that are not under their direct control; it cannot be taken for granted that more transparency and more communication enhance trust; and measuring trust remains difficult.

7. Limits to communication with the public

There is broad consensus among central bankers that more communication with the broad public is both warranted and important. However, most non-specialists remain unaware of central banking issues, are difficult to reach, and find it difficult to understand central bank communications even when they are reached. Those stark facts seem discouraging. However, there are some glimmers of hope. In particular, several efforts to make central bank messages simpler and more relatable to ordinary people look promising. In brief, central bank communications with the public need to hit closer to people's lives, to use plainer language, and to be better targeted to a non-specialist audience.

Sounds simple, but it's not. For one thing, most central bank efforts to communicate with the general public are of recent vintage, so there is no deep well of experience on what works best. According to an old cliché, "practice makes perfect." But central bankers have

had little practice; indeed, many have never tried. A second problem is that there may be limits on how much the central bank can or should communicate. How much detail can they expect the public to absorb? How simple can the messages be without distorting the underlying (often complex) reality? Since these limits may differ across central banks, so must the style of communication.

Clearly, central bank communication is most effective when it maximizes the signal-to-noise ratio, that is, when it increases the genuine *message* while minimizing any associated *noise*. This principle, which Blinder, Ehrmann, Fratzscher, de Haan, and Jansen (2008) emphasized for communicating with the financial markets, applies also to communicating with the general public. It implies, among other things, that more communication is not better if it adds more noise than signal. Consistency is crucial here. While the general public is unlikely to appreciate or understand the more detailed and specialized communications that are essential for experts, the two must at least be consistent. Inconsistent messages risk confusion, which can even degrade the communication with experts. Consistency is also crucial for avoiding the cacophony problem. As Blinder (2007) noted years ago, a central bank that speaks with too many voices has "no voice at all."

Often there is a trade-off between accuracy and simplicity. Central banks may reach households better by communicating in simpler and shorter ways. However, if messages get too simple, they may not match up well with the underlying realities. And if the public sees such inconsistency, trust in the central bank may be undermined (Haldane, Macauly, and McMahon, 2020). Messages that are too simple may also discard important information that conveys a more accurate, albeit more complex, account of monetary policy—including, importantly, limits on central bank actions. As the ECB (2021: 53) puts it: "Simplification could potentially give the public a false sense of certainty and understanding of the central bank's power. This in turn could set the wider public—and those market participants that might resort to such simplified communication—down one particular path, further risking the central bank's credibility if that path does not lead in the desired or expected direction."

Another open issue is about *what information* central banks should provide to the general public. Should they mainly talk about their objectives, or should they also talk about the instruments employed to achieve those objectives? And what about current (or possibly even future) monetary policy? The jury seems out on these questions. Evidence presented by D'Acunto, Hoang, Paloviita, and Weber (2020) suggests that communication manages

expectations more effectively when it focuses on policy objectives rather than on the instruments employed to achieve those objectives. However, Brouwer and de Haan (2021) report evidence that individuals who receive information on how the ECB tries to achieve its inflation target adjust their inflation expectations more toward that target. Consistent with this, the ECB was judged to be more credible when individuals were told not just about its new inflation target, but also about what the target implies for the conduct of monetary policy (Ehrmann, Georgarakos, and Kenny 2022).

In contrast, communication about individual policy decisions or about the current stance of monetary policy may be too challenging for the general public. Various studies show that the public's inflation expectations barely respond to monetary policy actions (Lamla and Vinogradov 2019; 2021; De Fiore, Lombardi, and Schuffels 2021). In fact, central bank policy announcements might even push the expectations of non-experts in the wrong direction. For instance, individuals who received information about the ECB's emergency COVID-19 asset purchase program significantly *lowered* their estimates of expected future economic growth (ECB, 2021). Why? Perhaps because households read those policy announcements as suggesting that the economy was weaker than they had previously thought. Coibion, Gorodnichenko, and Weber (2022) find similar effects in a survey of U.S. households.

Forward-looking information about *future* policy seems to be particularly challenging for the general public to digest, even though experts devour it. Kryvtsov and Petersen (2021) show that such announcements have smaller effects on individual expectations than *backward-looking* announcements of interest rate changes--especially if the forward-looking announcements do not clarify the timing of future policy changes. Likewise, D'Acunto, Hoang, and Weber (2022) report that the ECB's forward guidance had negligible impact on household inflation expectations or readiness to spend on durables. Such findings cast doubt on the effectiveness of monetary policy strategies that rely mainly on influencing popular inflation expectations, such as the Federal Reserve's August 2020 switch to average inflation targeting (Coibion, Gorodnichenko, Knotek, and Schoenle 2020). In fairness, however, that policy change was probably aimed more at market participants than at the general public.

The fact, documented in Section 5, that inflation expectations of households and firms are much more biased than those of professional forecasters leads to an obvious question: What information failures prevent households and firms from doing better? The explanations suggested—including insufficient financial literacy, cognitive limitations, and rational

inattention—have different implications for how likely it is that central bank communication can affect non-experts' expectations of inflation.

As discussed in Sections 5 and 6, greater financial literacy does lead to more accurate inflation expectations—and to more trust in central banks. However, greater economic and financial literacy is an elusive goal. According to a recent survey of adult financial literacy in 26 countries by the Organisation for Economic Co-operation and Development (OECD 2001) via its International Network on Financial Education (INFE), only 60% of respondents understood the concept of inflation.

Several central banks are making active efforts to educate the broader public. However, their efforts focus mostly on personal financial management, not on monetary policy (ECB, 2021). Such matters are clearly more "relatable" than abstract policy issues, but whether they contribute to better understanding of monetary policy is an open question. Furthermore, views differ on even whether these educational efforts work.

To illustrate, three recent meta-analyses summarizing this literature reached rather different conclusions. Kaiser and Menkhoff (2017), in a meta-analysis of 126 impact evaluation studies, found that financial education significantly improved financial literacy. However, not all interventions are equally effective; for example, financial education is less effective with low-income individuals. Based on 76 randomized experiments, Kaiser, Lusardi, Menkhoff, and Urban (2020), reported that financial education programs have, on average, positive causal treatment effects on financial knowledge and behaviors. But note that our comment on RTCs applies to this literature as well: In experiments, all subjects receive the information. In reality, they do not. Furthermore, Fernandes, Lynch, John, and Netemeyer's (2014) meta-analysis of 168 articles reporting on 201 studies concluded that interventions to improve individuals' financial skills explained just 0.1% of the variance in financial behavior.

As pointed out earlier, research has demonstrated that cognitive limitations also affect inflation expectations (D'Acunto, Hoang, Paloviita, and Weber 2019a;b). Cavallo, Cruces, and Perez-Truglia (2017) report that, even when statistical information about inflation is available, individuals still place significant weight on inaccurate sources of information, such as their memories of the price changes of supermarket products they purchase. Individuals' cognitive abilities also likely influence their levels of financial literacy. For instance, recent experimental evidence by Muñoz-Murillo, Álvarez-Franco, and Restrepo-Tobón (2020) suggests that general cognitive ability is a robust predictor of financial literacy, even controlling for other

factors like risk aversion, patience, and parental characteristics. Evidence like this has to temper optimism about how much central bank educational efforts can improve financial literacy. Cognitive ability is not easily changed.

Another open issue is *which channels* of communication to employ. Most information from and about central banking is intermediated, of course, since central bankers rarely write newspaper articles or appear on television—the two media which Section 3 showed to remain the main sources of information about central banks. Increased presence in such traditional media outlets might be helpful. It would also give these sometimes opaque and remote institutions human faces to which people can relate, possibly generating more interest and understanding (D'Acunto, Fuster, and Weber 2021). Clearer communications would, of course, help garner more media attention (Ferrara and Angino 2021).

Social media channels offer further opportunities for direct outreach to specific segments of the population, but also carry risks. Ehrmann and Wabitsch (2022) show that tweets about the ECB are more likely to get retweeted if they are *less* factual. At the same time, however, their study shows that Twitter traffic related to the ECB generally becomes *more* factual in response to ECB communication. So, there may be some hope that central banks can improve the tone and content of discussions on social media. Maybe.

Finally, as several central banks have embarked on "listening events" to better understand the public's views, they may want to use these opportunities to educate and explain. However, it is important *not* to leave people with an exaggerated impression of how much these consultations will shape the central bank's decisions.

Taken together, all these considerations suggest that central banks must carefully design their public communication strategies to generate understanding, not *mis*understanding. Among the relevant factors are the media landscape in the country, the level of financial literacy, the extent to which there is public debate about central bank issues, the bank's mandate, and even the personalities and communication skills of the bank's leaders. It is therefore immediately apparent that one style is unlikely to fit all.

8. Conclusions

One of us (Blinder, 2004) many years ago referred to the explosion of central bank communication with financial markets since the 1990s as part of a "quiet revolution" in central banking practice. That explosion had two motivations—democratic accountability and

enhancing the effectiveness of monetary policy. But it is clear that the second was the main driving force within the central banking community. Commensurately, there is by now a huge literature on the effects of central bank "talk" on interest rates, expectations, and other variables related to monetary policy.[13] Essentially all of it, however, pertains to talking to market participants and other experts.

In recent years, a new frontier in central bank communication has begun to open up: communication with the general public. These new efforts, surveyed here, are of very recent vintage; the reader has probably noticed the number of references to papers dated 2020 or 2021, including many that are not yet published. Communications with the public look and sound different from communications with the markets. They have different purposes, emphasizing, for example, democratic accountability more than policy effectiveness. And they encounter different problems, such as getting ordinary people to listen and to understand. For most central bankers, communicating with the public is like landing on a strange planet; many have not landed there at all.

This survey nonetheless unearths several potentially important findings. Since we have organized the paper around a series of questions, we conclude with a brief summary of each. Every conclusion, of course, is provisional. These are early days, and there is much more to learn.

First, how do (or should) central banks communicate with the broad public, and are their messages received? The latter, of course, is a non-problem when communicating with markets; specialists dote on every syllable. But ordinary citizens have other, more pressing things to do, and they are constantly bombarded with messages from everywhere. Getting heard amid this din is a serious challenge for central bankers. But the evidence to date suggests that television and newspapers are still the most effective routes. They reach people "for free," rather than requiring them to seek out information. This process works better, it seems, if the banks' leaders appear in person. We think it fair to say that not many central banks have done much such media work to date, the Bank of Jamaica being a notable exception. It clearly puts them outside their comfort zone. They may need to expand that zone.

[13] The literature through about 2007 was surveyed by Blinder, Ehrmann, Fratzscher, de Haan, and Jansen (2008). Much more has been written since.

Second, are central bank communications understood by the general public? Mostly not, it appears, though there are some glimmers of hope. These glimmers can be stoked if central bankers use simpler prose, explain their ideas in ways to which ordinary people can relate, and focus on monetary policy's objectives rather than on the details of implementation. "Layered" approaches to communication, now being tried by several central banks, may also hold promise. Tailor your message to the intended audience (but keep it consistent across audiences). Ironically, and mindful of the well-known cacophony problem, some of this tailoring may involve using different speakers to reach different audiences.

Third, can central bank communication be used to influence—or even anchor—public expectations of inflation? According to most macro models, success in managing expectations is important to effective monetary policy. But the evidence to date is that central banks have not been very successful in this domain. A minimal goal might be to get the broad public to "get the sign right." At present, it seems, too many believe that, e.g., interest rate hikes probably raise, not reduce, inflation. This rank misunderstanding may be due to the public's belief in the "stagflationary" view of such matters: that weak economies go with high inflation. Maybe central bank talk can abuse people of this notion.

Fourth, can better communication with the public increase trust in the central bank? Here, the answer appears to be yes—though not easily or predictably. While there is no magic formula, some central banks have already scored successes in this domain. Remember, most efforts to communicate with the public are motivated by the democratic accountability argument, accountability clearly works better if the central bank is trusted, and transparency is one way to build trust. Incidentally, but potentially important, more trusted central banks appear better able to influence inflationary expectations. Furthermore, public trust might also help the central bank defend its independence from political threats where and when necessary. All this makes us think that building trust may be the most important objective of central bank communication with the general public.

Finally, however, there are severe limits on what communication with the broad public can reasonably be expected to achieve. No country will ever become a nation of monetary policy experts. Ordinary people simply have neither the time nor the energy for that; levels of financial/economic literacy are low and hard to raise; and the subject matter is complicated enough to strain the cognitive abilities of many. Citizens with so many other

things on their minds cannot be expected to understand, for example, the nuances of forward guidance or quantitative easing.

All that said, the potential benefits from more, and more effective, central bank communication with the general public—including greater accountability, more trust, and more steadfast political support—are important enough that central bankers should strive to achieve them. Doing so won't be as easy as educating the markets, and there will be many failures along the way. But the game is worth the candle.

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Acknowledgements

We are grateful to Steven Durlauf (the editor) and five anonymous referees, as well as to Guido Ascari for comments and suggestions. Jansen worked on this paper prior to joining the FSB.
Views expressed in this paper are personal and do not reflect those of the European Central Bank, de Nederlandsche Bank, the Eurosystem, or the Financial Stability Board.

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PDF ISBN 978-92-899-5278-1 ISSN 1725-2806 doi:10.2866/67997 QB-AR-22-059-EN-N