

Lamla, Michael; Vinogradov, Dmitri V.

Working Paper

Is the word of a gentleman as good as his tweet? Policy communications of the Bank of England

Working Paper Series in Economics, No. 403

Provided in Cooperation with:

Institute of Economics, Leuphana Universität Lüneburg

Suggested Citation: Lamla, Michael; Vinogradov, Dmitri V. (2021) : Is the word of a gentleman as good as his tweet? Policy communications of the Bank of England, Working Paper Series in Economics, No. 403, Leuphana Universität Lüneburg, Institut für Volkswirtschaftslehre, Lüneburg

This Version is available at:

<https://hdl.handle.net/10419/234592>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Is the Word of a Gentleman as Good as His Tweet?
Policy communications of the Bank of England

by

Michael J. Lamla and Dmitri V. Vinogradov

University of Lüneburg
Working Paper Series in Economics

No. 403

May 2021

www.leuphana.de/institute/ivwl/working-papers.html

ISSN 1860 - 5508

Is the Word of a Gentleman as Good as His Tweet?

Policy communications of the Bank of England[‡]

Michael J. Lamla*
Dmitri V. Vinogradov**

May 25, 2021

Abstract

Policy announcements by central banks affect financial markets, but their effect on consumer beliefs is limited. This paper studies the implications of using different communication channels: established media outlets versus social media. Information on the news sources comes from our original consumer surveys administered just before and right after policy announcement events, enabling a causal inference on the announcement effect. We focus on the Bank of England, the first central bank to actively adopt accessible language, simplified messages and new forms of communication via its Twitter account. Based on about 10 000 individual consumer responses in 2018-2019, overall we find no statistically significant effect of announcements on perceptions or expectations, yet respondents who receive news have better perceptions and expectations than those who don't. Policy announcement events trigger an increase in the share of consumers who receive monetary policy news, the share of informed consumers is higher among Twitter users, suggesting potential benefits from Twitter communication with the public. However, Twitter users tend to overestimate inflation and interest rates, make a greater expectations/perception error. In addition they report higher confidence in their estimates. In terms of expectations quality, spreading the word of the Central bank via conventional mass media appears to be more effective than tweets.

Keywords: perceptions, expectations, central bank communication, consumer, Twitter.

JEL classification: E52; E58.

[‡]We thank the participants of research seminars at the University of Glasgow, the Bank of England, Nottingham Business School, University of Hannover, and of the international Conference on applied research in economics (iCare 2020) at NRU HSE Perm. Both authors acknowledge financial support through the Bank of England research donations scheme.

*Leuphana University Lüneburg and ETH Zürich, KOF Swiss Economic Institute.

**University of Glasgow and National Research University Higher School of Economics.

1 Introduction

Since [Blinder et al. \(2008\)](#) called for more attention to central bank communication with the general public, there has been some rapid growth in research investigating effects of central bank communication on the information set and the resulting beliefs of the general public. Information does affect beliefs and decisions ([Haldane and McMahon, 2018](#); [Coibion et al., 2018](#); [Binder, 2020](#)) but the effect appears short-lived ([Coibion et al., 2019](#)) and overall minuscule given the low proportion of those who receive news about the central bank policy ([Lamla and Vinogradov, 2019](#)). Simplified communication appears to improve expectations ([Haldane and McMahon, 2018](#)) but newspaper coverage of policy decisions is not always as good received as the information coming straight from the central bank ([Coibion et al., 2019](#)). If central banks wish to ensure more people are properly informed about their policies, should they resort to direct communication (via social media) or further rely on intermediated communication (via news media)? We investigate whether and how policy communication by central banks affects the information set and expectations of consumers through the intermediated and the direct channels.

Our focus is on communications by the Bank of England (BoE). Over the last few years, central banks intensified their social media engagement, aiming to improve the efficiency of their communication with the greater public. However, so far there is no evidence this greater presence in social media is any better than policy communication through conventional outlets. The Fed, the ECB and a number of other central banks use Twitter to regularly inform followers about the outcomes of policy meetings. The BoE differs in that it presents information in an accessible form, using simple words and concise infographics. Theoretically, presenting monetary policy news in accessible versus traditional (complex and technical) form makes a difference - decision-makers adjust beliefs stronger after receiving easier to digest policy news ([Haldane and McMahon, 2018](#); [Bholat et al., 2019](#)). Providing households with simple statistics has a much stronger effect on expectations than giving them a typical post-meeting statement or a news article ([Coibion et al., 2019](#)). The simplified language

used by the BoE in its Twitter communications makes it a suitable object to investigate how accessible communication affects beliefs in real life.

To identify the effect of information provision, the above cited papers measure expectations before and after the information inflow: in [Haldane and McMahon \(2018\)](#); [Coibion et al. \(2019\)](#) and [Binder \(2020\)](#) information comes within the survey wave, in [Coibion et al. \(2018\)](#) the after-effect is measured in a follow-up survey, and in [Lamla and Vinogradov \(2019\)](#) information comes exogenously through policy announcements between the two adjacent waves of a survey. Well-established expectations datasets, such as the Michigan Survey or the NYFed consumer expectations survey, are not frequent enough to be able to draw causal inference from policy announcements to changes in public expectations. To overcome this obstacle, we follow the approach developed in [Lamla and Vinogradov \(2019\)](#), administering our surveys around the Monetary Policy Committee (MPC) announcements in the UK which allows inferring causal effects of announcements. In comparison to the Fed survey in [Lamla and Vinogradov \(2019\)](#), the questionnaire in the current paper is designed to provide more information regarding the sources of information the public relies on, including the Twitter account of the BoE.

It may be convenient to distinguish between three stages of news communication: first, the news leaves the central bank or the media outlet, for example, a message is posted on Twitter or published in a newspaper (*provision*), then it comes to consumers, who buy the relevant newspaper, turn on the TV or log in to their social media account, yet not all news would be noticed and received by the public at this step (*arrival*), and finally the news is registered and understood, once received (*processing*, or digestion). In an experimental setup, the difference between the three stages may be blurred. In a lab setting (e.g., in [Haldane and McMahon, 2018](#)), an experimenter provides subjects with information, and the set up incentivizes subjects to read it (arrival) and to make an effort to understand (processing). In survey experiments (as in [Binder, 2020](#)), where the information bit is included in the questionnaire, there is no distinction between provision and arrival of information: all participants receive the news. If the survey is short and focused, most subjects will read it and

make an attempt to understand, further blurring out the processing phase. In a field setup (as in [Lamla and Vinogradov, 2019](#)), under a precise control for the provision of information (central bank policy announcement), about two-thirds of participants report not having received the news, emphasizing the difference between the provision and the arrival. A policy aiming at increasing the news coverage, addresses exactly the issue of reducing this difference. Once news is received, it needs to be digested to potentially affect beliefs and decisions, which is addressed by the policy of simplification and increasing the accessibility of news. The effectiveness of the latter has so far been investigated without an explicit focus on the communication channel. Our data details all the three phases of communication, enabling us, in particular, to distinguish between news arrival through mass and social media.

Our key result is that Twitter communication does not add much in terms of news dissemination: the fraction of people who heard monetary policy news increases by 20% in our UK data (a double of what [Lamla and Vinogradov, 2019](#), report for U.S. consumers), yet this increase comes almost exclusively through the conventional mass media. We document traditional media like newspapers, TV and radio dominate as information channels. Twitter users tend to make a greater error in their assessment of the current inflation and interest rates, as well as report higher expectations of inflation and interest rates than experts and the rest of the public. Nevertheless, Twitter users have stronger confidence in their assessments of inflation and interest rates. The potential precision and reliability benefits of single-source direct communications by a Central bank are overridden by poorer quality of expectations of Twitter users. All results are robust to controlling for socio-demographic factors, hence this Twitter effect can hardly be associated with the conventional "Twitter-type" (i.e., younger, better educated, and higher-earning, see, e.g. [Wojcik and Hughes, 2019](#), in whose data, noteworthy, only 22% of the US public use Twitter). A possible explanation is that the continued flow of information through Twitter contaminates the Central bank's message and its effect on expectations, yet knowing that one receives news from the Central bank directly, improves confidence. All in one, our results call for caution in using the direct communication channel.

2 Related literature

Social networks in general, and Twitter in particular, receive increasingly more academic attention as tools of communication of government agencies and political leaders with and to the public.¹ A new and growing strand studies communication and dissemination of information across social network users - also in the context of inflation expectations. [Haldane and McMahon \(2018\)](#) report that monetary policy news trigger substantial Twitter activity, independent of the communication channel - hence, news spread over social media potentially becomes an important source informing economic expectations of social media users. A recent study by [Ehrmann and Wabitch \(2020\)](#) uses Twitter to differentiate experts from non-experts and confirms Twitter activity significantly informs non-experts on monetary policy news. In [Gorodnichenko et al. \(2021\)](#) the focus is on the activity of users in response to Fed communications on Twitter and Facebook: in particular, they show Twitter is used by far more than Facebook, the majority of those who engage with messages from the central bank (retweeting or commenting) are the general public, and more activity takes place around the policy announcement events. While [Gorodnichenko et al. \(2021\)](#) detect some market reaction to social media posts by the Fed, it remains unclear whether the general public updates expectations in response to those posts. In this paper, we focus on social networks exclusively as an alternative channel through which central banks directly communicate policy decisions to the general public; our interest is in whether and how this communication affects expect-

¹Much better established is the literature that studies and uses social networks as the source of information on public preferences, tastes and opinions. Most existing studies of government or political leaders' communication with the general public via social networks are in political sciences and public administration. [Rainie et al. \(2012\)](#) report survey results indicating already a decade ago about a third of adult internet users in the U.S. received at least some information about government activities through social networks. An early documentation and analysis of the role of Twitter as a tool of political communication is, for example, in [Parmelee and Bichard \(2011\)](#), who list the desire to be informed and shared political views among the motivating factors that drive Twitter users to follow political leaders; we may expect the same factors to lead people to follow a central bank - either out of the desire to be informed, or/and out of shared interests (someone interested in central banking would be more likely to follow them on social networks). [Jungheer \(2016\)](#) reviews extant literature on the usage of Twitter in election campaigns and notes, in particular, that the opposition tends to be more likely to use Twitter than the government, yet even the opposition prefers the "communication" mode to the "interaction", by merely informing followers about events and opinions, rather than engaging in an interactive dialogue. Survey results in [Park et al. \(2016\)](#) suggest communications of government agencies on Twitter improve public trust in those agencies and the government as a whole, especially if communications are by the relevant heads of agencies or executive officers.

tations and their responses to policy announcements. Concurrently, [Conrad et al. \(2020\)](#) investigate the role of information channels for consumer expectations in Germany, using a similar gradation of information sources, yet their data contains only one wave, and the focus is on the information about the European Central Bank's (ECB) monetary policy flowing in through Facebook or Twitter, which may be a general discussion on social networks but not necessarily the message coming through the ECB account. We use the high frequency feature of our data to detect causal effects of policy announcements (if any) and the precise identification of central bank followers on Twitter or Facebook to explore the role of the central bank communication.

A growing field of research deals with *information overload* in social networks. A thorough review of managerial and accounting information overload literature in [Eppler and Mengis \(2004\)](#) emphasises the drop in decision accuracy that it causes and places information technology among key causes of the overload, while listing selectivity, ignorance of information, general lack of perspective and cognitive stress among main symptoms of it. [Sasaki et al. \(2016\)](#) report that although Twitter users can control the amount of information they receive, they rarely "unfollow" someone, and continue to increase the number of "Twitter-friends" despite information overload; informationally overloaded users avoid viewing all tweets. [Agnew and Szykman \(2005\)](#) show that information overload distorts financial decisions; in their pension plan experiment the degree of this distortion depends on financial literacy of participants. In a public policy context, [Persson \(2018\)](#) argues information disclosure rules (aimed at providing consumers with correct decision-relevant information) are inefficient if many other market participants compete in the information provision space: the signal designed by the regulator gets contaminated by the surrounding noise, and effectively consumer knowledge gets reduced due to information overload. This latter argument applies to policy communication via social media, where users compete for attention, and the Central bank becomes just one of many. The information overload may reduce or reverse the effect of simplified communication. At the same time, having received news from the reliable source (even if not having used that news) may give a feeling of being better informed, and thus

boost confidence in own decisions and beliefs. Beliefs and confidence, and their relationship to the source of information, are the subject of our investigation.

Our paper is linked to a broader body of research on consumers' expectations, that focuses on factors that drive them. [Easaw et al. \(2013\)](#) as well as [Dräger and Lamla \(2017\)](#) analyze how expectations of consumers are adjusted and which factors might affect the adjustment process. [van der Cruijssen et al. \(2015\)](#) distill from a survey how much consumers know about the European Central Bank's objectives. Understanding of economic concepts by consumers and professionals is analysed in [Carvalho and Nechio \(2014\)](#) who use the Michigan survey of consumers to explore how many people are aware of the Taylor rule, and by [Dräger et al. \(2016\)](#) who look at both consumers and professionals and test whether central bank communications improve consistency of expectations with the Taylor rule and the Phillips Curve. More recently, [Dräger and Nghiem \(2021\)](#) show that news on monetary policy or financial markets improve consistency of consumer expectations and spending decisions with the Euler equation.

With respect to the news sources, extant research suggests dispersed opinions published by different media may adversely affect consumer expectations. In [Vinogradov \(2012\)](#) the lack of a single articulated signal about the central bank policy generates heterogeneity in beliefs, distorting the savings decisions of consumers. The issue of dispersed experts' opinions about monetary policy is addressed in [Ehrmann and Fratzscher \(2013\)](#) who investigate whether members of monetary policy committees should communicate a collegiate (unified) view on monetary policy or provide a diversity of opinions. They find, in particular that consistent communication by committee members makes monetary policy decisions more predictable and reduces uncertainty about future macroeconomic parameters, such as interest rates. In our analysis, the communication by the central bank via Twitter represents the unanimous view from a single source, while the diversity of opinions is present in media reports published before as well as after the announcement.

3 Survey design and data

As in [Lamla and Vinogradov \(2019\)](#), the key feature of our survey design is quasi-experimental: a random sample of respondents report their opinions shortly before the monetary policy announcement (control group), and another random sample of equal size report their opinions right after the monetary policy announcement (treatment group). We focus on the quarterly monetary policy committee (MPC) meetings, which come with a publication of Monetary Policy Report, containing precise assessments of the current CPI inflation rate and its projections one and two years ahead. As we want to contrast changes in inflation and interest expectations due to MPC announcements, this seems an ideal setting. The speed with which responses are collected is crucial for the identification of the announcement effect. Conventional ways to target respondents (letters or telephone interviews) do not allow one to collect enough responses within this short event window. We have chosen Pollfish.com as our survey provider for this study.² Pollfish respondents are incentivized by an opportunity to earn e-rewards in mobile phone apps upon completion of the survey. Pre-registered users are invited to participate in the survey. The panels are balanced according to census data of age, gender, and location.

Figure 1 depicts the timeline of data collection per announcement event. First wave invitations are sent out on Tuesday morning, 2 days before the press-conference on a Thursday, and the second wave invitations are sent out on Friday morning. Each wave yields 550 complete responses³; this target is usually achieved within 1-2 hours, which gives us two non-overlapping cross-sections of expectations and perceptions taken within a maximum of 4 days between each other, minimizing the potential impact of other macroeconomic factors.

The questionnaire consists of 16 questions, see Appendix A. Core questions are as in [Lamla and Vinogradov \(2019\)](#) and relate to perceptions and expectations of inflation and

²In [Lamla and Vinogradov \(2019\)](#) the US data was collected through SurveyMonkey.com. For the UK study in this paper we have chosen the most cost efficient option available to us. The only implication in terms of the survey design was the need to re-word questions as Pollfish administers surveys via mobile phones, which means restrictions on the length of the question and for the presentation of options.

³Pollfish do not deliver responses where subjects left any questions unanswered or dropped out.

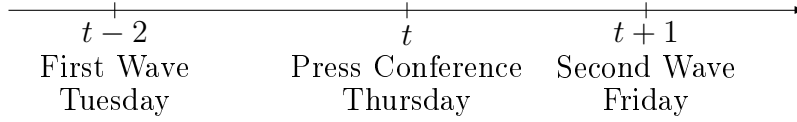


Figure 1: Timeline Survey

interest rates, suitably re-worded for the UK market.⁴ We refer to these four variables in general as "*beliefs*". The style of these questions follows that of the University of Michigan Survey of Consumers. We further ask how confident (on a 5-point scale) respondents are in their answers. This set of four questions measures the degree of uncertainty respondents perceive. Notation for beliefs and confidence variables is self-explanatory.

With respect to the information set, we identify respondents' exposure to news by asking whether they heard any news on that week's central bank's policy decision. We assign $NewsBoE_i = 1$ if consumer i 's answer to this question is positive, and zero otherwise. By design, we assign $Announcement_i = 1$ if responses of consumer i are obtained in the post-announcement wave of the survey, $Announcement_i = 0$ if they come from the pre-announcement wave.

For control variables, we use sociodemographic characteristics such as age, gender, and household income. Table 1 presents summary statistics of the main variables described above.

Figure 2 depicts the aggregated distributions of reported beliefs regarding past and present inflation and interest rates. On average, the data is comparable with Lamla and Vinogradov (2019): in particular, the level of inflation expectations agrees with D'Acunto et al. (2019) but is higher than in the Michigan or New York Fed surveys⁵, and confidence in future rates is lower than in current rates, consistent with the idea that predicting the future is a more difficult task than guessing the current value of rates based on contemporaneous observations.

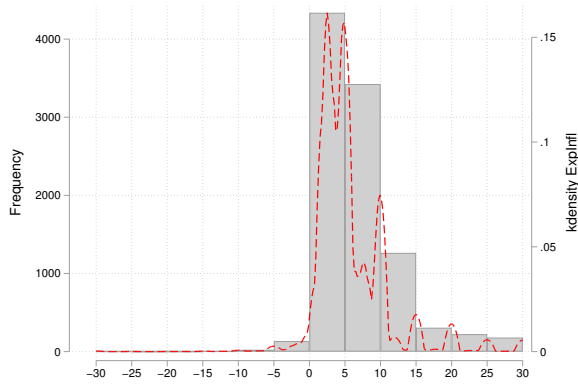
⁴For example, the UK survey asks about the interest rate on a car loan of £10 000 instead of \$10 000.

⁵We explain this by sample selection: ours is a non-repeated sample. In repeated samples expectation errors diminish with time (Dräger and Lamla, 2017)

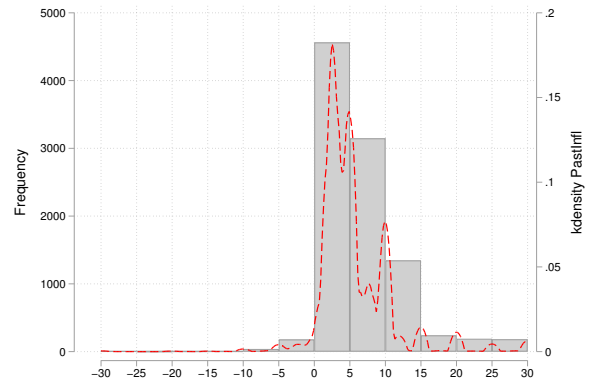
Variable	Mean	Median	SD
<i>Beliefs</i>			
Past Inflation (PastInfl)	5.06	5.00	2.80
Expected Inflation (ExpInfl)	5.12	5.00	2.73
Past Interest Rate (PastRate)	9.06	8.00	5.19
Expected Interest Rate (ExpRate)	10.32	9.00	5.6
<i>Confidence</i>			
Confidence Past Inflation	0.32		0.47
Confidence Expected Inflation	0.20		0.40
Confidence Past Interest Rate	0.16		0.37
Confidence Expected Interest Rate	0.15		0.35
<i>Information set</i>			
NewsBoE	0.35		0.48
NewsBoEC (correct news)	0.29		0.45
Announcement	0.50		0.50
Twitter	0.03		0.18
<i>Controls</i>			
Gender	0.53		0.50
Year of Birth	1974.35	1975	14.19
Income Indicator	1.7	2	0.6
Income	33793	34250	24154.28

Notes: SD denotes the standard deviation of the corresponding series.
Income Indicator equals 1 for low income (0-18499 GBP), 2 for middle income (18500-62499 GBP) and 3 for high income (>62500 GBP).

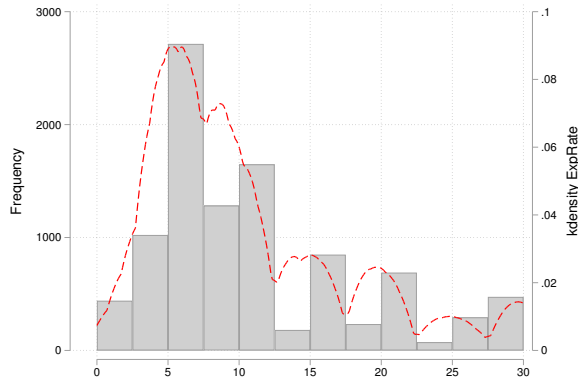
Table 1: Summary Statistics



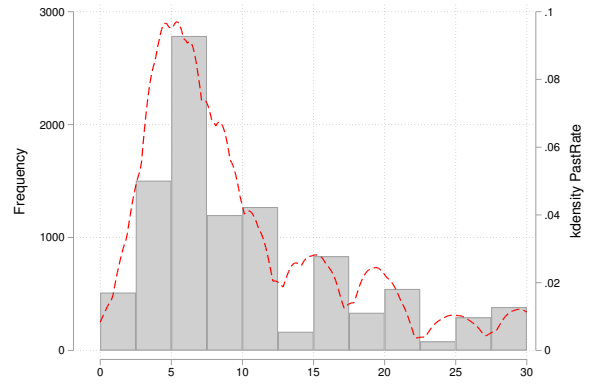
a) PastInfl



b) ExpInfl



c) PastRate



d) ExpRate

Figure 2: Distribution of individual perceptions and expectations

4 Provision of Information through Announcements

Our main focus is on the impact the inflow of information through different channels has on consumers' information set and expectations. We begin by testing whether announcements indeed induce an inflow of information, crucial for the analysis of how this, eventually new, information transmits through media channels.

4.1 Announcements and the Information Set

The following probit regression estimates whether more consumers are informed about the central bank policy after the announcement:

$$F(NewsBoE_i) = \alpha + \beta_A \cdot Announcement_i + \sum_j \beta_j X_{i,j} + \epsilon_i, \quad (1)$$

where F is the inverse normal, α is the constant term, variables $NewsBoE_i$, $Announcement_i$ refer to exposure to news and to the pre/post-announcement wave, and $X_{i,j}$ is the set of controls - all defined above; in addition to previously defined control variables, we also include survey fixed effects in all specifications.

Note that media reports about the central bank may be published both before and after the meeting. Especially when sharp policy changes are largely anticipated, the news coverage may begin well before the announcement itself. This increased coverage may reduce the effect of the announcement, thus our identification offers a conservative estimate of the announcement effect on exposure to news. Estimates of (1) in Table 2 (note, column 1 shows the bi-variate system with $\beta_j = 0$ for all $j \neq A$, while column 2 controls for all available sociodemographic factors) reveal a strong increase in the fraction of the public who have heard the monetary policy news, by 20% on average, despite this potential earlier coverage in the news.⁶

⁶This increase is higher than the 10% increment in the US data reported in [Lamla and Vinogradov \(2019\)](#).

	(1)	(2)	(3)	(4)	(5)	(6)
	NewsBoE bivariate b/se	NewsBoE with controls b/se	NewsBoEC bivariate b/se	NewsBoEC with controls b/se	NewsBoEW bivariate b/se	NewsBoEW with controls b/se
announcement (d)	0.200*** (0.01)	0.212*** (0.01)	0.213*** (0.01)	0.226*** (0.01)	0.025*** (0.01)	0.021*** (0.01)
Survey	No	Yes	No	Yes	No	Yes
Demographics	No	Yes	No	Yes	No	Yes
Regional	No	Yes	No	Yes	No	Yes
N	9900	8984	9292	8415	7015	6355

Note: Probit. Marginal effects reported.

Table 2: Effects of announcements on the probability of receiving news about the BoE monetary policy (*NewsBoE*), probability of receiving correct news (*NewsBoEC*) and probability of receiving wrong news (*NewsBoEW*).

An increase in the exposure to news can be interpreted as a change in the information set, at least for those consumers who would have been in the uninformed cohort prior to announcement, and have received the news once the announcement has been made. Do all consumers correctly understand the news they heard? In the above discussion, the uninformed cohort was defined by a negative answer to the question "During the last week, have you heard any news about the monetary policy?", with the remainder of the sample being treated as those who have heard something about the central bank. We have referred to it as the news effect: respondents heard something about the monetary policy or the central bank. Yet this cohort would also include subjects who either did not pay attention to the news, or could not recall what was in the news, or even did not clearly remember when exactly they heard anything about the central bank. To improve the identification, we now focus on those subjects who report having heard in what direction the central bank is changing (or not) the interest rate. We match these answers with the actual policy decision taken in the week of the survey. If respondent i 's answer coincides with the actual policy move, we deem such a respondent received correct news and assign $NewsBoEC_i = 1$, and zero otherwise. On average, about one in six respondents who report having heard some news about the central bank, reported the policy decision incorrectly (see the difference between the two variables in Table 1). For subjects who report receiving news but in their report the BoE policy move does not match the one that was expected or announced in that week we generate variable $NewsBoEW_i = 1$ (zero if no news heard). We now re-run our estimation of the effects of announcements on exposure to news (1), where $NewsBoE_i$ is replaced with $NewsBoEC_i$ (see columns (3) and (4) in Table 2 for estimates) and $NewsBoEW_i$ (columns (5) and (6) in Table 2), in order to analyze whether announcements increase the likelihood of receiving correct or incorrect news. In all estimates the benchmark is receiving no news. On the positive side, announcements trigger an increase in the probability of receiving correct news: the effect is even somewhat higher than that on the likelihood of having heard any monetary policy news. Announcement effect on those who we label as incorrectly informed

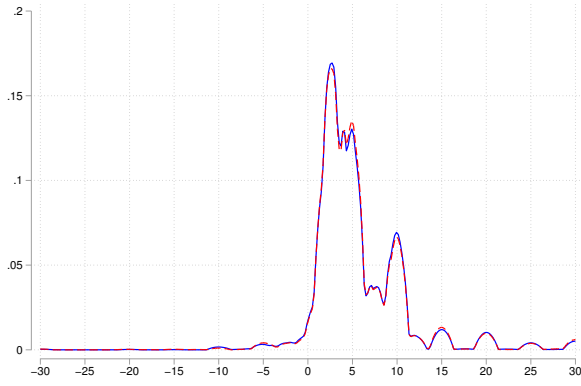
is almost ten times lower but strikingly this cohort also becomes larger, by 2.1% (recall, on average we have 6% of the sample in this category.)

An important take away from this section is that while announcements (policy communication events) trigger an increase in the fraction of people aware of the monetary policy move, there is a non-negligible cohort of those who recall having received the news but are unable to correctly identify the policy decision. This may be due to their lack of attention to what exactly has been communicated, or due to the information overload, whereby newer information overwrites the previously acquired one. In any case, the difference between the cohorts that report having heard correct and wrong news underlines the difference between the provision of information and the digestion (processing) of information. This difference comes on top of the difference between informed and uninformed cohorts, which highlights the distinction between the provision and the reception (arrival) of the news. In the subsequent analysis we keep paying attention to all the three cohorts, and as such to the three stages of effective communication.

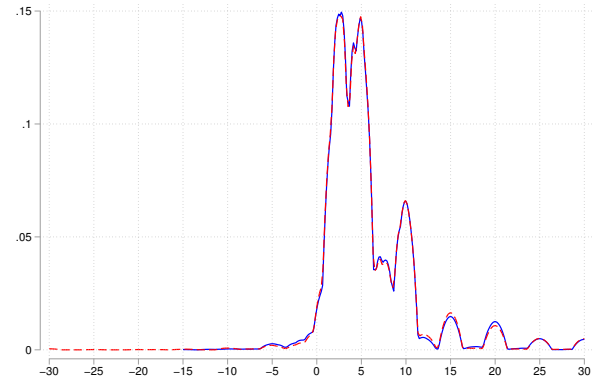
4.2 Announcements and Average Beliefs

Now that we have established that provision of news triggers an increase in awareness, predominantly through the cohort of people who have heard the right news, we turn to the question whether this rise in awareness has implications for expectations and perceptions. Here we report results for the overall sample, which includes all communication channels. Later, we focus on cohorts reporting having heard correct and incorrect news. Figure 3 plots distributions of beliefs pre- and post-announcement. While we observe a slightly increased concentration of the post-announcement densities with some shift to the left, the changes are not significant.⁷ For the overall sample, the announcement effect on expectations and perceptions of both inflation and interest rates is close to nil, similarly to the nil average effect reported for the U.S. in [Lamla and Vinogradov \(2019\)](#).

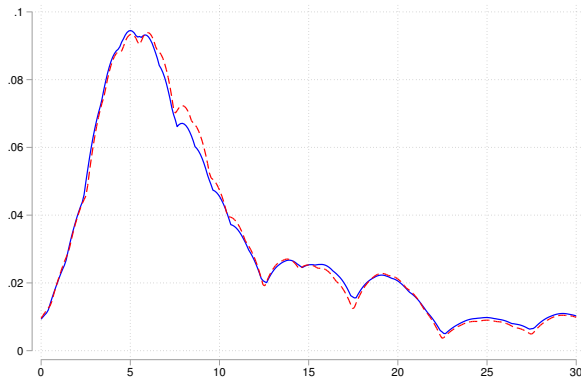
⁷The Kolmogorov-Smirnov test shows no statistically significant difference between pre- and post-announcement distributions for each belief.



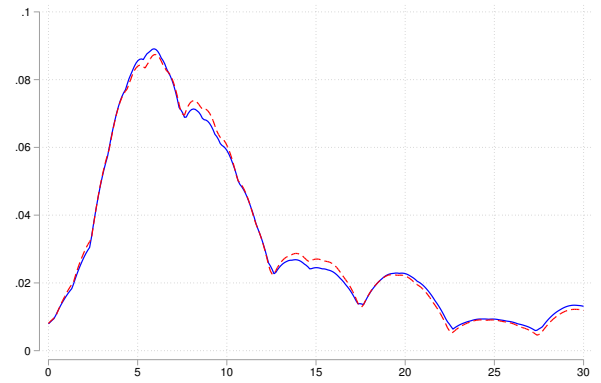
a) PastInfl



b) ExpInfl



c) PastRate



d) ExpRate

Notes: Kernel density plots. Blue line (solid) shows the distribution 1-2 days before the announcement, red line (dashed) depicts the distributions on the next day after the announcement.

Figure 3: Effects of Monetary Policy Announcement Events

	(1)	(2)	(3)	(4)
	Past Infl	Expected Infl	Past IR	Expected IR
	b/se	b/se	b/se	b/se
announcement	-0.012 (0.06)	0.056 (0.06)	-0.037 (0.12)	-0.061 (0.13)
Survey	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes
Regional	Yes	Yes	Yes	Yes
r2	0.122	0.060	0.033	0.030
N	7789	7705	7906	7739

Table 3: Effects of BoE policy announcements on perceptions and expectations of inflation and interest rates

We confirm the nil announcement effect in a regression

$$Belief_i = \alpha + \beta_A \cdot Announcement_i + \sum_j \beta_j X_{i,j} + \epsilon_i, \quad (2)$$

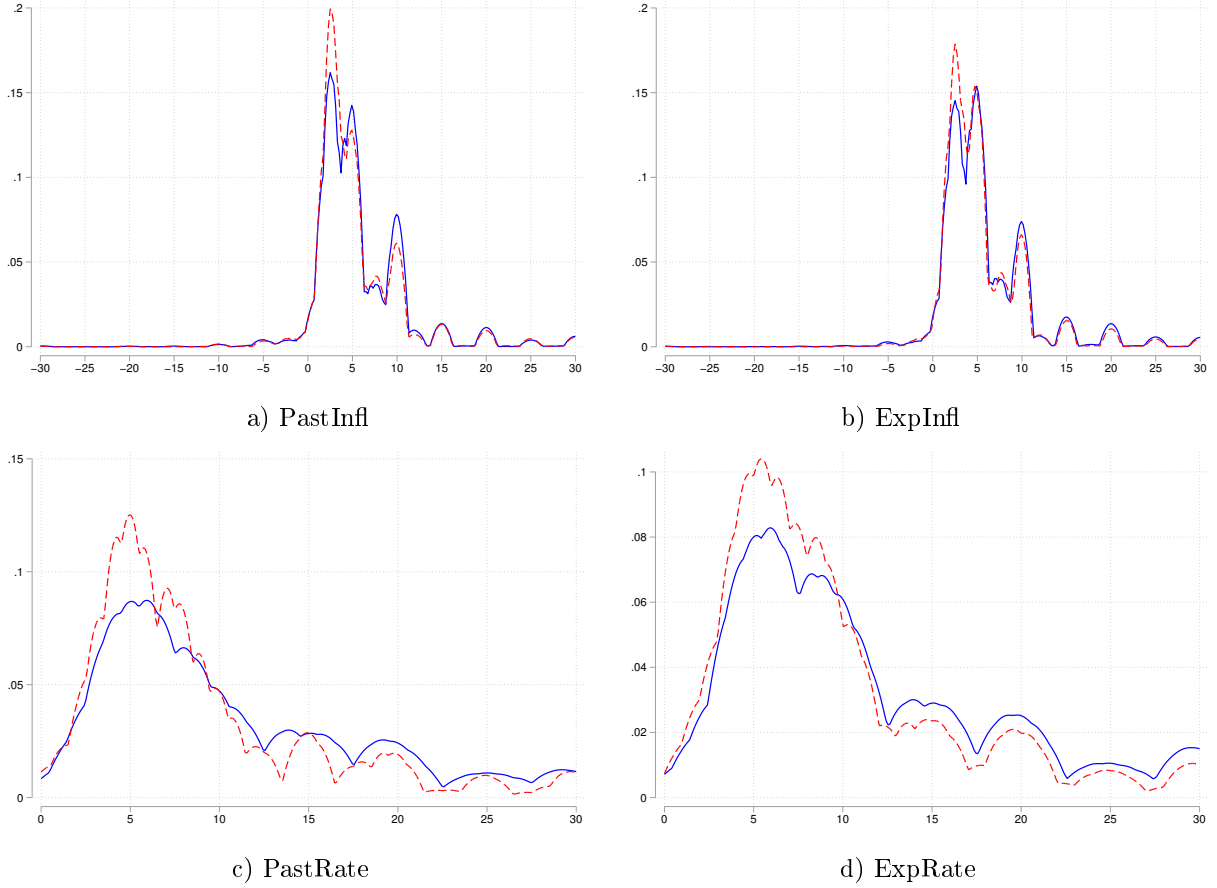
where, $Belief_i$, $Announcement_i$ and the set of controls $X_{i,j}$ are defined above, again, survey fixed effects included in controls. OLS estimates of (2) are in Table 3.⁸ Overall, despite triggering more news and increasing the probability of receiving correct news about monetary policy, on average announcements exert no statistically significant effect on beliefs. Our focus now turns to consumers who heard news about monetary policy.

4.3 Information Set and Beliefs

The overall effect of announcements on expectations may be blurred by the large share of consumers who do not get the news: only 35% of our sample receive monetary policy news (see Table 1), averaged across pre- and post-announcement waves. Figure 4 compares expectations and perceptions of consumers who heard news about the BoE’s monetary policy with those who did not. There is a substantial and statistically significant difference⁹ between

⁸Note that in all estimations we use a truncated sample removing the top and bottom 5% of the dependent variable.

⁹We use the Kolmogorov-Smirnov and the Epps-Singleton two-sample test of similarity of distributions, both leading to qualitatively identical results, not rejecting similarity of distributions before and after the announcement, but strongly rejecting similarity of distributions generated by different exposure to news at $p < .001$.



Notes: Kernel density plots. **Red line** (dashed) shows the distribution of consumers that heard news about the BoE, **blue line** (solid) depicts the distribution of consumers that heard no news about the BoE MPC meeting.

Figure 4: Effects of Monetary Policy News

the two cohorts: the densities of informed respondents are more centered, and perceptions and expectations are less dispersed.

To quantify the role of the information set, Table 4 (Panel A) estimates

$$Belief_i = \alpha + \beta_N \cdot NewsBoE_i + \sum_j \beta_j X_{i,j} + \epsilon_i. \quad (3)$$

Informed subjects on average report 0.2-0.3% lower inflation (both perceived and expected) and about 1% lower interest rate (again, both perceived and expected). Note that inclusion of controls in the even columns has almost no effect in terms of statistical significance of being informed, although it reduces the size of the impact, especially so for perceived and

expected interest rates. This may indicate that the difference in expectations between the informed and the uninformed cohort is in part due to the composition of these cohorts, e.g. if individuals with low expectations are more likely to be informed than individuals with high expectations. Adding all available socioeconomic variables controls for the type of the individual, thus revealing the net effect of being informed, which is evidently non-negligible. Note also that controlling for the type has the most pronounced effect for interest rates, which are heterogeneous and are harder to predict than the rate of inflation, which is explicitly discussed in the news and in the BoE report. This further confirms that information matters for beliefs.

In the same Table 4 (Panel B), we re-estimate (3) with $NewsBoEC_i$ as the main independent variable, to track the impact of receiving correct news. Qualitatively results remain the same, correctly informed subjects have lower expectations and perceptions than those uninformed, yet quantitatively we observe 1.3-1.5 times larger coefficients for inflation estimates, and less pronounced and inconclusive changes in coefficients for interest rates, as compared to those in Panel A of Table 4. Recall that all the BoE policy announcements in our period are accompanied by a publication of the inflation report, and as such the inflation figure is actively discussed in the news. While the announcement contains a clear value for the policy rate, it is not so straightforward to link this rate to the consumer loan rates, which may explain the lack of difference in effects information sets have on beliefs. To get a deeper insight, we now re-run (3), where $NewsBoE_i$ is decomposed into correct and wrong news (results are in Table 5):

$$Belief_i = \alpha + \beta_{NC} \cdot NewsBoEC_i + \beta_{NW} \cdot NewsBoEW_i + \sum_j \beta_j X_{i,j} + \epsilon_i. \quad (4)$$

An intriguing question here is: do people who report having heard incorrect news differ from those who have not heard any news? Table 5 highlights several noteworthy patterns. First, for inflation expectations the lack of attention to the content of the news (resulting in reporting the incorrect policy news received) is associated with an overestimation of in-

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Past Infl N/b/se	Past Infl N/b/se	Expected Infl N/b/se	Expected Infl N/b/se	Past IR N/b/se	Past IR N/b/se	Expected IR N/b/se	Expected IR N/b/se
Panel A								
NewsBoE	-0.371*** (0.06)	-0.309*** (0.06)	-0.280*** (0.06)	-0.168** (0.07)	-1.193*** (0.11)	-0.794*** (0.12)	-1.113*** (0.12)	-0.734*** (0.13)
Survey	No	Yes	No	Yes	No	Yes	No	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Regional	No	Yes	No	Yes	No	Yes	No	Yes
N	8586	7789	8483	7705	8715	7906	8551	7739
Panel B								
NewsBoEC	-0.570*** (0.06)	-0.406*** (0.07)	-0.418*** (0.06)	-0.239*** (0.07)	-1.163*** (0.12)	-0.817*** (0.13)	-0.983*** (0.13)	-0.636*** (0.15)
Survey	No	Yes	No	Yes	No	Yes	No	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Regional	No	Yes	No	Yes	No	Yes	No	Yes
N	8071	7302	7969	7223	8185	7406	8053	7276

Table 4: Awareness of the MPC meeting (NewBoE = 1) and perceptions and expectations of inflation and interest rates

flation and of its expected value, opposite to the bias of the informed cohort. Second, this overestimation becomes statistically insignificant once we control for the respondent's type (sociodemographic controls). This confirms our control variables have the intended effect: if subjects do not pay attention to information they receive, their inflation estimates are mainly dictated by their personal characteristics (such as pessimism, for example). Controlling for the type removes this effect for the cohort that reports wrong policy moves yet does not suffice to remove the information effect on people who have heard and report the correct news. Third, and somewhat puzzling, apparently incorrectly informed subjects underestimate interest rates compared to uninformed participants, and do this by a larger extent than correctly informed people. A possible explanation may be that under the zero bound regime, people who pay less attention to information they receive, translate the "zero bound" to the consumer rates. Controlling for the type does not remove the effect, which deserves further investigation.

The analysis of correct versus incorrect news in this section sheds further light on understanding (digestion) of news, versus receiving news. Here NewsBoEC serves a proxy for digestion: the likelihood that people understood the news is higher in the cohort that report receiving the correct news than in the cohort that say they heard the news but didn't get it right.

4.4 Announcements, Information Sets and Beliefs

The information set effects in Table 4 are averages for the sample, including pre- and post-announcement waves. If announcements produce an exogenous variation in the information

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Past Infl N/b/se	Past Infl N/b/se	Expected Infl N/b/se	Expected Infl N/b/se	Past IR N/b/se	Past IR N/b/se	Expected IR N/b/se	Expected IR N/b/se
NewsBoEC	-0.570*** (0.06)	-0.414*** (0.07)	-0.418*** (0.06)	-0.240*** (0.07)	-1.163*** (0.12)	-0.819*** (0.13)	-0.983*** (0.13)	-0.650*** (0.14)
NewsBoEW	0.606*** (0.13)	0.138 (0.13)	0.393*** (0.13)	0.137 (0.13)	-1.340*** (0.23)	-0.688*** (0.24)	-1.772*** (0.25)	-1.108*** (0.26)
Survey	No	Yes	No	Yes	No	Yes	No	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Regional	No	Yes	No	Yes	No	Yes	No	Yes
N	8586	7789	8483	7705	8715	7906	8551	7739

Table 5: Impact of receiving correct (NewBoEC = 1) and wrong (NewBoEW = 1) information about the MPC meeting on perceptions and expectations of inflation and interest rates.

set, this should have implications for expectations and perceptions. To test this, we now estimate the interaction terms between *NewsBoE* and *Announcement*:

$$\begin{aligned}
Belief_i = & \alpha + \beta_N \cdot NewsBoE_i + \beta_A \cdot Announcement_i + \\
& \beta_{AN} \cdot Announcement_i \times NewsBoE_i + \\
& \sum_j \beta_j X_{i,j} + \epsilon_i.
\end{aligned} \tag{5}$$

This interaction term helps identify whether and to what extent moves in average expectations may be attributed to differences in beliefs between informed and uninformed subjects, and potential changes in this difference due to announcements. Results are reported in Table 6. The interaction effect is strongly significant for inflation perceptions and expectations: after the announcement informed subjects adjust their expectations and perceptions stronger than those who are uninformed. In Table 2 we reported that the cohort of informed subjects after the announcement is about 20% larger than before, hence the after-announcement wave includes subjects who were uninformed about the monetary policy before the announcement and, according to Table 4, on average have higher expectations, and yet the announcement effect on the informed cohort is both sizable and significant, at least for inflation.

As mentioned above, all the MPC announcements in our sample-period come with a publication of Monetary Policy Report, which contains numerical assessments of the current CPI inflation rate and its projections one and two years ahead. Unlike these bits of precise information, the information on interest rates remains vague: although the BoE publishes interest rate projections, they do not exactly match the car loan interest rates in our questions. This explains why the arrival of the precise inflation data on the MPC announcement day has a strong impact on assessments of current and expected inflation, while for the interest rates there is no significant difference in beliefs of those informed before or after the announcement. It is worth comparing these results with those in Lamla and Vinogradov (2019) for the US public and Fed press conferences: in both countries announcements do not affect beliefs regarding the interest rates, while affecting beliefs of informed subjects regarding inflation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Past Inflation b/se	Past Inflation b/se	Expected Infl b/se	Expected Infl b/se	Past IR b/se	Past IR b/se	Expected IR b/se	Expected IR b/se
Announcement	0.034 (0.07)	0.163* (0.09)	0.022 (0.07)	0.098 (0.08)	0.221* (0.13)	0.157 (0.16)	0.211 (0.14)	0.086 (0.17)
NewsBoE	-0.332*** (0.07)	-0.108 (0.11)	-0.241*** (0.07)	-0.112 (0.10)	-0.854*** (0.13)	-0.963*** (0.18)	-0.822*** (0.14)	-1.025*** (0.20)
NewsBoE \times Announcement		-0.390*** (0.14)		-0.226* (0.13)		0.191 (0.24)		0.361 (0.26)
Constant	-57.920*** (4.78)	-57.221*** (4.77)	-35.447*** (4.53)	-35.043*** (4.54)	-27.415*** (8.55)	-27.842*** (8.57)	-14.840 (9.33)	-15.451* (9.33)
Survey	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
r ²	0.126	0.127	0.064	0.064	0.042	0.043	0.036	0.036
N	6649.000	6649.000	7543.000	7543.000	7731.000	7731.000	7581.000	7581.000

Table 6: Impact of News before and after Announcement

In their sample-period, as well, press-conferences are associated with the publication of inflation reports, hence the data on current and expected inflation are likely to be explicitly communicated in the news.

Given receiving correct news makes at least beliefs with respect to inflation more precise, we may expect direct communication by the central bank would have a similar expectations improving effect. We now turn to the Twitter communications of the Bank of England.

5 Twitter as Communication Channel

5.1 Twitter Communication and Coverage

Thus far, we have established that overall, announcements trigger higher exposure to news, and exposure to news is associated with improved expectations and perceptions. We now focus on the role of the communication channel/source of information and distinguish between respondents who follow the BoE on Twitter and those who don't. The underlying assumption is that there is a strictly positive probability that the former receive news about the central bank policy and decisions directly from the BoE via its social media communications, while for the latter this probability is zero.

The overall number of the central bank's Twitter followers is not large: as shown in Figure 5, they constitute roughly 3-4% of the sample, and the difference between pre- and post-announcement waves is insignificant. Our interest is in testing whether announcements have an effect on Twitter followers: since the tweets of the BoE automatically appear in their news feed, one could conjecture that the effect should be sizable.

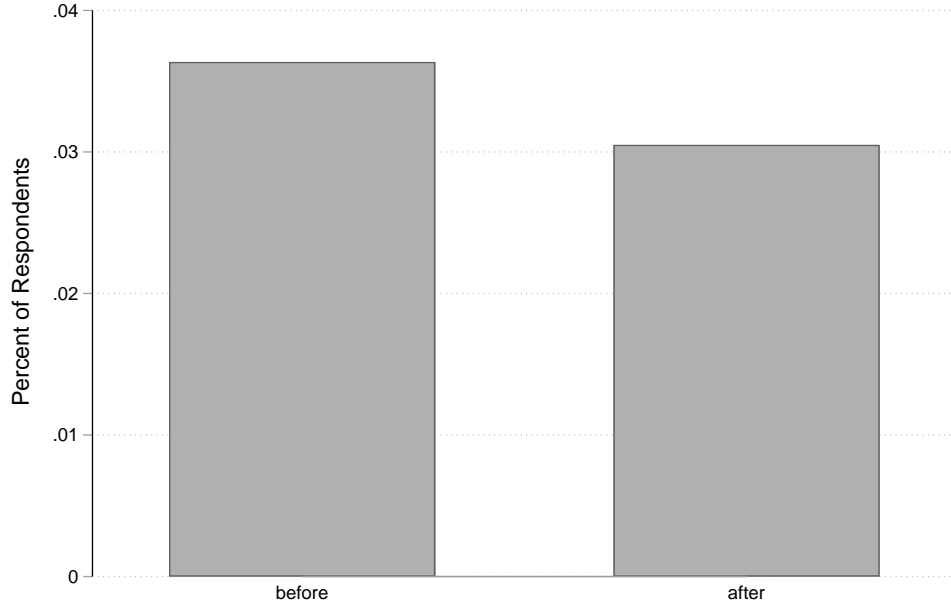


Figure 5: Twitter followers of BoE: averages for pre- and post-announcement waves.

We start by estimating the value added of Twitter communication in terms of informing people, effectively decomposing the estimates of (1) in Table 2 into those for Twitter followers and non-followers:

$$F(NewsBoE_i) = \alpha + \beta_{T=1} \cdot Announcement_i \times Twitter_i + \beta_{T=0} \cdot Announcement_i \times (1 - Twitter_i) + \sum_j \beta_j X_{i,j} + \epsilon_i, \quad (6)$$

where notation is as above, and $Twitter_i$ is a dummy equal to 1 if the respondent follows the Bank of England on Twitter, zero otherwise. Results are in Table 7: the announcement does not affect the fraction of informed subjects on Twitter, the overall effect we observed in Table 2 comes exclusively through other channels of communication. Recall that we ask people "During the last week, have you heard any news about the monetary policy of the Bank of England?". The explicit policy of the Bank is not to disclose the decision prior to the official announcement. However, the bank continues to tweet almost daily on other issues, which may include notes in circulation and new notes design, regulation of the financial

	News		Correct News	
	(1)	(2)	(3)	(4)
	b/se	b/se	b/se	b/se
1.announcement				
Twitter=0	0.209*** (0.01)	0.224*** (0.01)	0.211*** (0.01)	0.225*** (0.01)
Twitter=1	0.006 (0.05)	-0.001 (0.05)	-0.079 (0.05)	-0.085 (0.06)
Survey	No	Yes	No	Yes
Demographics	No	Yes	No	Yes
Regional	No	Yes	No	Yes
N	9900	8984	9900	8984

Note: Marginal Effects reported

Table 7: Twitter and non-Twitter channels of the announcement effect on receiving news (columns 1 and 2) and receiving correct news (columns 3 and 4)

industry and financial services in a broader sense, etc. Respondents who follow the Bank on Twitter may register this news as relating to monetary policy. Another explanation is that the followers of the BoE have an interest in central banking, and as such would be highly likely to follow the monetary policy news published in traditional media. In both cases effectively all followers would have received news about the Bank before and after the announcement, and as such the fraction of followers classified as "informed" would indeed remain unchanged, as estimated in columns (1-2) in Table 7.

We now focus on the cohort who correctly report the announced or about to be announced monetary policy move. This cohort demonstrates higher attention to the announcement. We may expect them to be able to better distinguish between monetary policy and other news on Twitter, in which case if Twitter was the main source of monetary policy news, we should observe an increase in the fraction of informed followers of BoE. At the same time, this cohort may be even more likely to follow monetary policy news in other media before and after the announcement, in which case the announcement would not affect the fraction of correctly informed followers either. In columns (3-4) in Table 7 we run the same model (6) as in columns (1-2) replacing $NewsBoE_i$ with $NewsBoEC_i$ as the dependent. Results stay

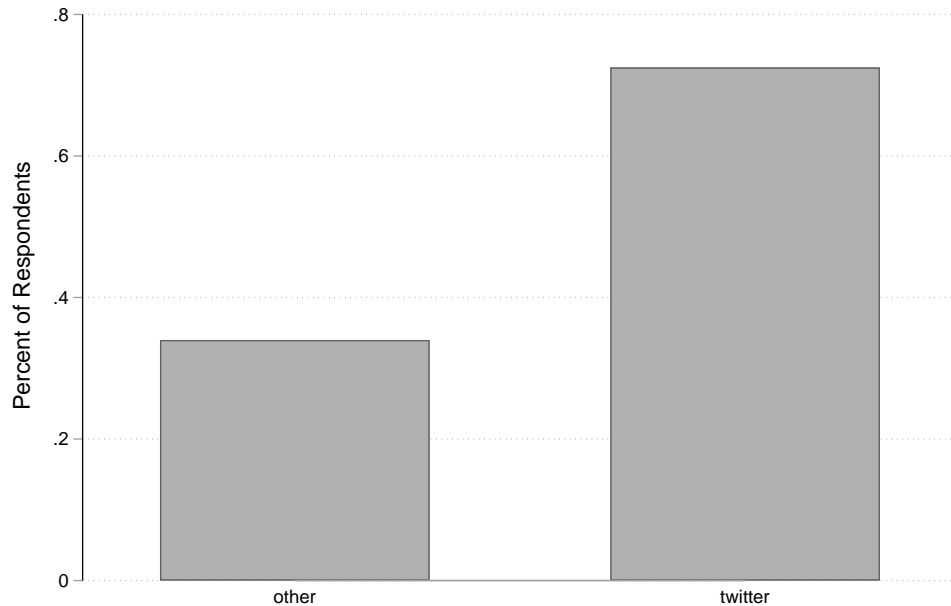


Figure 6: Fraction of informed respondents among Twitter followers of BoE and among all other respondents.

the same, the Twitter effect remains insignificant. It follows that Twitter communications of the BoE do not serve as a principal source of information.

Consonant with the above conclusion, the fraction of informed subjects among Twitter followers of the BoE is high, see Figure 6: about 80% of BoE followers report receiving news about monetary policy, a double of the fraction of informed subjects who do not follow the central bank on Twitter. These numbers include receiving news through any channel, as discussed above.

5.2 Twitter Communication and Beliefs

By definition, Central bank communication before the announcement cannot cover the content of monetary policy announcement itself - otherwise, there is no need in the scheduled announcement event. This is especially true for the Bank of England as there is a substantial

delay between the actual MPC meeting and the announcement of its decision.¹⁰ On the announcement day, the Bank publishes short and informative messages with clear figures. For example, on 5 November 2020, on the day of the MPC decision announcement, the BoE tweeted "The Monetary Policy Committee voted unanimously to maintain #BankRate at 0.1% and to inject an additional £150bn into the economy through quantitative easing", "Inflation is below our 2% target. The main factor that has pulled inflation down is the spread of Covid", and "We have published our #MonetaryPolicyReport which examines the impact of Covid on the economy", but between 25 October and 4 November 2020 there have been zero monetary policy news through its account (as mentioned above, tweets may cover other related issues but not the key policy figures). This is in sharp contrast with mass media who usually begin discussions of likely monetary policy decisions well ahead of the actual announcement. Thus, if news through the BoE Twitter account matter for beliefs, we should observe at least some effect of announcement for beliefs of BoE followers. Estimating the following equation reveals this is not the case, see the triple interaction term in Table 8:

$$\begin{aligned}
Belief_i = & \alpha + \beta_A \cdot Announcement_i + \beta_T \cdot Twitter_i + \beta_N \cdot NewsBoEC_i + \\
& \beta_{AT} \cdot Announcement_i \times Twitter_i + \beta_{AN} \cdot Announcement_i \times NewsBoEC_i + \\
& \beta_{ANT} \cdot Announcement_i \times Twitter_i \times NewsBoEC_i + \sum_j \beta_j X_{i,j} + \epsilon_i,
\end{aligned}$$

with all variables defined above.

The quality of information argument would suggest better informed subjects have lower expectations and perceptions - at least, this is the effect we observed above for the *NewsBoE* variable in Table 4. However following the BoE on Twitter has either no effect, or the opposite:

¹⁰The Bank of England is explicit on this quiet period policy: "MPC members must not give speeches on monetary policy matters or talk to the media or other outside interests, on or off the record on such matters, from the point that the pre-MPC meeting is held (generally eight or nine days before the decision is announced), until the policy announcement is made. ... The purpose of the quiet period is to prevent public speculation about MPC decisions." - see Communications guidance of MPC members, available at <https://www.bankofengland.co.uk/about/people/monetary-policy-committee>.

	(1) Past Infl b/se	(2) Past Infl b/se	(3) Expected Infl b/se	(4) Expected Infl b/se	(5) Past IR b/se	(6) Past IR b/se	(7) Expected IR b/se	(8) Expected IR b/se
Announcement=1	0.064 (0.06)	0.133* (0.08)	0.122* (0.06)	0.181** (0.08)	0.139 (0.12)	0.025 (0.15)	0.076 (0.13)	0.023 (0.16)
NewsBoEC=1	-0.449*** (0.07)	-0.351*** (0.11)	-0.289*** (0.07)	-0.145 (0.11)	-0.874*** (0.14)	-1.075*** (0.21)	-0.640*** (0.15)	-0.839*** (0.23)
Twitter=1	0.466** (0.21)	0.202 (0.45)	0.299 (0.21)	0.462 (0.47)	0.320 (0.36)	-0.813 (0.69)	-0.288 (0.39)	0.491 (0.98)
NewsBoEC=1 \times Announcement=1		-0.197 (0.14)		-0.228 (0.14)		0.301 (0.26)		0.282 (0.29)
NewsBoEC=1 \times Twitter=1		0.564 (0.55)		-0.463 (0.58)		1.056 (0.85)		-0.543 (1.16)
Announcement=1 \times Twitter=1		-0.266 (0.69)		-0.232 (0.65)		1.446 (1.36)		-2.742** (1.38)
NewsBoEC \times Announcement \times Twitter		0.035 (0.87)		0.767 (0.84)		-0.419 (1.63)		2.831* (1.65)
Constant	-56.984*** (4.53)	-56.632*** (4.53)	-32.147*** (4.69)	-32.037*** (4.69)	-25.903*** (8.87)	-26.098*** (8.87)	-22.310** (9.67)	-22.482** (9.67)
Survey	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
r2	0.129	0.130	0.060	0.061	0.037	0.037	0.031	0.032
N	7302	7302	7223	7223	7406	7406	7276	7276

Table 8: Effects of BoE policy announcements on perceptions and expectations of inflation and interest rates

Twitter followers of the Bank report, on average, higher perceived and expected inflation. Controlling for potential interaction effects (in even columns) makes this variable insignificant for all dependent variables considered.

The interaction terms for Twitter and News as well as Twitter and announcement are not significant either, implying there is no difference in beliefs between informed subjects who follow BoE on Twitter and those who don't. It appears that the higher inflation expectations for Twitter users in the previous result were mainly caused by those who follow BoE on Twitter yet did not receive the monetary policy news.

5.3 Twitter and the Errors

The previous results indicate that the Twitter effect could be either insignificant at best or even detrimental to the quality of perceptions and expectations at worst. However, to provide clearer evidence in favor or against it we need to check the quality of perceptions and expectations. We do this in table 9 where we estimate the previous model on dependent variables that represent the forecast error (absolute expectations gap, aeg) and the absolute perceptions error (ape).

The result shows that Twitter on average worsens the perception and the expectation errors (see estimates without interactions). To the contrary, receiving (correct) news from the media reduces perception and expectation errors. This effect is driven by news received after the announcement for inflation perceptions and has the a negative sign while being insignificant for expectations.

5.4 Effects on Confidence

So far we have addressed the level of expectations. We now turn to their second moment, i.e. the degree of their precision. In a survey this is measured by respondents' confidence. Central bank communication may affect confidence because the information is coming (a) from a single official source, and (b) when the monetary policy decision has been made. For instance,

	(1)	(2)	(3)	(4)	(5)	(6)
	ape b/se	ape b/se	ape b/se	ape b/se	ape b/se	ape b/se
Announcement=1	0.001 (0.11)	0.108 (0.12)	0.298** (0.14)	-0.012 (0.07)	0.066 (0.07)	0.109 (0.08)
NewsBoEC=1		-0.522*** (0.12)	-0.178 (0.19)		-0.374*** (0.07)	-0.232** (0.11)
Twitter=1		0.947** (0.43)	1.957 (1.34)		0.362* (0.22)	0.622 (0.46)
NewsBoEC=1 \times Announcement=1			-0.583** (0.23)			-0.204 (0.14)
NewsBoEC=1 \times Twitter=1			-0.844 (1.52)			-0.837 (0.57)
Announcement=1 \times Twitter=1			-2.202 (1.51)			-0.169 (0.65)
NewsBoEC=1 \times Announcement=1 \times Twitter=1			1.566 (1.77)			1.199 (0.87)
Constant	-88.562*** (7.62)	-81.088*** (7.83)	-80.257*** (7.81)	-37.994*** (4.57)	-33.433*** (4.63)	-33.580*** (4.65)
Survey	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Regional	Yes	Yes	Yes	Yes	Yes	Yes
r ²	0.066	0.069	0.071	0.046	0.049	0.050
N	6198	6198	6198.000	7069	7069	7069

Table 9: Effects of BoE policy announcements on the quality of perceptions and expectations of inflation

if a consumer sees his/her expectations confirmed by the communication of the central bank, expectations would not change, but confidence may increase. In our surveys subjects report confidence in their reported beliefs on a five point scale. We classify a respondent as confident if (s)he indicates confidence of 4 or 5 on the five-point scale ($Conf_i = 1$), otherwise we deem him/her as lacking confidence ($Conf_i = 0$).

Table 10 estimates the following probit regression, enabling us to compare the Twitter effect on confidence with that of receiving monetary policy news (from any source) against the announcement effect:

$$F(Conf_i) = \alpha + \beta_A \cdot Announcement_i + \beta_T \cdot Twitter_i + \beta_N \cdot NewsBoEC_i + \sum_j \beta_j X_{i,j} + \epsilon_i. \quad (7)$$

Theoretically, if people receive news directly from the newsmaker, they might feel better informed, and through that be more confident in their beliefs. Inclusion of $Twitter_i$ in the regression thus enables us to estimate the effect of $NewsBoEC_i$ net of any such potential distortion. Controls include, as before, socioeconomic characteristics, region, financial literacy and time effects. On average, exposure to news raises the probability of being confident in inflation perceptions by roughly 11% and 13% respectively and for interest rates by 10% and 8%. This is a remarkably sizeable effect, amounting to 25-30% of the mean level of confidence (see Table 1). The effect is striking also because in this exercise we do not account for the quality and the content of news received. On top of this information effect, Twitter substantially increases the confidence level by 13% to 18%. Twitter followers, while having inferior responses to announcements, are more confident in their assessments. This seems an unwanted combination from the communication perspective.

6 Conclusion

Better communication with the general public is of concern for businesses and governments alike. Central banks are special in this respect as providing guidance and aligning consumer

	(1)	(2)	(3)	(4)
Announcement	-0.0385*** (-3.50)	-0.0209 (-1.92)	-0.0214* (-2.16)	-0.0173 (-1.80)
Twitter	0.169*** (5.13)	0.146*** (4.60)	0.179*** (6.52)	0.161*** (6.36)
NewsBoEC	0.115*** (9.32)	0.107*** (8.66)	0.0858*** (7.72)	0.0740*** (6.81)
N	7302	7223	7406	7276

t statistics in parentheses, marginal effects reported.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10: Confidence Effects of News, Twitter and Announcements

expectations about future economic conditions is crucial for stimulating growth and supporting financial and macro stability. Many Central banks explore the direct communication channel with the general public, to complement the indirect channel through the conventional mass media. Our analysis assesses the efficiency of this approach.

We focused on the UK because the Bank of England was the only Central bank at the time of administering our surveys that adopted a policy of using simplified language in its communication with the general public via social media, such as Twitter. Our estimates show that over the last two years the number of the BoE followers remained rather small, and as such could not contribute strongly to making more people aware of the moves of the central bank. The majority of Twitter followers of the BoE receive information about its policy this or the other way, but they overestimate inflation and interest rates by more than other consumers. Despite this greater error, Twitter followers of the BoE are more confident in their assessments of inflation and interest rates. The confidence-inflating effect through following the central bank on social media is stronger than that of generally being informed about the central bank policy.

Following a central bank on social media thus distorts beliefs in a wrong direction, yet adds confidence. This effect can hardly be attributed to the individual socio-demographic types usually ascribed to Twitter users (young, better educated and higher earning than the

average), for which we control in all our estimates. Instead, it appears that Twitter users develop higher confidence (perhaps, but not necessarily exclusively through being in direct contact with the central bank), yet they do not fully absorb information they receive from the central bank. A possible explanation is the contamination of the information flow on social media where different unsorted news come from a large number of sources, and this large amount of news cannot get processed/digested properly. In a limit, this inability to process news may be observationally similar to "rational inattention" in the sense of the lack of news effect on expectations. However, our respondents report receiving the news, thus they pay attention to it, but fail to digest and appropriate. Delivery of news through other channels appears more efficient.

Our analysis highlights the importance of media as a transmission device between the central bank and the general public. As such, it justifies the great efforts of central banks over the last 20 years to become more transparent with regard to their policy. In particular, it reflects the importance of press conferences, which draw significant attention of media outlets, as a crucial tool in managing the expectations of the greater public. Social media are seen as a viable alternative to conventional media, and we see they have a significant effect on consumer beliefs. However, while standard news outlets tend to improve perceptions and expectations Twitter does not. We conclude there are caveats and limits to using social media that need to be addressed and better understood.

References

- Agnew, J. R. and L. R. Szykman (2005). Asset allocation and information overload: The influence of information display, asset choice, and investor experience. *The Journal of Behavioral Finance* 6(2), 57–70.
- Bholat, D., N. Broughton, J. Ter Meer, and E. Walczak (2019). Enhancing Central bank communications using simple and relatable information. *Journal of Monetary Economics* 108, 1–15.
- Binder, C. (2020, 10). Coronavirus fears and macroeconomic expectations. *The Review of Economics and Statistics* 102(4), 721–730.
- Blinder, A. S., M. Ehrmann, M. Fratzscher, J. D. Haan, and D.-J. Jansen (2008, December). Central bank communication and monetary policy: A survey of theory and evidence. *Journal of Economic Literature* 46(4), 910–45.
- Carvalho, C. and F. Nechio (2014). Do people understand monetary policy? *Journal of Monetary Economics* 66, 108–123.
- Coibion, O., Y. Gorodnichenko, S. Kumar, and M. Pedemonte (2018, June). Inflation expectations as a policy tool? NBER Working Papers 24788, National Bureau of Economic Research, Inc.
- Coibion, O., Y. Gorodnichenko, and M. Weber (2019, January). Monetary policy communications and their effects on household inflation expectations. Working Paper 25482, National Bureau of Economic Research.
- Conrad, C., Z. Enders, and A. Glas (2020). The role of information and experience for households’ inflation expectations. mimeo, University of Heidelberg.
- Dräger, L. and M. J. Lamla (2017, December). Imperfect information and consumer inflation expectations: Evidence from microdata. *Oxford Bulletin of Economics and Statistics* 79(6), 933–968.

- Dräger, L., M. J. Lamla, and D. Pfajfar (2016). Are survey expectations theory-consistent? the role of central bank communication and news. *European Economic Review* 85(C), 84–111.
- Dräger, L. and G. Nghiem (2021, 05). Are consumers’ spending decisions in line with a Euler equation? *The Review of Economics and Statistics*, 1–17.
- D’Acunto, F., U. Malmendier, J. Ospina, and M. Weber (2019, September). Exposure to daily price changes and inflation expectations. Working Paper 26237, National Bureau of Economic Research.
- Easaw, J., R. Golinelli, and M. Malgarini (2013). What determines households inflation expectations? Theory and evidence from a household survey. *European Economic Review* 61(C), 1–13.
- Ehrmann, M. and M. Fratzscher (2013). Dispersed communication by Central bank committees and the predictability of monetary policy decisions. *Public Choice* 157(1-2), 223–244.
- Ehrmann, M. and A. Wabitch (2020). Central bank communication with non-experts – a road to nowhere? mimeo, European Central Bank.
- Eppler, M. J. and J. Mengis (2004). The concept of information overload: A review of literature from organization science, accounting, marketing, MIS, and related disciplines. *The Information Society* 20(5), 325–344.
- Gorodnichenko, Y., T. Pham, and O. Talavera (2021, April). ’Liked’, ’Shared’, ’Commented’: Central bank communication on Facebook and Twitter. Discussion Papers 21-05, Department of Economics, University of Birmingham.
- Haldane, A. and M. McMahon (2018). Central bank communications and the general public. *American Economic Review, Papers and Proceedings* 108, 578–83.
- Jungherr, A. (2016). Twitter use in election campaigns: A systematic literature review. *Journal of Information Technology & Politics* 13(1), 72–91.

- Lamla, M. J. and D. V. Vinogradov (2019). Central bank announcements: Big news for little people? *Journal of Monetary Economics* 108, 21–38.
- Park, M. J., D. Kang, J. J. Rho, and D. H. Lee (2016). Policy role of social media in developing public trust: Twitter communication with government leaders. *Public Management Review* 18(9), 1265–1288.
- Parmelee, J. H. and S. L. Bichard (2011). *Politics and the Twitter revolution: How tweets influence the relationship between political leaders and the public*. Lexington Books.
- Persson, P. (2018). Attention manipulation and information overload. *Behavioural Public Policy* 2(1), 78–106.
- Rainie, L., A. Smith, K. L. Schlozman, H. Brady, and S. Verba (2012). Social media and political engagement. *Pew Internet & American Life Project* 19, 2–13.
- Sasaki, Y., D. Kawai, and S. Kitamura (2016). Unfriend or ignore tweets?: A time series analysis on Japanese Twitter users suffering from information overload. *Computers in Human Behavior* 64, 914–922.
- van der Crujisen, C., D.-J. Jansen, and J. de Haan (2015, December). How much does the public know about the ECB’s monetary policy? Evidence from a survey of Dutch households. *International Journal of Central Banking* 11(4), 169–218.
- Vinogradov, D. (2012). Destructive effects of constructive ambiguity in risky times. *Journal of International Money and Finance* 31(6), 1459–1481.
- Wojcik, S. and A. Hughes (2019). Sizing up Twitter users. Report, Washington, DC: Pew Research Center.

Appendix

A Survey questionnaire

We want to know your view on prices and interest rates in the United Kingdom. By answering our 15 quick questions you will greatly help our research. No special knowledge is needed. There is no right or wrong answer: any answer is correct as long as it truly reflects your view. Thank you for your help!

1. By how much did prices in general change in the UK during the past 12 months? For example, if you think prices went down by about 5%, enter "-5"; if they went up by 2%, enter "2".

Answer options: field for numerical entry between -30% and 30%.

2. How confident are you in your last answer? (1 star = not at all, 5 stars = absolutely sure)

Answer options: slider to highlight one, two, three, four, or five stars graphically

3. What annual interest rate would an average UK citizen be charged, if they take a car loan of £10,000 now? For example, if you think the rate would be about 10%, enter "10".

Answer options: field for numerical entry between 0% and 30%.

4. How confident are you in your last answer? (1 star = not at all, 5 stars = absolutely sure)

Answer options: slider to highlight one, two, three, four, or five stars graphically

5. By how much do you think prices in general will change during the NEXT 12 months? For example, if you think prices go down by about 5%, enter "-5"; if they go up by 2%, enter "2".

Answer options: field for numerical entry between -30% and 30%.

6. How confident are you in your last answer? (1 star = not at all, 5 stars = absolutely sure)

Answer options: slider to highlight one, two, three, four, or five stars graphically

7. What annual interest rate will an average UK citizen be charged, if they take a car loan of £10,000 IN A YEAR from now? For example, if you think the rate will be about 10%, enter "10".

Answer options: field for numerical entry between 0% and 30%.

8. How confident are you in your last answer? (1 star = not at all, 5 stars = absolutely sure)

Answer options: slider to highlight one, two, three, four, or five stars graphically

9. If you had an extra £1,000 now, how would you spend it? Please rank the following options (1 = most important, 6 = least important):

- buy stocks
- buy safe bonds
- keep in my bank account
- repay part of my mortgage or other loan
- buy something that I long wanted (car, jewellery, holiday trip)
- spend on everyday consumption (food, clothing, utility bills, school)

Answer options: respondents allocate number 1 to 6 to the above six options.

10. Next few questions help us learn about you and your type of thinking. Did you take part in an inflation survey like this before?

Answer options: - Never. - Yes, this week. - Yes, less than 3 months ago. - Yes, more than 3 months ago. - Other.

11. Assume you have a lottery ticket with a $1/2$ chance of winning £1000 and $1/2$ chance of getting nothing. What is the LOWEST AMOUNT of money you would accept in exchange for this lottery ticket?

Answer options: field for numeric entry

12. Consider two urns, each containing 100 balls coloured either red or blue.

Urn A contains red and blue balls in an unknown proportion. Urn B contains 50 red balls and 50 blue balls.

You will get a prize if you draw a RED ball. From which urn would you draw - from urn A or B?

Answer options: - Urn A (unknown proportion) - Urn B (50/50)

From August 2019 this question has been replaced with the following:

Assume you have a similar lottery ticket, except that the chance of winning £1000 is unknown. What is the LOWEST AMOUNT of money you would accept in exchange for this new ticket?

Answer options: field for numeric entry

13. Consider the same two urns as above, again each containing 100 balls coloured either red or blue.

Urn A contains red and blue balls in an unknown proportion. Urn B contains 50 red balls and 50 blue balls.

You will get a prize if you draw a BLUE ball. From which urn would you draw - from urn A or B?

Answer options: - Urn A (unknown proportion) - Urn B (50/50)

In August 2019 and November 2019 this question was replaced with questions unrelated to the topic of this paper. In January 2019 the question was:

How will the general financial and economic situation in the UK change during the next 12 months?

Answer options: - I'm pretty sure it will be worse - It seems like it will be better but I'm not so sure - It may become better or worse, who knows? - It seems like it will be worse but I'm not so sure - I'm pretty sure it will be worse

14. Question 14 has two versions. Question 14before is asked in the wave before the announcement and Question 14after is asked after the announcement. This way we try to make sure that there is no overlap.

Q14before

During the last week, have you heard any news about the monetary policy of the Bank of England? What did you hear?

Answer options:

- I heard NO news about the Bank of England
- The Bank would raise the official interest rate
- The Bank would keep the official rate unchanged
- The Bank would lower the official rate
- I heard some other news about the Bank: [Open box]

Q14after

During the last few days, have you heard any news about the monetary policy of the Bank of England? What did you hear?

Answer options:

- I heard NO news about the Bank of England
- The Bank has raised the official interest rate
- The Bank has not changed the official rate
- The Bank has lowered the official rate
- I heard some other news about the Bank: [Open box]

15. During the last week, what were your main sources of information on economic and business conditions in the UK?

Answer options:

- I searched for news on the Bank of England policy
- I follow the Bank of England on Twitter/Facebook
- I searched for news on the UK economy
- I did not search but came across this news

- I did not come across any information on economic and business conditions
- Other sources of information:- [open text box]

16. How would you rank your understanding of economic and business issues? (1 star = I understand very little, 5 stars = I am an expert)

Answer options: slider to highlight one, two, three, four, or five stars graphically

Thank you for taking part in our survey!

Working Paper Series in Economics

(recent issues)

- No. 402 *Lena Dräger, Michael J. Lamla and Damjan Pfajfar*: The Hidden Heterogeneity of Inflation and Interest Rate Expectations: The Role of Preferences, May 2021
- No. 401 *Joachim Wagner*: The Good have a Website Evidence on website premia for firms from 18 European countries, April 2021
- No. 400 *Luise Görge*: Of housewives and feminists: Gender norms and intra-household division of labour, April 2021
- No. 399 *Joachim Wagner*: With a little help from my website. Firm survival and web presence in times of COVID-19 – Evidence from 10 European countries, April 2021
- No. 398 *Katja Seidel*: The transition from School to Post-Secondary Education – What factors affect educational decisions?, March 2021
- No. 397 *Institut für Volkswirtschaftslehre*: Forschungsbericht 2020, Januar 2021
- No. 396 *Sabien Dobbelaere, Boris Hirsch, Steffen Mueller and Georg Neuschaeffer*: Organised Labour, Labour Market Imperfections, and Employer Wage Premia, December 2020
- No. 395 *Stjepan Srhoj, Vanja Vitezić and Joachim Wagner*: Export boosting policies and firm behaviour: Review of empirical evidence around the world, November 2020
- No. 394 *Thomas Wein*: Why abandoning the paradise? Stations incentives to reduce gasoline prices at first, August 2020
- No. 393 *Sarah Geschonke and Thomas Wein*: Privacy Paradox –Economic Uncertainty Theory and Legal Consequences, August 2020
- No. 392 *Mats P. Kahl*: Impact of Cross-Border Competition on the German Retail Gasoline Market – German-Polish Border, July 2020
- No. 391 *John P. Weche and Joachim Wagner*: Markups and Concentration in the Context of Digitization: Evidence from German Manufacturing Industries, July 2020
- No. 390 *Thomas Wein*: Cartel behavior and efficient sanctioning by criminal sentences, July 2020
- No. 389 *Christoph Kleineber*: Market definition of the German retail gasoline industry on highways and those in the immediate vicinity, July 2020
- No. 388 *Institut für Volkswirtschaftslehre*: Forschungsbericht 2019, Januar 2020
- No. 387 *Boris Hirsch, Elke J. Jahn, and Thomas Zwick*: Birds, Birds, Birds: Co-worker Similarity, Workplace Diversity, and Voluntary Turnover, May 2019
- No. 386 *Joachim Wagner*: Transaction data for Germany's exports and imports of goods, May 2019
- No. 385 *Joachim Wagner*: Export Scope and Characteristics of Destination Countries: Evidence from German Transaction Data, May 2019
- No. 384 *Antonia Arsova*: Exchange rate pass-through to import prices in Europe: A panel cointegration approach, February 2019

- No. 383 *Institut für Volkswirtschaftslehre*: Forschungsbericht 2018, Januar 2019
- No. 382 *Jörg Schwiebert*: A Sample Selection Model for Fractional Response Variables, April 2018
- No. 381 *Jörg Schwiebert*: A Bivariate Fractional Probit Model, April 2018
- No. 380 *Boris Hirsch and Steffen Mueller*: Firm wage premia, industrial relations, and rent sharing in Germany, February 2018
- No. 379 *John P. Weche and Achim Wambach*: The fall and rise of market power in Europe, January 2018
- No.378: *Institut für Volkswirtschaftslehre*: Forschungsbericht 2017, Januar 2018
- No.377: *Inna Petrunyk and Christian Pfeifer*: Shortening the potential duration of unemployment benefits and labor market outcomes: Evidence from a natural experiment in Germany, January 2018
- No.376: *Katharina Rogge, Markus Groth und Roland Schuhr*: Offenlegung von CO2-Emissionen und Klimastrategien der CDAX-Unternehmen – eine statistische Analyse erklärender Faktoren am Beispiel der CDP-Klimaberichterstattung, Oktober 2017
- No.375: *Christoph Kleineberg und Thomas Wein*: Verdrängungspreise an Tankstellen?, September 2017
- No.374: *Markus Groth, Laura Schäfer und Pia Scholz*: 200 Jahre „On the Principles of Political Economy and Taxation“ – Eine historische Einordnung und Würdigung, März 2017
- No.373: *Joachim Wagner*: It pays to be active on many foreign markets - Profitability in German multi-market exporters and importers from manufacturing industries, March 2017
- No.372: *Joachim Wagner*: Productivity premia for many modes of internationalization - A replication study of Békes / Muraközy, Economics Letters (2016), March 2017 [published in: International Journal for Re-Views in Empirical Economics - IREE, Vol. 1 (2017-4)]
- No.371: *Marius Stankoweit, Markus Groth and Daniela Jacob*: On the Heterogeneity of the Economic Value of Electricity Distribution Networks: an Application to Germany, March 2017
- No.370: *Joachim Wagner*: Firm size and the use of export intermediaries. A replication study of Abel-Koch, The World Economy (2013), January 2017 [published in: International Journal for Re-Views in Empirical Economics - IREE, Vol. 1 (2017-1)]
- No.369: *Joachim Wagner*: Multiple import sourcing First evidence for German enterprises from manufacturing industries, January 2017 [published in : Open Economies Review 29 (2018), 1, 165-175]
- No.368: *Joachim Wagner*: Active on many foreign markets A portrait of German multi-market exporters and importers from manufacturing industries, January 2017 [published in: Jahrbücher für Nationalökonomie und Statistik 238 (2018), 2, 157-182]
- No.367: *Institut für Volkswirtschaftslehre*: Forschungsbericht 2016, Januar 2017
- No.366: *Tim W. Dornis and Thomas Wein*: Trademarks, Comparative Advertising, and Product Imitations: An Untold Story of Law and Economics, September 2016
- No.365: *Joachim Wagner*: Intra-good trade in Germany: A first look at the evidence, August 2016 [published in: Applied Economics 49 (2017), 57, 5753-5761]

- No.364: *Markus Groth and Annette Brunsmeier*: A cross-sectoral analysis of climate change risk drivers based on companies' responses to the CDP's climate change information request, June 2016
- No.363: *Arne Neukirch and Thomas Wein*: Collusive Upward Gasoline Price Movements in Medium-Sized German Cities, June 2016
- No.362: *Katja Seidel*: Job Characteristics and their Effect on the Intention to Quit Apprenticeship., May 2016
- No.361: *Katja Seidel*: Apprenticeship: The Intention to Quit and the Role of Secondary Jobs in It., May 2016
- No.360: *Joachim Wagner*: Trade costs shocks and lumpiness of imports: Evidence from the Fukushima disaster, May 2016 [published in: Economics Bulletin 37 (2017), 1, 149-155]
- No.359: *Joachim Wagner*: The Lumpiness of German Exports and Imports of Goods, April 2016 [published in: Economics - The Open-Access, Open-Assessment E-Journal 10, 2016-21]
- No.358: *Ahmed Fayez Abdelgouad*: Exporting and Workforce Skills-Intensity in the Egyptian Manufacturing Firms: Empirical Evidence Using World Bank Firm-Level Data for Egypt, April 2016
- No.357: *Antonia Arsova and Deniz Dilan Karaman Örsal*: An intersection test for the cointegrating rank in dependent panel data, March 2016
- No.356: *Institut für Volkswirtschaftslehre*: Forschungsbericht 2015, Januar 2016
- No.355: *Christoph Kleineberg and Thomas Wein*: Relevance and Detection Problems of Margin Squeeze – The Case of German Gasoline Prices, December 2015
- No.354: *Karsten Mau*: US Policy Spillover(?) - China's Accession to the WTO and Rising Exports to the EU, December 2015
- No.353: *Andree Ehlert, Thomas Wein and Peter Zweifel*: Overcoming Resistance Against Managed Care – Insights from a Bargaining Model, December 2015
- No.352: *Arne Neukirch und Thomas Wein*: Marktbeherrschung im Tankstellenmarkt - Fehlender Binnen- und Außenwettbewerb an der Tankstelle? Deskriptive Evidenz für Marktbeherrschung, Dezember 2015
- No.351: *Jana Stoever and John P. Weche*: Environmental regulation and sustainable competitiveness: Evaluating the role of firm-level green investments in the context of the Porter hypothesis, November 2015
- No.350: *John P. Weche*: Does green corporate investment really crowd out other business investment?, November 2015
- No.349: *Deniz Dilan Karaman Örsal and Antonia Arsova*: Meta-analytic cointegrating rank tests for dependent panels, November 2015
- No.348: *Joachim Wagner*: Trade Dynamics and Trade Costs: First Evidence from the Exporter and Importer Dynamics Database for Germany, October 2015 [published in: Applied Economics Quarterly 63 (2017), 2, 137-159]
- No.347: *Markus Groth, Maria Brück and Teresa Oberascher*: Climate change related risks, opportunities and adaptation actions in European cities – Insights from responses to the CDP cities program, October 2015

(see www.leuphana.de/institute/ivwl/working-papers.html for a complete list)

Leuphana Universität Lüneburg

Institut für Volkswirtschaftslehre

Postfach 2440

D-21314 Lüneburg

Tel.: ++49 4131 677 2321

email: korf@leuphana.de

www.leuphana.de/institute/ivwl/working-papers.html