# What people believe about monetary finance and what we can('t) do about it Evidence from a large-scale, multi-country survey experiment

Link to supplementary material<sup>\*</sup>

Cars Hommes<sup> $\dagger$ </sup>

Julien Pinter<sup>‡</sup>

Isabelle Salle<sup>§</sup>

December 26, 2023

**Abstract** We conduct an information-provision experiment within a large-scale household survey on public finance in France, The Netherlands and Italy. We elicit prior opinions *via* open-ended (OE) questions and introduce a measure of macroeconomic policy literacy. A central bank (CB) educational blogpost explaining the mechanics of CB money preceded by a short video clip on public finance can persistently induce less support for monetary-financed proposals and more for fiscal discipline and CB independence, no matter the respondents' level of policy literacy. However, prior beliefs matter and contradictory information may be polarizing. Additional analysis of our data shows that information affects the respondents' views by shifting their inflation and tax expectations associated to these policies.

**Keywords** Large-scale household survey, information-provision experiment, RCT, central bank communication, expectations.

#### **JEL classification** E70; E60; E62; E58; G53; H31; C83.

<sup>†</sup>Amsterdam School of Economics, University of Amsterdam, Tinbergen Institute & Bank of Canada, Ottawa.

<sup>‡</sup>Minho University, Braga, Portugal & Fundamentos del Análisis Económico (FAE), Universidad de Alicante, Spain. <sup>§</sup>Corresponding author: Department of Economics, University of Ottawa, Amsterdam School of Economics, Amsterdam School of Economics, University of Amsterdam & Tinbergen Institute.

<sup>\*</sup>We are grateful to the Faculty of Economics & Business of the University of Amsterdam (NL) for financing this project through the Research Priorities Area (RPA) 'Complex Human Systems Lab.' The experiment has been pre-registered on the AEA RCT registry under project number AEARCTR-0008819 (Hommes et al., 2022) and has been granted ethical approval by the Ethics Committee Economics and Business at the University of Amsterdam under project number EB-46. We thank participants of the internal seminar at the Department of Economics of the University of Ottawa on November 8, 2022, the BBL seminar at the Bank of Canada on December 2, 2022, the ASSA meeting on January 7, 2023, and in particular our discussant Luba Peterson, the MInt seminar at the University of Amsterdam on April 19, 2023, the seminar at the University of Pablo de Olavide on May 15, 2023, the Barcelona Summer Forum on June 13, 2023, the CESifo Summer Institute Workshop in Venice, on June 23-24, 2023, the ESA World meeting in Lyon on June 26-29, 2023, as well as Alan Blinder, Jeffry Frieden, Chase H. Harrison, Myra Mohnen, Peter Stella, Nicolas Pasquier, Marc Pourroy and Dani Rodrik for helpful discussions. We are grateful to Rodolfo Arioli, Ottavia Papagalli and Isabella Vornehm for excellent research assistance. Pinter acknowledges support from the National Funds of the FCT Portuguese Foundation for Science and Technology within the project UIDB/03182/2020. The views expressed in this paper are those of the authors and do not necessarily represent those of the Bank of Canada. The reference to the replication package will be provided here.

# 1 Introduction

Below-target inflation following the Great Financial Crisis has spurred debates on the expanse of central banks' (CBs) toolkit and has even brought to light groundbreaking policies such as monetary finance.<sup>1</sup> Particularly in Europe, the narrative around 'helicopter money' and the cancellation of the public debt held by CBs went viral, as evidenced by Figure 1 (we borrow this terminology to Shiller 2019). Globally, the strong complementarities in the policy mix response to the COVID-19 pandemic have further blurred the lines between governments' fiscal policies and CBs' independent monetary policy mandates.<sup>2</sup> In this context, the public has been repeatedly confronted with contradictory messages regarding the feasibility and desirability of some form of monetary finance, while most of the opposition seems to have originated from the policy institutions themselves.<sup>3</sup> Macroeconomic arguments against this 'magic money' narrative include incomplete accounting, the risk of loss of control on inflation and the unanchoring of expectations. Political economy points to the risk of developing the unrealistic perception among the citizens that the government budget constraint is irrelevant, which would then undermine support for budget discipline, tax collection and CB independence.

Where do people stand? What do they know about macroeconomic policies and believe about the advantages and risks of public finance options? Importantly, do people's views on

<sup>&</sup>lt;sup>1</sup>We use the definition of monetary finance of Reis and Tenreyro (2022), i.e. fiscal expenses that result in an increase in the take-home nominal income of some private agents and are funded by the expansion of the monetary base, that is, the liabilities of the CB, as opposed to tax or debt-financed fiscal expenses.

<sup>&</sup>lt;sup>2</sup>In these exceptional circumstances, it has been argued that monetary finance could circumvent the traditional Ricardian equivalence arguments against fiscal stimulus; see, e.g., Galí (2020); Benigno and Nisticò (2020) for discussions. In a somewhat parallel conversation, some influential general-audience commentators have gone as far as advocating for monetary finance to systematically bypass governments' budget constraints; see Mankiw (2020) for a critical account of this proposal.

<sup>&</sup>lt;sup>3</sup>See, for example, Barthelemy and Penalver 2020; Ghebrihiwet et al. 2021.



<u>Notes:</u> Authors' computations from the Nexis database. The key words used are 'monetary financing', 'modern monetary theory', 'debt monetization', 'helicopter money', 'printing press', 'money creation', 'canceling' and 'erasing public debts'. The data are taken from the main general-interest and financial newspapers in the three countries used in our survey: for France, *Le Figaro*, *Libération*, *Le Monde*, *Les Echos* and *La Tribune*; for Italy, *Corriere della Sera*, *Il sole*, *Il messaggero* and *la Stampa*; for the Netherlands, *De Volkskrant*, *De Telegraaf*, *Algemeen Dagblad*, *NRC Handelsblad*, and *ESB*. The relative frequencies are computed by normalizing the number of occurrences with respect to the maximum amount reported over the entire period considered (2003 to 2022).

Figure 1: Relative frequency of concepts related to monetary finance in the main French, Dutch and Italian newspapers

monetary finance affect their support for fiscal consolidation programs or independent CB mandates? Then, how can CBs counter the narrative of 'magic money' given the perceived complexity of the topic and the potentially limited macroeconomic literacy in the public?

This paper is the first to investigate these questions. To do so, we use a unique dataset from a large-scale household survey with more than 8,500 respondents from a diverse set of EU countries (namely France, Italy and the Netherlands) that we conducted between November 2021 and March 2022.<sup>4</sup> We designed a measure of people's 'macroeconomic policy literacy',<sup>5</sup> elicited their opinions on public finance options *via* an extensive use of openended (OE) questions, and implemented an original random controlled trial (RCT) where we systematically vary the information provided to the respondents. Our RCT is innovative as we emphasize educational and real-world content. Our main treatment is a post from the educational blog of an actual CB arguing against monetary finance because '*there is nothing magic in central bank money.*' We also mixed an entertaining introductory video on public finance with this textual content and, crucially, exposed respondents to contradictory messages in order for the experiment to emulate the tone of the public debate. The contradiction is brought by an actual opinion column by a prominent European economist arguing that monetary finance could be used on an exceptional basis. The RCT is designed to exogenously shift opinions about monetary finance and its tax and inflation implications, to then assess whether such shifts can alter fiscal preferences. Our survey design allows us to control for policy literacy, prior beliefs and a wide range of socio-economic variables.

Our main results may be summarized as follows. First, we find an average policy literacy score of 40%, a substantial gender gap and cross-country disparities that do not necessarily align with the standard measures of financial literacy and numeracy, which speaks to the added value of our innovative metric. We find that more 'policy-literate' respondents tend to support fiscal discipline and CB independence more, monetary-financed proposals less and perceive inflation as the major risk if these proposals were to be implemented. However, the

<sup>&</sup>lt;sup>4</sup>Therefore, the survey took place before the persistent surge in inflation in these countries. We provide additional discussion on the timing of the survey with respect to the dynamics of inflation and inflation perception in Section 2.1 and Appendix A.

<sup>&</sup>lt;sup>5</sup>We may define 'macroeconomic policy literacy' as the ability to understand the main mechanisms of macroeconomic policies and correctly interpret information pertaining to them. Given our research questions, we focus on monetary and fiscal policies. In the sequel, we refer simply to 'policy literacy.'

risk of future tax increases is not often spontaneously mentioned, neither of debt issuance nor monetary finance, no matter the level of policy literacy. Second, we provide a proof-ofconcept that CB educational content may impact individuals' views on what are commonly considered complex issues. CB communication can significantly shift respondents' opinions towards less support for monetary-financed proposals and a higher perception of their inflation-related risk. Furthermore, exposure to opposite views tend to produce polarization rather than a convergence of opinions: people generally respond more favorably to the information that aligns with their pre-treatment beliefs. Third, by offering a counter-narrative to the 'magic money' narrative, CB communication can in turn affect fiscal preferences and induce more support for fiscal consolidation and, when adequately introduced with educational content, for CB independence. We highlight the value of simple and short educational messages to frame CB communication so as to influence people's views across all levels of policy literacy. Importantly, these effects tend to persist in a follow-up obfuscated survey conducted several weeks later. The information provided shifts respondents' inflation and tax expectations associated with monetary-financed or debt-financed proposals. Higher inflation expectations strongly and significantly result in lower support for monetary finance and both higher expected inflation and taxes result in more support for fiscal discipline. The related literature – surveyed hereafter – has extensively discussed, on the one hand, the effects of information on expectations and, on the other, the role of preferences in opinion formation regarding economic policies. We add to the literature by shedding light on the expectation channel of public support for policies.

The rest of the paper is organized as follows. After discussing the related literature, Section 2 introduces the experimental design of our survey. Section 3 analyzes the policy literacy, beliefs and opinions of the respondents, and Section 4 discusses the effects of the information provision treatments on the respondents' views. Section 5 concludes.

**Related literature** Our work builds on a growing body of literature exploiting RCTs in surveys to study people's understanding and beliefs about economic questions; see Haaland et al. (2023) for a methodological account. An important strand of this literature focuses on the effect of CB communication on inflation expectations; see D'Acunto et al. (2023) and the references herein and Blinder et al. (2023) for a focus on CB communication. The evidence collected emphasizes that simple communication has a greater impact on agents' expectations and their ensuing financial and economic decisions than more exhaustive, technical or detailed forms of communication; examples include D'Acunto et al. (2020) on a survey of Finnish households, Binder and Rodrigue (2018) or Coibion et al. (2022) on US data, or Haldane and McMahon (2018) and Bholat et al. (2019) within the context of the Bank of England's inflation reports.<sup>6</sup> More financially literate individuals have also been found to respond more to CB communication than low-literate people (Ehrmann et al., 2023). Beyond inflation expectations, several contributions look into households' understanding of the transmission mechanisms of shocks; see, e.g., Carvalho and Nechio (2014) on the study of consistency of inflation beliefs with a Taylor rule and Andre et al. (2023) on households' inflation narratives. There is also a strand of the RCT literature that studies support for policies. For instance, Roth et al. (2022) show how beliefs about the debt-to-GDP ratio and the perceived sustainability of the US public debt affect people's support for government spending cuts. Another example is Stantcheva (2021) who shows that people's support for taxation reflects preferences for redistribution and fairness rather than efficiency concerns,

<sup>&</sup>lt;sup>6</sup>There also exists a strand of the experimental literature studying the expectation channel of macroeconomic policies in the laboratory; see Hommes (2021) for a survey. This literature has also emphasized the importance of simple and relatable information in influencing subjects' macroeconomic forecasts; see, e.g., Mokhtarzadeh and Petersen (2021); Kryvtsov and Petersen (2021).

or Kuziemko et al. (2015) on the link between perceived income inequality and support for tax policies. We add to this RCT literature three innovative dimensions: i) an exploration of several forms of communication (text or video) where respondents are exposed to contradictory messages, ii) a focus on educational content, and iii) an emphasis on OE questions, which allows for a less contrived and richer exploration of beliefs than the usual multiplechoice questions (MCQs). We also conduct the first survey of people's perceptions of public finance options and the first study of the effects of these beliefs on fiscal preferences.

Finally, our 'macroeconomic-literacy score' is related to the survey literature that aims to measure people's factual knowledge about macroeconomic questions. While earlier contributions have found a fairly accurate factual knowledge about economic figures (Blinder and Krueger, 2004), large shortcomings have been uncovered when it comes to knowledge about the monetary-policy framework. For instance, Bottone et al. (2021) find that most Italian households believe that the ECB is primarily concerned with economic growth rather than price stability; for other examples, see Van der Cruijsen et al. (2015); Hayo and Neumeier (2021).

## 2 The survey

We first detail the data collection, then the design of the information provision experiment, and give a descriptive overview of the dataset.

## 2.1 The data collection

We run a survey of households in France, the Netherlands and Italy, which reflect the diversity of Western European economies. The survey was conducted by Kantar, a major multinational marketing research company. The survey consisted of two waves: a main wave (Wave 1) and a recontact wave (Wave 2). A pilot for the first wave involving 100 respondents per country was first launched on November 23, 2021. The main wave was then conducted from January 14, 2022, to February 17, 2022, that is before the start of the war in Ukraine and, importantly, before the recent and persistent surge in inflation.<sup>7</sup> A total of 8,601 respondents took part in the main wave of the survey: 2,200 respondents in the Netherlands, 2,201 in Italy and 4,200 in France. The larger sample size in France was used in anticipation of the recontact wave, used to analyze the persistence of the treatment effects about a month later, from March 4 to 21, 2022. The recontact wave involved two thirds of the respondents of the first wave (2,809 respondents in total).<sup>8</sup>

The survey was conducted online using the Kantar Profiles proprietary panels and was device-agnostic, i.e., respondents could complete it using a PC, tablet or smart phone.<sup>9</sup> We elaborated the questionnaire in English, which we report in Appendix D. As native speakers, and hopefully trained macroeconomists, we translated the questions into Dutch and French,

<sup>&</sup>lt;sup>7</sup>Survey data from the ECB-CES in Appendix Figure A.1 show that the break towards higher inflation perception in the three countries studied takes place later in 2022. In particular, the inflation perception of the households did not greatly differ between July 2020 and January 2022: the median perception between these two dates differs by less than 0.5% in France and Italy and this difference is even statistically insignificant in France, which provides the majority of our sample. Considering one-step-ahead expectations from the same survey leads to an identical pattern. Moreover, the yearly inflation rates in 2021 in France, the Netherlands and Italy were 1.6% (source: INSEE), 2.7% (source: CBS) and 1.8% (source: Istat), respectively.

<sup>&</sup>lt;sup>8</sup>For budgetary and practical reasons, only France could be used for the recontact wave.

<sup>&</sup>lt;sup>9</sup>Evidence from the pilot shows that the device used does not correlate with the time the respondents spent on the text content of the survey.

and two graduate students in macroeconomics whose mother tongue was Italian, translated it into Italian.

We took precautions when designing and implementing the survey to maximize the quality of the data: we stressed the academic background of the study and anonymity of the data collected; used categorical answer keys for financial variables to maximize the response rate while allowing for a 'rather-not-disclose' option; obfuscated the Wave-2 questionnaire to hide its connection with the first wave; elicited feedback from the respondents about clarity and difficulty in the pilot and varied the format of the answers to keep participants engaged while measuring their attention level. Speedsters were also excluded from the dataset.

## 2.2 The experimental design

Figure 2 displays the general structure of the survey experiment. Upon starting the survey, respondents were randomly assigned to one treatment arm, and no respondent could take part to the survey more than once. In all treatments, the respondents were first presented with usual socio-demographic and household-finance related questions and were asked about their habits and general opinions, including their macroeconomic expectations. The respondents then took a quiz consisting of five MCQs, three on monetary policy and two on fiscal policy. Participants could also choose the 'I don't know' option. This quiz aims to *ex-ante* measure the level of knowledge of the respondents regarding macroeconomic policies. Respondents were made aware that these questions had right and wrong answers.<sup>10</sup>

<sup>&</sup>lt;sup>10</sup>Precisely, we state that 'We are interested in learning whether economic information finds its way to the general public. These are questions for which there are right or wrong answers but they are not designed to catch you out.'



<u>Notes:</u> Respondents were randomly assigned to one of the five treatment arms with equal probability upon starting the survey. 1,720 respondents per treatment (1,721 for Tr. Video+CB+Media). In this last treatment, the order of display of the CB communication and the economist's opinion piece was randomized, with an equal probability for each respondent to see one or the other first.

Figure 2: Structure of the survey experiment

After completing the quiz, the respondents were given different pieces of information depending on the treatment to which they had been assigned. The key treatment variable was the provision of a CB communication piece arguing against monetary-financed fiscal expenditures. We used a blog post published online on May 20, 2020, on the *Bloc-notes Eco* blog, the blog of the Bank of France dedicated to the publication of educational content concerning the Bank's research studies and expertise. In their words, the blog 'targets an audience of students, professionals, journalists and scholars.' We used this information

source to convey a negative view of monetary finance. We did not name the Bank of France but referred to a CB of a euro-area country. The entire text can be found in Appendix D. It explains the mechanics of money creation and CBs' balance sheets and why money cannot be created without any counterparts or costs. Note that there is no reference to the ECB's independent mandate.

Even though the text is real-world educational content, one may argue that it is long – in particular within the context of a general-population survey – and still fairly technical, at least at first glance. Therefore, the information treatment first presented a three-sentence summary of the blog post that highlights its main message that the 'there is nothing magic in central bank money' (see Box 2.2). The respondents had to spend at least 10 seconds on this summary before being able to scroll down through the full text to proceed with the rest of the survey. This procedure was designed to keep the cognitive load reasonable and direct attention to the information while giving the respondents the option of reading the full text.

Cols. I and II of Figure 2 describe the control group, where no information was displayed, and Treatment CB, where the CB communication opposing monetary-financed initiatives was displayed to the respondents after the elicitation of their prior views on debt issuance and monetary finance. The posterior questions, common across all respondents, then surveyed opinions on fiscal consolidation, CB independence, exceptional and systematic monetary financing of government expenses as well as expectations of taxes and inflation in thought experiments where debt or money creation would be chosen to fund public expenditures.

Despite the simplified summary, the topic of the CB communication piece is arguably

not trivial once we step out of our expert shoes and acknowledge the point of view of lay people.<sup>11</sup> To address this concern, we provided an introductory educational video about public finance to some respondents.<sup>12</sup> We designed this video to convey educational content in an entertaining way, using jazzy music in the background, while abstracting from any macroeconomic jargon and ideological connotations. Such a stylized presentation aimed to provide context to the trade-offs associated with each public funding option and maximize survey engagement on this complex matter, which is crucial given our reliance on OE answers. The video successively presents, in lay and apolitical terms, the different options for financing a public expense, namely, raising taxes, issuing debt or expanding the monetary base, and states that each option has downsides and upsides. The video concludes by stating that because the risks associated with monetary financing are usually considered high, CBs like the ECB are independent from governments. The risks and advantages are not spelled out. In particular, there is no mention of any inflationary bias. Respondents had to play the whole video before proceeding to the rest of the survey and could repeat it as desired. We wrote the text of the video and translated it into Italian, French and Dutch. All videos are subtitled and we outsourced the direction and production to the team of La Cité de l'Eco. an educational museum of economics in Paris that has a close relationship with the Bank of France.

The third column of Figure 2 summarizes the treatment Video+CB where both supports – the video and the CB communication – are displayed. Because the video aims to provide

<sup>&</sup>lt;sup>11</sup>Before the actual data collection, we tried out the survey questions on many non-expert respondents in our entourage and a fair share of them considered the topic of government funding options, debt issuance and monetary finance quite technical and rather intimidating.

<sup>&</sup>lt;sup>12</sup>The video in the three languages along with an English version (not used in the survey) can be found in the replication package and accessed using the links in Appendix D.

Box 2.2 – Information provision treatment: Central bank's communication (see Barthelemy and Penalver 2020 for the full text)

Before answering the last part of the survey, you will be randomly assigned to read a piece of information from a set with different views on economic policies. We now invite you to read the article below. It is a piece from a central bank from the euro area. It states that "there is nothing magic in central bank money". It was written at the beginning of the pandemic (in the first semester of 2020). We invite you to skim through it yourself but an external expert has also summarized it for your convenience:

"The article argues that if the European Central Bank were to create money to fund government expenses, this would be illegal and it could entail **very high social and economic costs** in the future. Looking at historical experience, creating money to fund government expenses has often led to a **loss of confidence in the currency** and a **loss of control over the general level of the prices** in the economy. A situation where prices start increasing rapidly refers to **inflation** or even hyperinflation."

context, respondents watched it first. This design choice allows us to investigate whether the lack of context (in Tr. CB) affects the elicitation of people's views in the OE questions, and their understandings of and reactions to CB communication. We also explored a fourth treatment, namely Tr. Video in the fourth column of Fig. 2, where respondents only watch the video and do not receive any further information.

We designed a last treatment – Tr. Video+CB+Media; see Col. V of Figure 2 – to test whether the CB message, if effective in shifting views against an apparently 'easy and free financing option,' can stand up to opposing views in the public debate. In this treatment, we add an opinion column from Prof. Paul de Grauwe, who holds the John Paulson Chair in European Political Economy at the London School of Economics and Political Science. His opinion piece argues for a one-time monetary-financed fiscal stimulus in the wake of the COVID-19 pandemic (De Grauwe, 2020). The author argues that the long-run trend in Europe has been deflationary, which leaves room for monetary finance, also described



Notes: The average age of acquisition of the words in each text is obtained using the classification from Kuperman et al. (2012). The Flesch Reading Ease, Flesch-Kincaid and Gunning Fog indexes measure the ease with which a text can be read and understood by an average reader based on the number of words, syllables and sentences. A higher Flesch Reading Ease score implies higher readability, where a score between 70 to 80 is equivalent to school grade level 8 and is usually seen as well-adapted to the general public. The Flesch-Kincaid score and the Gunning Fog score return the required grade level (in the US education system) necessary to read the text. The Analytic LIWC (Linguistic Inquiry and Word Count) score measures the reliance of a text on analytic thinking and logical reasoning, where a higher score corresponds to higher analytical content. The 'time to absorb' is the time that an online prompter (oratlas) takes to read the text out loud (articulating each word properly) in seconds in each language.

Figure 3: Comparison of the complexity of the two textual pieces of information

as thinking 'outside the box.' This piece was chosen because the author is a prominent economist in Europe and often contributes to the economic debate in English, Dutch and French newspapers with a general readership. Therefore, in Tr. Video+CB+Media, the CB communication has both a facilitating component (the introductory video) and a hurdle (De Grauwe's piece). This treatment explores the relative effect of each on the ability of the CB to influence public opinion and assesses whether contradicting messages tend to generate uncertainty and confusion or a polarization of ideas. This treatment has a strong empirical Box 2.2 – Information provision treatment: Economist's opinion column

The second article below is a piece from a renowned European economist. It states that 'the European Central Bank (ECB) must finance COVID-19 deficits'. It was written at the beginning of the pandemic (in the first semester of 2020). We invite you to skim through it yourself but an external expert has also summarized it for your convenience:

'The article argues that if the European Central Bank were to create money to fund government expenses, this would create **relief for countries' budgets** and allow them to **avoid potential indebtedness problems**. It also argues that this would **not induce any risk of a large increase in the level of the prices** in the current context. It proposes to find the appropriate way to make this option legal.'

relevance because in the real world, people are frequently confronted with contradicting messages. The order in which respondents saw the two texts was randomized, and the procedures used for the CB communication were implemented for De Grauwe's piece as well. The summary of the text is reproduced in Box 2.2, and the respondents had the option of reading the entire text, which can be found in Appendix D. As illustrated in Figure 3, the two texts have a similar level of readership according to several standard metrics of textual complexity.

The experimental design is essentially exploratory. Therefore, we refrain from formulating firm hypotheses. In short, the treatments involving the CB blog post aim to test whether textual educational content from a CB alters people's opinions of public finance by manipulating their views about monetary finance and its inflation and tax implications. The video may help people structure their opinions and help the CB affect these opinions. The last treatment explores people's reactions in the presence of contradictory information. The extensive socio-demographic questionnaire and the five-question quiz allow us to control for a wide range of factors when gauging the effects of the treatments, as well as to investigate heterogeneity considerations, in particular, with respect to people's knowledge of macroeconomic matters.

## 2.3 Data overview

Our data are representative of the general population of the three countries in terms of gender, age, region of residence and, as much as possible given the sample size required, education levels and income (see Appendix Table B.10).<sup>13</sup> We also show that our sample is fairly representative in terms of unemployment and involves fewer one-person households than the general population, resulting in an average household size slightly larger. Most importantly, the distribution of any of these characteristics does not significantly differ across the five treatments.

The median completion time was about 14 minutes, with a 20-minute average, ranging from 17 minutes in the Control group to more than 21 in the Video+CB+Media treatment and close to 19 minutes in the three other treatments.<sup>14</sup> Given that the video lasts for 1:20 minute, the time spent by respondents on the information treatments is substantial. In particular, respondents spent on average 59 seconds on the CB educational blog post versus 41 seconds on the opinion piece. An equal and small share of respondents acknowledged not paying attention to the information provided (only 7% for each of the texts), and more than two-thirds of the respondents found the content of the texts clear (68% for the CB text and 69% for the media piece). Additionally, the vast majority of respondents (86%) did not find

<sup>&</sup>lt;sup>13</sup>Low-education and high-income quotas are a common challenge of online panels.

<sup>&</sup>lt;sup>14</sup>In the recontact wave, the median completion time was 3:30 minutes, with an average of 5.30 minutes.

the survey biased, and the rest were divided equally between a left- or a right-wing bias. About one out of eight participants found the survey too technical, ranging from 9% in the Video treatment to 13.5% in the Control group, which shows that the information provided in the different treatments was accessible for most participants and the educational content successfully mitigated the perceived technicality.

In the next section, we provide a roadmap of respondents' policy literacy and publicfinance beliefs.

# **3** Macroeconomic policy literacy and opinions

### 3.1 What do people know?

We measured respondents' knowledge about macroeconomic policies with three questions on monetary policy in the euro area and two on fiscal policy and public finances; see Q. 27-31 in Appendix D. The resulting metric is a policy literacy score ranging from 0 (in the absence of any correct answers) to 5 (if all questions are correctly answered), along with a sub-score for monetary policy (with a maximum of 3 points) and one for fiscal policy (with a maximum of 2 points).

Figure 4 displays the distribution of these scores. We first see that respondents only correctly answered an average of two questions out of the five, and fewer than 5% obtained the maximum score (see Figure 4a). Comparing Figures 4b and 4c further shows that respondents are more knowledgeable about fiscal policy than about monetary policy: about a quarter of



Notes: The entire sample involves 8,601 observations. The scores correspond to the fraction of correct answers.

Figure 4: Distribution of the policy literacy scores

the respondents correctly answered at least two out of the three monetary-policy questions, while more than 40% obtained a score of 2/2 on the fiscal-policy questions. The significantly greater fiscal-policy knowledge persists when performing pair-wise comparisons of individual questions and comparing each single monetary-policy question to the fiscal-policy score as a whole (the p-values of the corresponding rank-sum tests are always < 0.001). Despite CBs' transparency efforts, the lesser understanding of monetary policy may stem from fiscal policy's direct impact on household finance through taxes and government transfers, as well as its greater media coverage in national political debates, and the perception of monetary policy as complex and less politically engaging (Bearce, 2003). This may be particularly true in the euro area, where monetary policy has been delegated to a supra-national entity.

Table 1 reports on the relationships between socio-demographic and financial variables and policy literacy scores.<sup>15</sup> Male respondents, older and more educated individuals and

<sup>&</sup>lt;sup>15</sup>These variables are used throughout the paper as controls and are described in Appendix B.1. After

higher-income earners tend to obtain higher scores. Even after controlling for a wide range of socio-economic factors, men score on average 6 points more out of 100 than women (see Col. III). Intriguingly, while gender differences in literacy are well-established, our cross-country score differences differ from the outcomes from the 'big 3' questions about financial literacy and numeracy that are the usual metrics of the economic knowledge of the public; see, *inter alia*, Lusardi and Mitchell (2014) for details. While the Netherlands scores (much) higher in financial literacy than France, which scores higher than Italy, the ranking is reversed when it comes to knowledge about monetary policy (Col. IV). Taken together, these observations call for the inclusion of specific questions on economic mechanisms in household surveys to accurately measure the public's knowledge of the matter and for more research to design effective targeted communication policies within the European Monetary Union.

Additionally, people inclined to financial planning, those who finances were negatively affected by the COVID-19 pandemic, those who express clear political opinions, or declare a high level of subjective knowledge also score higher in all questions. Greater trust in the ECB is further associated with higher policy literacy (see Hayo and Neumeier 2021 for a study on the matter). Finally, readers of newspapers tend to display the highest policy literacy scores while social-media users the lowest. This finding suggests that broadcasting CB communication on these platforms could help target the fraction of the public that could benefit the most from CB educational content.

checking for the absence of multicollinearity (see Appendix Table B.2), a factor analysis does not yield to a substantial decrease in the size of the dataset. For as many as eight factors, the associated  $\chi^2(7)$ -statistic is 18.54 with an associated p-value < 0.001.

	Total score		Monetary policy	Fiscal policy				
	(I)	(II)	(III)	(IV)	(V)			
		$Demographic \ variables$						
Female	$-9.09^{***}$	$-6.36^{***}$	$-5.75^{***}$	$-5.84^{***}$	$-5.63^{***}$			
	(0.57)	(0.56)	(0.56)	(0.62)	(0.88)			
Age	$0.48^{***}$	$0.34^{***}$	0.29***	$0.18^{***}$	$0.46^{***}$			
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)			
Education	7.99***	5.55***	$4.97^{***}$	4.13***	6.50***			
	(0.42)	(0.41)	(0.41)	(0.46)	(0.64)			
Household size	0.01	-0.32	$-0.71^{***}$	$-0.45^{*}$	$-1.10^{***}$			
	(0.23)	(0.22)	(0.23)	(0.25)	(0.37)			
Working	$3.38^{***}$	2.97***	$1.53^{***}$	0.78	$2.50^{***}$			
	(0.61)	(0.58)	(0.59)	(0.66)	(0.93)			
France	$2.77^{***}$	$3.74^{***}$	$2.65^{***}$	4.80***	-0.39			
	(0.67)	(0.66)	(0.68)	(0.75)	(1.09)			
Italy	$4.64^{***}$	4.49***	$4.46^{***}$	10.07***	$-3.69^{***}$			
	(0.78)	(0.76)	(0.78)	(0.87)	(1.23)			
		Habits and opinion variables						
Left-wing		7.36***	$6.61^{***}$	5.55***	8.72***			
5 5		(0.70)	(0.69)	(0.79)	(1.07)			
Right-wing		4.80***	3.66***	$2.78^{***}$	$5.02^{***}$			
		(0.64)	(0.64)	(0.73)	(1.01)			
Trust the ECB		3.96***	$3.60^{***}$	4.03***	3.32***			
		(0.70)	(0.70)	(0.85)	(1.06)			
Financial planner		3.75***	3.42***	1.65***	6.46***			
		(0.37)	(0.36)	(0.39)	(0.57)			
Financial newspaper re	ader	0.24	0.06	0.68**	$-0.99^{**}$			
		(0.30)	(0.30)	(0.35)	(0.45)			

Dependent variable: Macroeconomic literacy score (fraction of correct answers)

Continued on next page

 $2.67^{***}$ (0.28)

0.24

(0.28)

2.60\*\*\*

(0.28)

0.30

(0.27)

1.99\*\*\*

(0.31)

0.46

(0.30)

 $3.58^{***}$ 

(0.42)

0.05

(0.42)

General newspaper reader

TV-watcher

	(I)	Total scor (II)	re (III)	Monetary policy (IV)	Fiscal policy (V)
Radio-listener		$0.19 \\ (0.25)$	-0.0004 (0.25)	-0.21 (0.28)	$0.29 \\ (0.39)$
Social media user		$-1.59^{***}$ (0.22)	$-1.57^{***}$ (0.22)	$-1.22^{***}$ (0.25)	$-2.14^{***}$ (0.34)
Self-reported knowledge		$7.13^{***}$ (0.66)	$6.89^{***}$ (0.66)	$6.13^{***}$ (0.78)	$8.51^{***}$ (1.00)
			Financ	cial variables	
Income: low			$1.81 \\ (1.13)$	0.18 (1.12)	$4.21^{**}$ (1.87)
Income: medium			$6.39^{***}$ (1.10)	$4.94^{***}$ (1.10)	$8.76^{***}$ (1.81)
Income: high			$8.46^{***}$ (1.18)	$6.00^{***}$ (1.23)	$\begin{array}{c} 12.17^{***} \\ (1.92) \end{array}$
Net wealth: low			$0.14 \\ (1.11)$	-1.68 (1.29)	2.50 (1.65)
Net wealth: medium			$1.05 \\ (1.16)$	-0.15 (1.37)	2.66 (1.69)
Net wealth: $< 0$			-1.89 (1.23)	$-4.44^{***}$ (1.40)	1.44 (1.89)
Net wealth: missing			$-3.63^{***}$ (1.18)	$-4.80^{***}$ (1.36)	-2.56 (1.78)
COVID-19 financial loss	3		$3.41^{***}$ (0.56)	$1.35^{**}$ (0.62)	$6.50^{***}$ (0.88)
Constant	2.06 $(1.70)$	$-11.13^{***}$ (2.20)	(2.63)	$-5.71^{**}$ (2.85)	$-14.64^{***}$ (4.15)
Observations $\mathbb{R}^2$	$8,585 \\ 0.14$	8,585 0.22	$8,585 \\ 0.24$	$8,585 \\ 0.16$	$8,585 \\ 0.19$

Table 1: Huber-robust OLS models of the policy literacy score

<u>Notes</u>: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01. The scores are expressed out of 100 p.p. All explanatory variables are described in Appendix B.1. The omitted variable for income is 'missing income,' for net wealth 'high net wealth' and for political opinions 'neutral or not declared;' the omitted country is the Netherlands.

We highlight the following first finding:

#### Finding 1 (Macroeconomic policy literacy)

- 1. Respondents appear less knowledgeable when it comes to monetary policy than fiscal policy.
- 2. Males, more educated, wealthier, newspaper readers, and French and Italian respondents have higher macroeconomic scores than females, people with lower education achievement, Dutch respondents and social-media users.

We now turn to the prior opinions of the respondents on public finance options.

## 3.2 What do people believe?

#### 3.2.1 Priors on monetary and debt-financed public expenses

We elicited respondents' prior opinions on monetary and debt-financed expenses in three steps. A first set of questions asked whether they saw any advantage or risk to each funding option (they could also answer 'I don't know'). In case they did, a second set of questions elicit these risks or advantages *via* OE questions. A third set of MCQs asked all respondents whether each option had more drawbacks than advantages (which we treat as having a negative prior) or the other way around (which we treat as having a positive prior). We treat an 'I don't know' answer to this last question as not having any prior.<sup>16</sup> A large fraction of the respondents declared a prior opinion: almost two thirds (5,459) on monetary-financed

<sup>&</sup>lt;sup>16</sup>The survey questions correspond to Questions 36 and 39 in Appendix D. The order of the questions on advantages and risks is randomized for each financing option (debt or money).



(a) Risks of monetary financing (4,977 obs.)



(b) Advantages of monetary financing (2,755 obs.)

<u>Notes</u>: The survey questions correspond to the OEQ component of Questions 37 and 38 in Appendix D. The order of the two sub-questions are randomized over the entire sample. The figures represent the most commonly mentioned keywords, where their relative sizes are proportional to their relative frequencies over the entire sample.

Figure 5: Prior views on monetary-financed policies

expenses and up to 70% (6,029) on debt-financed policies. Overall, priors were negative: about two thirds believed that debt- or monetary-financed policies had more drawbacks than advantages.

Figure 5 reports wordclouds of the answers to the OE questions – the relative size of a word indicates its relative frequency in the answers over the entire sample. Strikingly,

inflation-related risks dominate the answers about monetary finance (Figure 5a), with words such as 'inflation', 'devaluation', 'increase', 'currency', 'worth' and 'loss' being the most frequently cited. By contrast, words positively associated with monetary finance belong to the vocabulary of 'liquidity', such as 'money', 'easy', 'availability' and 'increase' (Figure 5b). Similar words are used to describe advantages of debt issuance, while the risks cited mostly pertain to debt burden and interest payments (see Appendix Figure C.3).

Figure 6 further classifies the OE answers into a few, commonly observed, categories. In line with Finding 1-1, respondents appear more familiar with, and were more prolific about the concept of debt than of monetary finance. About 80% of the respondents filled up an intelligible answer about risks related to debt issuance (see the last bar of Figure 6d) whereas less than half of them did so when it came to risks associated with monetary finance (see the last bar of Figure 6b). Anecdotally, in the Netherlands, since 2009, advertisements for loans and mortgages have been legally required to include the warning 'borrowing money costs money', and we find many instances of this statement in the related OE answers. Moreover, only 57% of all respondents saw the OE question about the risks of monetary finance because the rest did not answer that monetary finance involves any risk, including about 30% who declared not to know. By contrast, almost 80% declared risks associated with public debt issuance and only about 10% did not know. The comparisons of advantage-related OE answers describe a similar picture (see Figures 6c versus 6a).

Breaking down the answers by policy literacy score, most respondents with a high score cited the loss of value of the currency as a risk associated with monetary finance, while only one of out of six of the low-score group linked monetary finance to the loss of purchasing power (Figure 5a). A minority of high-score respondents also mentioned governance issues.

Interestingly, considerations about future taxes were barely mentioned (a maximum of 10% of the occurrences when it comes to risks of debt issuance) and inflation concerns were much more prominent than future tax worries. Furthermore, mentions of 'higher future taxes' do not significantly differ across policy literacy scores.<sup>17</sup> This finding speaks to a fairly diverse literature that emphasizes that people tend to be myopic (Gabaix and Laibson, 2022). Hence, their beliefs need not align with Ricardian equivalence, which undermines the benefits of fiscal and monetary policy coordination established under rational expectations; see, e.g., Bianchi and Melosi 2019 and the experimental evidence of Kronick and Peterson (2022).

Finally, Table 2 shows that the video achieved its primary objective of framing the OE questions, inducing more intelligible answers and fostering survey engagement: respondents who watched it tended to provide more OE answers and were less uncertain about their answers than those who were asked to write down their opinions about public finance without any introduction to the topic.

We summarize our findings concerning the prior opinions of the respondents as follows:

#### Finding 2 (Prior beliefs about public finance options)

- Respondents are less familiar with monetary finance than public-debt issuance, with great disparities across levels of policy literacy.
- Tax arguments are not often mentioned, neither related to debt issuance nor to monetary finance, neither as a risk nor as an advantage, and no matter the level of policy literacy.
- The educational video achieved the promotion of survey engagement.

 $<sup>^{17}</sup>$ The p-values associated with the test of the cross-score differences of mentioning taxes as a risk of, respectively, debt issuance and monetary finance are 0.89 and 0.87.



(c) Advantages of debt issuance

(d) Risks of debt issuance

<u>Notes</u>: The OE questions are presented if the respondent indicated that they believed risks (or advantages) exist for each funding option as asked in Questions 34, 35, 37 and 38, see App. D. The group of low policy literacy scores comprises respondents who answered correctly no more than one question out of the five knowledge questions, and the group of high scores includes those who answered correctly at least four. N corresponds to the number of respondents in each group but the barplots are based on the number of answers, which are larger than N because some respondents provided multiple answers.

Figure 6: Distribution of the OE answers by policy-literacy score

	(I)	(II)	(III)	(IV)	(V)		
	'I am certain	Ν	o answer to the	he OEQs abo	• OEQs about:		
	or very certain'	monet	tary finance	debt issuance			
		risks	advantages	risks	advantages		
Video	40.8	40.7	64.4	21.4	55.8		
$No \ video$	37.8	45.5	74.0	24.2	70.2		
<i>p</i> -value	$0.005^{***}$	$< 0.001^{***}$	$< 0.001^{***}$	0.002***	$< 0.001^{***}$		

<u>Notes:</u> \*\*\*: significant at the 1% level, \*\*: significant at the 5% level, and \*: significant at the 10% level. 'Video' corresponds to the sample containing respondents treated with Tr. Video, Video+CB and Video+CB+Media, while 'No video' corresponds to the sample containing respondents in the control group and those treated with Tr. CB. The p-values correspond to the  $\chi^2$ -test where the null hypothesis is the absence of a relationship between exposure to the video and the respondents' answers. The order of the questions is randomized. Cols. I to III correspond to Question 39 and Cols. IV and V to Question 36 in Appendix D.

Table 2: Effect of the video on survey engagement

Before turning to the treatment effects, we describe our main post-treatment variables.

#### **3.2.2** Posteriors on public-finance options

Our post-treatment variables are the support for monetary-financed policies on a systematic or exceptional basis, the support for CB independence, and the support for fiscal consolidation, either as spending cuts or as a tax increase. Appendix Tables B.5 and B.9 describe these variables and Appendix Table C.11 reports on their socio-economic determinants.

Cross-country differences stand out: there is less opposition to CB independence, more support for monetary finance and more hostility towards tax increase in France and in Italy than in the Netherlands (Appendix Table B.5). Regarding socio-economic determinants, higher education attainments also correlate with more support for fiscal discipline and less for monetary-financed policies (Appendix Table C.11). Other determinants, such as age, gender, financial variables, news habits and even political preferences and wealth are not significantly or unambiguously related to respondents' opinions on public finance options. Across the whole sample, we find a surprising significant correlation between more support for monetary finance and *less* support for CB independence (Appendix Table B.9). Trust in the ECB is further associated with more support for exceptional monetary finance and fiscal discipline but does not correlate with opinions on CB independence (Appendix Table C.11). These two observations suggest that respondents may be unfamiliar with the concept or the rationale for CB independent mandates. We also find a significantly positive correlation between support for budget cuts and support for tax increases, which reflects overall preferences for fiscal discipline, but the tax-increase option enjoys overall less support than the spending-cut option. In the next section, we investigate how information provision may shift these beliefs.

# 4 Can information change people's views?

We first show the effects of the treatments on the support for monetary finance, then highlight how these treatment-induced changes in opinion affect the preference for fiscal discipline and CB independence. We then look at the inflation and tax expectations channel of the information provision, and conclude by uncovering persistent treatment effects in the recontact wave.

## 4.1 Treatment effects on the support for monetary finance

Our information treatments are designed to create exogenous shifts in the views about monetary finance. To uncover those, we perform OLS cross-sectional estimations of the following baseline specification:

$$Y_i = \alpha + \beta_1 . \operatorname{Tr}_{\mathsf{CB},i} + \beta_2 . \operatorname{Tr}_{\mathtt{Video}+\mathtt{CB},i} + \beta_3 . \operatorname{Tr}_{\mathtt{Video},i} + \beta_4 . \operatorname{Tr}_{\mathtt{Video}+\mathtt{CB}+\mathtt{Media},i} + \gamma X_i + \epsilon_i$$
(1)

where the dependent variables Y are the Likert items corresponding to respondents' posttreatment reported opinions on monetary-financed public spending, as described in Appendix Table B.5; the dummy variables  $\text{Tr}_{*,i}$  represent the exposure of respondent i to Treatment \*, and the vector  $X_i$  includes the control variables used in Table 1, along with policy literacy as analyzed in Section 3.1, their prior beliefs as discussed in Section 3.2.1 and a measure of their reported medium-run inflation expectations.<sup>18</sup> All OLS regressions are Huber (1964)robust. Heterogeneous-treatment effects along the prior opinion about monetary finance and the level of macroeconomic policy literacy are analyzed by adding interaction terms to Specification (1).

Results are reported in Table 3. The main take-away is that the information provided about monetary finance significantly affects the respondents' opinion about this public finance option. Exposure to the CB educational blog post results in more opposition to monetary-financed expenses (Cols. I and IV). This effect is of similar magnitude whether they saw the introduction video on public finance (Tr. Video+CB) or not (Tr. CB). Watching the video alone (Tr. Video) does not influence views on monetary finance, which confirms the neutrality of its content as per design. Furthermore, higher policy literacy and higher inflation expectations are associated with greater opposition to monetary finance on a sys-

<sup>&</sup>lt;sup>18</sup>Inflation expectations are elicited via the following qualitative question (see Question 24 in Appendix D): 'Relative to the past year, how do you think that the average level of the prices in the economy will evolve over the next five years?'), where answers range from 1 for 'it will increase a lot' to 5 for 'it will decrease a lot.' The answer 'I don't know' is treated as a missing variable. Hence, a higher value of the inflation expectations correspond to *lower* inflation expectations. Including a similar measure of tax expectations does not change the findings in this section but results in fewer observations due to more 'I don't know'-answers.

tematic (Col. I) but not on an exceptional basis (Col. IV). In other words, support for a one-time policy intervention in an exceptional context is not tied to individual characteristics or long-term outlooks. Interestingly, however, the treatment effects do not depend on policy literacy: we do not find evidence of differentiated effects among low and highly 'policy literate' respondents (Cols. II and V).

Additionally, the effect of Tr. Video+CB+Media appears to depend on the priors about monetary finance (Cols. III and VI). The two contradictory pieces of information exert a polarizing effect on respondents' opinions about monetary finance: they reinforce the opposition to this financing option among those who held a negative prior view on the matter, whereas they increase the support for this option on respondents who held a positive prior view or did not express any particular prior opinion. This polarizing effect is non-negligible: the after-treatment difference between the group with negative priors and the rest of the respondents amounts to more than one point out of the five-point Likert scale versus about half a point without treatment exposure.

After showing how CB communication shifts opinions regarding monetary finance, we look at the resulting effects on fiscal preferences.

		(systematic)			(exceptional)			
	all resp I	ondents II	'CB text is clear' III	all resp IV	oondents V	'CB text is clear VI		
CB	$-0.07^{**}$ (0.03)	-0.07 (0.04)	$-0.23^{***}$ (0.09)	$-0.12^{***}$ (0.03)	$-0.11^{**}$ (0.05)	$-0.19^{***}$ (0.07)		
Video+CB	$-0.13^{***}$ (0.03)	$-0.11^{**}$ (0.05)	0.03 (0.08)	$-0.12^{***}$ (0.03)	$-0.12^{**}$ (0.05)	0.01 (0.07)		
Video	-0.02 (0.03)	-0.02 (0.05)	$0.02 \\ (0.04)$	$0.06^{*}$ (0.03)	$0.07 \\ (0.05)$	$0.06 \\ (0.04)$		
Video+CB+Media	-0.05 (0.03)	-0.04 (0.05)	$0.17^{**}$ (0.09)	$0.04 \\ (0.03)$	$0.05 \\ (0.05)$	$0.35^{***}$ (0.07)		
$\label{eq:inflation} Inflation \\ expectations$	$\begin{array}{c} 0.07^{***} \ (0.01) \end{array}$	$0.07^{***}$ (0.01)	$0.06^{***}$ (0.02)	$0.003 \\ (0.01)$	$0.01 \\ (0.01)$	$0.003 \\ (0.02)$		
Low policy literacy score	$0.20^{***}$ (0.02)	$0.19^{***}$ (0.05)	$0.18^{***}$ (0.03)	$0.01 \\ (0.02)$	$\begin{array}{c} 0.03 \\ (0.05) \end{array}$	$0.02 \\ (0.03)$		
High policy literacy score	$-0.23^{***}$ (0.03)	$-0.17^{***}$ (0.06)	$-0.23^{***}$ (0.04)	-0.03 (0.03)	-0.03 (0.06)	-0.06 (0.04)		
Negative prior	$-0.64^{***}$ (0.02)	$-0.65^{***}$ (0.02)	$-0.62^{***}$ (0.04)	$-0.64^{***}$ (0.02)	$-0.65^{***}$ (0.02)	$-0.58^{***}$ (0.05)		
		Heterogene	eous treatment effect	cts: interact	ion with:	Negatine prior		
$\times$ CB	1	$\begin{array}{c} 0.03 \\ (0.07) \end{array}$	$ \begin{array}{c} -0.002 \\ (0.11) \end{array} $		-0.06 (0.07)	$\begin{array}{c} 0.02\\(0.10)\end{array}$		
$\times$ Video+CB		$0.001 \\ (0.07)$	$-0.40^{***}$ (0.11)		$0.04 \\ (0.07)$	$-0.28^{***}$ (0.10)		
imes Video		$0.02 \\ (0.07)$	-0.08 (0.06)		-0.07 (0.07)	-0.04 (0.07)		
imes Video+CB+Media		$0.02 \\ (0.07)$	$-0.41^{***}$ (0.12)		-0.04 (0.07)	$-0.51^{***}$ (0.10)		
$\times$ CB	Ε	$\begin{array}{c} \text{High score} \\ -0.07 \\ (0.09) \end{array}$		1	$\begin{array}{c} \text{High score} \\ 0.02 \\ (0.10) \end{array}$			
$\times$ Video+CB		-0.13 (0.09)			-0.11 (0.10)			
imes Video		-0.06 (0.09)			-0.04 (0.10)			
imes Video+CB+Media		-0.10 (0.09)			$0.06 \\ (0.10)$			
Constant	$2.39^{***} \\ (0.12)$	$2.68^{***}$ (0.12)	$2.44^{***} \\ (0.16)$	$2.88^{***}$ (0.12)	$3.06^{***}$ (0.12)	$2.81^{***} \\ (0.16)$		
$\begin{array}{c} \text{Observations} \\ \text{R}^2 \end{array}$	$\begin{array}{c} 8,289\\ 0.22\end{array}$	$8,\!289$ 0.21	$\begin{array}{c} 4,\!686 \\ 0.25 \end{array}$	$8,\!289 \\ 0.15$	$8,\!289 \\ 0.15$	$4,686 \\ 0.16$		

Dependent variable: Support for monetary-financed fiscal policy (systematic) (exceptional

<u>Notes:</u> All controls included (see Table 1). Huber-robust OLS. The Likert-scale dependent variables are the answers to Q53 (Cols. I–III) and Q51 (IV–VI). Low and high policy-literacy scores are defined in Fig. 6, inflation expectations are elicited in Q24, where 1 corresponds to 'prices will increase a lot over the next five years' and 5 to 'prices will decrease a lot over the next five years.' 'I don't know' answers are excluded. Negative prior refers to prior opinion on monetary finance as elicited in Q39. 'CB text is clear' excludes the respondents in Trs. CB, Video+CB and Video+CB+Media who declared finding the texts unclear, i.e., who answered 1, 2, 3 (or 6) to Qs. 43 and 44.

Table 3: Treatment effects on public support for monetary finance

## 4.2 How views on monetary finance affect fiscal preferences

We use second-stage 2SLS regression models to investigate how the variations in opinions regarding monetary finance induced by our exogenous information treatments in turn affect the support for fiscal discipline and CB independence. Table 4 reports the effects of opinions about systematic monetary finance. The analysis using views on exceptional monetary finance gives a similar picture and is therefore deferred to Appendix Table C.12.

Starting with the support for fiscal consolidation, we find that a decrease in the support for monetary finance significantly increases the support for tax increase. This effect is similar among all respondents (Col. I) and the subset who found the CB piece clear (Col. II). Less support for monetary finance also produces more support for budget cuts, and with a larger effect than regarding tax increase, but only among people who found the CB text clear (Col. IV versus Col. III). Because we elicit all views using the same five-point Likert scale, we may interpret the estimated coefficients associated to the support for monetary finance in Table 4 as follows: a coefficient of -1 means that a one-unit shift to the left on the opinion scale about monetary finance (i.e., towards *less* support) results in a one-unit shift to the right on the same scale when it comes to supporting tax increase for fiscal consolidation purposes (i.e., towards *more* support). In this respect, the magnitude of the estimated coefficients shows important effects.

These results suggest that the CB communication, by offering a counter-narrative to the 'magic money' narrative, can strengthen the rationale for fiscal discipline even though fiscal considerations are not explicitly discussed in any of the information provided. Therefore, the effects on fiscal preferences are particularly interesting because they indirectly result from

Dependent variable:	$Support\ for\ tax\ increase$		$Support\ for\ budget\ cuts$		Oppo	sition to	CB independence	
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
	All data	'CB text' 'clear'	All data	'CB text' 'clear'	All data	All data	'CB text 'clear'	' All data
Support for systematic monetary finance	$-0.65^{**}$ (0.30)	$-0.61^{**}$ (0.27)	-0.07 (0.23)	$-0.82^{***}$ (0.25)	$0.10 \\ (0.28)$	-6.45 (4.65)	$-1.35^{**}$ (0.52)	$1.24^{***} \\ (0.46)$
Constant	$\begin{array}{c} 4.62^{***} \\ (0.80) \end{array}$	$ \begin{array}{c} 4.58^{***} \\ (0.77) \end{array} $	$2.83^{***}$ (0.62)	$5.10^{***}$ (0.72)	$2.60^{***}$ (0.76)	20.12 (12.43)	$6.58^{***}$ (1.47)	-0.44 (1.25)
Instruments Wald test Nb. Obs.	All trs. 20.39*** 8,289	All trs. 13.01*** 4,686	All trs 39.12*** 8,289	All trs. 13.59*** 4,686	All trs 16.49*** 8,289	Tr. CB 0.57 8,289	Tr. CB 4.67*** 4,686	Tr. Video+CB 10.2*** 8,289

<u>Notes:</u> 2SLS estimates with robust standard errors; all controls included (see Tables 1 and 3). The F-statistics of the Wald test indicate the joined significance of all the regressors. "All. trs." refer to the four dummies associated to the four treatments as defined in Eq. (1). \*p<0.1; \*\*p<0.05; \*\*\*p<0.01.

Table 4: Effects of the views on systematic monetary finance on fiscal discipline

a shift in beliefs about monetary finance, which speaks against any experimenter demand effect.<sup>19</sup> For instance, the treatments may have convinced respondents that monetary finance is not a viable government funding option and may have made the government budget constraint more salient to them, which could have in turn reinforced the rationale for fiscal discipline.

As for the support for CB independence, we do not find any effect of the views on systematic monetary finance on the views about monetary finance (Col. V). When looking at the views on exceptional monetary finance (Appendix Table C.12), *less* support for an excep-

<sup>&</sup>lt;sup>19</sup>This a common pitfall of within-designs, albeit less present in settings like ours, i.e. an anonymous online survey on a non-sensitive topic, namely public finance; see Haaland et al. (2023) for a comprehensive discussion of this concern and the best practices to mitigate these. Within the context of our study, we used, *inter alia*, short treatments, a neutrally framed video and an obfuscated follow-up. The persistence of our treatment effects in this obfuscated recontact wave also speaks against such a bias in our results.

tional monetary-financed initiative rather results in *more* opposition for CB independence. To dig further into this somewhat counter-intuitive finding, we isolate the effects of the views on monetary finance affected by Tr. CB (Cols. VI-VII of Table 4) from the effects of the views affected by Tr. Video+CB (Col. VIII). We use these two treatments because they exert the most significant and strongest effect on the views on monetary finance (see again Cols. I-III of Table 3). This exercise reveals that these two treatments result in opposite effects on the views on CB independence. When reading the CB blog post alone, more opposition to monetary finance does turn into *less* support for CB independence (see Col. VII of Table 4). This effect is even stronger when looking at views about exceptional monetary finance where the estimated coefficient amount to -2 in the whole sample (see Appendix Table C.12, Col. VI). By contrast, when combined with the educational video, more opposition to monetary finance after reading the blog post results in *more* support for CB independence. These effects are large as the estimated coefficients translate into more than a one-to-one shift on the corresponding Likert scale (Cols. VII and VIII of Table 4). By reading the blog post only, people may have missed the link between CB independence, which is not explicitly discussed in the text, and the risks associated to monetary financing, which are explained in the post.<sup>20</sup> If this is the case, the combination of the educational video with the CB communication may have allowed the respondents to connect the dots between the inflationary risks associated with monetary finance and the governance motive for CB independence from the governments. Our findings support the added-value of simple and short educational messages to frame CB communication so as to influence people's views even on

<sup>&</sup>lt;sup>20</sup>The blog post could in fact have been misleading because the full text mentions a scenario where the government ends up recapitalizing the CB, which would neutralize the effect of monetary finance and explicitly states that 'the government owns the central bank.' We hypothesize that this detail of the text may have created confusion between the concept of operational independence and financial independence. We did not modify nor remove it because of our objective of using real-world information content.

apparently complex matters, such as monetary finance, and seemingly unrelated topics, such as fiscal discipline.

We now investigate the expectation channel that may underlie these treatment effects.

### 4.3 The expectation channel of the public support for policies

We utilize the expectations elicited in thought experiments where the respondents have to consider various fiscal policy scenarios; see Qs 49 and 48 in Appendix D. We focus on the effect of inflation expectations in the event of a monetary-financed public expense, that we denote by  $\pi_M^e$ , and future tax expectations in the event of a debt-financed public expense, that we denote by by  $\tau_B^e$ , on the opinions about monetary finance and fiscal consolidation. The answers range from 1 to 5, with higher values suggesting higher expectation values. Similarly to the previous section, we estimate the effect of the four information-provision treatments on the respondents' support for these policies *via* their effects on their expectations using 2SLS regression models.<sup>21</sup> We add all the control variables considered so far, including the medium-run inflation and tax expectations of each respondent. Results are reported in Table 5.

The main message from this exercise is a strong and significant effect of expectations on the opposition to monetary-financed policies, both on a systematic (Cols. I and II) and exceptional basis (Cols. III and IV), and on the support for fiscal consolidation, whether as budget cuts (Cols. V–VII) or tax increases (Cols. VIII–X). Inflation expectations asso-

 $<sup>^{21}</sup>$ The first-stage regressions in Appendix Table C.13 confirm that the treatments have a significant and strong effect on expectations.

Dependent variable:	Support for monetary-financed spending (systematic) (exceptional)			Support for decrease in public spending			Support for increase in taxes			
	All data I	All data II	All data III	All data IV	All data V	'CB tex VI	ct clear' VII	All data VIII	'CB tex IX	ct clear' X
$\pi^e_M$	$-0.53^{***}$ (0.18)	$-0.37^{***}$ (0.13)	$-1.01^{***}$ (0.23)	$-0.87^{***}$ (0.16)	-0.11 (0.16)	$\begin{array}{c} 0.53^{***} \\ (0.12) \end{array}$	-	$0.65 \\ (0.62)$	$0.42^{***}$ (0.14)	-
$ au^e_B$	$\begin{array}{c} 0.40 \\ (0.32) \end{array}$	-	$\begin{array}{c} 0.36 \ (0.39) \end{array}$	-	$0.30 \\ (0.27)$	-	$1.07^{***}$ (0.34)	-0.52 (1.34)	-	$0.84^{**}$ (0.33)
Constant	$3.36^{***}$ (0.73)	$\begin{array}{c} 4.07^{***} \\ (0.42) \end{array}$	$5.18^{***}$ (0.87)	$5.81^{***}$ (0.53)	$\frac{1.86^{***}}{(0.61)}$	$0.93^{**}$ (0.43)	-0.85 (1.12)	$2.38 \\ (2.51)$	$2.56^{***}$ (0.43)	$0.06 \\ (1.08)$
Wald test Nb. Obs.	$54.95^{***}$ 7,911	$65.38^{***}$ 7,911	$27.19^{***}$ 7,911	$29.92^{***}$ 7,911	$37.74^{***}$ 7,911	$18.24^{***}$ 4,498	$11.69^{***}$ 4,498	$17.96^{***}$ 7,911	$15.81^{***}$ 4,498	$12.47^{***}$ 4,498

<u>Notes:</u> See Table 4. The F-statistic from the first-stage OLS regression refers to the test of the null that the instruments are weak.

Table 5: The effects of tax and inflation expectations on support for policies

ciated with monetary finance have a more negative effect on the support for an exceptional monetary-financed stimulus than for systematic monetary-financed expenses. This is not unexpected given that inflation expectations are elicited within an exceptional context illustrated by the pandemic-related government spending. Because opinions and expectations are elicited on the same Likert scale, we can interpret the estimated coefficients as previously and the effects are quite large. For instance, looking at Cols. III and IV, a coefficient associated with inflation expectations close to -1.00 means that a one-unit shift towards more agreement with the inflation consequences of monetary finance results in a one-unit shift towards more opposition to a monetary-financed fiscal stimulus.

As for support for fiscal discipline, in line with the discussion of Table 4, we find a significant effect of expectations among respondents who found the treatments clear (Cols. VI and IX and Cols. VII and X, respectively), not in the whole sample (Col. V and VIII). Among this subset of respondents, both higher inflation and tax expectations significantly

resulted in more support for fiscal consolidation measures, with a stronger effect of tax than inflation expectations.

Finally, we uncover persistent treatment effects using the recontact wave.

## 4.4 Persistent treatment effects in the recontact wave

Between 540 and 590 respondents per treatment took part in the recontact wave compared to 1,720 in the main wave. To deal with the smaller sample size, we group the treatments per information content in Wave 1 and look at the effects of being exposed to the CB blog post (in Trs. Video+CB, CB and Video+CB+Media) or the CB text together with the video (in Trs. Video+CB and Video+CB+Media) on the reported opinions related to monetary finance, CB independence and fiscal consolidation in Wave 2 (see items A, D and F of Question 11 and Item A of Question 12 in Appendix D.2, respectively). Results are reported in Table 6.

Even after controlling for a wide range of socio-economic variables, policy literacy, expectations and priors expressed in Wave 1, the CB communication persistently affects the respondents' opinions. Reading the CB communication several weeks prior to the recontact wave in combination (Col. II), or not (Col. I), with the educational video, significantly increases the opposition to systematic monetary finance, and along the same order of magnitude as in Wave 1 (see, again, Cols. I and IV of Table 3). Nevertheless, these persistent effects concern respondents who paid sufficient attention to the CB text in Wave 1, which still constitutes the majority of the recontact sample.

When combined with the educational video, the CB text continues to foster support for

The dependent variables are the support in Wave 2 for:										
Systematic monetary finance				independence	$Fiscal\ consolidation$					
					(budget cuts)	) (tax increase)				
		Readers only	All	respondents	Readers only Readers only					
Being exposed to the	$CB \ text$	video +CB $text$	$CB \ text \ video \ +CB \ text$		$t  CB \ text  video \ +CB \ text$					
	Ι	II	III	IV	V	VI				
Info provision in Wave 1	$-0.13^{**}$	$-0.17^{***}$	-0.04	0.11**	0.05	0.07				
	(0.06)	(0.07)	(0.03)	(0.05)	(0.05)	(0.07)				
Constant	$3.04^{***}$	3.03***	$3.10^{***}$	$3.44^{***}$	2.75***	$2.59^{***}$				
	(0.32)	(0.32)	(0.23)	(0.28)	(0.30)	(0.35)				
Observations	1,643	1,643	2,707	1,643	1,643	1,592				
$\mathbb{R}^2$	0.17	0.17	0.14	0.14	0.14	0.12				

Notes: All controls included, see Tables 1 and 3. Huber-robust standard errors in brackets. The dependent variables are the five-point scale Likert items associated with the statement 'The European Central Bank should always create money to pay for the public expenses of the French government' (Cols. I and II), 'A central bank (such as the European Central Bank) should remain independent from its government(s)' (Cols. III and IV), and 'When the level of the **public debt** becomes concerning... The government should increase the overall amount of taxes' (Col. V1) in Wave 2. These correspond to items A, E (I) of Question 11 and items A and B of Question 12 in Appendix D.2, respectively. Cols. I, II, V and VI include only the respondents who said they had read the CB text, i.e., who spent at least 50% of the time required to read the whole text on this text page, as measured by a computational speech reader in each language. Financial variables are included when they are jointly significant. The dummy variables video+CB text and video+CB text equal one if the respondent in Wave 2 was exposed to Tr. Video, Video+CB or Video+CB+Media; and Video+CB or Video+CB+Media; respectively, in the first wave.

Table 6: Persistent treatment effects in the recontact wave

CB independence after several weeks (Col. IV) and among all respondents. The size of the effect is still about two-third the size of the main-wave estimate, although the statements presented to the respondents were formulated in opposite directions in the two waves.<sup>22</sup> The treatment effects on support for fiscal discipline do not, however, remain significant in the recontact wave (Cols. V and VI). The limited sample size combined with the inherent noise of survey data make it impossible to disentangle a true null effect from a lack of statistical power though.

 $<sup>^{22}</sup>$ This is part of the obfuscation strategy. Therefore, in Cols. III and IV of Table 6, a positive sign is associated with *more* support for CB independence, whereas it is associated with *less* support for CB independence in the main wave.

We conclude by summarizing the results of this section as follows:

#### Finding 3 (Information provision and opinion shifts)

- Only the CB educational blog post preceded by an introduction video on public finance significantly and persistently decreases the support for monetary finance across all levels of policy literacy. However contradictory information may have a polarizing effect.
- More opposition to monetary finance enhances the support for fiscal discipline both in the form of budget cuts and tax increases and, when complemented by the educational video, persistently increases the support for CB independence.
- Information significantly affects respondents' tax and inflation expectations related to policy options, which, in turn, affect their opinions on public finance options.

# 5 Conclusion

This paper explores what people believe regarding public finance trade-offs, in particular monetary finance, which has received extensive media coverage in recent years. We do so by conducting an innovative large-scale cross-country household survey experiment on a representative sample of 8,601 Europeans across three diverse OECD countries. We construct an innovative 'macroeconomic-policy-literacy' score and show how economic knowledge relates to people's opinions. Given this strong association, it may be valuable to develop systematic and standardized measures of policy literacy and investigate to what extent increasing this type of literacy relates to opinions and preferences about macroeconomic policies in general. Our results also suggest that people do not necessarily relate CB independent mandates with the inflation risks of monetary financing. It may be valuable to develop educational tools to improve knowledge on the matter to enhance the legitimacy of these non-elected institutions. Thanks to our OE questions, we further reveal that a vast majority of the respondents express some views on monetary financing and public debt issuance. Concerns about higher future taxes are never prevalent, no matter the policy literacy level or the funding option considered. This result speaks for even highly policy-literate individuals being myopic rather than purely forward-looking. While myopia undermines the benefits of inter-temporal fiscal and monetary policy coordination, it may also imply that the policy conflicts need not lead to costs as dire as predicted by rational expectation models.

Furthermore, we find strong evidence that providing educational content opposing monetary financing can persistently shift people's views on the matter which enhances, in turn, support for fiscal discipline and CB independence across all levels of policy literacy. We show how people's tax and inflation expectations associated with the different public finance options are a key channel by which information provision affects views on these options. Our finding implies that management of expectations through CB communication could help limit the risk of opening Pandora's box along an exceptional monetary-financed fiscal stimulus. By using an episode of large government spending where public finance issues are particularly salient to test the effects of CB communication on opinions on the matter, our study is akin to a large-scale wind-tunnel. We provide a proof-of-concept that CB communication can lodge in people's minds even on apparently complex topics. How beliefs about future consequences of policy options are formed and may be influenced by CB communication deserves further investigation. Our results on policy literacy and information sources further show that social media could be an effective vector to scale our intervention up in a naturally-occurring setting. Finally, while the two pieces of information debating monetary finance do so in the context of the COVID-19 pandemic government rescue plans, the relevance of the questions addressed in this paper goes well beyond this particular, albeit far-reaching, event. There is no shortage of challenges potentially requiring large government intervention and public adhesion, such as the financing of environmental transition or the reinforcement of health care capacities amid aging populations and the risks of future pandemics. Economic education and widespread CB communication are therefore likely to remain first-order continuous concerns for policy makers.

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