Information Frictions among Firms and Households*

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Abstract

We leverage survey data from Germany, Italy, and the US to document several novel stylized facts about the extent of information frictions among firms and households. First, firms' expectations about the central bank policy rate, inflation, and aggregate unemployment are more aligned with expert forecasts and less dispersed than households'. Second, there is substantially more heterogeneity in information frictions within households than within firms. Third, consistent with firms having stronger priors, they update their policy rate expectations significantly less compared to households when provided with an expert forecast. Our results have important implications for modeling heterogeneity in macroeconomic models.

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1 Introduction

Information frictions are at the core of models of expectation formation in macroeconomics (Sims, 2003a; Woodford, 2003). Such frictions can explain various empirical puzzles and stylized facts, and have important implications for the transmission of monetary and fiscal policy (Ball et al., 2005; Paciello and Wiederholt, 2014). The extent of information frictions likely varies across groups of agents in the economy, for instance, due to differences in stake size or information acquisition and processing costs (D'Acunto et al., 2019a; Fuster et al., 2020; Maćkowiak and Wiederholt, 2015; Reis, 2006a,b). Given the importance of information frictions for expectation formation, it is crucial for both modeling choices and policy making to understand how the degree of these frictions differs across and within groups of decision makers in the economy.

In this paper we examine the relative strength of information frictions among firms and households in the context of expectations about inflation, unemployment, and the central bank's policy rate.[1] Forecasting macroeconomic developments accurately is central for firms to predict their future product demand or the cost of raising capital. Households have an interest in holding accurate expectations about changes in the cost of living, the real interest rate earned on savings or paid on loans, or the development of the labor market. Both firms and households may therefore perceive high stakes in being informed about macroeconomic developments. At the same time, managers may face lower costs of acquiring and processing macroeconomic information than households.

We leverage micro data from Germany, Italy, and the US to document several novel stylized facts about the extent of information frictions among firms and households. Our main evidence draws on two sets of almost identical surveys of in total 4,219 German firms and 4,925 households broadly representative of the German population, conducted at the same points in time. A key aspect of our firm surveys is that they are answered by managers who are responsible for high-stakes economic decisions in these firms. Cru-

[1] For convenience and in line with the convention in macroeconomics, we use the term "firm expectations" to describe the expectations of managers of these firms.

cially, our surveys use identical framing of key questions on expectations, addressing the importance of wording choices, e.g., when asking about inflation (Bruine de Bruin et al., 2012). Hence, our setup ensures a high level of comparability of survey responses between firms and households, allowing us to provide novel evidence on heterogeneity in information frictions. In addition, we draw on 3,295 and 6,311 survey observations from Italian firms and households, respectively, as well as survey data from 582 firm observations and 503 household observations from the US to probe the external validity of our main findings.

In the surveys conducted with German firms and households in September 2020, we elicit expectations about inflation and unemployment in 2022, as well as the policy rate of the European Central Bank (ECB) in 2022 and 2025. We document that firms' expectations about policy rates, inflation, and unemployment are substantially less dispersed than those of households, and on average closely aligned with expert forecasts, consistent with a stronger degree of information frictions among households. The differences between households and firms are large: mean absolute deviations from expert benchmarks among firms are 0.38 percentage points for the policy rate in 2022, 0.94 percentage points for the inflation rate, and 1.93 percentage points for the unemployment rate, while they are much higher at 2.08, 3.23, and 6.11 percentage points, respectively, for households. We confirm our finding of lower dispersion and smaller deviations from expert benchmarks in firms' expectations compared to households' using representative survey data on inflation expectations from the US and Italy.

Leveraging the richness of our German survey data, we next examine heterogeneity in information frictions within each group of agents. We split the household and the firm sample into "sophisticated" and "non-sophisticated" respondents according to variables that are associated with significant differences in expectations. The expectations of a group of "sophisticated households" with higher numeracy, age, and financial wealth are indistinguishable from those of firms. In contrast, expectations of "non-sophisticated" firms, i.e., smaller and non-exporting firms, are still much closer to "sophisticated" firms' expectations compared to households'. This suggests that there is substantially more het-

erogeneity in information frictions within households than within firms.

Are differences in expectations about the future between firms and households due to differential informedness about current realizations of macroeconomic variables? We provide random subsets of respondents in our German surveys from September 2020 with information about the current policy rate of zero percent before they make their predictions about future rates. Households' expectations about future policy rates become significantly less dispersed and shift towards expert forecasts when learning about the current policy rate. This finding is striking given that the policy rate had been at the zero lower bound for 4.5 years at the time of our survey. It is not easily explained by sticky information models in which households update their information sets every few quarters on average, but suggests that a fraction of households are completely inattentive to policy rates. By contrast, information about the current policy rate has only negligible effects on firms' expectations about future rates. Our estimates reveal that approximately 50 percent of the difference between firms' and households' expectations about future policy rates is eliminated when respondents are informed about the current rate. This indicates that differential knowledge about current economic conditions potentially explains a large part of the substantial differences in expectations about the future between households and firms.

To study the strength of households' and firms' prior expectations about monetary policy, we conducted additional surveys with German firms in December 2019, in which we randomly assign our respondents into groups receiving differential truthful expert forecasts about the likely date of a hike in the ECB policy rate. Subsequently, we elicit a broad range of expectations about future policy rates, personal interest rates, as well as other macroeconomic and personal outcomes. We find that firms update their expectations about policy rates significantly less than households in response to the provision of the same expert forecasts, consistent with firms holding stronger priors about future ECB monetary policy. Firms report to have acquired more information about monetary policy than households over the weeks before the survey, which may contribute to their stronger priors. Furthermore, while households significantly change their expectations

about interest rates they will personally face on savings accounts and loans, firms do not adjust their expectations about own loan rates in response to the expert forecast. Changes in households' expectations about policy rates and own rates persist at a reduced size in a four-week follow-up survey. Taken together, these pieces of evidence further support the notion that information frictions are less pronounced among firms than among households.

Our findings have important implications for macroeconomic modeling choices. First, the differences in belief dispersion across groups of households and across groups of firms highlight the importance of incorporating heterogeneity into macroeconomic models, especially on the household side. Second, the differences in information frictions between firms and households indicate that abstracting from information frictions is a less reasonable approximation for households than for firms. Third, our results suggest that the practice of using professional forecasts as a proxy for beliefs of households and firms when no direct expectations data from these groups are available is more difficult to defend for households than for firms.

We contribute to a growing literature studying firm expectations (Afrouzi, 2020; Bachmann et al., 2018, 2020, 2013; Coibion et al., 2020b, 2018c; Dovern et al., 2020; Enders et al., 2019a,b, 2020; Frache and Lluberas, 2018). Most closely related, Coibion et al. (2018b) conduct surveys on macroeconomic beliefs among firms in New Zealand and document a number of novel stylized facts. They show that firms' macroeconomic expectations, especially about inflation, share two important characteristics with those of households: wide disagreement and an upward bias compared to expert forecasts.[2] We contribute to this literature by studying the relative importance of information frictions among these two groups using our own tailored surveys of both firms and households conducted at identical points in time. Consistent with Coibion et al. (2018b) we document important disagreement and an upward bias in firms' inflation expectations compared to experts.

However, in contrast to Coibion et al. (2018b), our micro data for three different ma-

[2]We use the term "bias" to describe deviations from expert forecasts for readability. Of course, expert forecasts may themselves be biased, e.g., due to reputational concerns in forecasting.

jor industrialized countries reveal that information frictions seem to be substantially less pronounced among firms than among households. Reweighting our sample of German firms to mimic the firm sample of Coibion et al. (2018b) we show that these contrasting findings are only partly explained by observable differences between firms in New Zealand and Germany, such as firm size and export share. Moreover, our data allow us to compare the differences in information frictions between households and firms not only for inflation expectations as in Coibion et al. (2018b), but also for unemployment and central bank policy rate expectations. In addition, we use simple variation in information about the realizations of macroeconomic variables to show that a large fraction of differences in expectations about the future between firms and households are driven by higher informedness about current realizations of macroeconomic variables among firms as compared to households.

We also add to a literature studying the way households form expectations about macroeconomic variables (Afrouzi and Yang, 2021; Armona et al., 2019; Bachmann et al., 2015; Bailey et al., 2018; Cavallo et al., 2017; Coibion et al., 2018a; D'Acunto et al., 2019b; Fetzer et al., 2020; Fuster et al., 2020; Giglio et al., 2020; Goldfayn-Frank and Wohlfart, 2020; Hanspal et al., 2020; Kuchler and Zafar, 2019; Malmendier and Nagel, 2016; Roth and Wohlfart, 2020; Roth et al., 2020). Several papers study households' expectation formation in the context of monetary policy (Andre et al., 2019; Coibion et al., 2020c; D'Acunto et al., 2019a). For instance, Coibion et al. (2019) examine how households' inflation expectations respond to the provision of different pieces of information about the conduct of monetary policy in the US. Coibion et al. (2020a) provide large-scale evidence that information treatments about current and next year's policy rates have strong effects on household expectations but treatments beyond one year do not have any additional impact. Our setting differs in that the ECB policy rate had been at the zero lower bound for a long time at the time of our surveys, while Coibion et al. (2020a) study an environment of positive policy rates in the US. At the zero lower bound, policy makers often resort to unconventional measures whose transmission heavily depends on the degree of information frictions, such as forward guidance about future interest rates (Wiederholt,

2015).

The remainder of the paper is organized as follows. Section 2 provides descriptive evidence on differences in information frictions between households and firms leveraging rich micro data from Germany, the US, and Italy. In Section 3, we describe how households and firms update their expectations in response to expert forecasts about the future ECB policy rate. Section 4 concludes.

2 Descriptive Evidence on Information Frictions

In this section we use data from our own September 2020 surveys in Germany as well as existing survey data from the US and Italy to provide descriptive evidence on information frictions among firms and among households.Table A.1 in the Online Appendix provides an overview of the different datasets used in this paper.

In line with much of the macroeconomic literature, we use the extent of disagreement and deviation from expert forecasts in macroeconomic expectations within a group of economic agents as proxy for the degree of information frictions within this group (see, e.g., Coibion and Gorodnichenko, 2012). In most prevalent models of information frictions, there is a close correspondence between disagreement and the extent of information frictions. For instance, a higher frequency of updating information sets will reduce disagreement in Calvo-style sticky information models (Mankiw and Reis, 2002; Mankiw et al., 2003), and higher signal-to-noise ratios in private signals about the economy will be reflected in lower dispersion in noisy information models (Maćkowiak and Wiederholt, 2015; Sims, 2003b; Woodford, 2003).[3]

[3]Recent evidence highlights heterogeneity in households' beliefs about the reaction of the economy to shocks, which may generate disagreement in expectations even if information sets are identical (Andre et al., 2019). Moreover, deviations from expert forecasts may be driven by distrust towards experts. In our paper, we abstract from such alternative drivers and use disagreement and deviations from expert forecasts as a proxy for information frictions. In Section 3 we study the strength of priors about future macroeconomic developments as an alternative measure of information frictions.

2.1 Samples of September 2020 Surveys

Firm Sample We leverage the ifo Business Survey (IBS), which is conducted by the ifo Institute on a monthly basis, and which aims to be representative of the German economy. The survey provides the basis for the ifo Business Climate Index, the most recognized leading indicator of the German business cycle. Every month approximately 9,000 survey participants from firms in manufacturing, services, construction, wholesale, and retail assess various dimensions of their business activities, including their current and expected business conditions for the next six months.[4] The IBS has been used extensively in previous research in economics (e.g. Bachmann et al., 2019, 2013; Balleer et al., 2020; Buchheim et al., 2020; Enders et al., 2019b; Link, 2019). More than 90% of respondents are in an upper management position such as owner, CEO, or department head (Sauer and Wohlrabe, 2019). Hence, we survey individuals that are responsible for high-stakes economic decisions in these firms.

The supplementary questions used in our study were added to the online portion of the September 2020 wave of the IBS covering 4,528 firms in manufacturing, services, retail, and wholesale. In total, 3,748 firms (83 percent) responded to our additional survey questions. Panel A of Table A.2 in the Online Appendix shows summary statistics of our firm sample. 37 percent of the firms operate in the manufacturing sector, 38 percent in services sectors, and 26 percent of firms are retailers or wholesalers. The average (median) number of employees is 313 (42), the average (median) firm age is 53 years (38 years), and the average (median) share of exports in the firms' revenue is 18 percent (9 percent). 64 percent of respondents from the sample hold a university degree.

Household Sample We collect a sample of 961 German respondents in collaboration with the online panel provider Dynata, which is widely used in the social sciences (Haaland et al., 2020). We drop respondents in the top and bottom percent of response time,

[4]See Sauer and Wohlrabe (2020) for details on the survey and Lehmann (2020) for a documentation of the very high forecasting power of IBS-based indicators with respect to aggregate administrative data including GDP, industrial production, employment, investment, exports, and prices.

as these respondents were likely inattentive to the survey. This leaves us with a sample of 933 respondents. Panel A of Table A.3 in the Online Appendix shows summary statistics of our household sample for the September 2020 survey, and a comparison with benchmarks from the 2017 wave of the German Socioeconomic Panel (GSOEP), a representative household survey. Our sample is roughly representative of the population in terms of gender, age, region, and total household income. The main difference of our sample to the population is a higher share of highly educated individuals, which is a common feature in online surveys.

2.2 Design of September 2020 Surveys

Firms Due to space constraints, each firm participating in the survey only responds to two questions in total (in addition to the regular questions). All firms respond to one question about the policy rate. Two thirds of the firms report their expectations about the ECB policy rate in 2022. The remaining firms are asked for the expected rate in 2025. We cross-randomize across respondents whether they are told that the current policy rate is zero percent before making their prediction about future policy rates.[5] In addition, respondents are either asked to predict the inflation rate in 2022 or the unemployment rate in 2022, or are asked about their trust in economic forecasts by experts. We also randomize whether the policy rate question or the other question is asked first. Online Appendix E.1 documents the exact survey instructions.

Households Crucially, we use identical framing of key questions on expectations in the household survey as in the firm survey, ruling out that wording choices are driving differences in reported expectations (Bruine de Bruin et al., 2012). We first elicit respondents' expectations about the ECB policy rate in 2022 and in 2025, as well as their confidence in these predictions. The order of the questions on the two horizons is randomized. Moreover, a random half of our respondents is informed that the current policy rate is zero

[5]Columns 5 and 6 of Table A.2 Panel A in the Online Appendix show that our firm sample is balanced between those who received the current rate and those who did not according to some key covariates.

percent before making their prediction about future policy rates.[6] Then, we ask our respondents to predict the average unemployment rate and the inflation rate in 2022, and elicit their confidence in these estimates. We randomize the order in which expectations about policy rates, inflation, and unemployment are elicited. We also include questions on various individual characteristics, such as household finances, labor market behavior, and numeracy. Furthermore, we elicit the respondents' trust in expert forecasts about the economy. Online Appendix E.2 documents the exact survey instructions.

Coding of Outcome Variables Our main survey items of interest are point forecasts of economic variables. As it is common in survey data, the responses to these questions contain some extreme outliers. Extreme responses could indicate typos, inattention to the survey, or respondents not taking the survey seriously. Even if extreme responses reflect true beliefs, those responses could be driving estimation results due to the sensitivity of OLS to outliers. We therefore trim predictions about interest rates, inflation, and unemployment at -1 and 25 percent, 0 and 35 percent, and 0 and 50 percent, respectively, commonly for the firm and household samples. This results in setting between three and four percent of responses in the household sample and less than one percent in the firm sample to missing. In our figures, we mostly winsorize these variables at lower values for expositional reasons. None of our findings are sensitive to the exact trimming or winsorization procedures used.

2.3 Descriptive Results

We start by presenting expectations about policy rates, the unemployment rate, and the inflation rate from the groups of households and firms that were not provided with information about the current policy rate. Our main results presented below all do not make use of sampling weights, but we provide evidence of robustness to the use of weights in Section 2.7.

[6]Columns 6 and 7 of Table A.3 Panel A in the Online Appendix show that our household sample is balanced across these two arms according to some key covariates.

Figure 1 displays the cumulative density function of firms' and households' expectations about the ECB policy rate in 2022 and 2025, inflation in 2022, and the unemployment rate in 2022.[7] We compare predictions about the policy rate in 2022 to the median expert forecast from the October 2020 round of the ECB Survey of Professional Forecasters (0%), and the predictions about inflation and unemployment in the "Joint Economic Forecast" of Germany's leading economic research institutes (1.6 and 5.5%, respectively), which was published in October 2020 (Joint Economic Joint Economic Forecast, 2020).[8]

Firms' expectations are much less dispersed and more aligned with the expert benchmarks compared to households'. Table 1 shows that the standard deviation of households' expectations is between 2.9 and 5.7 times higher than for firms, while the interquartile range is between 2.4 and 4 times higher (between 2.5 and 5 times for the difference between 90th and 10th percentile). Moreover, mean absolute deviations from expert benchmarks are 0.4 for the policy rate in 2022, 0.9 for the inflation rate, and 1.9 for the unemployment rate for firms, while they are much higher at 2.1, 3.2, and 6.1, respectively, for households. Both firms and households over-predict interest rates, inflation, and unemployment relative to experts, on average and at the median.

Our first main result can be summarized as follows:

Result 1. *Firm expectations about policy rates, inflation, and unemployment are less dispersed and more closely aligned with expert forecasts than household expectations.*

Robustness A potential concern is that our survey was conducted during the coronavirus pandemic and that patterns of information acquisition and information frictions are unusual during this time. In Online Appendix B we provide evidence from surveys conducted in Germany in September and December 2019, i.e., before the pandemic, that firm expectations are less dispersed and more aligned with expert predictions than household expectations.

[7] For the sake of readability, we winsorize expectations in Figure 1 at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

[8] The "Joint Economic Forecast" ("Gemeinschaftsdiagnose") is used by the German Federal government for its own economic outlook and planning over the next years.

In addition, we compare the expectations of households in the September 2020 wave who worry about personal health or economic consequences of the coronavirus to the expectations of those who do not (see Figure A.2). Similarly, we display separately the distribution of expectations for firms that report that their business activity was negatively affected by the pandemic and for those reporting a non-negative impact (see Figure A.3). The figures suggest that more exposure to the pandemic is associated with only slightly more dispersed expectations, and somewhat higher deviations from expert benchmarks. Non-exposed households still exhibit substantially higher dispersion and bias than exposed firms. Thus, our finding of differences in information frictions between households and firms does not seem to be driven by the special circumstances of the coronavirus pandemic.

Another potential concern is that firms might be more experienced in answering survey questions regarding their macroeconomic expectations than households given the fact that the IBS is a long-standing survey. However, there are at least two reasons why this difference is very unlikely to drive our results: first, the regular IBS only includes qualitative questions regarding firms' own business activities and expectations about firm-specific variables. Hence, participating firms are not used to answering questions about macroeconomic expectations on a quantitative scale. Second, Figure A.8 in the Online Appendix shows that the distributions of macroeconomic expectations are virtually the same for respondents with high (above median number of responses to IBS prior to September 2020), medium (between median and 10th percentile), and low (below 10th percentile) experience in answering the regular IBS.

2.4 Correlates of Beliefs

Firms We leverage our rich data on background characteristics to study the correlates of expectations and absolute deviations of beliefs from expert benchmarks. Table 2 displays multivariate regressions of these outcomes on respondent characteristics. The results show that firms with more employees hold expectations that are more closely aligned

with those of experts for inflation ($p < 0.01$) and unemployment ($p < 0.01$). Firms that have experienced a change to their loan interest rate over the previous six months hold less biased beliefs about policy rates ($p < 0.1$).[9] Moreover, firms with a higher subjective exposure to the coronavirus crisis expect higher rates of inflation ($p < 0.1$) and unemployment ($p < 0.01$) in 2022. Managers of firms with a higher export share ($p < 0.01$), managers of services firms ($p < 0.01$) or of firms in retail and wholesale ($p < 0.05$), and more educated managers ($p < 0.1$) display significantly lower deviations in their inflation expectations from expert forecasts. We find no systematic patterns according to firm age, the equity ratio, or the ratio of cash to total assets.

Households Table 3 presents the results of the corresponding analysis for households. The results show that higher financial asset holdings are associated with policy rate and inflation expectations that are more closely aligned with expert benchmarks ($p < 0.01$), while homeownership is associated with more biased expectations about these outcomes (mostly $p < 0.05$). This is consistent with higher stakes among households investing in financial assets, as the real return on these assets is affected by movements in interest rates and inflation, while real estate holdings should be protected from movements in nominal rates or inflation. We find no patterns according to financial asset holdings or homeownership for expectations about aggregate unemployment.

Moreover, more numerate respondents' macroeconomic expectations are more closely aligned with expert benchmarks ($p < 0.01$).[10] Figure A.4 highlights for the no-anchor condition that the dispersion of expectations is higher among respondents with lower

[9]The covariates "Equity ratio", "Cash to total assets" ratio, and "Any change in loan interest rate in last 6 months" are elicited in supplementary survey questions in the September 2020 wave of the IBS. These questions were answered by 82%, 55%, and 82% of firms in our sample, respectively. Moreover, we use survey information on firms' subjective exposure to the coronavirus crisis elicited in the September 2020 IBS (reported by 97% of firms in the sample) and the degree of schooling the survey respondent completed elicited in February 2020 (82%). "Firm age" and "Export share" are calculated from responses to the September 2018 IBS wave. We code missing values of all covariates (exempt the export share which we set to the average of the two-digit industry if missing) to zero and include dummies indicating missings in the respective variable. See Appendix E.1 for translated survey instructions.

[10]We measure numeracy using seven questions adapted from the New York Fed's Survey of Consumer Expectations (see documentation of questions in Section E.2 in the Online Appendix), and define respondents who respond to at least six questions correctly as highly numerate (46 percent of our sample).

numeracy. These findings are consistent with i) less numerate respondents facing higher information acquisition or processing costs and therefore being less well-informed, or ii) less numerate respondents holding different beliefs about how macroeconomic variables, such a policy rates, are determined (i.e., holding a different "mental model"). These findings are in line with recent evidence on an important role of cognitive constraints in macroeconomic expectation formation of households (D'Acunto et al., 2019b). We similarly find that higher education is associated with somewhat smaller deviations from expert benchmarks. Given these findings, the fact that our sample is more highly educated on average than the population implies that our descriptive evidence on differences between firms and households should be interpreted as a lower bound.

We also find that individuals who agree that a recession would worsen their households' financial situation (51 percent of our sample) have less biased beliefs about the unemployment rate ($p < 0.01$). This is consistent with causal evidence in Roth et al. (2020) that higher perceived risk exposure increases the demand for macroeconomic information, in line with models of endogenous information acquisition.

Moreover, consistent with prior evidence (e.g., D'Acunto et al., 2020), the expectations of females are less well-aligned with expert forecasts (mostly $p < 0.05$). Older individuals hold expectations that are more consistent with those of experts ($p < 0.01$), in line with models of learning over the life-cycle. Other demographic characteristics, such as employment status, are uncorrelated with expectations.[11]

2.5 Within-Group Heterogeneity

We next assess the extent of heterogeneity in information frictions within households and within firms. For both firms and households we define a group of "sophisticated" and "non-sophisticated" agents based on a few observables that are most predictive of hold-

[11] Table A.5 Columns 1-3 show similar evidence on correlates of interest rate expectations from our household survey from December 2019. Less biased groups are also more likely to follow news about interest rates (Columns 5-6), and – with the exception of more numerate respondents – are more confident in their expectations (Column 4).

ing expectations that are more consistent with expert benchmarks. For households, we study a group of "sophisticated" households aged 50 or higher with high numeracy and above-median financial assets, which have had more time to learn over the life cycle, arguably face lower information acquisition and processing costs, and have higher stakes in being informed (at least about inflation and nominal rates). Along these lines, we label 19 percent of our respondents as "sophisticated". As shown in Figure A.5 in the Online Appendix for the no-anchor condition, the expectations of this group are much less dispersed and more aligned with expert benchmarks compared to expectations of "non-sophisticated" households. Indeed, mean absolute deviations from expert benchmarks in this group are 0.5, 1.1, and 2.7 for the policy rate, inflation, and unemployment in 2022 – almost as low and – in the case of expected policy rate and inflation – statistically indistinguishable from the results in the firm sample.

We also study a group of "non-sophisticated" firms, whose number of employees is below the sample median and which are not exporting. Figure A.6 in the Online Appendix plots cumulative distribution functions of the expectations of this group of non-sophisticated firms (18 percent of respondents), of all other firms ("sophisticated firms"), and of households. The figure shows that even non-sophisticated firms hold macroeconomic expectations that are substantially less dispersed and more aligned with expert benchmarks compared to the expectations of households. Indeed, differences in mean absolute deviations from expert benchmarks between sophisticated and non-sophisticated firms are 0.02, 0.4, and 0.2 percentage points for the policy rate, inflation, and unemployment in 2022, respectively, which is only statistically different for the case of inflation expectations. In contrast, differences between non-sophisticated firms and households are much larger at 1.7, 2, and 4, and highly significant in all cases ($p < 0.01$).

Thus, disagreement and deviations from expert forecasts seem to differ more strongly across different groups of households than across different groups of firms. Our second main result can thus be summarized as follows:

Result 2. *The degree of information frictions varies substantially more within households than*

within firms.

2.6 The Effects of the Anchor on Beliefs

Is uninformedness about current realizations of macroeconomic variables driving differences in expectations about the future between households and firms? We examine this question by comparing expectations between respondents who received an anchor about the current ECB policy rate before making their predictions and those who did not.

Households who received the anchor expect policy rates for 2022 and 2025 that are lower by 0.80 percentage points ($p < 0.01$) and 0.60 percentage points ($p < 0.05$), respectively (see Table 3). The anchor also reduces the dispersion in household expectations about future rates (see Panel A of Figure 2). By contrast, the anchor has economically small and mostly insignificant effects on the level and dispersion of the policy rate expectations of firms (see Table 2 and Panel B of Figure 2). The differences in the effects of the anchor on policy rate expectations between firms and households are significant at the 1-percent level. As can be seen in Table 1, the difference in the average expected policy rate for 2022 between firms and households shrinks from 1.8 percentage points in the no anchor condition (2.1 percent among households vs. 0.3 percent among firms) to 0.9 percentage points in the anchor condition (1.2 vs. 0.3 percent). This highlights that roughly half of the difference in average beliefs between households and firms can be attributed to unawareness of the current level of the policy rate among households.[12]

This finding is quite striking considering that the policy rate had been at the zero lower bound for 4.5 years at the time of the survey. This is not easily explained by sticky information models in which households update their information sets every few quarters on average, as in Mankiw and Reis (2002) or Carroll (2003), but points to a corner solution in which groups of households are completely inattentive to policy rates. Our third main

[12]Having received the anchor somewhat reduces households' inflation expectations, consistent with households inferring from rates being at the zero lower bound to an environment of lower inflation (see Table 3). The anchor has no significant effect on their unemployment expectations. Due to constraints to the survey programming, we have no arm in the firm survey in which respondents received information on the current policy rate before reporting their inflation or unemployment expectations.

result can be summarized as follows:

Result 3. *Household expectations become significantly less dispersed after learning about the current ECB policy rate, while firm expectations do not respond. This indicates that uninformedness about the status quo partially explains the substantial differences in expectations about the future between households and firms.*

2.7 Comparison to Related Evidence

So far, we demonstrated that both firms and households exhibit high levels of disagreement and an upward bias compared to experts in their macroeconomic expectations, consistent with the seminal work by Coibion et al. (2018b) who leverage firm samples from New Zealand. However, in contrast to Coibion et al. (2018b), information frictions are more pronounced among households compared to firms in our samples. To reconcile the differences in findings, we first assess the relevance of observable differences between firms from New Zealand and Germany. To do so, we conduct a reweighting exercise (which we describe in detail in Online Appendix C). Using the micro data from New Zealand, we reweight our sample of German firms to make it similar to their sample of firms from New Zealand in terms of number of employees, export status, and industry composition.[13] Table A.4 and Figure A.7 in the Online Appendix show that the gap in average inflation expectations between households and firms closes by approximately 10% ($p < 0.05$) once we reweight the sample.[14] This is consistent with our finding that exporters and larger firms exhibit smaller biases in inflation expectations (see Table 2). The remaining unexplained part of the gap in expectations could result from differences in (i)

[13]We could not conduct such a reweighting exercise for German households as we did not have access to micro data on households from New Zealand. However, census data reveal that the main difference in the demographic composition of our sample to the population in New Zealand is a higher average age (46 vs. 38). Older respondents have somewhat less biased inflation expectations in our data. Therefore, if anything, reweighting our household sample would likely somewhat further increase the gap in expectations between households and firms.

[14]We find similar patterns of higher deviations from professional forecasts for policy rate expectations in the anchor condition ($p < 0.05$) and for unemployment expectations ($p < 0.1$) after the reweighting. We find no significant effect of reweighting on policy rate expectations in the no anchor condition.

the institutional and economic setting (New Zealand versus Germany), (ii) other, unobservable characteristics of firms, (iii) the different timing of surveys (2013-2017 vs. 2019-2020), or (iv) the differences in forecast horizons (12 month forecast horizon in Coibion et al. (2018b) compared to 15 to 27 months in our case). In the next subsection we confirm our findings using data on 12 month-ahead inflation expectations between 2013 and 2019 from households and firms in other major economies.

2.8 Evidence from the United States and Italy

To probe the robustness and generalizability of our findings, we use micro data on inflation expectations from representative surveys with firms and households in the United States and Italy.

For the United States, we leverage data on inflation expectations from firms participating in the Atlanta Fed's Business Inflation Expectations Survey (BIE) and households participating in the New York Fed's Survey of Consumer Expectations (SCE). Our analysis focuses on September 2014, July 2015, and April 2019, the three time periods in which the BIE elicited participating firms' expectations about CPI inflation. Since the BIE only includes firms from Alabama, Florida, Georgia, Louisiana, Mississippi, and Tennessee, we also restrict our sample of households from the SCE to respondents from those states. The results reported below do not make use of sampling weights, but are virtually identical when using sampling weights

Figure 3 and Table A.6 show strikingly similar patterns in the US samples as in our German samples. In particular, firms have substantially less dispersed and lower 12-month ahead inflation expectations compared to households. Specifically, pooled over the three waves, the interquartile range of firms' expectations is 1 percentage point, while it is 5 percentage points for households. Moreover, the average absolute deviation of firms' expectations from expert forecasts taken from the Philadelphia Fed's Survey of Professional Forecasters (SPF) is 1.5 percentage points, while it is 4.2 percentage points for households. For Italy, we leverage quarterly data on inflation expectations from firms

participating in the Bank of Italy's Survey on Inflation and Growth Expectations, and compare them to households' expectations measured in a special survey conducted by YouGov for the investment firm M&G during the years 2013-2015.[15]

Figure 4 and Table A.7 highlight that the inflation expectations of firms are much less dispersed (interquartile range of 1.3 vs. 2.8 percentage points) and closer to expert forecasts from Consensus Economics compared to households' (mean absolute bias of 0.7 vs. 3.3 percentage points). The figure highlights that the patterns of large differences in expectations between firms and households are very stable over the whole time period between 2013 and 2015. Taken together, these findings underscore the robustness of our findings from the German setting in other large industrialized countries.

3 Learning from Expert Forecasts

Besides shaping the level of dispersion and deviation from expert benchmarks in expectations, the degree of information frictions should be reflected in the strength of agents' priors about macroeconomic variables. In this Section, we shed light on the strength of priors by studying the degree of learning from expert forecasts about future policy using data from our December 2019 surveys of German households and firms.

3.1 Samples of December 2019 Surveys

Firms In December 2019, we conducted another survey containing an information treatment among German firms. Given the more extensive set of questions compared to our September 2020 survey, this survey could not be included in the monthly IBS due to space constraints. To circumvent this constraint, we conducted a special survey on the sample of firms regularly participating in the ifo Investment Survey (IIS), a semi-annual survey

[15] In the Bank of Italy firm survey, a random subset of firms received information about the current realization of inflation, which is exploited by Coibion et al. (2020b) to study the causal effect of inflation expectations on firm decisions. We focus on the subsample of firms that did not receive the anchor about the current inflation rate to make the evidence comparable to the household sample.

of the German manufacturing sector, run by the ifo Institute since 1955 (see Sauer and Wohlrabe, 2020, for details).[16] Like the IBS, the IIS micro data have been used in recent research in economics (Bachmann and Zorn, 2020; Bachmann et al., 2017).

Similar to the regular IIS, the special survey was conducted as a paper and pencil survey, which was mailed to firms and filled in and returned by the respondents. Although this was the first time ever a special survey was conducted among the participants of the IIS, a total of 471 firms completed the survey.[17] Like the regular IBS survey, the special survey was predominantly answered by firm employees that are responsible for high-stake economic decisions.[18] We merge the data from the special survey with average levels of investment, number of employees, and revenues the firms reported in the regular IIS during the three years prior to the special survey. Panel B of Table A.2 in the Online Appendix shows summary statistics for our sample of firms. The median firm employs 152 workers, has annual revenues of approximately €28 million, and has annual investments of €820,000. While firms are on average slightly larger compared to manufacturing firms in our September 2020 survey, the firm size distribution does not differ strongly between the two samples.

Households We collect a sample of 4,072 employed respondents (both self-employed and individuals in paid employment, both full-time and part-time) with the same online panel provider as in the September 2020 survey. We drop respondents in the top and bottom percent of response time to the survey, as these respondents were likely inattentive to the survey. This leaves us with a sample of 3,992 observations. The main survey was conducted in December 2019 and a follow-up survey in January 2020, which was

[16] The IIS covers a large share of investment activity in Germany. In total, the sum of investment expenditures covered by the firms in the IIS corresponds to roughly 40 percent of the total volume of investment expenditures in the German manufacturing (plus mining) sector (Bachmann et al., 2017).

[17] This corresponds to a response rate of 20.3% which is largely comparable to response rates in first waves of other firm surveys, e.g., Coibion et al. (2018b). The pool of firms that completed our special survey does not differ significantly from the entire sample of the IIS with respect to averages in total investment, number of employees, and revenues.

[18] Approximately 60 percent of all respondents stated in the survey that they personally have "very much influence" on investment or personnel decisions (recruitment and dismissals), while another 24 percent stated to have "much influence".

started by 2,615 of the individuals in our final sample of the main survey, among which 2,394 completed it. For each outcome variable elicited in the follow-up, we focus on the largest available set of respondents. Panel B of Table A.3 shows summary statistics of our household sample and a comparison to benchmarks from the 2017 wave of the German Socioeconomic Panel (GSOEP). Our sample is roughly representative of the employed German population in terms of gender, age, region, and household income. As in the September 2020 wave, our respondents are more educated on average than the general population, as is common in online surveys.

3.2 Design of and Information Treatment in December 2019 Surveys

3.2.1 Firms

Anchoring on Current Interest Rate While in our September 2020 surveys we examine how information about the current policy rate affects expectations, in our December 2019 surveys we study how expert forecasts about future policy rates affect expectations. Our interest lies in understanding whether — conditional on knowledge of current realizations — firms hold stronger priors about future realizations of macroeconomic variables than households. We therefore inform all respondents that the *current* ECB policy rate lies at zero percent before all questions eliciting prior beliefs about future interest rates, and before all information treatments on future interest rates. Online Appendix F.1 shows the exact instructions of the firm survey from December 2019.

Information Treatment The firm survey starts with our information treatment on future interest rates. Our respondents are randomly assigned either into the "Increase 2020" arm or into the "Increase 2025" arm, which both provide the respondents with a truthful expert forecast about the point in time the ECB interest rate will increase back to a higher level. Respondents in the "Increase 2020" group are told that according to an expert who regularly participates in an expert survey of the ECB, the key interest rate of the ECB will rise to a higher level in the third quarter of 2020. This information is based on the forecast

of a participant in the fourth quarter of 2019 wave of the ECB Survey of Professional Forecasters. Respondents in the "Increase 2025" group are told that according to an expert from a large German bank, the key interest rate of the ECB will rise to a higher level at the earliest in 2025.[19,20]

Thus, respondents in the two arms of the experiment receive information treatments that differ in the timing the expert attaches to an interest rate hike.[21] Our design therefore features an active control group, which has several advantages relative to designs that provide a random subset of respondents with information and another subset (a passive control group) with no information. Most relevant for our setting, identification in alternative designs hinges on the prior beliefs, which determine the expected direction and strength of the information treatment. We could not elicit prior beliefs, as the firm survey was administered in paper and pencil rather than as an online survey and we hence had no control over the order in which respondents received the information and responded to the different questions. In addition, prior beliefs may be measured with error, which could attenuate estimated treatment effects. Moreover, heterogeneous treatment effects across groups are more straightforward to interpret in our active control group design (Haaland et al., 2020).

Post-treatment Beliefs Subsequently, we measure the respondents' expectations about inflation over the year 2020 and over the year 2022, as well as the unemployment rate in 2020 and in 2022. As for policy rates, the question wording includes information about the current values of these rates, in order to hold constant beliefs about current realizations across firms and households. We also measure detailed credit market perceptions. We first ask the managers how difficult they think it is for similar firms to take out a loan

[19]Information on this prediction can be found under: `https://www.diepresse.com/5702921/deutscher-volkswirt-erwartet-positive-zinsen-fruhestens-ab-2025`.

[20]Columns 5 and 6 of Table A.2 Panel B in the Online Appendix show that our firm sample is balanced across these two arms according to some key covariates.

[21]One concern could be that respondents perceive the forecasts from different sources as differentially credible or trustworthy. However, in unreported regressions, we found no significant differences across treatment arms in the weight respondents to the household survey put on their prior beliefs when reporting their posterior beliefs about interest rates.

(i) currently, and (ii) in 2022 using five-digit response scales ranging from "very difficult" to "very easy". Thereafter, we measure the managers' beliefs about the interest rates that companies with similar characteristics as their own firm would have to pay to take out a loan to finance investment (i) today and (ii) in 2022. We also measure the managers' expectations about firm-level outcomes such as product demand or employee wages.

To study whether the information provision successfully shifts the managers' interest rate expectations, we also elicit their beliefs about the year of a rate hike and the level of the policy rate in 2022 and in 2025. Finally, we measure respondents' confidence in these predictions about the policy rate using a four-digit categorical scale, ranging from "very certain" to "very uncertain". Moreover, we ask the respondents how often they have heard news about the policy rate of the ECB over the last two weeks.

3.2.2 Households

Prior Beliefs and Information Treatment We use the same instructions as in the firm survey whenever possible, although there are some differences. In the household survey, which was conducted as an online survey, we included questions on prior beliefs about the timing of a rate hike and policy rates in 2022 and 2025 before the information provision. The information treatment is identical to the one used in the firm survey.[22] Online Appendix F.2 shows the exact instructions of the household survey from December 2019.

Post-treatment Beliefs After the information provision and after eliciting expectations about inflation and unemployment using identical questions as in the firm survey, we measure households' perceptions about their own credit access, separately for consumer credit and mortgages. We also elicit households' beliefs about own borrowing rates and credit access now and in 2022, as well as the interest rate they expect to receive on their savings account. We then elicit the respondents' posterior expectations about policy rates

[22]Columns 6 and 7 of Table A.3 Panel B in the Online Appendix show that our household sample is mostly balanced across these two arms according to some key covariates. The expected year of a rate hike is 0.2 years higher in the "Increase 2025" arm. This difference is statistically significant but economically small. To address any concerns, we include a set of control variables in all our estimations.

and measure news acquisition about the ECB policy rate using the same questions as in the firm survey. Moreover, we elicit the respondents' expectations about their own labor market outcomes.

Follow-up To examine the persistence of treatment effects and to mitigate concerns about numerical anchoring, we conducted a follow-up survey about four weeks after the initial survey, in which no additional treatment information is provided and in which people are not reminded of the initial information. In the follow-up survey, we re-elicit some of the key outcome questions from the main survey, such as expectations about future policy rates and own interest rates. Online Appendix F.3 shows the exact instructions of the follow-up survey.

3.2.3 Coding of Outcome Variables

As in the September 2020 wave, we deal with outliers by trimming all quantitative point forecasts at thresholds that are common across firms and households. We again choose the thresholds such that the two to four percent most extreme answers in the households sample are set to missing. This results in thresholds of 2030 for the year of a rate hike, of -1 and 5 percent for policy rates, of 0 and 5 percent for inflation, of 15 percent for unemployment, of 0 and 15 percent for own interest rates, and of -20 and 40 percent for income growth.[23] When point beliefs are included as control variables, they are winsorized to keep the sample as large as possible. None of our findings are sensitive to the exact trimming or winsorization procedures used.[24] We z-score outcome variables elicited on categorical response scales using the means and standard deviations in our samples.

[23]The thresholds for policy rates, inflation, and unemployment are lower than in the September 2020 wave because respondents were anchored on current realizations of these rates in the December 2019 survey.

[24]See Appendix Table A.12 for versions of our main results on the household and firm samples, respectively, where outcome variables are winsorized and not trimmed.

3.3 Effects on Expectations about Policy Rates

We next examine the extent to which households and firms update their expectations about policy rates in response to the expert forecast. We estimate the following specification separately in the household and in the firm sample:

$$\text{posterior}_i = \alpha_0 + \alpha_1 \, \mathbb{1}(\text{Increase 2020}_i) + \Pi X_i + \varepsilon_i \tag{1}$$

where posterior_i are post-treatment beliefs on the trajectory of the ECB policy rate. $\mathbb{1}(\text{Increase 2020}_i)$ is a dummy variable taking value one for respondents who received the "Increase 2020" treatment, while it takes value zero for respondents who received the "Increase 2025" treatment. X_i is a vector of control variables, which we include to increase statistical power for estimating treatment effects and to address concerns related to imbalances according to observables.[25]

Panel A of Table 4 shows that households who receive the "Increase 2020" treatment think that a rate increase will happen 1.6 years earlier compared to respondents in the "Increase 2025" arm (Column 1, $p < 0.01$). Moreover, households in the "Increase 2020" treatment think that the ECB policy rate will be 0.29 percentage points higher in 2022 (Column 2, $p < 0.01$) and 0.27 percentage points higher in 2025 (Column 3, $p < 0.01$). Taken together, this highlights that households' expectations about the ECB policy rate are quite responsive to the provision of expert forecasts, consistent with households having relatively weak priors about the ECB policy rate. Panel C of Table A.8 in the Online

[25]Specifically, for households we control for respondents' prior beliefs about policy rates in 2022 and 2025 and about the year of a rate hike, and confidence in these beliefs, perceptions of the respondents' current access to and rates faced on mortgages, consumer loans and savings accounts, gender, age and age squared, dummies for educational attainment of middle school, high school and university, dummies for being in part-time paid employment and for being self-employed, polynomials of household income and net wealth, homeownership, stock ownership, household size, living in East Germany, a score based on answers on three numeracy questions, risk aversion, patience, being the financially knowledgeable person or main earner in the household, and perceptions of exposure to macroeconomic risk and to recessions. The regressions on the firm sample control for firms' perceptions of the respondents' access to and rates faced on loans, location in East Germany, and firms' total investment, number of employees, and revenues (all in logs) stated in the regular IIS. All our results are robust to the exclusion of control variables, see Table A.13 in the Online Appendix.

Appendix shows that these effects persist in a four-week follow-up. The effect sizes in the follow-up correspond to about one third of the initial effect sizes, in line with typical estimates of persistence in the literature (Haaland et al., 2020). Moreover, Table A.9 in the Online Appendix shows that respondents also significantly adjust their expectations about real policy rates, as well as the probabilities they assign to a rate hike until 2022. Finally, households who are more confident in their prior beliefs respond less to the forecasts, consistent with Bayesian updating (see Panels A, C, and E of Figure 5). At the same time, there are no systematic differences in updating of beliefs about policy rates across groups with different levels of financial assets, income, debt, or numeracy (see Table A.10 in the Online Appendix).

In contrast, Panel B of Table 4 highlights that firms are substantially less responsive to the expert forecasts. While firms change their expectations about the timing of the next rate increase by about half a year (Column 1, $p < 0.05$), they do not significantly adjust their expectations about the policy rate in 2022 and 2025 (Columns 2 and 3). This is consistent with firms having stronger prior beliefs about the ECB policy rate compared to households. The treatment effects on policy rate expectations differ significantly between firms and households ($p < 0.01$ for expectations about the year of a rate hike and policy rates in 2022 and 2025). Taken together, our fourth main finding can be summarized as follows:

Result 4. *Firms update their policy rate expectations less in response to expert forecasts compared to households. This is consistent with firms holding stronger prior beliefs and being more well-informed than households.*

Simple belief updating experiments of this type could be subject to concerns related to numerical anchoring and experimenter demand effects (de Quidt et al., 2018). Our evidence is less prone to numerical anchoring and demand effects for three reasons: First, policy rate expectations are elicited on a different scale than the scale on which the information is communicated (year of increase). Second, the persistence results for the household sample suggests that at least part of our effects operate through genuine learning

rather than numerical anchoring or demand effects (Haaland et al., 2020). Third, our finding on heterogeneous updating by confidence in the prior in the household sample would only be consistent with demand effects that vary systematically with confidence in the prior.

Mechanisms Sticky information models posit that information frictions arise from infrequent updating of information sets by economic agents. We test whether the frequency of updating differs between firms and households leveraging unique data on information acquisition elicited in our surveys. Specifically, we ask the respondents how often they have heard news about the ECB policy rate over the two weeks before the survey. Figure A.9 in the Online Appendix shows the distribution of responses to this survey question among households and firms. More than 80 percent of firms heard news about the ECB policy rate over the two weeks before the survey at least once, while only 56 percent of households did. Similarly, while among firms more than 60 percent heard news about the ECB policy rate at least twice over the preceding two weeks, only 33 percent of households did.

In Panels B, D, and F of Figure 5, we examine how learning from the expert forecast in the household sample varies with prior news consumption about the ECB policy rate. Consistent with the idea that information frictions arise from infrequent news consumption, learning rates about the year of a rate hike and policy rates in 2022 and 2025 decrease in the level of prior news consumption. Similarly, effects on the expected year of a rate hike in the firm sample are driven by those who report less prior news consumption, although this difference is insignificant in the smaller firm sample (see Figure 6). Moreover, the information significantly changes the expected policy rate in 2022 among firms that report lower news consumption.

Another potential driver of differences in learning rates between firms and households could be differential trust in economic forecasts of experts. To shed light on this mechanism, we leverage data on respondents' trust in expert forecasts from our September 2020 survey. Figure A.10 in the Online Appendix shows that firms have somewhat

lower levels of trust in the economics forecasts of experts compared to households. Thus, it is conceivable that differences in trust could explain some of the differences in learning rates between firms and households.

3.4 Effects on Expectations about Own Interest Rates

Do firms and households think that changes in policy rates will pass through to their own rates and credit access? Columns 4 through 6 of Panel A of Table 4 display estimated effects of the information treatment on interest rates households expect to pay if they were to take out a loan and the rate they expect to earn on savings accounts. Respondents who receive the "Increase 2020" treatment expect a 0.18 percentage point higher mortgage rate in 2022 ($p < 0.01$), a 0.15 percentage points higher rate on consumer loans ($p < 0.01$) and a 0.13 percentage points higher rate on savings accounts ($p < 0.01$) compared to individuals in the "Increase 2025" arm.[26] Respondents who receive the "Increase 2020" treatment also report a 0.043 standard deviation lower expected access to mortgages (Column 7, $p < 0.05$) and a 0.046 standard deviation lower expected access to consumer loans (Column 8, $p < 0.05$). Panel C of Table A.8 in the Online Appendix shows that changes in expected personal rates persist in the four-week follow-up, again alleviating concerns related to experimenter demand effects and numerical anchoring. As shown in Table A.10 in the Online Appendix, updating of expectations about personal borrowing rates is significantly higher for individuals with higher numeracy, and zero for those with low numeracy. This is consistent with cognitive constraints shaping people's understanding of the transmission of policy rates to personal interest rates (D'Acunto et al., 2019a). There are no systematic patterns of heterogeneity according to levels of household financial assets, income, or debt. Taken together, our evidence highlights that households expect that changes in policy rates will pass through to the rates they themselves face for borrowing and saving.

In contrast, Columns 4 and 5 of Panel B of Table 4 show that the information treat-

[26]These findings are reflected in significant updating of real own interest rates, which adjust for the respondent's inflation expectations, as can be seen in Table A.9 in the Online Appendix.

ment has no significant effects on firms' expected rates and credit access. This could be due to i) the weaker first stage effect on policy rate expectations or ii) a lower elasticity of expectations about own rates to expectations about policy rates among firms. Table A.11 in the Online Appendix displays IV estimates of the effect of the expected year of a policy rate hike on other expectations, which scale the estimated treatment effects by the first stage effects on the expected year of a rate hike. The coefficient estimates for effects on own loan rates and credit access have opposite signs compared to households, suggesting that firms may perceive a differential elasticity of own rates to policy rates than households. Given the weak first stage in the firm sample, these results should be interpreted cautiously.

Overall, the lack of an effect on firms' expectations is again in line with firms holding stronger priors than households about policy rates and own credit market outcomes. Taken together, our fifth main finding is the following:

Result 5. *Households significantly extrapolate from changes in beliefs about the timing of a policy rate hike to expectations about their own interest rates, while firms do not adjust their expectations about own rates.*

In Online Appendix D, we provide additional evidence on the role of expectations about future interest rates in shaping respondents' expectations about the broader economy and their own situation. The policy rate forecasts overall have no strong effects on expectations about aggregate unemployment or inflation or on households' and firms' expected own income and business situation.

4 Conclusion and Implications

Leveraging micro data from Germany, the US, and Italy, we document five stylized facts about the extent of information frictions among firms and households. First, firms' expectations about the central bank policy rate, inflation, and aggregate unemployment are more aligned with expert forecasts and less dispersed than households'. Second, differ-

ences in information about current realizations of macroeconomic variables may explain up to 50% of the differences in expectations between firms and households. Third, there seems to be substantially less heterogeneity in information frictions within firms than within households. Fourth, firms update their policy rate expectations significantly less than households when provided with an expert forecast about future rates, and those differences are in line with higher news consumption among firms prior to the survey. Fifth, while households significantly change their expectations about their personal saving and borrowing rates and their access to credit in response to the expert forecast, firms do not adjust their expectations about borrowing rates or credit access.

Our finding of higher information frictions among households than among firms has important implications for the transmission of macroeconomic shocks and policies. For instance, lower information frictions should result in more rapid adjustment of beliefs and economic decisions to macroeconomic shocks among firms. Moreover, monetary policy may be more effective in changing the economic decisions of firms, as it takes more time until changes in policy rates become part of households' information sets.

Our findings have important implications for macroeconomic modeling choices. First, the differences in belief dispersion across groups of households and across groups of firms highlight the importance of incorporating heterogeneity into macroeconomic models, especially on the household side. Second, the differences in information frictions between firms and households indicate that abstracting from information frictions is a less reasonable approximation for households than for firms. Third, our results suggest that the practice of using professional forecasts as a proxy for beliefs of households and firms when no direct expectations data from these groups are available is more difficult to defend for households than for firms.

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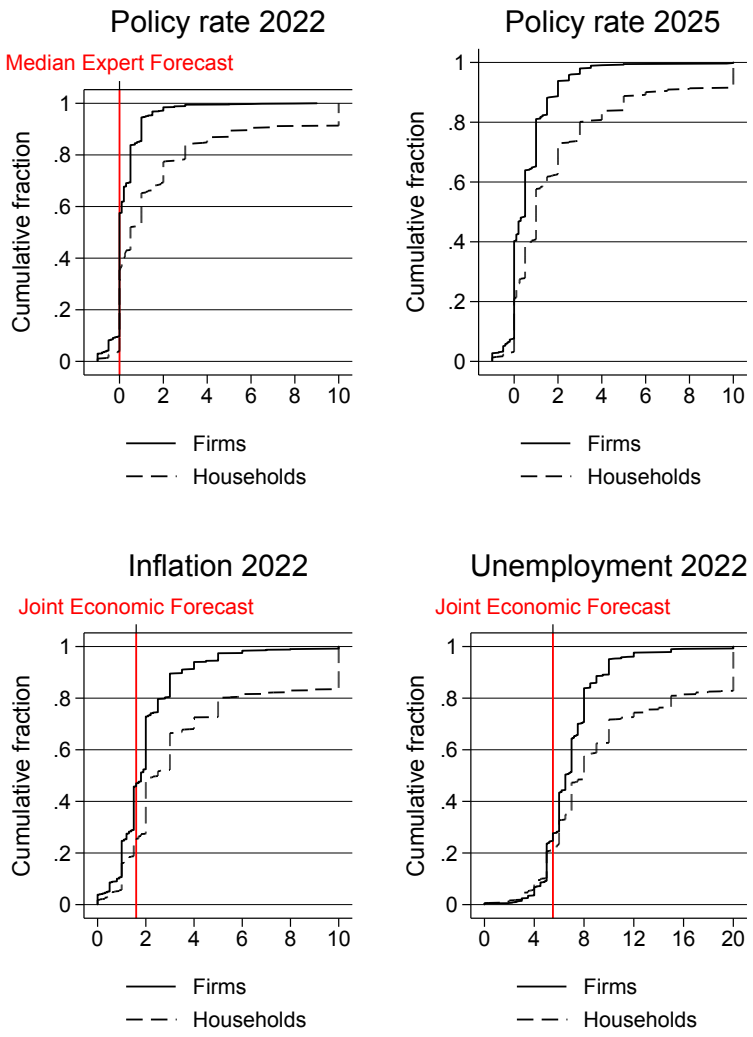
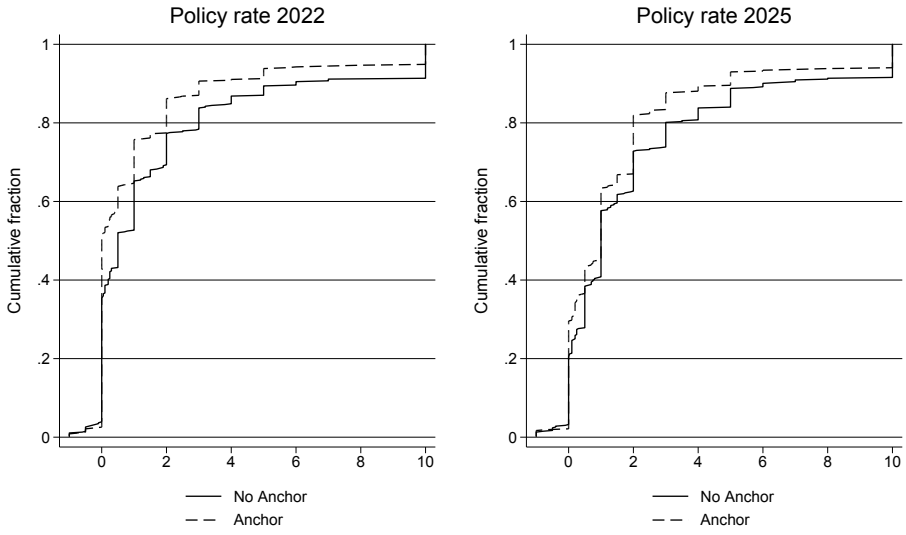
Main Figures

Figure 1: Macro Expectations among Households and Firms w/o Anchor: 2020 Survey

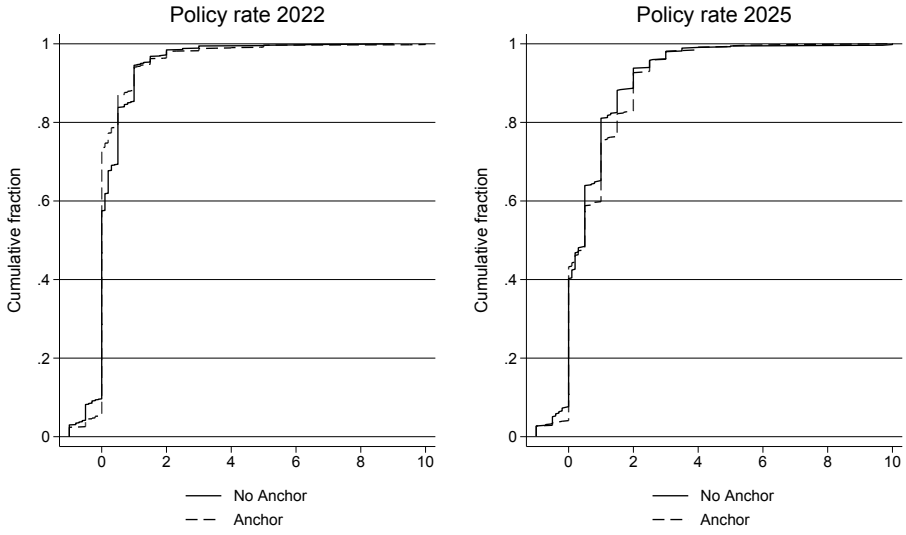


Notes: This Figure shows the cumulative distribution function of expectations from the German survey of September 2020 among the sample of respondents that did not receive information about the current ECB policy rate. The figures show expectations about the average 2022 ECB policy rate, the average 2025 ECB policy rate, the inflation rate over the year 2022, and the average unemployment rate in 2022 separately for households and firms. The vertical red lines indicate the median forecast of the 2022 policy rate from the October 2020 round of the ECB SPF (0%) and the predictions of inflation and unemployment in 2022 of the "Joint Economic Forecast" of Germany's leading economic research institutes (1.6% and 5.5%), respectively. For the sake of readability, we winsorize expectations at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

Figure 2: Effect of the Anchor on HHs' and Firms' Policy Rate Expectations: 2020 Survey



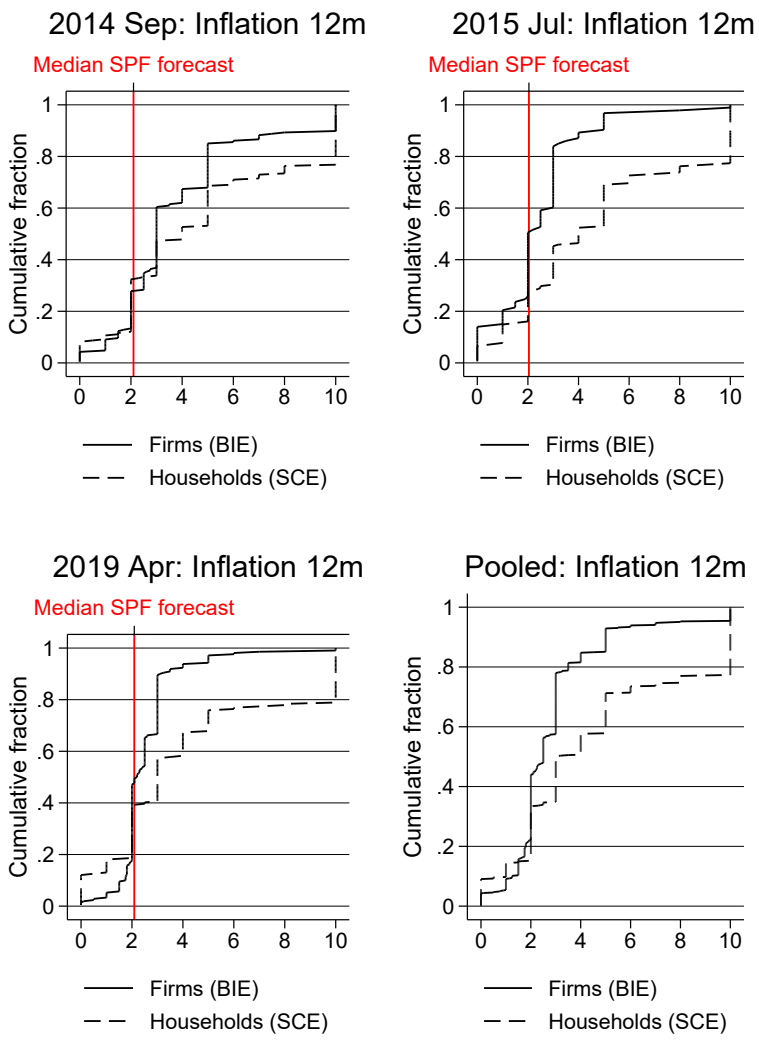
(a) Panel A: Households



(b) Panel B: Firms

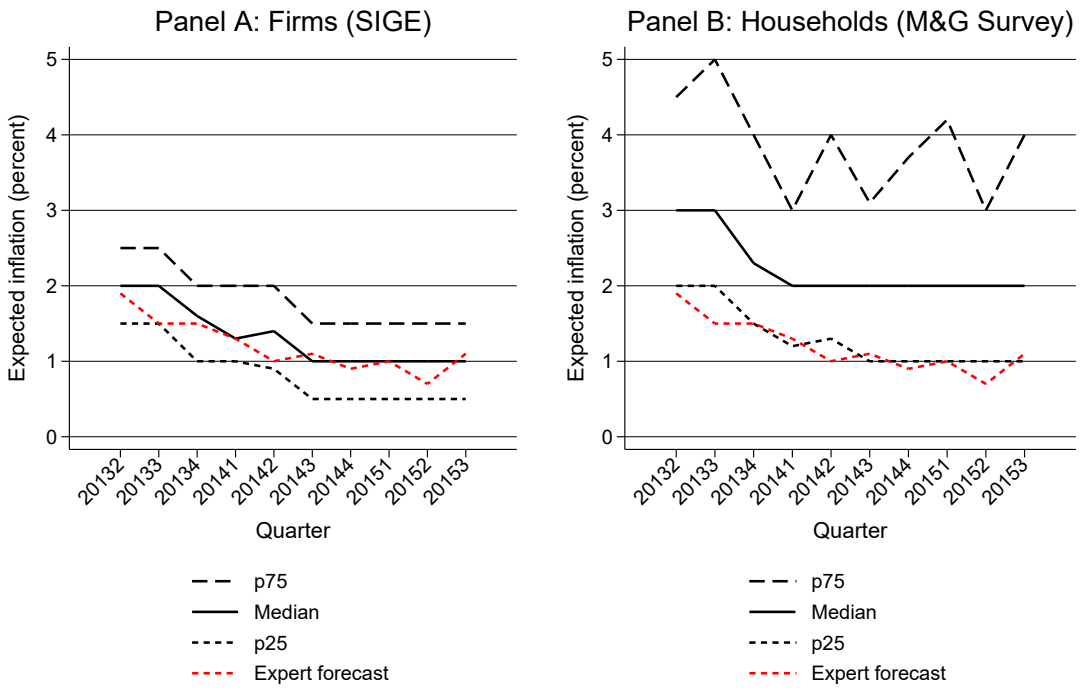
Notes: This Figure shows the cumulative distribution function of policy rate expectations from the German survey of September 2020 separately for respondents that received information about the current rate and those who did not receive the anchor before making their prediction. Respondents were asked to predict the average policy rate in 2022 and in 2025, respectively. Panel A presents these expectations for the household sample and Panel B for the firm sample. For the sake of readability, we winsorize policy rate expectations at -1 and 10.

Figure 3: Inflation Expectations among Households and Firms: United States



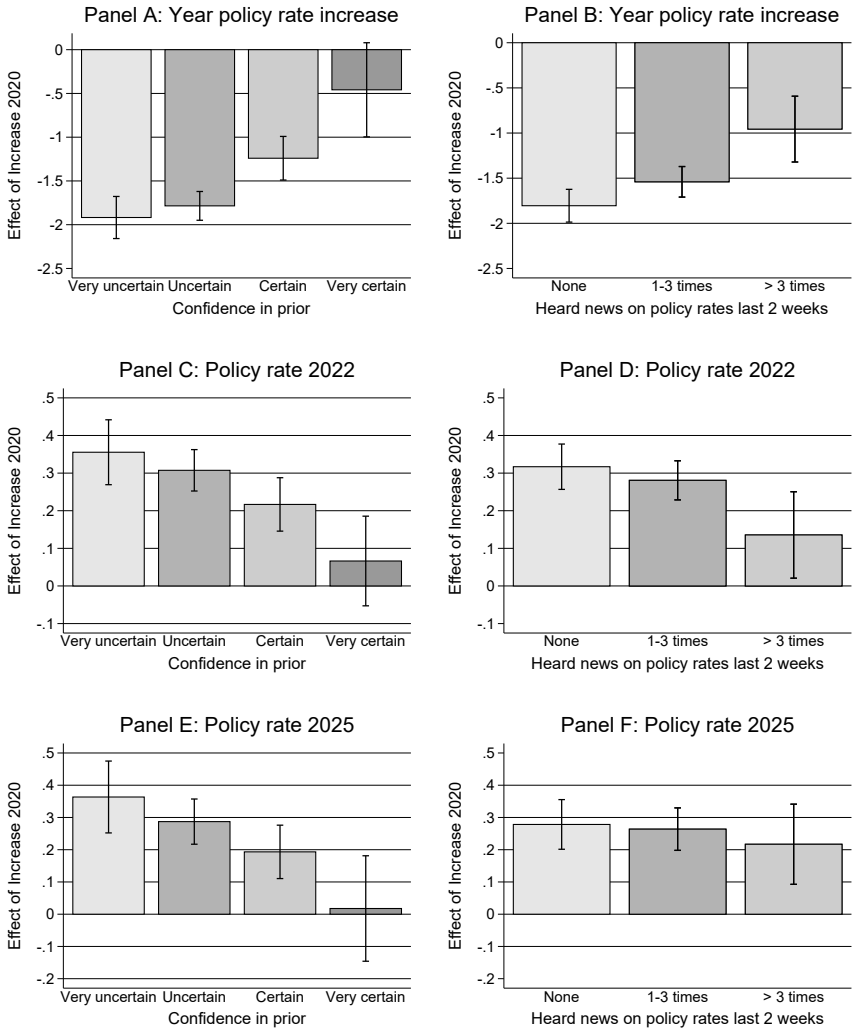
Notes: This Figure shows the cumulative distribution function of expected inflation rates over the next 12 months from US firms participating in the Atlanta Fed's Business Inflation Expectations Survey (BIE) and households participating in the New York Fed's Survey of Consumer Expectations (SCE). Distributions are presented separately for the three months in which the BIE elicited expectations about CPI inflation from participating firms, as well as pooling across these three months. The sample for the SCE is restricted to respondents from Alabama, Florida, Georgia, Louisiana, Mississippi, and Tennessee, in line with the sampling frame of the BIE. The vertical red lines indicate the median expert forecast taken from the Philadelphia Fed's Survey of Professional Forecasters (SPF), which is 2.10, 2.04, and 2.09, respectively for the waves in September 2014, July 2015, and April 2019. For the sake of readability, we winsorize inflation expectations at 0 and 10.

Figure 4: Inflation Expectations among Households and Firms: Italy



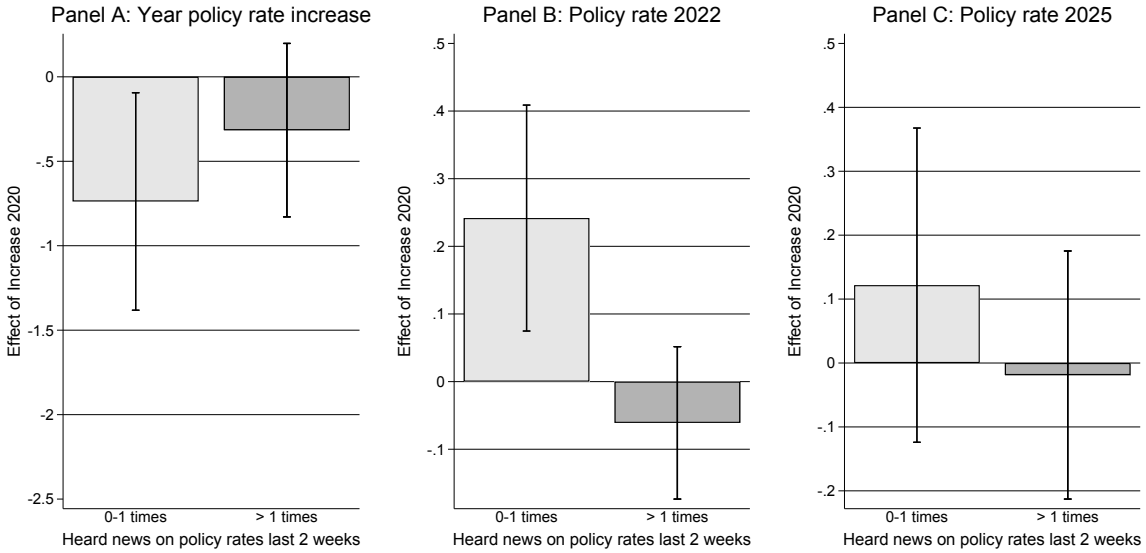
Notes: This Figure shows inflation expectations from Italian firms participating in the Bank of Italy's Survey on Inflation and Growth Expectations (SIGE), and households' inflation expectations measured in a special survey conducted by YouGov for the investment firm M&G during the years 2013-2015. The figure shows median inflation expectations, the 25th and 75th percentile of the distribution as well as the median expert forecasts. The dashed red lines indicate professional forecasts from Consensus Economics. Statistics for both surveys are computed using population weights. The statistics from the firm sample are based on firms in the control group of the experiment used in Coibion et al. (2020b), i.e., they are based on firms that were never provided with inflation-related information.

Figure 5: Heterogeneity in Learning from Experts among Households: 2019 Survey



Notes: This Figure presents the estimated response of households' expectations regarding the year of policy rate increase (Panels A and B), the policy rate in 2022 (Panels C and D), and the policy rate in 2025 (Panels E and F) to randomized information from an expert forecast predicting a policy rate increase in 2020 relative to respondents that received an expert forecast predicting an increase in 2025 at the earliest. All estimations are based on the German household survey from December 2019. Panels A, C, and E present separate estimations for the different confidence in priors reported by households and Panels B, D, and F estimate the effects separately for different prior news consumption about the ECB policy rate. The regressions control for respondents' prior beliefs about policy rates and confidence in these beliefs, perceptions of the respondents' access to and rates faced on mortgages, consumer loans and savings accounts, gender, age, educational attainment, employment status, household income and net wealth, homeownership, stock ownership, household size, living in East Germany, numeracy, risk aversion, patience, being the financially knowledgeable person or main earner in the household, and perceptions of exposure to macroeconomic risk. Confidence bounds are depicted at the 90% level.

Figure 6: Heterogeneity in Learning from Experts among Firms: 2019 Survey



Notes: This Figure presents the estimated response of firms' expectations regarding the year of policy rate increase (Panel A), the policy rate in 2022 (Panels B), and the policy rate in 2025 (Panel C) to randomized information from an expert forecast predicting a policy rate increase in 2020 relative to respondents that received an expert forecast predicting an increase in 2025 at the earliest. All estimations are based on the German firms survey from December 2019. The effects are estimated separately for different prior news consumption about the ECB policy rate. The regressions control for firms' perceptions of access to and rates faced on loans, location in East Germany, and firms' total investment, number of employees, and revenues (all in logs) stated in the regular ifo Investment Survey. Confidence bounds are depicted at the 90% level.

Main Tables

Table 1: Dispersion of Macro Expectations among Households and Firms: 2020 Survey

		Firms							Households							p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Bench-mark	Mean	Median	SD	p75-p25	p90-p10	Mean abs. bias	N	Mean	Median	SD	p75-p25	p90-p10	Mean abs. bias	N	(7)=(14)
Expected policy rate																
No Anchor:																
Policy rate 2022	0	0.28	0.00	0.74	0.50	1.00	0.38	1089	2.04	0.50	4.23	2.00	5.00	2.08	450	0.000
Policy rate 2025		0.71	0.50	1.43	1.00	2.00		540	2.41	1.00	4.21	2.60	5.00		449	
Anchor:																
Policy rate 2022	0	0.26	0.00	0.86	0.20	1.00	0.31	1238	1.22	0.00	3.05	1.00	3.00	1.24	458	0.000
Policy rate 2025		0.78	0.50	1.10	1.10	2.00		575	1.80	1.00	3.63	2.00	4.00		456	
Expected inflation																
Inflation 2022	1.6	2.06	1.80	1.69	1.30	2.50	0.94	1109	4.53	2.00	5.80	3.50	9.00	3.23	902	0.000
Expected unemployment																
Unemployment 2022	5.5	6.93	6.50	2.52	2.50	5.00	1.93	1225	11.03	8.00	9.36	6.00	19.50	6.11	908	0.000

Notes: This Table presents summary statistics of expected average ECB policy rates in 2022 and 2025, the expected inflation rate over the year 2022, and the average unemployment rate in 2022 elicited in the German firm and household surveys in September 2020. Statistics on policy rate expectations are presented separately for respondents that received information about the current rate and those who did not receive the anchor before making their prediction. Columns 2 through 6 depict the mean, median, standard deviation, interquartile range, and the difference between the 90th and 10th percentile for each variable in the firm survey, respectively. Column 7 displays the mean absolute deviation of firms' expectations from an expert benchmark depicted in Column 1, i.e., the median forecast of the 2022 policy rate from the October 2020 round of the ECB SPF and the predictions of inflation and unemployment in 2022 of the "Joint Economic Forecast" of Germany's leading economic research institutes, respectively. Column 8 presents the number of observations. Columns 9 through 15 present the same statistics for the household sample. The p-values in Column 16 reject the null hypothesis that the mean absolute bias of households and firms from the expert benchmark depicted in Columns 7 and 14 are equal.

Table 2: Correlates of Firms' Beliefs and Deviations from Experts: 2020 Survey

	Policy rate 2022		Policy rate 2025	Inflation 2022		Unempl. rate 2022	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Belief	| Belief - expert forecast |	Belief	Belief	| Belief - expert forecast |	Belief	| Belief - expert forecast |
Log(Firm age)	0.005	-0.012	-0.056	-0.069	-0.033	0.007	-0.020
	(0.024)	(0.023)	(0.053)	(0.079)	(0.069)	(0.121)	(0.105)
Log(Employees)	0.001	-0.001	-0.088***	-0.115***	-0.082***	-0.188***	-0.118***
	(0.014)	(0.014)	(0.033)	(0.034)	(0.029)	(0.048)	(0.041)
Export share	-0.008	-0.003	0.149	-0.880***	-0.782***	-0.072	0.069
	(0.087)	(0.084)	(0.203)	(0.227)	(0.192)	(0.421)	(0.363)
Negative impact of coronavirus	0.017	0.019	-0.015	0.191*	0.106	0.533***	0.393***
	(0.035)	(0.034)	(0.093)	(0.108)	(0.093)	(0.152)	(0.127)
Services Firm	0.069	0.004	0.132	-0.546***	-0.498***	-0.202	-0.035
	(0.049)	(0.047)	(0.090)	(0.175)	(0.157)	(0.185)	(0.158)
Retail/Wholesale Firm	-0.013	-0.061	-0.010	-0.501***	-0.426**	0.115	0.095
	(0.047)	(0.045)	(0.105)	(0.187)	(0.169)	(0.206)	(0.176)
Equity ratio	-0.055	-0.058	-0.102	0.106	0.188	-0.252	-0.101
	(0.082)	(0.080)	(0.138)	(0.196)	(0.171)	(0.310)	(0.268)
Cash to total assets	0.063	0.156	-0.223	0.384	0.138	0.585	0.409
	(0.149)	(0.144)	(0.186)	(0.288)	(0.247)	(0.569)	(0.496)
Any change in loan interest rate in last 6 months	-0.080*	-0.077*	-0.214**	0.037	0.018	-0.035	0.234
	(0.046)	(0.041)	(0.100)	(0.192)	(0.164)	(0.278)	(0.209)
University	-0.068	-0.058	0.068	-0.177	-0.219*	-0.025	-0.032
	(0.042)	(0.041)	(0.089)	(0.130)	(0.115)	(0.161)	(0.136)
Anchored on current policy rate	-0.019	-0.070**	0.063				
	(0.034)	(0.032)	(0.079)				
Observations	2317	2317	1106	1103	1103	1222	1222
R^2	0.01	0.01	0.02	0.03	0.03	0.03	0.02
Mean dep. variable (no anchor)	0.27	0.38	0.72	2.06	0.94	.	.
SD dep. variable (no anchor)	0.74	0.69	1.43	1.69	1.48	.	.
Mean dep. variable (anchor)	0.26	0.31	0.78	.	.	6.93	1.93
SD dep. variable (anchor)	0.86	0.84	1.10	.	.	2.52	2.16

Notes: This Table examines correlates of firms' expectations and absolute deviations of beliefs from expert benchmarks on respondent characteristics based on the German firm survey of September 2020. Experts benchmarks are the median forecast of the 2022 policy rate from the October 2020 round of the ECB SPF (0%) and the predictions of inflation and unemployment in 2022 of the "Joint Economic Forecast" of Germany's leading economic research institutes (1.6% and 5.5%), respectively. "Negative impact of coronavirus" is a dummy for firms that reported a negative impact of the Covid-19 crisis on their business activity in September 2020. The dummy variables "Services firm" and "Retail/Wholesale firm" capture the effect of firms in the respective industries relative to manufacturing firms. "Equity ratio", "Cash to total assets", and "Any change in loan interest rate in last 6 months" are elicited in the September 2020 wave of the IBS, while the latter is a dummy for firms stating that they have experienced a change to their loan interest rate over the previous six months. "University" is a dummy for respondents with a diploma, master, or Ph.D. degree. "Anchored on current policy rate" is a dummy that is one if respondents received information about the current rate before making their prediction. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 3: Correlates of Households' Beliefs and Deviations from Experts: 2020 Survey

	Policy rate 2022		Policy rate 2025	Inflation 2022		Unempl. rate 2022	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Belief	| Belief - expert forecast |	Belief	Belief	| Belief - expert forecast |	Belief	| Belief - expert forecast |
Female	0.458*	0.442*	0.341	0.942**	0.962**	2.831***	2.801***
	(0.267)	(0.266)	(0.281)	(0.398)	(0.386)	(0.627)	(0.600)
Age at least 50	-1.029***	-1.049***	-1.031***	-1.265***	-1.311***	-2.097***	-2.262***
	(0.252)	(0.251)	(0.282)	(0.395)	(0.384)	(0.604)	(0.574)
Highschool	-0.095	-0.110	-0.180	-0.171	-0.142	-1.907**	-1.859**
	(0.295)	(0.294)	(0.331)	(0.475)	(0.461)	(0.759)	(0.725)
University	-0.314	-0.316	-0.647**	-0.431	-0.410	-2.078***	-2.087***
	(0.263)	(0.261)	(0.259)	(0.431)	(0.415)	(0.674)	(0.637)
Covid-19 worsens economic situation	-0.051	-0.034	-0.279	0.571	0.579	2.060***	1.902***
	(0.262)	(0.260)	(0.277)	(0.415)	(0.402)	(0.674)	(0.647)
Employed	-0.126	-0.095	0.030	0.811	0.759	1.155	1.281
	(0.572)	(0.572)	(0.679)	(0.931)	(0.899)	(1.460)	(1.399)
Unemployed	1.611	1.679	0.433	1.607	1.582	1.316	2.619
	(1.499)	(1.488)	(1.157)	(2.123)	(2.068)	(3.393)	(2.963)
Income > € 3,000	-0.052	-0.052	0.070	-0.849**	-0.785**	-0.744	-0.660
	(0.248)	(0.247)	(0.291)	(0.377)	(0.362)	(0.620)	(0.585)
Financial assets > € 11,000	-0.619***	-0.639***	-0.771***	-1.052**	-1.094***	-1.056	-1.031
	(0.235)	(0.233)	(0.279)	(0.433)	(0.419)	(0.706)	(0.665)
Stockowner	0.004	0.001	0.145	-0.458	-0.389	-0.222	-0.359
	(0.262)	(0.261)	(0.337)	(0.417)	(0.403)	(0.755)	(0.728)
Homeowner	0.535**	0.558**	0.540*	1.028**	0.984**	0.428	0.368
	(0.267)	(0.266)	(0.294)	(0.426)	(0.415)	(0.606)	(0.574)
Debtor	-0.097	-0.107	-0.188	0.280	0.264	0.572	0.302
	(0.252)	(0.250)	(0.261)	(0.402)	(0.388)	(0.613)	(0.588)
High numeracy	-1.384***	-1.361***	-1.327***	-2.247***	-2.232***	-3.643***	-3.488***
	(0.244)	(0.243)	(0.262)	(0.377)	(0.365)	(0.561)	(0.538)
Main earner	0.175	0.169	0.186	0.541*	0.536**	0.071	0.110
	(0.184)	(0.184)	(0.194)	(0.278)	(0.269)	(0.382)	(0.360)
High recession exposure	-0.383	-0.385	-0.056	-0.229	-0.253	-1.599**	-1.711***
	(0.263)	(0.263)	(0.271)	(0.391)	(0.379)	(0.643)	(0.616)
Anchored on current policy rate	-0.804***	-0.816***	-0.602**	-0.753*	-0.686*	-0.255	-0.198
	(0.237)	(0.236)	(0.252)	(0.384)	(0.368)	(0.662)	(0.630)
Observations	903	903	900	897	897	903	903
R^2	0.13	0.13	0.10	0.14	0.15	0.16	0.18
Mean dep. variable (no anchor)	2.04	2.07	2.40	4.72	3.41	11.01	6.08
SD dep. variable (no anchor)	4.24	4.22	4.20	6.10	5.95	9.38	9.02
Mean dep. variable (anchor)	1.18	1.20	1.76	3.91	2.66	11.06	6.19
SD dep. variable (anchor)	2.93	2.92	3.54	4.71	4.52	9.32	8.91

Notes: This Table examines correlates of households' expectations and absolute deviations of beliefs from expert benchmarks on respondent characteristics based on the German household survey of September 2020. Experts benchmarks are the median forecast of the 2022 policy rate from the October 2020 round of the ECB SPF (0%) and predictions of inflation and unemployment in 2022 of the "Joint Economic Forecast" of Germany's leading economic research institutes (1.6% and 5.5%), respectively. "Anchored on current policy rate" is a dummy that is one if respondents received information about the current rate before making their prediction. All other covariates are coded as dummies and explained in the main text. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 4: Learning from Experts' Policy Rate Forecasts among Households and Firms: 2019 Survey

	Year policy rate increase	Policy rate 2022	Policy rate 2025	Mortgage rate 2022	Consumer loan rate 2022	Savings account rate 2022	Mortgage access 2022	Consumer loan access 2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Households								
Increase 2020 (A)	-1.612***	0.287***	0.266***	0.180***	0.145***	0.127***	-0.043**	-0.046**
	(0.072)	(0.023)	(0.029)	(0.040)	(0.044)	(0.020)	(0.017)	(0.019)
Observations	3758	3896	3828	3859	3864	3818	3992	3992
R^2	0.46	0.40	0.46	0.83	0.80	0.65	0.70	0.63
Mean dep. variable	2023.32	0.63	1.22	4.05	4.63	0.62	-0.00	0.00
SD dep. variable	2.93	0.92	1.22	3.04	3.08	1.03	1.00	1.00

	Year policy rate increase	Policy rate 2022	Policy rate 2025	Firm loan rate 2022	Firm loan access 2022
	(1)	(2)	(3)	(4)	(5)
Panel B: Firms					
Increase 2020 (B)	-0.519**	0.035	0.018	-0.020	-0.038
	(0.244)	(0.057)	(0.093)	(0.071)	(0.058)
Observations	401	430	428	436	463
R^2	0.03	0.03	0.04	0.85	0.62
Mean dep. variable	2023.45	0.26	0.95	2.80	0.00
SD dep. variable	2.43	0.59	0.95	1.87	1.00
p-value(A=B)	0.000	0.000	0.010		

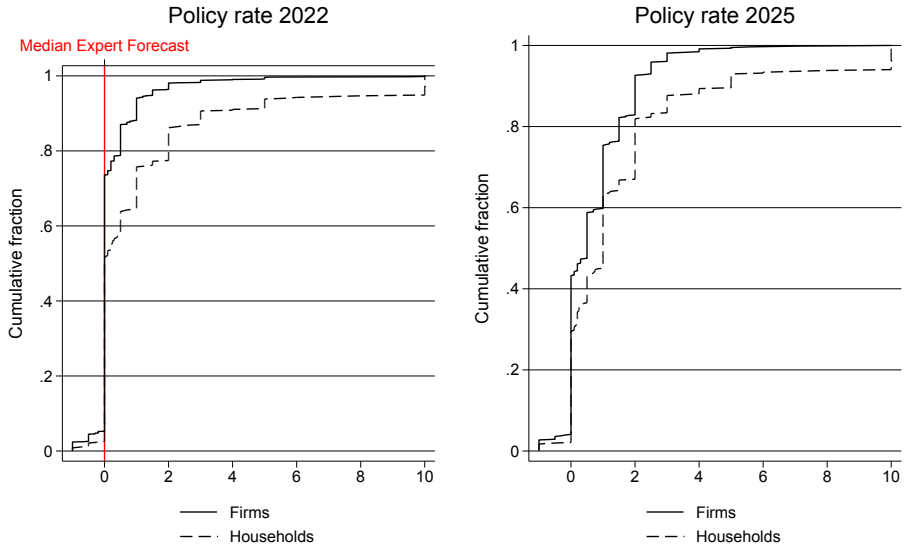
Notes: This Table examines the effect of the randomized information provision on posterior expectations of households (Panel A) and firms (Panel B) based on the German firm and household surveys of December 2019. "Increase 2020" is a dummy taking value one if the respondent received the forecast predicting a policy rate increase in 2020, and zero if the respondent received the forecast predicting an increase in 2025 at the earliest. The outcomes in Panel A Columns 7 and 8 and Panel B Column 5 are z-scored using the mean and the standard deviation in the corresponding sample. The regressions on the household sample control for respondents' prior beliefs about policy rates and confidence in these beliefs, perceptions of the respondents' access to and rates faced on mortgages, consumer loans and savings accounts, gender, age, educational attainment, employment status, household income and net wealth, homeownership, stock ownership, household size, living in East Germany, numeracy, risk aversion, patience, being the financially knowledgeable person or main earner in the household, and perceptions of exposure to macroeconomic risk. The regressions on the firm sample control for firms' perceptions of access to and rates faced on loans, location in East Germany, and firms' total investment, number of employees, and revenues (all in logs) stated in the regular ifo Investment Survey. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Online Appendix: Information Frictions among Firms and Households

Sebastian Link Andreas Peichl Christopher Roth Johannes Wohlfart

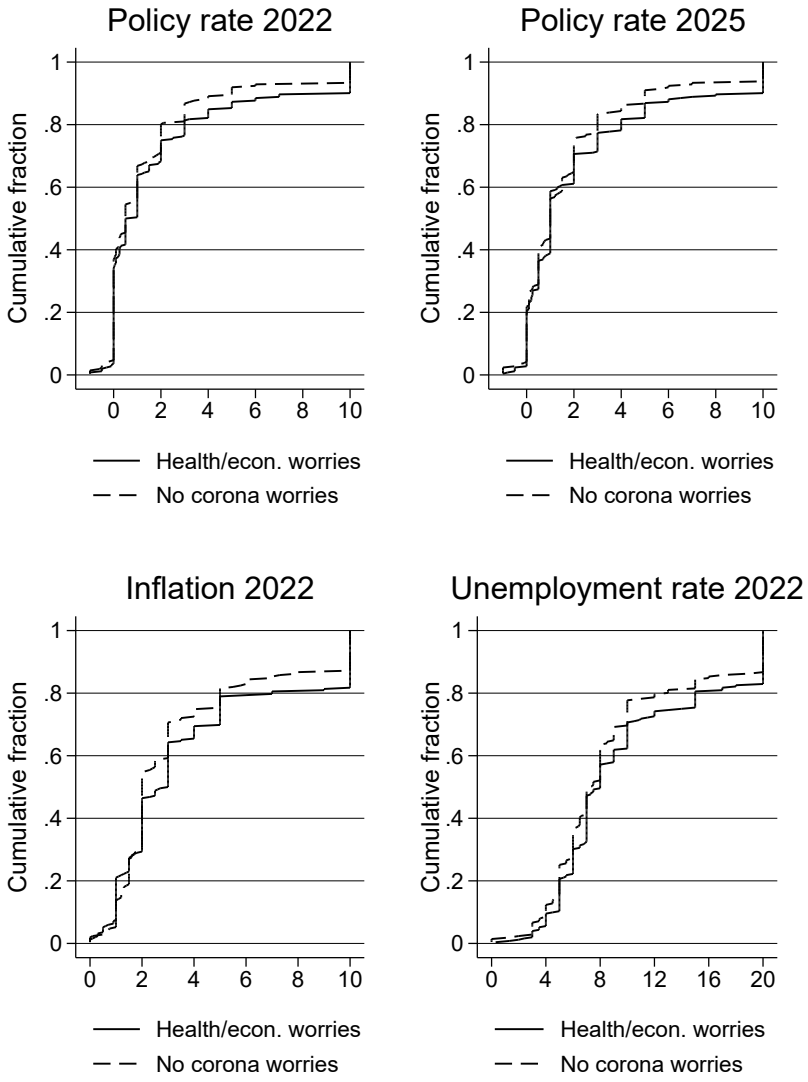
A Additional Figures and Tables

Figure A.1: Macro Expectations among Households and Firms with Anchor: 2020 Survey



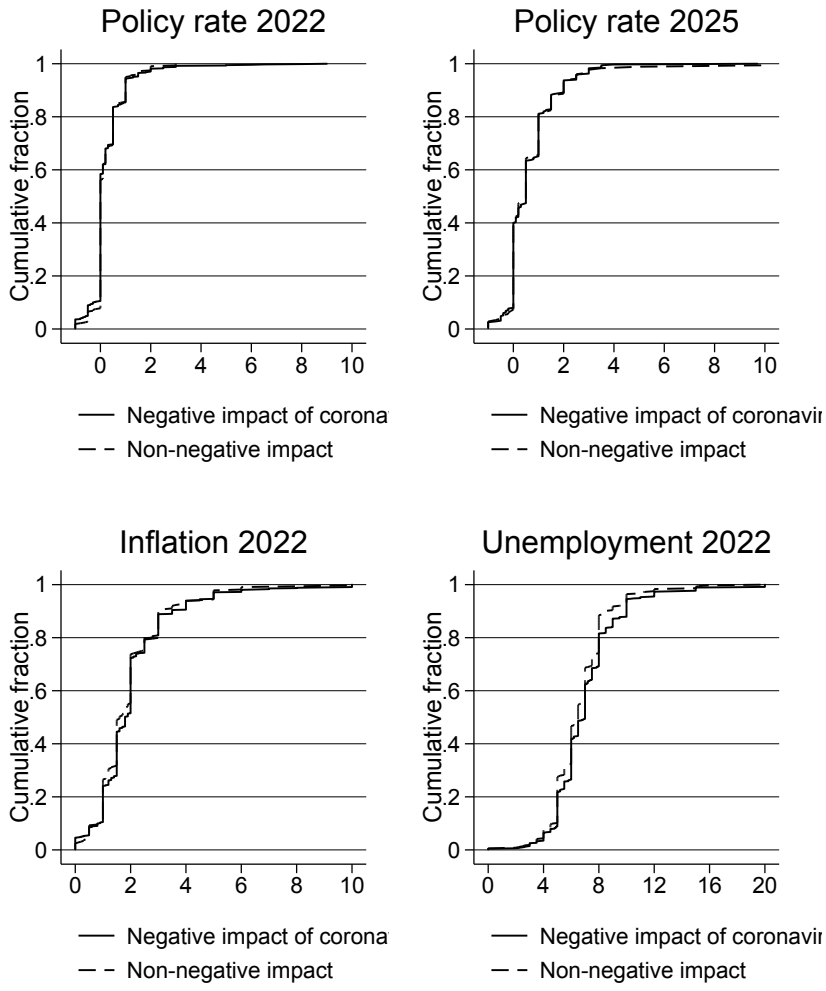
Notes: This Figure shows the cumulative distribution function of expectations from the German survey of September 2020 among the sample of respondents that received information about the current ECB policy rate before making their predictions. The figures show expectations about the average 2022 ECB policy rate and the average 2025 ECB policy rate separately for households and firms. The vertical red line indicates the median forecast of the 2022 policy rate from the October 2020 round of the ECB SPF (0%). For the sake of readability, we winsorize policy rate expectations at -1 and 10.

Figure A.2: Heterogeneity in Household Expectations by Coronavirus Worries: 2020 Survey



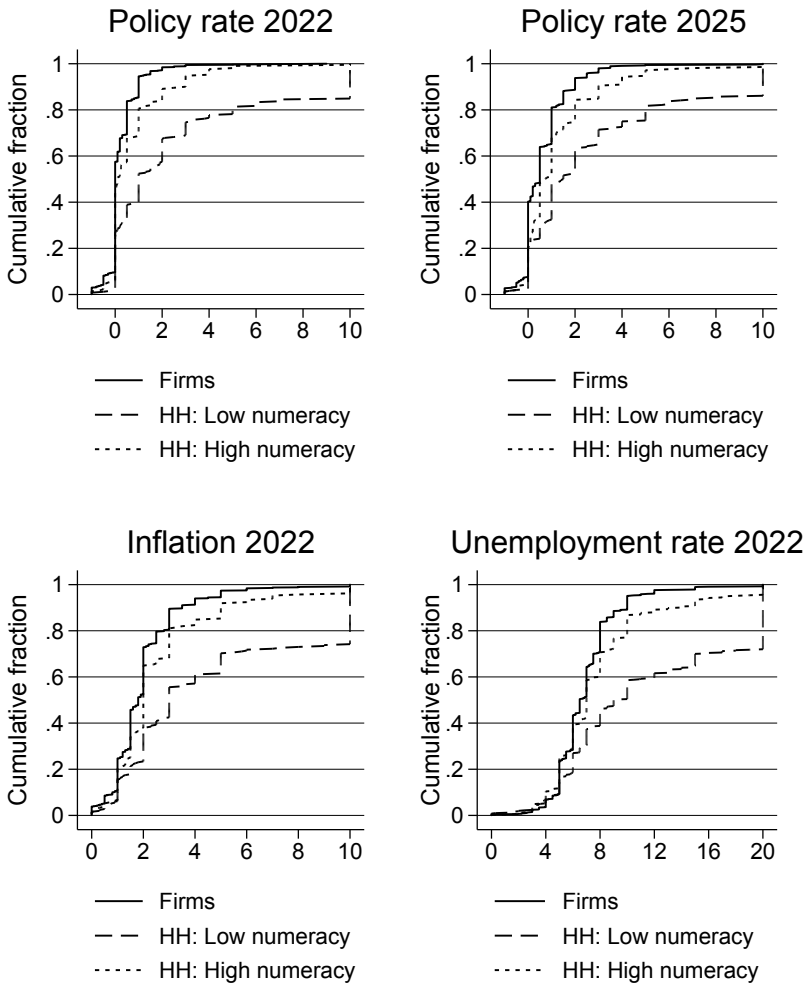
Notes: This Figure shows the cumulative distribution function of household expectations from the German survey of September 2020 using only respondents in the "no anchor" condition. The figures show expectations about the average 2022 ECB policy rate, the average 2025 ECB policy rate, the inflation rate over the year 2022, and the average unemployment rate in 2022. The Figure shows the distributions separately for respondents who worry about personal health or economic consequences of the coronavirus crisis and for those who do not. For the sake of readability, we winsorize expectations at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

Figure A.3: Heterogeneity in Firm Expectations by Coronavirus Impact: 2020 Survey



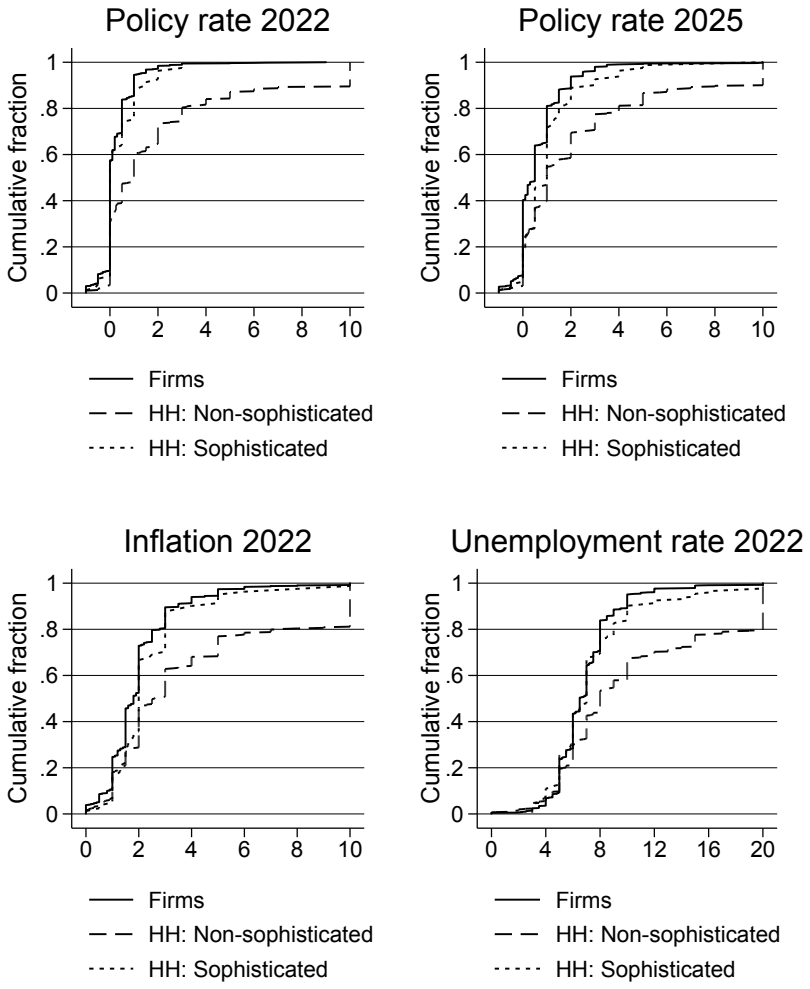
Notes: This Figure shows the cumulative distribution function of firm expectations from the German survey of September 2020 survey using only respondents in the "no anchor" condition. The figures show expectations about the average 2022 ECB policy rate, the average 2025 ECB policy rate, the inflation rate over the year 2022, and the average unemployment rate in 2022. The Figure shows the distributions separately for respondents that reported a negative vs a non-negative impact of the coronavirus crisis on their business activity. For the sake of readability, we winsorize expectations at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

Figure A.4: Heterogeneity in Household Expectations by Numeracy: 2020 Survey



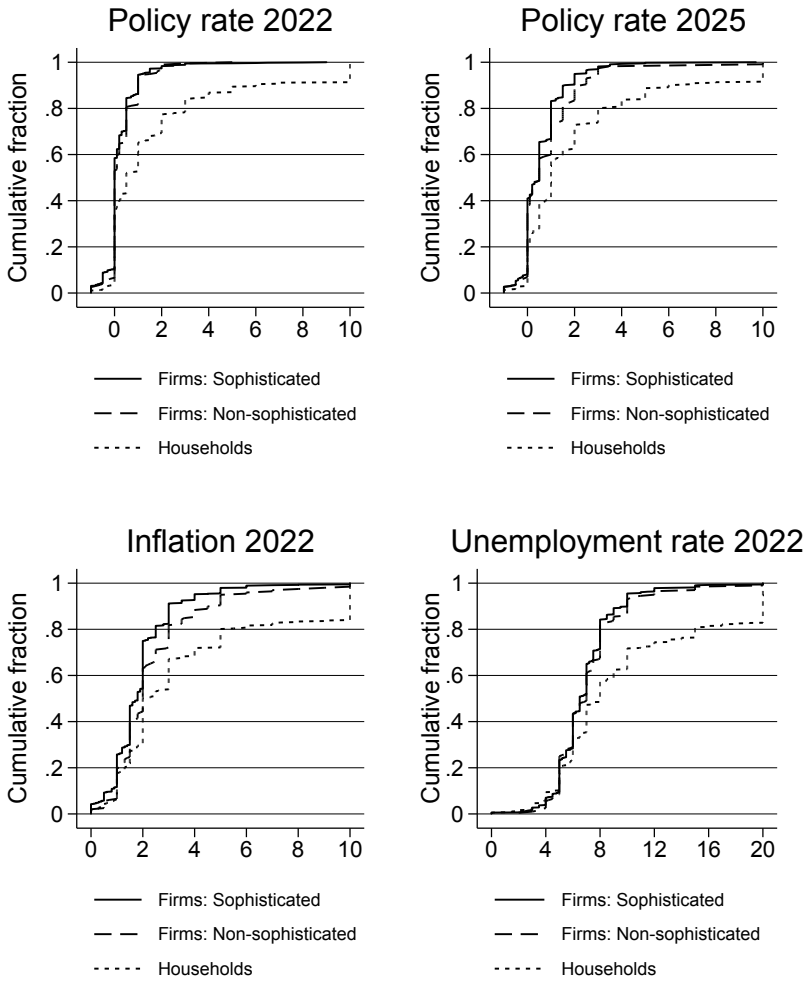
Notes: This Figure shows the cumulative distribution function of household and firm expectations from the German survey of September 2020 using only respondents in the "no anchor" condition. The figures show expectations about the average 2022 ECB policy rate, the average 2025 ECB policy rate, the inflation rate over the year 2022, and the average unemployment rate in 2022. The Figure displays these expectations separately for households with above median and below median numeracy against the benchmark of firms. For the sake of readability, we winsorize expectations at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

Figure A.5: Heterogeneity in Household Expectations by Sophisticated vs Non-Sophisticated Households: 2020 Survey



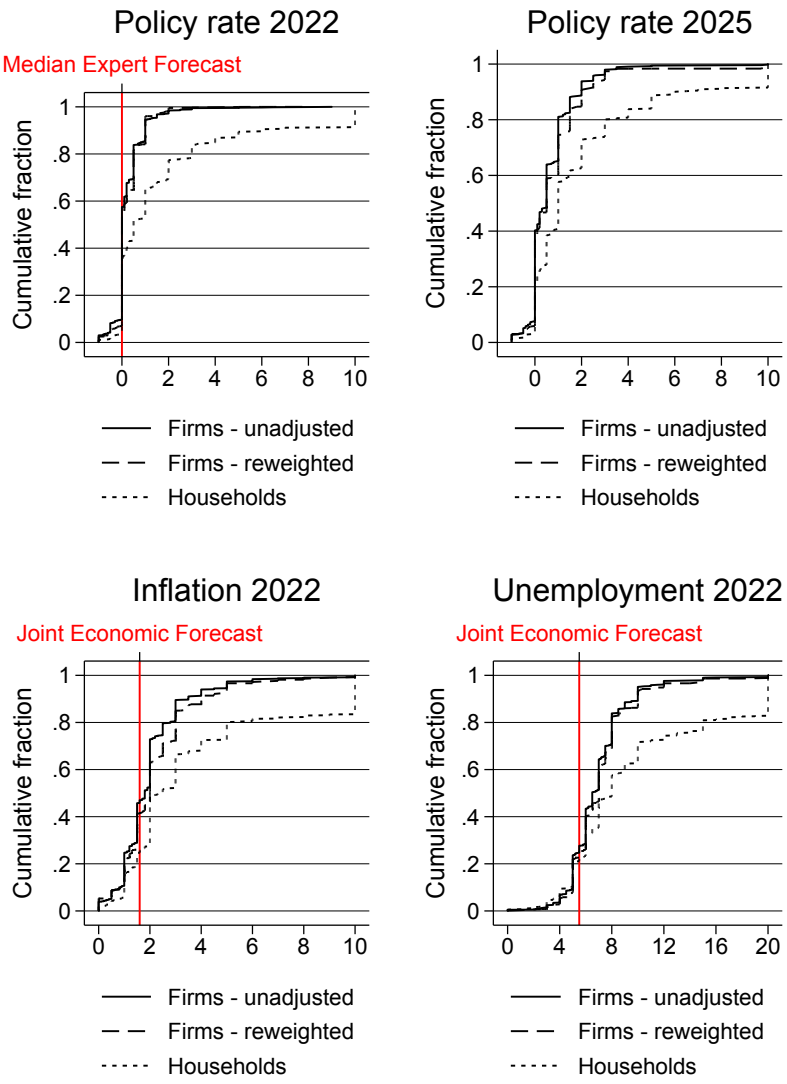
Notes: This Figure shows the cumulative distribution function of household and firm expectations from the German survey of September 2020 using only respondents in the "no anchor" condition. The figures show expectations about the average 2022 ECB policy rate, the average 2025 ECB policy rate, the inflation rate over the year 2022, and the average unemployment rate in 2022. The Figure displays these expectations separately for "sophisticated" households with more aligned expectations (above median age, financial assets, and numeracy), which applies to 19 percent of households, and the remaining, "non-sophisticated" households against the benchmark of firms. For the sake of readability, we winsorize expectations at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

Figure A.6: Heterogeneity in Firm Expectations by Sophisticated vs Non-Sophisticated Firms: 2020 Survey



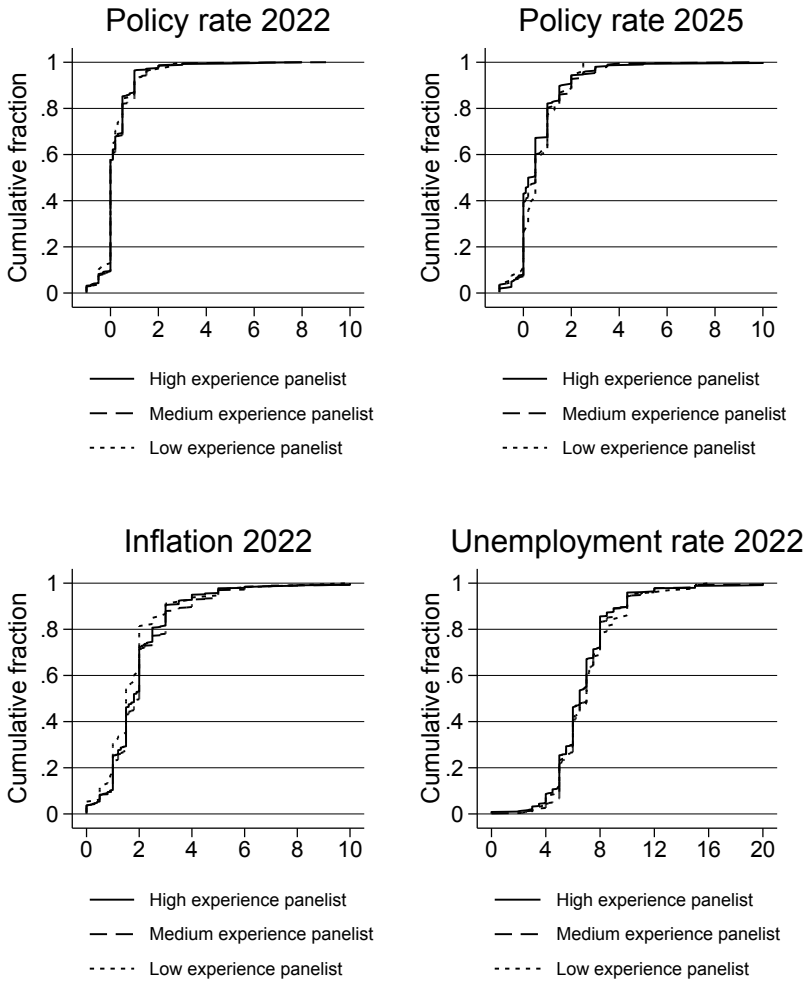
Notes: This Figure shows the cumulative distribution function of household and firm expectations from the German survey of September 2020 using only respondents in the "no anchor" condition. The figures show expectations about the average 2022 ECB policy rate, the average 2025 ECB policy rate, the inflation rate over the year 2022, and the average unemployment rate in 2022. The Figure displays these expectations separately for "non-sophisticated" firm with less aligned expectations (non-exporting firms with below median number of employees), which applies to 18 percent of firms, and the remaining, "sophisticated" firms against the benchmark of households. For the sake of readability, we winsorize expectations at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

Figure A.7: Macro Expectations among Households and Firms w/o Anchor: 2020 Survey: Effect of Reweighting the Firm Sample for Comparison with Coibion et al. (2018b)



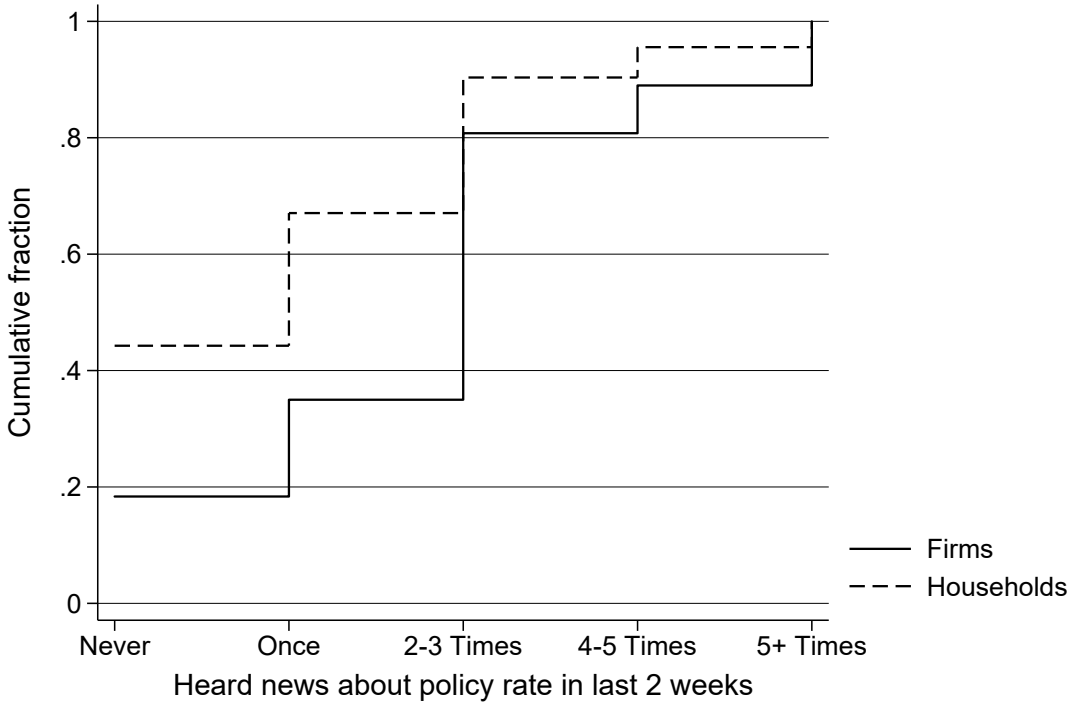
Notes: This Figure shows the cumulative distribution function of expectations about the average 2022 ECB policy rate, the average 2025 ECB policy rate, the inflation rate over the year 2022, and the average unemployment rate in 2022 from the German survey of September 2020 among the sample of respondents that did not receive information about the current ECB policy rate. In addition to the unadjusted samples of firms (solid lines) and households (short-dashed lines), the dashed lines present the distributions of expectations after reweighting the sample of firms to make it similar in terms of observables to the New Zealand firms in Coibion et al. (2018b) along the following dimensions: number of employees, export share, and industry composition as described in Appendix C. The vertical red lines indicate the median forecast of the 2022 policy rate from the October 2020 round of the ECB SPF (0%) and the predictions of inflation and unemployment in 2022 of the "Joint Economic Forecast" of Germany's leading economic research institutes (1.6% and 5.5%), respectively. For readability, we winsorize expectations at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

Figure A.8: Heterogeneity in Firm Expectations: 2020 Survey: Role of Experience in Survey Participation



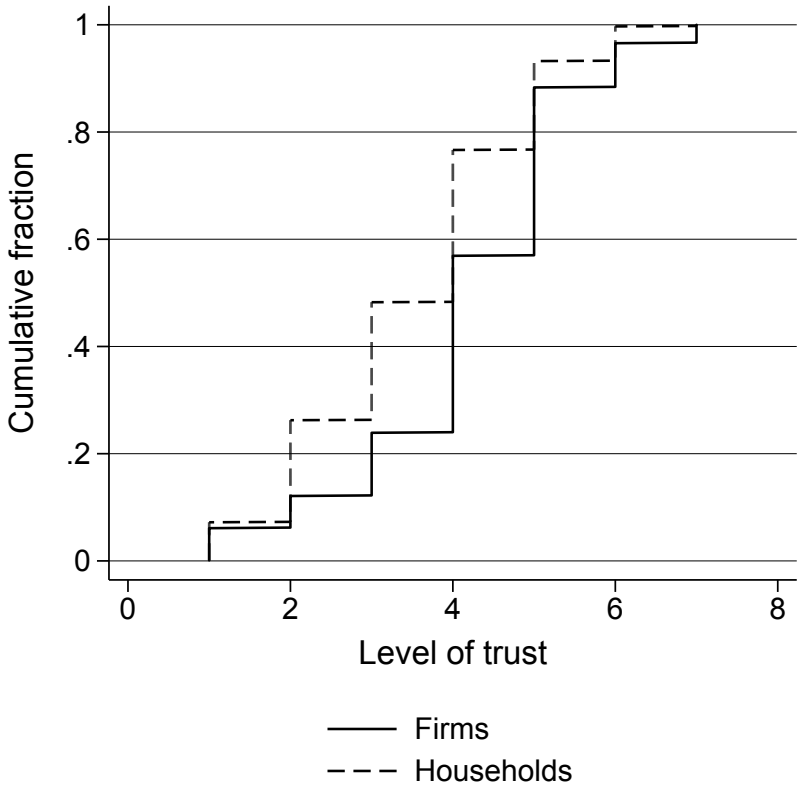
Notes: This Figure shows the cumulative distribution function of firm expectations about the average 2022 ECB policy rate, the average 2025 ECB policy rate, the inflation rate over the year 2022, and the average unemployment rate in 2022 from the German survey of September 2020 using only respondents in the "no anchor" condition. The figure shows the distributions separately for respondents with high, medium, and low experience in answering the regular IBS that usually elicits qualitative firm-specific variables at monthly frequency. We measure survey experience as a firms' number of responses to the regular IBS prior to the September 2020 wave and split the sample at the median and 10th percentile of the distribution. For readability, we winsorize expectations at -1 and 10, 0 and 10, and 0 and 20 for policy rates, inflation, and unemployment, respectively.

Figure A.9: Information Acquisition about Policy Rate: 2019 Survey



Notes: This Figure shows the cumulative distribution function of information acquisition about the ECB policy rate from the German survey of December 2019 in the firm and household samples. The figure shows the responses to the question: "How often have news about the policy rate of the European Central Bank (ECB) come to your attention in the last two weeks?". Respondents answered on the following scale: Never - Once - Between 2 and 3 times - Between 4 and 5 times - More than 5 times. The Figure displays these distributions separately for households and firms.

Figure A.10: Trust in Expert Forecasts among Households and Firms: 2020 Survey



Notes: This Figure shows the cumulative distribution function of trust in economic forecasts of experts as measured in the German survey of September 2020 in the firm and household samples. The figure shows responses to the question: "How much trust do you have in the economic forecasts of experts?" Respondents answered on a scale ranging from [1] "no trust at all" to [7] "very high trust". The Figure displays these distributions separately for households and firms.

Table A.1: Overview of Different Datasets

Sample	Country	Total Sample Size	Date	Treatments
Self-collected Surveys				
Firms Sept. 2020 Wave (ifo Business Survey)	Germany	3,748	September 2020	Info about current ECB policy rate
Households Sept. 2020 Wave (Dynata)	Germany	961	September 2020	Info about current ECB policy rate
Firms Dec. 2019 Wave (ifo Investment Survey)	Germany	471	December 2019	Expert forecast about timing of policy rate hike
Households Dec. 2019 Wave (Dynata)	Germany	3,992	December 2019	Expert forecast about timing of policy rate hike
Other Surveys				
Bank of Italy Survey on Inflation and Growth Expectations (SIGE)	Italy	3,295	2013-2015	None
M&G YouGov Household survey	Italy	6,311	2013-2015	None
Atlanta Fed's Business Inflation Expectations (BIE) Survey	US	582	2014, 2015, 2019	None
NY Fed's Survey of Consumer Expectations (SCE)	US	503	2014, 2015, 2019	None

Notes: This Table provides an overview of the different datasets used in this paper.

Table A.2: Summary Statistics and Balance of Firm Surveys

	Full survey sample (2020 wave)				No anchor	Anchor	p-value
	(1) Mean	(2) Median	(3) SD	(4) N	(5) Mean	(6) Mean	(7) (5) = (6)
Panel A: 2020 wave							
Firm age	53	38	39	2723	52.54	53.87	0.37
Employees	312.69	42.00	2239.94	3735	262.72	364.16	0.17
Export share	0.18	0.09	0.22	3744	0.17	0.18	0.11
East Germany	0.12	0.00	0.32	3748	0.12	0.12	0.94
Negative impact of coronavirus	0.69	1.00	0.46	3635	0.69	0.69	0.80
Equity ratio	0.46	0.40	0.28	2991	0.45	0.46	0.74
Cash to total assets	0.22	0.15	0.22	1942	0.22	0.21	0.31
Any change in loan interest rate in last 6 months	0.08	0.00	0.27	3078	0.07	0.08	0.39
University	0.64	1.00	0.48	3044	0.65	0.63	0.18
Manufacturing Firm	0.37	0.00	0.48	3748	0.35	0.38	0.05
Services Firm	0.38	0.00	0.48	3748	0.38	0.38	0.83
Retail/Wholesale Firm	0.26	0.00	0.44	3748	0.27	0.24	0.02
	Full survey sample (2019 wave)				Increase 2020	Increase 2025	p-value
	(1) Mean	(2) Median	(3) SD	(4) N	(5) Mean	(6) Mean	(7) (5)=(6)
Panel B: 2019 wave							
Employees (2016-2018 mean)	815.96	151.65	6022.83	464	878.05	750.57	0.82
Revenues (2016-2018 mean; in mn.)	351.97	28.07	3643.01	464	430.10	269.69	0.64
Total Investment (2016-2018 mean; in mn.)	11.87	0.82	114.29	464	13.54	10.11	0.75
East Germany	0.30	0.00	0.46	437	0.30	0.29	0.73

Notes: This Table presents summary statistics of the German firm surveys conducted in September 2020 (Panel A) and December 2019 (Panel B). Columns 5 and 6 of Panel A display the sample means separately for respondents that did not receive information about the current rate and those who received the anchor before making their prediction, respectively. Columns 5 and 6 of Panel B display the sample means separately for respondents that obtained information from an expert forecast predicting a policy rate increase in 2020 and for respondents that received an expert forecast predicting an increase in 2025 at the earliest, respectively. Column 7 presents the p-values of a t-test on the equality of the means depicted in Columns 5 and 6. "Negative impact of coronavirus" is a dummy for firms that reported a negative impact of the Covid-19 crisis on their business activity in September 2020. The "Equity ratio", the "Cash to total assets" ratio, and "Any change in loan interest rate in last 6 months" are elicited in the September 2020 wave of the IBS. "University" is a dummy for respondents with a diploma, master, or Ph.D. degree from the February 2020 IBS wave. Firm age and export share are calculated from responses to the September 2018 IBS wave. The number of observations differs across variables as we merge information from different modules and waves of the IBS. In our regressions we deal with non-response as described in Footnote 9. The variables in Panel B refer to average levels of the number of employees, revenues, and total investment the firms reported in the regular ifo Investment Survey during the three years prior to the special survey in December 2019.

Table A.3: Summary Statistics and Balance of Household Surveys

	GSOEP: Full	Full survey sample (2020 wave)				No anchor	Anchor	p-value
	(1) Mean	(2) Mean	(3) Median	(4) SD	(5) N	(6) Mean	(7) Mean	(8) (6) = (7)
Panel A: 2020 wave								
Female	0.51	0.46	0.00	0.50	933	0.46	0.45	0.783
Age	51.81	45.70	50.00	13.53	933	45.25	46.14	0.315
East	0.20	0.20	0.00	0.40	933	0.19	0.22	0.207
Log(HH net income)	7.85	7.90	8.01	0.61	933	7.89	7.90	0.782
At least highschool	0.32	0.59	1.00	0.49	933	0.60	0.59	0.834
Log(HH financial assets + 1)		7.56	9.17	4.16	933	7.72	7.40	0.237
Stockowner		0.34	0.00	0.47	930	0.35	0.34	0.850
Homeowner		0.44	0.00	0.50	933	0.46	0.42	0.146
Debtor		0.37	0.00	0.48	933	0.38	0.35	0.432
	GSOEP: Employed	Full survey sample (2019 wave)				Increase 2020	Increase 2025	p-value
	(1) Mean	(2) Mean	(3) Median	(4) SD	(5) N	(6) Mean	(7) Mean	(8) (6)=(7)
Panel B: 2019 wave								
Female	0.45	0.47	0.00	0.50	3992	0.47	0.47	0.746
Age	45.67	46.18	50.00	11.84	3992	46.33	46.03	0.426
East	0.20	0.19	0.00	0.39	3992	0.17	0.21	0.004
Log(HH net income)	8.04	7.96	8.01	0.58	3992	7.96	7.97	0.512
At least highschool	0.40	0.58	1.00	0.49	3992	0.58	0.58	0.804
Log(HH financial assets + 1)		7.78	9.31	4.15	3992	7.68	7.88	0.132
Stockowner		0.38	0.00	0.49	3992	0.37	0.39	0.113
Homeowner		0.49	0.00	0.50	3992	0.50	0.49	0.945
Debtor		0.42	0.00	0.49	3992	0.42	0.42	0.969
Prior policy rate 2022		0.57	0.10	0.95	3880	0.58	0.55	0.313
Prior policy rate 2025		1.14	1.00	1.22	3796	1.13	1.14	0.928
Prior year policy rate increase		2023.41	2022.00	3.07	3686	2023.31	2023.51	0.042
Prior confidence policy rates (z)		0.00	-0.13	1.00	3992	-0.01	0.01	0.666

Notes: This Table presents summary statistics of the German household surveys conducted in September 2020 (Panel A) and December 2019 (Panel B). For comparison, Column 1 depicts benchmarks from the 2017 wave of the German Socioeconomic Panel (GSOEP), a representative household survey in Germany. Columns 6 and 7 of Panel A display the sample means separately for respondents that did not receive information about the current rate and those who received the anchor before making their prediction, respectively. Columns 6 and 7 of Panel B display the sample means separately for respondents that obtained information from an expert forecast predicting a policy rate increase in 2020 and for respondents that received an expert forecast predicting an increase in 2025 at the earliest, respectively. Column 8 presents the p-values of a t-test on the equality of the means depicted in Columns 6 and 7.

Table A.4: Dispersion of Macro Expectations among Households and Firms: 2020 Survey: Effect of Reweighting the Firm Sample for Comparison with Coibion et al. (2018b)

		Firms - unadjusted				Firms - reweighted				Households				p-value	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Bench-mark	Mean	Median	SD	Mean abs. bias	Mean	Median	SD	Mean abs. bias	Mean	Median	SD	Mean abs. bias	(5)=(9)	(9)=(13)
Expected policy rate															
No Anchor:															
Policy rate 2022	0	0.28	0.00	0.74	0.38	0.28	0.00	0.58	0.36	2.04	0.50	4.23	2.08	0.435	0.000
Policy rate 2025		0.71	0.50	1.43		1.03	0.50	2.40		2.41	1.00	4.21			
Anchor:															
Policy rate 2022	0	0.26	0.00	0.86	0.31	0.36	0.00	1.19	0.40	1.22	0.00	3.05	1.24	0.044	0.000
Policy rate 2025		0.78	0.50	1.10		0.87	0.50	1.07		1.80	1.00	3.63			
Expected inflation															
Inflation 2022	1.6	2.06	1.80	1.69	0.94	2.36	2.00	1.74	1.11	4.53	2.00	5.80	3.23	0.018	0.000
Expected unemployment															
Unemployment 2022	5.5	6.93	6.50	2.52	1.93	7.18	7.00	2.71	2.10	11.03	8.00	9.36	6.11	0.094	0.000

Notes: This Table presents summary statistics of expected average ECB policy rates in 2022 and 2025, the expected inflation rate over the year 2022, and the average unemployment rate in 2022 elicited in the German firm and household surveys in September 2020. Statistics on policy rate expectations are presented separately for respondents that received information about the current rate and those who did not receive the anchor before making their prediction. Columns 2 through 4 depict the mean, median, and standard deviation for each variable in the firm survey, respectively. Column 5 displays the mean absolute deviation of firms' expectations from an expert benchmark depicted in Column 1, i.e., the median forecast of the 2022 policy rate from the October 2020 round of the ECB SPF and the predictions of inflation and unemployment in 2022 of the "Joint Economic Forecast" of Germany's leading economic research institutes, respectively. Columns 6 through 9 present the same statistics for firms after reweighting the sample of firms to make them similar in observables to the New Zealand firms of Coibion et al. (2018b) along the following dimensions: number of employees, export share, and industry composition as described in Appendix C. Columns 10 through 13 present the same statistics for the household sample. The p-values in Columns 14 and 15 reject the null hypotheses that the mean absolute bias from the expert benchmark depicted in Columns 5, 9, and 13 are equal in the respective samples.

Table A.5: Correlates of Households' Prior Beliefs about Policy Rates: 2019 Survey

	Prior beliefs				Information acquisition	
	(1)	(2)	(3)	(4)	(5)	(6)
	Year policy rate increase	Policy rate 2022	Policy rate 2025	Confidence policy rates (z)	Follow news interest rates (z)	Follow news ECB (z)
Female	0.154	0.054	0.041	-0.413***	-0.285***	-0.324***
	(0.114)	(0.034)	(0.044)	(0.035)	(0.034)	(0.033)
Age at least 50	0.107	-0.030	0.032	-0.023	0.075**	0.094***
	(0.108)	(0.032)	(0.041)	(0.032)	(0.031)	(0.032)
Highschool	0.166	-0.095**	-0.096*	0.047	0.043	0.036
	(0.127)	(0.038)	(0.050)	(0.039)	(0.038)	(0.038)
University	0.106	-0.067*	-0.071	0.034	0.108***	0.089**
	(0.127)	(0.036)	(0.048)	(0.038)	(0.038)	(0.038)
Part-time employed (paid)	-0.077	0.021	0.042	-0.142***	-0.021	-0.022
	(0.137)	(0.046)	(0.057)	(0.041)	(0.040)	(0.040)
Self-employed	0.275	-0.053	0.010	0.068	0.144**	0.201***
	(0.191)	(0.051)	(0.072)	(0.058)	(0.059)	(0.062)
Income > €3,000	-0.152	-0.044	-0.031	0.016	-0.027	-0.022
	(0.117)	(0.032)	(0.043)	(0.035)	(0.035)	(0.035)
Financial assets > €11,000	0.300**	-0.174***	-0.170***	0.081**	0.116***	0.115***
	(0.120)	(0.034)	(0.045)	(0.036)	(0.036)	(0.035)
Stockowner	0.064	-0.069**	-0.106**	0.222***	0.404***	0.381***
	(0.119)	(0.032)	(0.044)	(0.037)	(0.038)	(0.037)
Homeowner	0.071	-0.047	-0.047	0.110***	0.037	0.065**
	(0.108)	(0.031)	(0.041)	(0.032)	(0.032)	(0.032)
Debtor	-0.108	0.073**	0.101**	0.057*	0.074**	-0.002
	(0.104)	(0.031)	(0.041)	(0.032)	(0.031)	(0.031)
High numeracy	0.646***	-0.319***	-0.265***	-0.207***	0.096***	0.037
	(0.109)	(0.030)	(0.041)	(0.033)	(0.033)	(0.033)
Main earner	-0.108	0.057**	0.033	-0.037*	0.015	0.014
	(0.068)	(0.022)	(0.028)	(0.021)	(0.020)	(0.020)
High recession exposure	0.184*	-0.051*	-0.053	0.092***	0.149***	0.180***
	(0.101)	(0.030)	(0.040)	(0.031)	(0.030)	(0.030)
Observations	3686	3880	3796	3992	3992	3992
R^2	0.02	0.08	0.04	0.10	0.12	0.12
Mean dep. variable	2023.41	0.57	1.14	-0.00	0.00	-0.00
SD dep. variable	3.07	0.95	1.22	1.00	1.00	1.00

Notes: This Table examines correlates of households' prior beliefs and measures on information acquisition based on the German household survey from December 2019. The dependent variables are the prior beliefs on the expected year of a policy rate increase and the policy rate in 2022 and 2025, households' confidence in their priors about policy rates, and the frequency of news received on interest rates and the ECB in the two weeks prior to the survey, respectively. The outcomes in Columns 4 through 6 are z-scored using the mean and the standard deviation in the corresponding sample. All covariates are coded as dummies and explained in the main text. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table A.6: Dispersion of Inflation Expectations among Households and Firms: United States

		Firms (Atlanta Fed BIE survey)							Households (NY Fed SCE)							p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Bench-mark	Mean	Median	SD	p75-p25	p90-p10	Mean abs. bias	N	Mean	Median	SD	p75-p25	p90-p10	Mean abs. bias	N	(7)=(14)
2014 September:																
Inflation next 12 months	2.10	4.09	3.00	3.53	3.00	6.50	2.33	184	6.06	4.00	5.84	6.00	13.00	4.09	179	0.000
2015 July:																
Inflation next 12 months	2.04	2.65	2.20	2.45	1.00	5.00	1.30	91	6.19	4.00	5.94	5.50	13.50	4.40	153	0.000
2019 April:																
Inflation next 12 months	2.09	2.61	2.20	1.86	1.00	1.43	0.83	210	5.86	3.00	6.28	3.00	13.00	4.02	171	0.000
Pooled:																
Inflation next 12 months		3.01	2.50	2.61	1.00	3.50	1.49	582	6.03	4.00	6.01	5.00	13.00	4.16	503	0.000

Notes: This Table presents summary statistics of expected inflation rates over the next 12 months from firms participating in the Atlanta Fed's Business Inflation Expectations Survey (BIE) and households participating in the New York Fed's Survey of Consumer Expectations (SCE). Statistics are presented separately for the three months in which the BIE elicited expectations about CPI inflation from participating firms, as well as pooling across these three months. The sample for the SCE is restricted to respondents from Alabama, Florida, Georgia, Louisiana, Mississippi, and Tennessee, in line with the sampling frame of the BIE. Columns 2 through 6 depict the mean, median, standard deviation, interquartile range, and the difference between the 90th and 10th percentile for expected inflation in the firm survey, respectively. Column 7 displays the mean absolute deviation of firms' expectations from the median expert forecast taken from the Philadelphia Fed's Survey of Professional Forecasters (SPF). Column 8 presents the number of observations. Columns 9 through 15 present the same statistics for the household sample. The p-values in Column 16 reject the null hypothesis that the mean absolute bias of households and firms from the expert benchmark depicted in Columns 7 and 14 are equal.

Table A.7: Dispersion of Inflation Expectations among Households and Firms: Italy

		Firms (Bank of Italy SIGE)							Households (M&G YouGov Survey)							p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Bench-mark	Mean	Median	SD	p75-p25	p90-p10	Mean abs. bias	N	Mean	Median	SD	p75-p25	p90-p10	Mean abs. bias	N	(7)=(14)
2013 Q2:																
Inflation next 12 months	1.9	2.10	2.00	1.05	1.00	2.50	0.78	340	4.98	3.00	6.17	2.50	8.70	3.31	649	0.000
2013 Q3:																
Inflation next 12 months	1.5	2.00	2.00	1.07	1.00	2.00	0.76	348	4.82	3.00	5.79	3.00	9.50	3.42	627	0.000
2013 Q4:																
Inflation next 12 months	1.5	1.80	1.60	1.40	1.00	2.50	0.88	323	4.46	2.30	6.08	2.50	9.10	3.18	692	0.000
2014 Q1:																
Inflation next 12 months	1.3	1.50	1.30	1.07	1.00	1.50	0.74	352	3.98	2.00	5.75	1.80	9.00	2.89	616	0.000
2014 Q2:																
Inflation next 12 months	1.0	1.47	1.40	0.98	1.10	2.10	0.71	339	4.24	2.00	5.85	2.70	9.00	3.30	652	0.000
2014 Q3:																
Inflation next 12 months	1.1	1.14	1.00	1.11	1.00	2.09	0.75	324	4.03	2.00	5.95	2.10	9.50	3.15	602	0.000
2014 Q4:																
Inflation next 12 months	0.9	1.03	1.00	0.81	1.00	1.90	0.60	315	4.15	2.00	6.12	2.70	11.50	3.41	625	0.000
2015 Q1:																
Inflation next 12 months	1.0	1.09	1.00	0.96	1.00	1.80	0.58	320	4.26	2.00	6.40	3.20	11.50	3.47	632	0.000
2015 Q2:																
Inflation next 12 months	0.7	1.25	1.00	1.49	1.00	1.80	0.76	311	3.99	2.00	6.14	2.00	9.50	3.39	589	0.000
2015 Q3:																
Inflation next 12 months	1.1	1.10	1.00	1.03	1.00	1.80	0.64	323	4.25	2.00	6.50	3.00	11.50	3.40	627	0.000
Pooled:																
Inflation next 12 months		1.46	1.30	1.18	1.30	2.40	0.72	3295	4.32	2.00	6.08	2.80	9.90	3.29	6311	0.000

Notes: This Table presents summary statistics of expected inflation rates over the next 12 months from firms participating in the Bank of Italy's Survey on Inflation and Growth Expectations (SIGE) and households participating in a special survey conducted by YouGov for the investment firm M&G during the years 2013-2015. Statistics are presented separately for the ten quarters in which the M&G YouGov survey was conducted, as well as pooling across these ten quarters. Statistics for both surveys are computed using population weights. The statistics from the firm sample are based on firms in the control group of the experiment used in Coibion et al. (2020b), i.e., they are based on firms that were never provided with inflation-related information. Columns 2 through 6 depict the mean, median, standard deviation, interquartile range, and the difference between the 90th and 10th percentile for expected inflation in the firm survey, respectively. Column 7 displays the mean absolute deviation of firms' expectations from professional forecasts from Consensus Economics. Column 8 presents the number of observations. Columns 9 through 15 present the same statistics for the household sample. The p-values in Column 16 reject the null hypothesis that the mean absolute bias of households and firms from the expert benchmark depicted in Columns 7 and 14 are equal.

Table A.8: Persistence in Households' Learning from Experts' Policy Rate Forecasts: 2019 and Follow-up Survey

	Year policy rate increase	Policy rate 2022	Policy rate 2025	Mortgage rate 2022	Consumer loan rate 2022	Savings account rate 2022	Mortgage access 2022	Consumer loan access 2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Main								
Increase 2020	-1.612***	0.287***	0.266***	0.180***	0.145***	0.127***	-0.043**	-0.046**
	(0.072)	(0.023)	(0.029)	(0.040)	(0.044)	(0.020)	(0.017)	(0.019)
Observations	3758	3896	3828	3859	3864	3818	3992	3992
R^2	0.46	0.40	0.46	0.83	0.80	0.65	0.70	0.63
Panel B: Main follow-up sample								
Increase 2020	-1.493***	0.264***	0.234***	0.180***	0.127**	0.152***	-0.037*	-0.041*
	(0.086)	(0.027)	(0.035)	(0.048)	(0.053)	(0.023)	(0.020)	(0.023)
Observations	2397	2522	2475	2451	2446	2394	2568	2568
R^2	0.48	0.40	0.47	0.83	0.80	0.65	0.73	0.65
Panel C: Follow-up								
Increase 2020	-0.465***	0.105***	0.042	0.232***	0.209**	0.071**	-0.081**	-0.071**
	(0.100)	(0.029)	(0.038)	(0.088)	(0.100)	(0.034)	(0.031)	(0.032)
Observations	2397	2522	2475	2451	2446	2394	2568	2568
R^2	0.24	0.28	0.25	0.28	0.26	0.25	0.38	0.37

Notes: This Table examines the effect of the randomized information provision on posterior expectations of German households provided in the December 2019 survey. "Increase 2020" is a dummy taking value one if the respondent received the forecast predicting a policy rate increase in 2020, and zero if the respondent received the forecast predicting an increase in 2025 at the earliest. Panel A corresponds to Panel A of Table 4 and displays the immediate effect in the December 2019 survey. Panel C reports the effects of the information treatment in a four-week follow up in January 2020. Panel B presents the results based on the main survey in December 2019 for those households that are also in the sample of Panel C. The outcomes in Columns 7 and 8 are z-scored using the mean and the standard deviation in the corresponding sample. In all regressions we control for the same variables as in Panel A of Table 4. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table A.9: Effect of Provision of Expert Forecasts on Other Credit Market Expectations: 2019 and Follow-up Survey

	Real policy rate 2022	Real mortgage rate 2022	Real consumer loan rate 2022	Real savings account rate 2022	Prob. rate incr. 2022	Prob. rate decr. 2022
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Households main						
Increase 2020 (A)	0.251***	0.118***	0.082*	0.090***	13.881***	0.106
	(0.031)	(0.043)	(0.047)	(0.030)	(0.994)	(0.656)
Observations	3838	3794	3797	3769	3992	3992
R^2	0.19	0.80	0.77	0.40	0.19	0.07
Panel B: Households main follow-up sample						
Increase 2020	0.220***	0.101**	0.059	0.103***	14.524***	0.038
	(0.037)	(0.050)	(0.058)	(0.034)	(1.226)	(0.822)
Observations	2267	2251	2247	2205	2596	2596
R^2	0.21	0.82	0.78	0.41	0.20	0.07
Panel C: Households follow-up						
Increase 2020	0.028	0.123	0.148	0.040	5.862***	-1.968**
	(0.050)	(0.090)	(0.105)	(0.054)	(1.302)	(0.859)
Observations	2267	2251	2247	2205	2596	2596
R^2	0.10	0.23	0.22	0.11	0.15	0.07

	Real policy rate 2022	Real firm loan rate 2022
	(1)	(2)
Panel D: Firms		
Increase 2020 (D)	0.019	-0.022
	(0.078)	(0.094)
Observations	400	419
R^2	0.02	0.76
p-value(A=D)	0.005	

Notes: This Table examines the effect of the randomized information provision on posterior expectations of German households reported in the December 2019 survey about real policy rates, own real rates, and the probabilities respondents assign to a rate increase or decrease until 2022. "Increase 2020" is a dummy taking value one if the respondent received the forecast predicting a policy rate increase in 2020, and zero if the respondent received the forecast predicting an increase in 2025 at the earliest. Expectations about real rates are obtained by deflating expected nominal rates by the respondents' expected inflation rate for 2022. Panel A displays the immediate effect in the December 2019 household survey. Panel C reports the effects of the information treatment in a four-week follow up in January 2020. Panel B presents the results based on the main survey in December 2019 for those households that are also in the sample of Panel C. Panel D depicts the results for the firm survey from December 2019. In all regressions we control for the same variables as in Table 4. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table A.10: Heterogeneity in Learning from Experts' Policy Rate Forecasts among Households: 2019 Survey

	Year policy rate increase	Policy rate 2022	Policy rate 2025	Mortgage rate 2022	Consumer loan rate 2022	Savings account rate 2022	Mortgage access 2022	Consumer loan access 2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Increase 2020 (a)	-1.735***	0.260***	0.220***	0.081	0.001	0.109***	-0.010	-0.030
	(0.141)	(0.050)	(0.062)	(0.081)	(0.088)	(0.041)	(0.030)	(0.035)
Increase 2020 ×	0.061	-0.025	0.045	0.157*	0.133	0.017	-0.022	-0.018
Fin. assets > €11,000 (b)	(0.153)	(0.050)	(0.063)	(0.088)	(0.096)	(0.043)	(0.038)	(0.044)
Increase 2020 ×	0.265*	0.032	0.043	0.043	0.066	0.050	-0.016	0.034
Debtor (c)	(0.145)	(0.046)	(0.060)	(0.082)	(0.092)	(0.041)	(0.036)	(0.041)
Increase 2020 ×	0.229	-0.001	-0.008	-0.114	-0.152	-0.021	0.012	-0.001
Income > €3,000 (d)	(0.153)	(0.048)	(0.062)	(0.084)	(0.096)	(0.042)	(0.039)	(0.043)
Increase 2020 ×	-0.217	0.056	0.014	0.094	0.218**	-0.004	-0.040	-0.044
High numeracy (e)	(0.146)	(0.046)	(0.058)	(0.084)	(0.091)	(0.042)	(0.037)	(0.041)
p-value(a+b=0)	0.000	0.000	0.000	0.013	0.171	0.006	0.417	0.296
p-value(a+c=0)	0.000	0.000	0.000	0.189	0.513	0.000	0.493	0.913
p-value(a+d=0)	0.000	0.000	0.009	0.749	0.211	0.098	0.974	0.541
p-value(a+e=0)	0.000	0.000	0.000	0.053	0.026	0.020	0.189	0.084
Observations	3758	3896	3828	3859	3864	3818	3992	3992
R^2	0.46	0.41	0.46	0.83	0.80	0.65	0.70	0.63

Notes: This Table extends the analysis of Panel A of Table 4 for different group of German households in the December 2019 survey. "Increase 2020" is a dummy taking value one if the respondent received the forecast predicting a policy rate increase in 2020, and zero if the respondent received the forecast predicting an increase in 2025 at the earliest. "Increase 2020" is interacted with dummies that take value one for high levels of financial assets, debt, income, or numeracy. The outcomes in Columns 7 and 8 are z-scored using the mean and the standard deviation in the corresponding sample. The p-values testing whether treatment effects for different groups are different from zero are displayed at the bottom of the Table. In all regressions we control for the same variables as in Table 4. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table A.11: Effect of Expected Year of Policy Rate Hike on Other Expectations (IV): 2019 Survey

	Policy rate 2022	Policy rate 2025	Mortgage rate 2022	Consumer loan rate 2022	Savings account rate 2022	Mortgage access 2022	Consumer loan access 2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Households							
Year policy rate increase (A)	-0.182***	-0.166***	-0.117***	-0.088***	-0.081***	0.030***	0.032***
	(0.015)	(0.018)	(0.025)	(0.028)	(0.013)	(0.011)	(0.012)
Observations	3680	3630	3644	3652	3608	3758	3758
R^2	0.37	0.46	0.84	0.81	0.64	0.70	0.62
Mean dep. variable	0.65	1.27	4.04	4.63	0.64	0.01	0.02
SD dep. variable	0.92	1.21	3.01	3.07	1.03	0.99	0.99
First stage F-stat	511.71	508.57	490.10	483.60	496.56	506.01	506.01

	Policy rate 2022	Policy rate 2025	Firm loan rate 2022	Firm loan access 2022
	(1)	(2)	(3)	(4)
Panel B: Firms				
Year policy rate increase (B)	-0.141	-0.090	0.022	-0.011
	(0.102)	(0.174)	(0.155)	(0.118)
Observations	387	387	381	399
R^2	0.24	0.21	0.85	0.64
Mean dep. variable	0.28	0.99	2.81	0.01
SD dep. variable	0.60	0.94	1.90	1.01
First stage F-stat	4.44	4.08	3.83	4.33
p-value(A=B)	0.688	0.661		

Notes: This Table examines the effect of the expected year of a policy rate hike on other expectations of German households (Panel A) and firms (Panel B). The expected year of a rate hike is instrumented with the "Increase 2020" dummy, which takes value one if the respondent received the forecast predicting a policy rate increase in 2020, and zero if the respondent received the forecast predicting an increase in 2025 at the earliest. The outcomes in Panel A Columns 6 and 7 and Panel B Column 4 are z-scored using the mean and the standard deviation in the corresponding sample. In all regressions we control for the same variables as in Table 4. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table A.12: Learning from Experts' Policy Rate Forecasts: Robustness to Trimming Choices – 2019 Survey

	Year policy rate increase	Policy rate 2022	Policy rate 2025	Mortgage rate 2022	Consumer loan rate 2022	Savings account rate 2022	Mortgage access 2022	Consumer loan access 2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Households trimmed (baseline)								
Increase 2020	-1.612***	0.287***	0.266***	0.180***	0.145***	0.127***	-0.043**	-0.046**
	(0.072)	(0.023)	(0.029)	(0.040)	(0.044)	(0.020)	(0.017)	(0.019)
Observations	3758	3896	3828	3859	3864	3818	3992	3992
R^2	0.46	0.40	0.46	0.83	0.80	0.65	0.70	0.63
Panel B: Households winsorized								
Increase 2020	-1.523***	0.261***	0.251***	0.185***	0.150***	0.128***	-0.043**	-0.046**
	(0.072)	(0.025)	(0.031)	(0.044)	(0.047)	(0.020)	(0.017)	(0.019)
Observations	3992	3992	3992	3992	3992	3992	3992	3992
R^2	0.52	0.48	0.51	0.85	0.83	0.77	0.70	0.63
	Year policy rate increase	Policy rate 2022	Policy rate 2025	Firm loan rate 2022	Firm loan access 2022			
	(1)	(2)	(3)	(4)	(5)			
Panel C: Firms trimmed (baseline)								
Increase 2020	-0.519**	0.035	0.018	-0.020	-0.038			
	(0.244)	(0.057)	(0.093)	(0.071)	(0.058)			
Observations	401	430	428	436	463			
R^2	0.03	0.03	0.04	0.85	0.62			
Panel D: Firms winsorized								
Increase 2020	-0.437*	-0.011	-0.046	-0.160	-0.038			
	(0.264)	(0.120)	(0.127)	(0.143)	(0.058)			
Observations	416	466	466	466	463			
R^2	0.03	0.13	0.10	0.82	0.62			

Notes: This Table provides a robustness check of the results presented in Table 4. Panels A and C correspond to the baseline estimations of Table 4 that trim the data at thresholds of 2030 for the year of a rate hike, of -1 and 5 percent for policy rates, of 0 and 5 percent for inflation, of 15 percent for unemployment, of 0 and 15 percent for own interest rates, and of -20 and 40 percent for income growth. Panels B and D present results when winsorizing the data at the same thresholds. For variable descriptions and information on control variables refer to the note in Table 4. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table A.13: Learning from Experts' Policy Rate Forecasts: Robustness to Omission of Control Variables - 2019 Survey

	Year policy rate increase	Policy rate 2022	Policy rate 2025	Mortgage rate 2022	Consumer loan rate 2022	Savings account rate 2022	Mortgage access 2022	Consumer loan access 2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Households								
Increase 2020 (A)	-1.694***	0.303***	0.269***	0.252**	0.073	0.150***	-0.061*	-0.054*
	(0.092)	(0.029)	(0.039)	(0.098)	(0.099)	(0.033)	(0.032)	(0.032)
Observations	3758	3896	3828	3859	3864	3818	3992	3992
R^2	0.08	0.03	0.01	0.00	0.00	0.01	0.00	0.00
Mean dep. variable	2023.32	0.63	1.22	4.05	4.63	0.62	-0.00	0.00
SD dep. variable	2.93	0.92	1.22	3.04	3.08	1.03	1.00	1.00

	Year policy rate increase	Policy rate 2022	Policy rate 2025	Firm loan rate 2022	Firm loan access 2022
	(1)	(2)	(3)	(4)	(5)
Panel B: Firms					
Increase 2020 (B)	-0.513**	0.032	0.018	-0.039	0.036
	(0.241)	(0.057)	(0.092)	(0.180)	(0.093)
Observations	403	432	430	437	463
R^2	0.01	0.00	0.00	0.00	0.00
Mean dep. variable	2023.44	0.26	0.95	2.80	0.00
SD dep. variable	2.43	0.59	0.95	1.87	1.00
p-value(A=B)	0.000	0.000	0.012		

Notes: This Table examines the effect of the randomized information provision on posterior expectations of German households (Panel A) and firms (Panel B). "Increase 2020" is a dummy taking value one if the respondent received the forecast predicting a policy rate increase in 2020, and zero if the respondent received the forecast predicting an increase in 2025 at the earliest. The outcomes in Panel A Columns 7 and 8 and Panel B Column 5 are z-scored using the mean and the standard deviation in the corresponding sample. In contrast to Table 4, the regressions do not control for additional variables. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

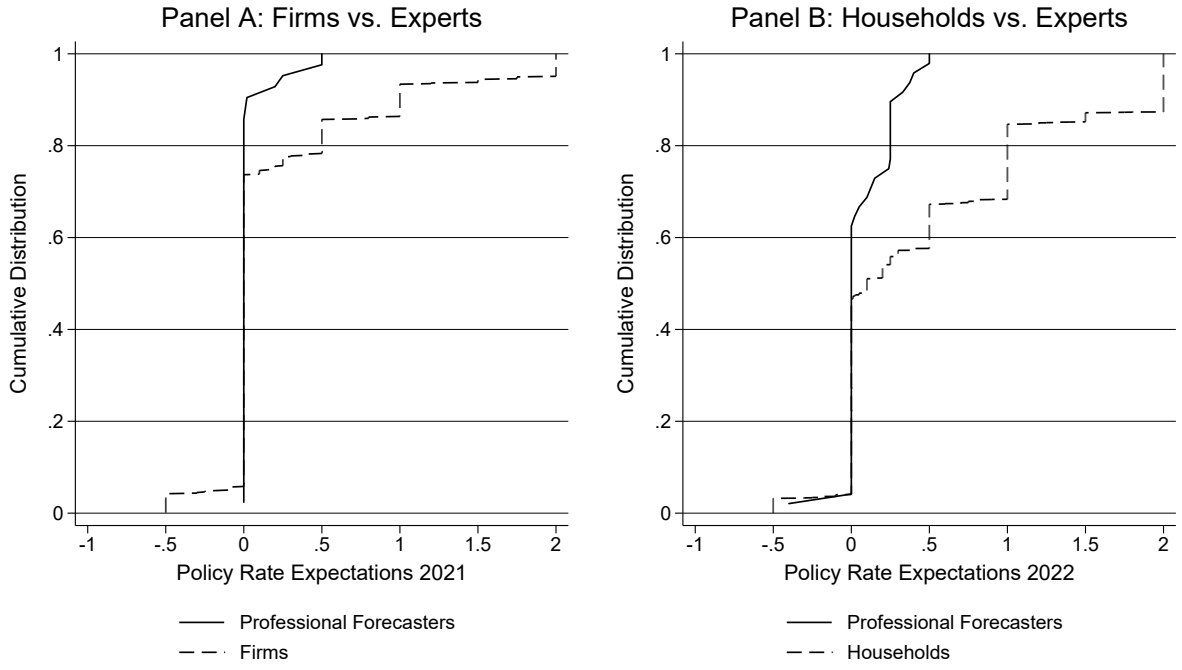
B Expectations about Policy Rates from Pre-Corona Period

We provide additional evidence on information frictions using our surveys conducted in 2019, i.e., prior to the coronavirus pandemic, on the ifo Investment Survey and on a representative household sample. We compare households' and firms' forecasts to those of experts participating in the ECB Survey of Professional Forecasters (SPF). Firms and households had been anchored on the policy rate of zero percent that prevailed at the time of the surveys before reporting their expectations. We winsorize predictions at -0.5 percent and 2 percent across all datasets for expositional purposes, but our findings are not sensitive to this choice.

Results Panel A of Figure B.1 displays the cumulative density function of firms' and experts' beliefs about the ECB policy rate 2021. Since our main firm survey in December 2019 did not allow us to elicit prior beliefs due to the paper and pencil format, we rely on a question we included in the previous regular round of the ifo Investment Survey conducted in September and October 2019, which we compare to expert forecasts from the October 2019 round of the SPF. As can be seen, firms' expectations are quite closely aligned with those of the professional forecasters. Firms predict a policy rate of 0.22 percent on average for the year 2021, while experts predict a policy rate of 0.04 percent on average. Moreover, 80 percent of firms in our sample expect a policy rate between 0 percent and 0.5 percent, within the range of forecasts given by the professionals.
Panel B of Figure B.1 shows the cumulative density function of household expectations about the ECB policy rate in 2022 as well as expert predictions taken from the January 2020 round of the SPF. Households on average expect a policy rate of 0.51 percent for the year 2022, higher than the average rate predicted by experts (0.09 percent). Moreover, 64 percent of households in our sample expect a policy rate between -.4 percent and 0.5 percent, within the range of the expert forecasts.

Discussion In line with our main evidence, households' expectations about policy rates seem to be less aligned with those of experts compared to firms' expectations. There are some caveats one should keep in mind in the interpretation of these results from our 2019 surveys. First, given that we provided both firms and households with information about the current policy rate, the differences in expectations we detect in this survey can be seen as a lower bound (see our evidence on the effect of the anchor in Section 2.6). Second, firms' and households' expectations concern different reference years, 2021 and 2022, which is due to availability of expert forecasts only for 2021 at the time of the October 2019 round of the ifo Investment Survey.

Figure B.1: Prior Policy Rate Expectations from before the Coronavirus Pandemic



Notes: Panel A shows the cumulative distribution functions of firms' and experts' expectations about the policy rate in 2021 based on a supplementary survey question in the regular ifo Investment Survey conducted in September and October 2019 and the October 2019 round of the ECB SPF, respectively. Panel B shows the cumulative distribution functions of households' and experts' expectations about the policy rate in 2022 based on a representative household survey conducted in December 2019 and the January 2020 wave of the ECB SPF, respectively. Predictions are winsorized at -0.5 percent and 2 percent across all datasets for expositional purposes.

C Reweighting Exercise for Comparison with Coibion et al. (2018b)

We document that deviations from expert forecasts and dispersion in expectations are more pronounced among German households than among German firms. This contrasts with Coibion et al. (2018b), who find similar degrees of bias and dispersion in samples of households and firms in New Zealand. One potential explanation for the differences between our findings and those in Coibion et al. (2018b) are observable differences between the samples of firms from New Zealand and Germany. This Appendix section provides details on the reweighting exercise that we use in Section 2.7 to shed light on this issue.
Specifically, we first reweight our sample of German firms such that it is similar in observables to the firms in the New Zealand sample of Coibion et al. (2018b), and then compare the distributions of expectations in the reweighted firm sample to our original firm sample and our sample of households. For this purpose, we use the micro data of firms in New Zealand in the first survey wave of Coibion et al. (2018b). The data are publicly available at the AEA website for replication purposes.
We reweight the firms in our sample to make them similar to the New Zealand firms with respect to the number of employees, export status, and industry composition, as these variables appear to be the most important correlates of deviations of firms' expectations from expert forecasts in our data (see Table 2). To keep the number of firms per cell sufficiently high, we create 18 cells based on three groups of firm size (less than 20 employees, between 20 and 49 employees, and 50 and more employees)[1], two groups with respect to export status (exporting firm vs. non-exporting firm), and three groups of broad industries (manufacturing, services, and retail/wholesale trade).
As documented in Columns 1 and 3 of Table C.1, our sample of firms differs substantially from the sample used by Coibion et al. (2018b).[2] First, there are 31 percent small, 23 percent medium-sized, and 46 percent large firms in our sample of German firms. By contrast, there are 73 percent small, 15 percent medium-sized, and 12 percent large firms in New Zealand.[3] Second, our sample consists of 35 percent manufacturing firms, 37 percent services firms, and 28 percent retail and wholesale firms. In New Zealand these shares are 14 percent, 54 percent, and 32 percent, respectively. Third, 61 percent of firms in the German sample export, while only 8 percent of firms in New Zealand export.

[1] We choose thresholds at 20 and 50 employees for the sake of comparability with the summary statistics on New Zealand firms reported in Coibion et al., 2018b.

[2] Table C.1 presents the distribution of firms reporting inflation expectations to our survey. As the distributions of firms reporting policy rate or unemployment expectations differ only slightly, we do not present the distributions of firms for these cases. To construct the reweighted samples for policy rate or unemployment expectations used in Table A.4 and Figure A.7, we conduct the reweighting exercise separately for the respective subsamples of firms.

[3] Importantly, Coibion et al. (2018b) use sample weights to ensure representativeness of their sample of firms with respect to the universe of firms in New Zealand. Consequently, we target the distribution of their reweighted firm sample using the sample weights provided in their micro data. However, the results of the reweighting exercise are similar if we target the firm distribution in their raw data.

Then, firms in each of the 18 size class $\times$ export status $\times$ industry cells are reweighted such that the distribution of cells in the reweighted German sample mimics the distribution of firms in New Zealand. As can be inferred from Columns 2 and 3 of Table C.1, the reweighted sample of German firms is similar to New Zealand firms in terms of the number of employees, export status, and industry composition. Table A.4 and Figure A.7 compare the distributions of macroeconomic expectations in our reweighted sample with our unweighted firm sample and our household sample.

Table C.1: Summary Statistics of Reweighting Exercise for Comparison with Coibion et al. (2018b)

	German Firms		NZ firms
	(1) unadjusted	(2) reweighted	(3)
Number of employees e:			
$e < 20$	0.31	0.73	0.73
$20 \leq e < 50$	0.23	0.15	0.15
$e \geq 50$	0.46	0.12	0.12
Exporter	0.61	0.08	0.08
Manufacturing firm	0.35	0.14	0.14
Services firm	0.37	0.54	0.54
Retail/Wholesale firm	0.28	0.32	0.32

Notes: This Table presents summary statistics of our sample of German firms and firms in New Zealand with respect to the number of employees, export status, and industry composition, as these variables appear to be the most important correlates of deviations of firms' expectations from expert forecasts in our data (see Table 2). Column 1 presents statistics for the German sample of firms reporting inflation expectations to our survey (see Footnote 2). Column 3 presents statistics for New Zealand firms based on the micro data of the first survey wave of Coibion et al. (2018b), which is publicly available at the AEA website for replication purposes. We reweight the New Zealand sample based on the sample weights used by Coibion et al. (2018b) for the sake of comparability to their results. Column 2 presents statistics for the reweighted sample of German firms after targeting the distribution of firms in New Zealand that is used in Table A.4 and Figure A.7.

D Additional Evidence: Effects on Other Expectations about the Macroeconomy and Own Circumstances

Our main focus is on the relative strength of information frictions among firms and households. However, our December 2019 survey also allow us to provide evidence on the role of expectations about future monetary policy in shaping respondents' expectations about the broader economy and their own situation. Forward guidance about the future path of policy rates has become a frequently used tool to change agents' expectations about future inflation in environments where the policy rate has reached the zero lower bound.

Macroeconomic Expectations Learning that the central bank is planning to leave interest rates low for longer than previously thought could also affect firms' and households' expectations about unemployment and inflation. On the one hand, agents could perceive more accommodating monetary policy to lead to higher demand, resulting in lower unemployment and higher inflation. On the other hand, the central bank's decision to keep interest rates low for longer could be perceived as a reaction to negative news about future demand, leading agents to expect higher unemployment and lower inflation (Wiederholt, 2015). The question of how economic agents interpret forecasts about the timing of policy rate hikes is central for monetary policy communication, and ultimately determines the potential of forward guidance about future interest rates to change economic decisions.
As shown in Table D.1 below, households exposed to the "Increase 2020" treatment expect somewhat higher inflation in 2022 and somewhat higher unemployment in 2020. Movements of inflation and unemployment expectations into the same direction are inconsistent both with a view that lower interest rates lead to higher demand and with an interpretation that lower policy rates are a reaction to lower demand. Instead, they are consistent i) with households taking a "supply-side" view of the world, and interpreting the announcement of lower interest rates as the central bank's reaction to a negative supply shock; or ii) with households perceiving a positive effect of interest rate hikes on inflation, consistent with recent evidence (Andre et al., 2019). However, changes in expectations are insignificant for inflation in 2020 and unemployment in 2022, are only of small size, and do not persist in a four-week follow-up.

Expectations about Own Circumstances This is also reflected in households' expectations about labor income growth and personal unemployment risk, and firms' expectations about changes in their product prices, the growth of employee wages, as well as changes in demand or profit margin, which are all unaffected by the information (Table D.1). Taken together, the policy rate forecast has no strong effects on expectations about aggregate unemployment or inflation or on households' and firms' expected own income and business situation.

Discussion These findings suggest that communication about the duration of the zero lower bound environment may not be successful in changing economic agents' expecta-

tions about the broader economy or their own circumstances beyond the effects on interest rate expectations. These findings are in line with evidence by Coibion et al. (2020a) that information about policy rates has no meaningful effects on households' expectations about aggregate unemployment. However, in contrast to our findings, Coibion et al. (2020a) detect stronger reactions of households' inflation expectations to interest rate projections in an environment outside the zero lower bound.

Table D.1: Effect of Provision of Expert Forecasts on Expectations about Macroeconomy and Own Circumstances: 2019 and Follow-up Survey

	Inflation 2020	Inflation 2022	Unempl. rate 2020	Unempl. rate 2022	Annual labor inc. growth 3 years	Pers. unempl. risk 2020	Pers. unempl. risk 2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Households main							
Increase 2020	0.023	0.043*	0.076*	0.076	0.128	-0.280	-0.361
	(0.018)	(0.023)	(0.042)	(0.063)	(0.200)	(0.564)	(0.586)
Observations	3940	3897	3940	3911	3866	3953	3943
R^2	0.09	0.12	0.05	0.06	0.12	0.10	0.13
Panel B: Households main follow-up sample							
Increase 2020	0.032	0.047*	0.113**	0.115	0.117	-0.055	-0.474
	(0.021)	(0.027)	(0.049)	(0.075)	(0.226)	(0.683)	(0.741)
Observations	2405	2305	2358	2308	2450	2533	2528
R^2	0.06	0.09	0.06	0.08	0.12	0.12	0.14
Panel C: Households follow-up							
Increase 2020	0.003	0.060	0.204*	0.157	-0.052	0.563	-0.351
	(0.042)	(0.045)	(0.109)	(0.121)	(0.221)	(0.654)	(0.714)
Observations	2405	2305	2358	2308	2450	2533	2528
R^2	0.05	0.06	0.06	0.05	0.09	0.08	0.10

	Inflation 2020	Inflation 2022	Unempl. rate 2020	Unempl. rate 2022	Product price change 2022	Employee wage growth 2022	Demand change 2022	Profit margin change 2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel D: Firms								
Increase 2020	-0.002	-0.014	-0.026	-0.115	0.273	-0.087	-0.054	0.018
	(0.036)	(0.063)	(0.065)	(0.121)	(0.297)	(0.205)	(0.092)	(0.095)
Observations	452	442	458	452	459	459	465	466
R^2	0.02	0.05	0.02	0.02	0.10	0.12	0.06	0.03
p-value(A=D)	0.523	0.396	0.185	0.159				

Notes: This Table examines the effect of the randomized information provision on posterior expectations about the macroeconomy and own circumstances of households (Panels A through C) and firms (Panel D). "Increase 2020" is a dummy taking value one if the respondent received the forecast predicting a policy rate increase in 2020, and zero if the respondent received the forecast predicting an increase in 2025 at the earliest. Panel A displays the immediate effect in the December 2019 household survey. Panel C reports the effects of the information treatment in a four-week follow up in January 2020. Panel B presents the results based on the main survey in December 2019 for those households that are also in the sample of Panel C. Panel D depicts the results for the firm survey from December 2019. In all regressions we control for the same variables as in Table 4. Robust standard errors are displayed in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

E Survey Instructions: September 2020 Surveys

E.1 Survey Instructions in English (Firms September 2020)

Due to space constraints, each firm participating in the ifo Business Survey (IBS) only responded to two questions in total (in addition to the regular questions). For this purpose, the sample of firms was randomly divided into six groups. To indicate the ordering and assignment of questions to these groups, we refer to "G1Q1" as the first question firms in the first group received, while "G6Q2" refers to the second question firms in the sixth group were assigned to, and so on.

Expectations about Interest Rates: No Anchor

[G3Q1 and G4Q2:] What do you think will the policy rate be on average in 2022: __%

[G6Q1:] What do you think will the policy rate be on average in 2025: __%

Expectations about Interest Rates: With Anchor

[G1Q2 and G2Q1:] Currently the policy rate of the ECB is 0%. What do you think will the policy rate be on average in 2022: __%

[G5Q1:] Currently the policy rate of the ECB is 0%. What do you think will the policy rate be on average in 2025: __%

Expectations about Inflation and Unemployment

[G3Q1 and G4Q2:] What do you expect the inflation rate to be over the year 2022? __%

[G1Q1 and G2Q2:] What do you expect the unemployment rate to be on average in the year 2022. __%

Trust

[G5Q2 and G6Q2:] How much trust do you have in the economic forecasts of experts? __ (1 = no trust at all, 7 = very high trust).

Additional Questions from IBS

In addition to these supplementary survey questions, we use the following survey questions from other modules and waves of the IBS:

Impact of Coronavirus Crisis [September 2020]: Do you realize an effect of the Corona pandemic on your current business situation? Is this effect negative or positive?
negative ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ $+1$ ☐ $+2$ ☐ $+3$ positive

Equity Ratio [September 2020]: How high was your company's equity ratio at the end of 2019? __%

Cash to Total Assets [September 2020]: How high were the "cash and cash equivalents" of your company in % of total assets in June 2020? __%

Any Change in Loan Interest Rate in last 6 Months [September 2020]: Has the interest rate your company pays on loans changed since March 2020? ☐ yes ☐ no

Level of Education of Respondent [February 2020]: What is your highest educational degree? Categories:
☐ Below high school ☐ A-levels (or equivalent) ☐ Completed vocational training ☐ Bachelor or master (vocational) ☐ Diploma or Master (University) ☐ Doctorate ☐ Other

Export Share [September 2018]: What percentage of your sales does your company/firm generate abroad? __%

Founding Year [September 2018]: In which year was your company/firm founded? __

E.2 Survey Instructions in English (Households September 2020)

Attention Check

The next question is about the following problem. In questionnaires like ours, sometimes there are participants who do not carefully read the questions and just quickly click through the survey. This means that there are a lot of random answers which compromise the results of research studies. To show that you read our questions carefully, please enter "Very strongly interested" and "Not at all interested" as your answers to the next question. How interested are you in politics?
Very strongly interested - Strongly interested A little bit interested - Almost not interested - Not at all interested

Explanation

Over the course of this survey we will repeatedly ask you things about your household, for instance about the net income of your household. By household we mean all family members whom you share your primary residence with, excluding housemates and subtenants.

Background Characteristics

What is your current employment relationship? full-time employed - part-time employed - self-employed (full-time) - self-employed (part-time) - job-seeking/unemployed - retired/pensioned - housekeeping - in full-time education/apprenticeship - parental leave - temporary leave from work - permanent leave from work other: __
What is your gender? male - female

What is your age? 18-24 - 25-34 - 35-44 - 45-54 - 55-64 - over 64

What do you think is your household's monthly disposable net income? Disposable net income refers to the amount of income that the household has available after taxes and transfers.

Which federal state do you live in?
What is your highest level of education?
School-leaving certificate from: Special school - Lower secondary school - Polytechnic secondary school (POS), 8th grade (GDR degree) - Secondary school - Polytechnic secondary school (POS), 10th grade (GDR degree) - Advanced technical college - High school - Extended comprehensive school (EOS) (GDR degree) or professional education with Abitur (GDR degree) - Other: __

Expectations about Interest Rates: No Anchor

What do you think will the policy rate be on average in 2022: __%

How certain are you about your estimate about the development of the ECB policy rate?
very certain - certain - uncertain - very uncertain

What do you think will the policy rate be on average in 2025: __%

How certain are you about your estimate about the development of the ECB policy rate?
very certain - certain - uncertain - very uncertain

Expectations about Interest Rates: With Anchor

Currently the policy rate of the ECB is 0%.

What do you think will the policy rate be on average in 2022: __%

How certain are you about your estimate about the development of the ECB policy rate?
very certain - certain - uncertain - very uncertain

What do you think will the policy rate be on average in 2025: __%

How certain are you about your estimate about the development of the ECB policy rate?
very certain - certain - uncertain - very uncertain

Expectations about Inflation and Unemployment

What do you expect the inflation rate to be over the year 2022? __%

How certain are you about your estimate about the development of the inflation rate?
very certain - certain - uncertain - very uncertain

What do you expect the unemployment rate to be on average in the year 2022. __%

How certain are you about your estimate about the development of the unemployment rate?
very certain - certain - uncertain - very uncertain

Trust

How much trust do you have in the economic forecasts of experts? (1 = no trust at all, 7 = very high trust).

How much trust do you have in the ECB? (1 = no trust at all, 7 = very high trust).

Numeracy

Next we would like to ask you five questions to see how people use numbers in everyday life.

In a sale, a shop is selling all items at half price. Before the sale, a sofa costs 300 Euros. How much will it cost in the sale? __

Let's say you have 200 Euro in a savings account. The account earns ten per cent interest per year. Interest accrues at each anniversary of the account. If you never withdraw money or interest payments, how much will you have in the account at the end of two years?
__

In the BIG BUCKS LOTTERY, the chances of winning a 10,000 Euro prize are 1%. What is your best guess about how many people would win a 10,000 Euro prize if 1,000 people each buy a single ticket from BIG BUCKS? __people

If the chance of getting a disease is 10 percent, how many people out of 1,000 would be expected to get the disease? __people

The chance of getting a viral infection is 0.0005. Out of 10,000 people, about how many of them are expected to get infected? __people

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money in this account?
More than today - The same as today - Less than today

Please tell me whether this statement is true or false: Buying a single company's stock usually provides a safer return than a share of a stock mutual fund with the same value.
True - False

Additional Demographics I

Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks when it comes to financial investment? 1 - Unwilling to take risk; 10 - Fully prepared to take risk.

Are you generally a patient person or an impatient person? 1- Very patient; 10 - Very impatient.

How often have news about the policy rate of the European Central Bank (ECB) come to your attention in the last two weeks? Never - Once - Between 2 and 3 times - Between 4 and 5 times - More than 5 times

How often have news about interest rates in general come to your attention in the last two weeks? Never - Once - Between 2 and 3 times - Between 4 and 5 times - More than 5 times

How often have news about the inflation rate come to your attention in the last two weeks? Never - Once - Between 2 and 3 times - Between 4 and 5 times - More than 5 times

How often have news about the unemployment rate come to your attention in the last two weeks? Never - Once - Between 2 and 3 times - Between 4 and 5 times - More than 5 times

To what degree do you agree with the following statements? fully agree, rather agree, neither agree nor disagree, rather disagree, fully disagree

- I usually follow news about the economy.
- My job security depends on the overall business cycle.
- A recession would impair the financial situation of my household.

Coronavirus Perceptions

What influence does the coronavirus crisis exert on the economic situation of your household?
Very negative influence - Negative influence - No influence - Positive influence- Very positive influence

Do you worry about your health or the health of other household members because of the coronvirus crisis?
No worries at all - Little worries - Moderate worries - Big worries - Very big worries

Assets and Debt

What do you estimate the value of your household's current accounts, savings accounts and demand deposit accounts to be? (Please enter zero if your household does not hold any current accounts, savings accounts or demand deposit accounts)

—

What do you estimate the value of your household's total holdings of stocks and stock mutual funds to be? (Please enter zero if your household does not hold any stocks/stock mutual funds.)

—

What do you estimate the value of your household's total holdings of other financial assets including money market funds, building loan contracts, or government and corporate bonds to be? (Please enter zero if your household does not hold any other financial assets.)

—

What do you estimate the total value of your household's holdings of real estate, including your primary residence (if it is owned by your household) to be? (Please enter zero if your household does not own any real estate.)

—

What do you estimate your household's total outstanding housing debt (mortgage debt and home equity loans) to be? (Please enter zero if your household does not hold any housing debt.)

—

What is your estimate of your household's total outstanding non-housing debt? This includes installment loans, outstanding balances on credit cards, student loans, and auto loans. (Please enter zero if your household does not hold any non-housing debt.)

—

Additional Demographics II

How many people live in your households?

In which industry do you work? [drop-down]

What is your main occupation? [drop-down]

Who is the main earner in your household?
You - Your spouse - You and your spouse earn the same amount - Another person

Who in your household is most knowledgeable regarding the finances of your household? By this we mean the household member who has the best overview of income, financial accounts, pension schemes, and real estate holdings.

I am most knowledgeable about the household's finances. - My spouse is most knowledgeable about the household's finances. - My spouse and I are equally knowledgeable about the household's finances - Another person.
Does your household use your main residence . . .
. . . as main owner - . . . as partial owner - . . . as renter - . . . for free

Does your household own stocks or stock mutual funds?
Yes - No

For which party have you voted in the general election of 2017?
Conservatives - Social Democrats - Greens - Liberals - Alternative for Germany - Left - Other - Have not voted - Prefer not to say

F Survey Instructions: December 2019 Surveys

F.1 Survey Instructions in English (Firms December 2019)

Information Treatment

Arm: Increase 2020

Currently the policy rate of the ECB is 0%. According to an expert who regularly participates in an expert survey of the ECB, the policy rate of the ECB will rise to a higher level in the third quarter of 2020 (next summer).

Arm: Increase 2025

Currently the policy rate of the ECB is 0%. According to an expert from a German Bank, the policy rate of the ECB will rise to a higher level at the earliest in 2025 (in five years).

Macroeconomic Expectations

Over the course of this survey we will repeatedly ask you things about your assessment in percentage terms. If you think that the respective probability/percentage change is X%, then please enter X.

Inflation refers to the percent increase in the general price level measured by the so-called Consumer Price Index. What do you expect the inflation rate to be in the following years?
__% over the year 2020.
__% over the year 2022.

The current unemployment rate in Germany is 5.0%. What do you expect the unemployment rate to be on average in the following years?
__% in the year 2020.
__% in the year 2022.

Credit Market Perceptions

How difficult do you think it is (will be) for German firms with similar characteristics as your firm (sector, number of employees, revenue) to ...
a) ...currently take out a loan to finance investment? very difficult - difficult - neither difficult nor easy - easy - very easy
b) ...take out a loan to finance investment in 2022? very difficult - difficult - neither hard nor easy - easy - very easy

What do you think would be the interest rate that German firms with similar characteristics as your firm (sector, number of employees, revenue) would have to pay on average if

they...
a) ... take out a loan to finance investment today? The interest rate would be __%
b) ... take out a loan to finance investment in the year 2022? The interest rate would be __%

Business Expectations

By how many percent will the following quantities change each year on average over the next three years? (If you expect a decrease, please enter negative percent value.)
Average price of your Firm's products __%
Average hourly wage of your firm's employees __%

How will the following quantities change until the end of 2022 compared to today?
. . . the demand for your firm's products? strongly increase - increase - neither increase nor decrease - decrease - strongly decrease
. . . the profit margin of your firm? strongly increase - increase - neither increase nor decrease - decrease - strongly decrease

Interest Rate Expectations

In what year do you think will the policy rate of the ECB rise to a level above 0%?
____ .

What do you think will the policy rate be on average ...
__% in 2022
__% in 2025

How certain are you about your expectations about the policy rate of the ECB?
very certain - certain - uncertain - very uncertain

News Consumption

How often in the last two weeks came news about the key interest rate of the European Central Bank (ECB) to your attention? Never - Once - Between 2 and 3 times - Between 4 and 5 times - More than 5 times

Trust in ECB

How much trust do you have in the ECB? Please enter a number between 0 and 10 (0 = no trust at all, 10 = very high trust).

Information about the Respondent

How much influence do you personally have in your firm when it comes to the following decisions:

…investment decisions?
very much influence - much influence - neither much nor little influence - little influence - very little influence

…production decisions?
very much influence - much influence - neither much nor little influence - little influence - very little influence

…personnel decisions (recruitment and dismissals)?
very much influence - much influence - neither much nor little influence - little influence - very little influence

What fraction of the revenue of your company is generated abroad?
__% within the Euro area (excluding Germany)
__% outside the Euro area

F.2 Survey Instructions in English (Households December 2019)

Attention Check

The next question is about the following problem. In questionnaires like ours, sometimes there are participants who do not carefully read the questions and just quickly click through the survey. This means that there are a lot of random answers which compromise the results of research studies. To show that you read our questions carefully, please enter "Very strongly interested" and "Not at all interested" as your answers to the next question. How interested are you in politics?
Very strongly interested - Strongly interested A little bit interested - Almost not interested - Not at all interested

Explanation

Over the course of this survey we will repeatedly ask you things about your household, for instance about the net income of your household. By household we mean all family members whom you share your primary residence with, excluding housemates and subtenants.

Background Characteristics

What is your current employment relationship? full-time employed - part-time employed - self-employed (full-time) - self-employed (part-time) - job-seeking/unemployed - retired/pensioned - housekeeping - in full-time education/apprenticeship - parental leave - temporary leave from work - permanent leave from work other: __
What is your gender? male - female

What is your age? 18-24 - 25-34 - 35-44 - 45-54 - 55-64 - over 64

What do you think is your household's monthly disposable net income? Disposable net income refers to the amount of income that the household has available after taxes and transfers.

Which federal state do you live in?

Prior Beliefs about Interest Rates

Currently the key interest rate of the ECB is 0%.

When do you think will the policy rate of the ECB rise to a level above 0%?
The policy rate will rise to a level above 0% in the year ____ .

What do you think will the policy rate be on average ...
... in 2022: __%
... in 2025: __%

How certain are you about your expectations about the ECB policy rate?
very certain - certain - uncertain - very uncertain

Information Treatment

On the next page you will receive an expert forecast about the future development of the ECB policy rate. Please carefully review the forecast, you will not be able to go back to that page. On the next page you can only proceed after 5 seconds.

Arm: Increase 2020

Currently the policy rate of the ECB is 0%. According to an expert who regularly participates in an expert survey of the ECB on the future economic development, the policy rate of the ECB will rise to a higher level in the third quarter of 2020 (next summer).

Arm: Increase 2025

Currently the policy rate of the ECB is 0%. According to an expert from a German Bank, the policy rate of the ECB will rise to a higher level at the earliest in 2025 (in five years).

Macroeconomic Expectations

In what follows we will ask you some questions about the aggregate economy.

Inflation refers to the percent increase in the general price level measured by the so-called Consumer Price Index. A decrease in the general price level is called deflation (negative inflation). The current rate of inflation in Germany is 1.1%. What do you expect the inflation rate to be in in the following years?
__% over the year 2020.
__% over the year 2022.

The current unemployment rate in Germany is 5%. What do you expect the unemployment rate to be on average in the following years?
__% in the year 2020.
__% in the year 2022.

Perceived Credit Constraints

How easy would it be for your household to take out a loan to finance consumption expenditures?
. . . currently: Very easy - Somewhat easy - Neither easy nor difficult - Somewhat difficult - Very difficult
. . . in 2022: Very easy - Somewhat easy - Neither easy nor difficult - Somewhat difficult - Very difficult

How easy would it be for your household to take out a mortgage loan?
. . . currently: Very easy - Somewhat easy - Neither easy nor difficult - Somewhat difficult - Very difficult
. . . in 2022: Very easy - Somewhat easy - Neither easy nor difficult - Somewhat difficult - Very difficult

Credit Market Expectations

Imagine your household wants to take out a loan to finance consumption expenditures. What do you think would be the interest rate your household would have to pay on such a loan?
. . . currently: __%
. . . in 2022: __%

Imagine your household wants to take out a fairly large mortgage. What do you think would be the interest rate your household would have to pay on such a loan?
. . . currently: __%
. . . in 2022: __%

What do you think is the interest rate your household could earn by saving on a savings account?
. . . currently: __%
. . . in 2022: __%

Personal Income and Unemployment Expectations

The next question is about the net labor income of your household. By net labor income we mean the amount your household earns through either self-employment or wage earnings after taxes and transfers. What do you think, in percentage terms, how much higher or lower will be your households' total net labor income in 2022 compared to today? If you expect a lower net labor income, please enter a negative number.
What do you think, by how many percent will your households' total net labor income change each year on average over the next 3 years? If you expect a decrease, please enter

a negative number. __%

What do you think is the probability that you will be involuntarily unemployed for at least 3 months in the following years? . . . 2020: __% . . . 2022: __%

Posterior Expectations about the Interest Rate

We want to ask you again for your assessment regarding the development of the interest rate.
When do you think will the key interest rate of the ECB rise to a level above 0%?
The key interest rate will rise to a level above 0% in the year ____ .

What do you think will the key interest rate be on average ...
. . . in 2022: __%
. . . in 2025: __%

How certain are you about your expectations about the ECB interest rate?
very certain - certain - uncertain - very uncertain

In this question we present you three scenarios about the average level of the key interest rate in 2022. For each scenario, please let us know the percent chance you assign to the event that this scenario happens. The probabilities of the three scenarios have to sum up to 100 percent.

The key interest rate in 2022 will on average be. . .
. . . higher than today: __%
. . . as high as today: __%
. . . lower than today :__%
sum: __%

Trust in ECB

How much trust do you have in the ECB? Please enter a number between 0 and 10 (0 = no trust at all, 10 = very high trust).

Assets and Debt

What do you estimate the value of your household's current accounts, savings accounts and demand deposit accounts to be? (Please enter zero if your household does not hold any current accounts, savings accounts or demand deposit accounts)
__

What do you estimate the value of your household's total holdings of stocks and stock mutual funds to be? (Please enter zero if your household does not hold any stocks/stock mutual funds.)

—

What do you estimate the value of your household's total holdings of other financial assets including money market funds, building loan contracts, or government and corporate bonds to be? (Please enter zero if your household does not hold any other financial assets.)

—

What do you estimate the total value of your household's holdings of real estate, including your primary residence (if it is owned by your household) to be? (Please enter zero if your household does not own any real estate.)

—

What do you estimate your household's total outstanding housing debt (mortgage debt and home equity loans) to be? (Please enter zero if your household does not hold any housing debt.)

—

What is your estimate of your household's total outstanding non-housing debt? This includes installment loans, outstanding balances on credit cards, student loans, and auto loans. (Please enter zero if your household does not hold any non-housing debt.)

—

Additional Demographics I

How many people live in your households?

What is your highest level of education?
School-leaving certificate from: Special school - Lower secondary school - Polytechnic secondary school (POS), 8th grade (GDR degree) - Secondary school - Polytechnic secondary school (POS), 10th grade (GDR degree) - Advanced technical college - High school - Extended comprehensive school (EOS) (GDR degree) or professional education with Abitur (GDR degree) - Other: __
Did you complete vocational training, for example an apprenticeship? Or do you have a qualification from a university, university of applied sciences, or university of cooperative education?
Company apprenticeship - Semi-skilled training - Training at a school of public health - Training at a vocational school - Master certification, engineering diploma or comparable - Certification from a university of cooperative education - Certification from a university

of applied sciences or from a teacher training college - Certification from a university - Other: __
In which industry do you work? [drop-down]

What is your main occupation? [drop-down]

Numeracy

Let's say you have 200 euro in a savings account. The account earns ten per cent interest per year. Interest accrues at each anniversary of the account. If you never withdraw money or interest payments, how much will you have in the account at the end of two years?
—

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money in this account?
More than today - The same as today - Less than today

Please tell me whether this statement is true or false: Buying a single company's stock usually provides a safer return than a share of a stock mutual fund with the same value.
True - False

Additional Demographics II

Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks when it comes to financial investment? 1 - Unwilling to take risk; 10 - Fully prepared to take risk.

Are you generally a patient person or an impatient person? 1- Very patient; 10 - Very impatient.

How often in the last two weeks have come news about the key interest rate of the European Central Bank (ECB) to your attention? Never - Once - Between 2 and 3 times - Between 4 and 5 times - More than 5 times

How often in the last two weeks have come news about interest rates in general to your attention? Never - Once - Between 2 and 3 times - Between 4 and 5 times - More than 5 times

To what degree do you agree with the following statements? fully agree, rather agree, neither agree nor disagree, rather disagree, fully disagree

- I usually follow news about the economy.
- Firms are usually better informed about the interest rate policy of the ECB than I am.
- My job security depends on the overall business cycle.
- A recession would impair the financial situation of my household.

Who is the main earner in your household?
You - Your spouse - You and your spouse earn the same amount - Another person

Who in your household is most knowledgeable regarding the finances of your household? By this we mean the household member who has the best overview of income, financial accounts, pension schemes, and real estate holdings.

I am most knowledgeable about the household's finances. - My spouse is most knowledgeable about the household's finances. - My spouse and I are equally knowledgeable about the household's finances - Another person.
Does your household use your main residence . . .
. . . as main owner - . . . as partial owner - . . . as renter - . . . for free

Does your household own stocks or stock mutual funds?
Yes - No

For which party have you voted in the general election of 2017?
Conservatives - Social Democrats - Greens - Liberals - Alternative for Germany - Left - Other - Have not voted - Prefer not to say

F.3 Survey Instructions in English (Follow-up Households January 2020)

Attention Check

The next question is about the following problem. In questionnaires like ours, sometimes there are participants who do not carefully read the questions and just quickly click through the survey. This means that there are a lot of random answers which compromise the results of research studies. To show that you read our questions carefully, please enter turquoise as your answer to the next question. What is your favorite color?

Explanation

Over the course of this survey we will repeatedly ask you things about your household, for instance about the net income of your household. By household we mean all family members whom you share your primary residence with, excluding housemates and subtenants.

Posterior Expectations about the Interest Rate

In what follows we will ask you some questions on your expectations about the aggregate economy and your own economic circumstances in the next years.

When do you think will the key interest rate of the ECB rise to a level above 0%?
The key interest rate will rise to a level above 0% in the year ____ .

What do you think will the key interest rate be on average ...
... in 2022: __%
... in 2025: __%

How certain are you about your expectations about the ECB interest rate?
very certain - certain - uncertain - very uncertain

Macroeconomic Expectations

Inflation refers to the percent increase in the general price level measured by the so-called Consumer Price Index. A decrease in the general price level is called deflation (negative inflation). What do you expect the inflation rate in Germany to be in the following years?
__% over the year 2020.
__% over the year 2022.

What do you expect the unemployment rate in Germany to be on average in the following years?

__% in the year 2020.
__% in the year 2022.

Perceived Credit Constraints

What do you think, how easy will it be for your household in 2022 to take out a loan to finance consumption expenditures?
Very easy - Somewhat easy - Neither easy nor difficult - Somewhat difficult - Very difficult

What do you think, how easy will it be for your household in 2022 to take out a mortgage?
Very easy - Somewhat easy - Neither easy nor difficult - Somewhat difficult - Very difficult

Credit Market Expectations

Imagine that in the year 2022 your household wants to take out a mortgage. What do you think would be the annual interest rate your household would have to pay on such a loan?
. . . in 2022: __%

Imagine that in the year 2022 your household wants to take out a loan to finance consumption expenditures. What do you think would be the annual interest rate your household would have to pay on such a loan?
. . . in 2022: __%

What do you think will be the annual interest rate your household can earn by saving on a savings account in the year 2022?
. . . in 2022: __%

Additional Demographics

In what year were you born?
__

What do you think is your household's monthly disposable net income (in Euro)?
Disposable net income refers to the amount of income that the household has available after taxes and transfers.

What is your gender? male - female

What is your age? 18-24 - 25-34 - 35-44 - 45-54 - 55-64 - over 64

Which federal state do you live in?

Did you answer the question in this survey truthfully? Yes - No

What do you think is the purpose of this study?