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Ivan Yotzov
Nicholas Bloom
Philip Bunn
Paul Mizen
Gregory Thwaites

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## ABSTRACT

This paper analyses the response of firms to monthly CPI inflation releases using high-frequency data from a large economy-wide business survey. CPI inflation perceptions respond very quickly, in a matter of hours after the release. We also find that firms' expected own-price growth has a strong positive correlation with changes in CPI inflation, particularly for increases in inflation. This sensitivity is stronger when inflation is high. Firms are also more responsive when inflation coverage in the media is elevated and appear to have had a supply-side view of the economy since 2022: higher aggregate inflation leads to lower expected sales volume growth and higher expected cost growth. Firms also seem to anticipate the monetary policy response, as positive inflation changes are associated with higher expected borrowing rates.



Ivan Yotzov
Bank of England
Threadneedle Street
London EC2R 8AH
United Kingdom
Ivan.Yotzov@bankofengland.co.uk

Nicholas Bloom
Stanford University
Department of Economics
579 Jane Stanford Way
Stanford, CA 94305-6072
and NBER
nbloom@stanford.edu

Philip Bunn
Bank of England
Threadneedle Street
London EC2R 8AH
United Kingdom
Philip.Bunn@bankofengland.co.uk

Paul Mizen
King's Business School
Bush House, 30 Aldwych
London
WC2B 4BG
London
United Kingdom
Paul.Mizen@kcl.ac.uk

Gregory Thwaites
Department of Economics
University of Nottingham
Nottingham NG7 2QX
United Kingdom
gregorythwaites@gmail.com

# 1 Introduction

How much attention do firms pay to aggregate inflation dynamics? Do monthly inflation releases have a significant impact on the prices they expect to set in the future? If so, what channels might explain this effect? As inflation rates increased across developed countries starting in the second half of 2021, there has been an increased focus on the price-setting behaviour and expectations formation of households and firms (Mann, 2022; Powell, 2022; Reis, 2023a,b). In this paper, we contribute to the research agenda by analysing the response of firms to aggregate inflation dynamics using a large economy-wide business survey in the UK, and specific questions on inflation perceptions and expectations. To do this, we use an estimation strategy which exploits daily and even *hourly* variation in firm responses. To the best of our knowledge, the use of such high-frequency data for firms is a key contribution to the literature.

There are several (not mutually exclusive) reasons why firms may adjust their own-price expectations in response to changes in aggregate inflation (which we proxy using changes in Consumer Price Index (CPI) inflation rates). First, during a period of higher inflation, firms may be paying more attention to aggregate outturns, and therefore more likely to respond quickly following a release. Second, firms may adjust their price expectations if they interpret changes in CPI inflation as signals about supply-side or demand-side shocks to the economy. Finally, firms may adapt their own-price expectations because they are trying to keep their *relative* prices close to optimal. This could be if the firm is trying to catch up with a lag to the aggregate inflation dynamics. Alternatively, it could be because they view CPI inflation as persistent, and are therefore trying to maintain their future relative prices stable.

We use data from the Decision Maker Panel (DMP) for the empirical analysis in this paper.[1] The DMP is a monthly survey of CFOs and Finance Directors across businesses in the UK. It was launched in 2016. Firms are regularly asked about their realisations and their year-ahead expectations for a number of variables, including own prices, sales, employment, and capital expenditure. In addition, starting in May 2022, newly designed questions were introduced in the survey, focusing on CPI

[1] https://decisionmakerpanel.co.uk/

inflation perceptions, CPI inflation expectations, unit costs, and wages. This allows us to address important distinctions highlighted above relating to demand, supply, and competitive drivers of inflation expectations. Finally, a question on expected borrowing rates was also asked on several occasions during the past two years. This allows us to observe firms' perceptions of the effect of aggregate inflation on the monetary policy response. We leverage all these data to study the impact of monthly CPI data releases on firm expectations.

Our empirical methodology uses the overlap between survey dates (the DMP collects responses from firms for two weeks each month, and is able to identify the precise date and time of the survey submission) and CPI release dates (usually on a Wednesday during the second half of each month). This allows us to test for the effects of data releases at the *daily* frequency, comparing the average responses of firms in the few days before versus after the latest inflation data are announced. Within these tight windows, few other events are likely to influence firm expectations, which means our results are plausibly causal. In further analysis, we also extend the estimation windows to track how expectations adapt over time.

We present three key findings. First, we document that firms have been *attentive* to CPI inflation trends. CPI inflation perceptions update very quickly following monthly data releases, with a highly significant impact seen from the day of the release. The pass-through from CPI inflation to perceptions is around 70% on impact, and remains highly significant over time. We also show that inflation perceptions are equally responsive to positive as well as negative changes in CPI inflation.

Second, we analyse the impact of changes in CPI inflation on firms' expected year-ahead *own-price* growth. The ability to study firm output price expectations is a key contribution, as it is the most relevant metric for what will happen to future prices. We find that over the 2022-2024 period, own-price expectations responded significantly to changes in aggregate inflation. A one percentage point increase in headline CPI inflation is associated with a 0.6 percentage point increase in expected own-price growth. Furthermore, we find that the sensitivity to data releases is non-linear, with highly significant effects for positive CPI inflation changes, and a quantitatively smaller and less significant effect for negative CPI inflation changes. Finally, we show that these effects on price expectations are also absent in the previous, relatively low-

inflation period between 2017 and 2021. These effects highlight how firm expectation formation changes in high-inflation environments. Likewise, the lower responsiveness to CPI inflation decreases could imply a slower decline in firm price growth, even as CPI inflation falls and external shocks dissipate.

Third, we explore the potential mechanisms which may explain the sensitivity of firm own-price expectations to monthly data releases. One hypothesis is that firms are more attentive to aggregate inflation because media coverage of inflation has been elevated since the start of 2022. To test this, we create a daily index of 'inflation media chatter' as the share of all articles in UK newspapers which discuss inflation. We find that firms' expectations are more responsive during months with particularly elevated inflation media coverage. Second, we show that firms also increase their near-term CPI inflation expectations in response to positive CPI inflation changes. Together with the main results on own-price expectations, this suggests a desire to keep relative prices stable. We also investigate the responsiveness of firm expectations beyond price growth. The evidence suggests firms interpreted changes in CPI inflation since 2022 as signals about supply-side changes in the economy. Positive CPI inflation changes lead to lower expected sales volume growth and higher expected unit cost growth. Finally, firms also seem to anticipate the impact of higher inflation on their borrowing rates, as positive CPI inflation changes also lead to higher expected borrowing rates for the year ahead. Thus, firms seem to anticipate how monetary policy might react to higher inflation rates.

This paper contributes to three strands of the literature. First, it relates to studies which analyse the reaction of expectations to macroeconomic or policy news. These papers can be grouped in two main categories: (1) whether they focus on household or firm-level data on expectations, and (2) the type of news being considered. The closest study to ours is Gorodnichenko et al. (2023); the authors use quarterly survey data from Israeli firms and find that unexpected changes in CPI inflation lead to increases in year-ahead aggregate inflation expectations. For households, Binder (2021) shows that inflation expectations are also responsive to CPI releases in the US, but only for highly-numerate respondents. Binder et al. (2024) show that inflation expectations of Republican households were more responsive to CPI releases during 2021 than expectations of Democrats. Link et al. (2023) use survey data from Ger-

man firms and households, and find that households update their expectations more strongly than firms when presented with information about current ECB policy rates. Baumann et al. (2024) show that firm inflation expectations are responsive to information on both past inflation and professional inflation forecasts. Beyond these studies, a large literature has analysed the responsiveness of firm expectations to monetary policy announcements and surprises, using quarterly data from Italy (Bottone and Rosolia, 2019), quarterly data from Israel (Gorodnichenko et al., 2023), monthly data from Germany (Enders et al., 2019), and monthly data from the DMP for the UK (Di Pace et al., 2023). In general, firm inflation expectations are indeed sensitive to monetary policy decisions in the expected direction.[2] Di Pace et al. (2023), in particular, use the same survey data as us, and show that firms respond significantly to changes in Bank of England policy rates, where higher rates lead to lower price expectations. Our main contribution here is showing that when inflation is high, firms respond by adjusting their own-price expectations in response to monthly CPI inflation data releases. Furthermore, we provide detailed analysis on the potential mechanisms which may explain this effect. Firms also increase their near-term CPI inflation expectations in response to positive CPI inflation changes, which combined with the results on own-price expectations, suggests a desire to keep relative prices stable. Furthermore, positive CPI inflation changes are associated with lower expected sales volume growth and higher expected cost growth over 2022-2024, consistent with a supply-side view of the economy by firms.

Second, this paper contributes to the literature that analyses the (time-varying) attention of economic agents to aggregate inflation. Savignac et al. (2021), for instance, document a significant dispersion of perceptions around recent inflation across French firms, indicating inattention to macroeconomic conditions. Likewise, Candia et al. (2021) show that only around 20% of US CEOs are aware of the Federal Reserve's inflation target. However, an additional key finding in this literature is that the level of attention is *endogenous* to the economic environment. In a recent paper, Weber et al. (2023) show, using household and firm-level survey data across multiple countries, that agents are significantly more attentive to inflation dynamics when inflation is high. This result has been replicated in a number of different settings and using a

[2]There are also numerous studies which study the effect of monetary policy on household expectations, e.g. Coibion et al., 2022; Lamla and Vinogradov, 2019; Lewis et al., 2019; Rast, 2021.

variety of methodologies (Bracha and Tang, 2022; Cavallo et al., 2017; Korenok et al., 2022; Pfäuti, 2023, 2024). We contribute to these studies in three ways. First, we document that in 2022-2024, firm CPI inflation perceptions have closely followed actual CPI inflation, and they have adjusted rapidly following monthly data releases. Furthermore, we find evidence that firms' own-price expectations have only been responsive to CPI releases when inflation is high, but not during the relatively low-inflation years of 2017-2021. Finally, we construct a new index of 'inflation media chatter' which captures the discussions of inflation across all UK newspapers. We find that firm own-price expectations are more responsive to CPI releases precisely in those months when inflation media chatter is elevated. These results are consistent with the evidence on time-varying attention to macroeconomic data.[3]

Lastly, this paper contributes to the literature analysing how agents perceive economic shocks to propagate. In other words, their 'subjective models' of the macroeconomy. Among households, it is a common stylised fact that higher inflation is associated with worse expected economic performance (Binetti et al., 2024; Stantcheva, 2024). Macaulay (2022) shows that more households report inflation makes the economy weaker when inflation is higher. McClure et al. (2022) find a positive correlation between unemployment and inflation expectations among US managers. This suggests respondents, on average, have a supply-side view of the economy. Among firms, there is more heterogeneity in these views. Candia et al. (2021) show that across a number of countries (e.g. Ukraine, South Africa), firms associate higher inflation with lower output growth expectations. In others (e.g. New Zealand, Sweden), however, this relationship is positive, indicative of a more demand-side view. Andre et al. (2022) document substantial heterogeneity in these 'subjective models' of the economy, both across households and experts. In this paper, we also find evidence consistent with a supply-side view of inflation, at least over the period since 2022. Positive CPI inflation changes lead to lower expected sales volume growth among firms and higher expected cost growth. Furthermore, we also find evidence that firms anticipate a monetary policy response, as higher CPI inflation also leads to higher expected borrowing costs. The use of daily variation in firm responses on a

[3]In a related setting, Mikosch et al. (2024) use household and firm survey data from Switzerland to show that higher exposure to exchange rates is associated with higher demand for information on exchange rate movements, consistent with models of endogenous information acquisition.

range of expectations variables is a key contribution of the paper to the literature.

The rest of the paper is organised as follows: Section 2 describes the data, Section 3 discusses the empirical methodology, and Section 4 presents the results. Finally, Section 5 concludes.

# 2 Data

The section outlines the main data sources used in the paper.

**Firm-level data** To estimate the impact of CPI releases on firms' inflation perceptions and expectations, we use data from the Decision Maker Panel (DMP) survey.[4] The DMP is a monthly survey of businesses in the UK. It was launched in late 2016, and is organised by the Bank of England, in collaboration with the University of Nottingham and King's College London. On average, it receives around 2,500 responses each month (Figure A1), with an active response rate around 50%. The survey is representative of industries in the UK and each month samples around 4% of UK employment.[5]

In the DMP, firms are regularly asked about their realised firm performance along a number of dimensions, including sales growth, own output price growth, employment, and capital expenditure. In addition, firms are asked about their year-ahead expectations for these variables. In particular, they are asked to provide a five-point distribution for their expectations and assign probabilities to each of the five scenarios. Figure A3 shows the template for this question, particularly for own-price expectations. In Panel A, firms are invited to provide five scenarios for their expected own-price growth over the next 12 months: a lowest, low, middle, high, and highest value. In Panel B, they assign a probability to each of the scenarios they indicated. This format allows us to analyse not only the mean expected price growth (as the weighted average of the scenarios), but also construct firm-level measures of uncertainty and skewness over future price growth (see Yotzov et al. (2023), for example, who analyse firm-level inflation uncertainty using data from the DMP). Finally, since

[4]Monthly aggregated statistics on own-price growth, own-price expectations, and CPI expectations are available on the DMP website: https://decisionmakerpanel.co.uk/

[5]Figure A2 compares the coverage of the DMP survey across industries and by firm size with data for the universe of UK businesses from the Business Register. Panel A shows that the DMP broadly matches industry shares in the UK. However, the share of employment in the DMP is skewed towards larger firms (Panel B). For this reason, we weight results by industry and employment shares.

the DMP is a panel, we can compare firm expectations with their realisations *a year later*. Figure A4 presents this comparison for own-price growth, and shows that there is a very strong positive correlation between own-price expectations and realisations a year later. In other words, expectations are generally a very good guide for how firms expect their prices to evolve.

(Figure 1)

Figure 1 compares the trends in firm annual own-price growth and expected price growth from the DMP with annual Consumer Price Index (CPI) inflation for the UK. Annual price growth (dark blue line) among DMP firms closely matches the trends in CPI inflation in the pre-pandemic period. Since 2020, firm price growth continues to track CPI inflation trends, although changes in the CPI inflation have been somewhat larger, both on the downside and the upside. A large portion of this deviation can be explained by energy prices, which have a larger weight in the CPI basket and contributed to the sharp increase in CPI inflation in 2022-2023.[6] Nevertheless, the trends in CPI and firm-level inflation series are highly correlated. This can be further corroborated by direct evidence on the importance of CPI inflation for firm pricing decisions. When asked, around 60% of firms report CPI inflation as one of the top three or the most important factor in their own pricing decisions (Figure A5).[7]

In addition to questions about their own output price growth, since May 2022 firms in the DMP have been asked about their current CPI inflation perceptions and their CPI inflation expectations, both one year and three years in the future. Figure A6 shows the precise format of these questions in the survey. In contrast to the questions on own-price expectations, firms are asked to provide only a point estimate for their CPI inflation perceptions and expectations.

Figure 2 presents the trends in CPI inflation perceptions and expectations. In Panel A, current CPI inflation perceptions are compared to the actual CPI inflation rate, *on the day* when firms answered the question. The corrects for the fact that CPI releases occur during the survey window. On average, CPI inflation perceptions track

[6]This is not the only difference between the DMP series and CPI inflation. The DMP is a sample of firms across the whole economy, whereas CPI inflation covers only consumer-facing firms. Furthermore, the CPI is constructed by weighting price changes by their shares in a representative consumer basket. In contrast, price growth in the DMP is weighted by industry and employment shares.

[7]The question on the importance of CPI inflation was asked between May and July 2023.

CPI inflation rates very well over the past two years, with only small 'perception errors' between the two series. Panel B shows the distribution of the CPI inflation perception errors, where a positive value indicates inflation perceptions exceeding actual CPI inflation. These are tightly distributed around zero over the sample period, ranging from -0.4pp at the 25th percentile to 0.3pp at the 75th percentile. In Section 4.1 we analyse in more detail the responsiveness of firms' CPI inflation perceptions to monthly CPI releases.

(Figure 2)

Panel C, meanwhile, shows the trends in one-year and three-year ahead CPI inflation expectations. Expectations for CPI inflation one year ahead have fallen materially since peaking at 9.5% in September 2022. In June 2024, firms expected CPI inflation to be 2.8% one year ahead. Three-year ahead CPI expectations have been more stable since the data began, but have nevertheless declined over 2023 and in 2024. In June 2024, firms expected CPI inflation to be 2.7% three years ahead. Although this rate is certainly elevated relative to the inflation target, it is consistent with inflation expectations typically displaying an upward bias among households and firms (e.g. Coibion et al., 2018; D'Acunto et al., 2023). In addition, these data are only collected since May 2022, so it is unfortunately not possible to see what medium-term CPI expectations were in the pre-pandemic low-inflation environment.

**Additional data** In addition to the firm-level data from the DMP, we collect a number of further data series for our analysis. First, we obtain several series of inflation rates published by the UK Office for National Statistics (ONS). These include annual CPI inflation, as well as producer price inflation (PPI) rates for both input and output prices. Figure A7 shows the evolution of these three series since 2016. Relative to CPI inflation, output PPI and, particularly input PPI, have been more volatile over the last few years, and indeed have turned negative in the last months of data. However, it should be noted that PPI rates are only reflective of prices for UK manufacturers, and are therefore less representative for trends among services sector firms.[8] Still, in robustness checks, we also analyse the responsiveness of firms' expectations to changes in these PPI inflation series as well.

[8]There is also a Services Producer Price Inflation series produced by the ONS. However, this is only available at a quarterly frequency, and therefore we do not use it in our analysis.

Second, we collect data on forecasts for monthly CPI inflation from Bloomberg. These are median forecasts based on a survey of 'qualified economists'. Using these data, we construct a series of 'CPI news', which compares the actual CPI inflation to the median CPI forecast. Panel A in Figure A8 shows the trends in CPI inflation alongside the median forecasts. In general, forecasts were accurate in 2022, and tracked the evolution of aggregate price growth.[9] In 2023, there were a series of positive CPI news months, where inflation has been more persistent than expected. Panel B compares the changes in headline CPI inflation to the CPI news. Naturally, CPI news (shown on the vertical axis) have been much smaller in magnitude compared with changes in CPI inflation rates. In Section 4.2 we compare the responsiveness of firms' own-price expectations to changes in headline CPI versus CPI news.

In order to test whether media coverage of inflation amplifies the responsiveness of firms to CPI releases, we construct an 'inflation media chatter' index using data from all UK newspapers gathered from Access World News' NewsBank service. The index measures the share of articles at a daily frequency which mention at least one of the following three keywords: (1) 'inflation', (2) 'CPI', or (3) 'Consumer Price Index' over the period 2010-2023. The main results using this index are presented in Section 4.3.

Finally, we collect daily stock market data and exchange rate data which we use as additional controls for robustness. We also collect data on daily Economic Policy Uncertainty (EPU) for the UK as an additional control in our regressions.[10]

# 3 Methodology

**Main event study specification** To analyse the effects of CPI releases on firm inflation perceptions and expectations, we use an event-study approach, comparing the responses of firms in the days before versus after the latest inflation data are published. CPI inflation data are released by the ONS on a monthly basis. There is no fixed release date, but most often it has been on a Wednesday during the second

[9]There have been 30 CPI data releases between January 2022 and June 2024. Of these, 17 have been characterised by positive CPI news (i.e. outturn above Bloomberg forecast), ten have been negative CPI news, and in three cases there has been no news relative to the forecast.

[10]The data on daily UK EPU are taken from here: https://www.policyuncertainty.com/

half of the month.[11] The DMP survey, meanwhile, collects responses from firms for a two-week period every month. In most months, the CPI release occurs during the second week of the survey window.[12] This creates an ideal natural experiment, as we can compare average responses of firms in tight windows around each release.

To operationalise this, we first create 'event windows' of $\pm 2$, $\pm 5$, and $\pm 7$ days around each CPI release. Because releases usually occur on the second Wednesday of the survey window, there is a shorter 'post' period in each month. This is clearly seen in Figure 3, which shows the average number of firm responses across the event window, with day 0 being the CPI release date. Day 2 is typically the last date before the survey closes (a Friday), hence there are very few observations in the subsequent days. Although this is a limitation given the nature of the release and survey calendars, we show that our results are generally robust to estimating the effects of CPI releases in two-day, five-day, and seven-day event windows.[13] Furthermore, as described below, we also build extended event windows across months which allow us to track the effects across longer horizons.

(Figure 3)

A second observation from Figure 3 is that the number of responses varies over the event window. This is because firms are not randomly assigned to a specific date on which they should respond to the survey, but are free to submit their answers on any day during the two-week window. Days -3 and -4 in the figure refer to Saturday and Sunday, therefore we see very few observations on those days. Furthermore, the figure has two clear spikes on Days -6 and +1. These are days (usually Thursdays) on which firms are sent reminder emails to complete the survey. Unsurprisingly, we see a much higher response rate on those occasions.

In terms of the empirical analysis, these unequal response rates over the event window may create an issue if they correlate with certain firm characteristics. For ex-

[11] Until March 2020, CPI data were released at 9:30am. Starting in April 2020, the data have been released at 7:00am. A release calendar of CPI inflation rates can be found here: https://www.ons.gov.uk/releasecalendar?view=upcoming&query=CPI

[12] Since January 2022, there have been only four months in which the CPI release has happened outside the DMP survey window: March 2022, March 2023, May 2023, and December 2023.

[13] We generally use the two-day event window as our baseline specification. One additional reason for this is that extending the event window often creates overlaps with additional data releases. For example, UK GDP releases and US CPI releases commonly occur in the week prior to the UK CPI release. To the extent that these are correlated with the UK CPI releases, it may affect our pre-treatment observations.

ample, if larger and more productive firms tend to respond following a CPI release, or indeed wait specifically for the release before responding, this may bias our results. In Figures A10 and A11 we look for such patterns across the event window. We do not find any clear trends in firm size or firm productivity across the CPI release windows. In Table 1, we test this formally in our event study framework. Specifically, we test whether there are average differences across a number of firm-level variables before versus after CPI releases. Columns 1-4 suggest there are no significant differences in productivity, assets, sales, or employment across the two-day event windows. In Column 5, we also test whether there are average differences in survey duration, and again find no significant difference. This suggests the distribution of firms responding to the survey is arguably random. In our empirical analysis, we provide further robustness checks for this sampling assumption by controlling for firm-level variables as well as a demanding set of fixed effects.

(Table 1)

One may still worry that because firms can respond to the survey on any day during the two-week window, they may strategically time their responses depending on the day of the CPI release and whether they plan to update their expectations. We address this concern by exploiting the fact that on several occasions, the CPI release falls outside the survey window. Over 2022-2024, there were four such months: March 2022, March 2023, May 2023, and December 2023. We can therefore compare whether firm response patterns are, on average, similar for months with and without a CPI release. This is presented in Figure 4. The figure reveals several insights. First, it shows that for firms which responded in both CPI and non-CPI months, average response days are very highly correlated. This is inconsistent with the argument that they systematically time responses depending on the day of the release. Furthermore, only around 3% of total responses occur on CPI release days (days 6 and 13 of the survey window). Instead, responses are clustered on days 1, 7, and 14, when firms receive either the initial email invite or reminders. Around 56% of total responses are on these days. Overall, the evidence from Figure 4 suggests that firm responses are generally stable over time, and we do not see evidence of strategic timing.

(Figure 4)

After setting up the CPI release event windows, we estimate the following specification for firm $i$ in industry $w$, responding to the survey in month $m$ on day $j$ of the event window:

$$Y_{i,w,m,j} = \alpha_m + \beta_w + \sum_{j=-2}^{+2} \gamma_j + \sum_{k=-2}^{+2} \lambda_k \Delta CPI\ Inflation_m \times 1[Day = k] + \varepsilon_{i,w,m,j} \quad (1)$$

In Equation 1, the dependent variable, $Y_{i,w,m,j}$, is a measure of firm-level current CPI inflation perceptions or inflation expectations. On the right-hand side, we interact the change in headline CPI in a given month, $\Delta CPI\ Inflation_m$, with indicators for each day of the event window. Figure A12 shows a time series of the changes headline CPI inflation between 2016 and 2024. Prior to 2020, these changes were relatively small. Changes in CPI inflation have become larger in magnitude, especially over the past two years. In addition, they were clearly skewed to the positive in 2021 and 2022 as inflation increased, but have been skewed to the negative in 2023-24 as inflation has started to fall. The coefficients of interest are $\lambda_k$, which trace out the effects of CPI inflation changes before versus after the release date. In this specification, we take the day before the release (i.e. $k = -1$) as the reference category. Naturally, we would expect to see no significant effect of CPI changes prior to the release date, with effects (if any) materialising only in the days following the release. In addition, the specification controls for three sets of fixed effects: $\alpha_m$ are monthly fixed effects, which control for general time trends across all firms. Second, $\beta_w$ are industry fixed effects, which capture time-invariant industry characteristics.[14] Finally, $\gamma_j$ are event window fixed effects, which capture common trends across event windows. These would capture, for example, if inflation expectations are systematically higher on Fridays (post-CPI release) versus Tuesdays (pre-CPI release). In our main specification, we cluster standard errors at the firm level.

In addition to this event-study analysis, it is possible to estimate a simplified specification which pools the effects on days before and those after the CPI release:

[14] In some specifications, we go further and include firm fixed effects rather than industry fixed effects. However, these reduce our estimation sample substantially, so we do not consider them as our main specification.

$$Y_{i,w,m,j} = \alpha_m + \beta_w + \sum_{j=-2}^{+2} \gamma_j + \lambda \times \Delta CPI\ Inflation_m \times Post_j + \varepsilon_{i,w,m,j} \quad (2)$$

This resembles a difference-in-differences specification, with a continuous treatment. The variable of interest in Equation 2 is $\lambda$, which captures the *average* effect of the change in CPI inflation in the days post-release versus pre-release. This version of the specification makes it easier to report results in tabular form, and also to explore heterogeneities across firm and industry characteristics.

**Hourly event windows** In the DMP, we observe the exact time of day firms have submitted their responses. This allows us to zoom in on the day of the release, for example, and estimate an event study at the *hourly* frequency. Figure A9 shows the distribution of firm responses over 2022-2024 by hour on CPI release days only. Responses are mostly concentrated during workday hours, with two peaks around 9-11 in the morning and 2-4 in the afternoon. Furthermore, note that there are almost no responses prior to 7am, justifying our treatment of the release day in the 'post' period.

**Extended event windows** One limitation of the empirical design, as discussed above, is that there are typically only three days of observations following a data release. This makes it difficult to track the effects over a longer horizon. We address this by creating an alternative event window structure which pools together survey dates across calendar months, keeping calendar days outside the survey window as missing. This format is likewise not perfect, as it leaves a large gap between days. It also means that there are overlaps in days, as the 'post' period in one month will also contain days which are the 'pre' period of the following month. We are careful, however, to only include one CPI release within a given event window. The advantage of this specification is that it allows us to test whether the effects of CPI inflation changes persist over time, or whether they are only present in the immediate aftermath of a data release.

**Daily panel specification** Finally, as a robustness exercise, we also construct an alternative dataset by first collapsing firm-level observations at the daily level. This helps address the sizable differences in firm responses across event window days

(Figure 3). We then estimate a similar specification as in Equation 2, and also weighting the daily observations by the square root of the number of responses on that date.

# 4 Results

## 4.1 CPI releases and current CPI inflation perceptions

We first present the main results analysing the effects of CPI inflation changes on current CPI inflation perceptions. Figure 5 shows the effects of CPI releases based on Equation 1, estimated over a five-day (i.e. $\pm 2$ day) window. The event study highlights three important results. First, there is no significant effect of a change in CPI inflation *before* the release date, i.e. in period $t-2$. At the same time, there is an immediate and highly statistically significant effect from period $t$ (the release date), which is persistent in subsequent days of the release window. In other words, firms are indeed paying attention to news about inflation, and they update their perceptions from the day of the release. However, the third result is that this updating is not full in the days immediately following a release. The coefficient on date $t$ suggests that a one percentage point increase in headline CPI inflation is associated with a 0.6-0.7 percentage point increase in CPI inflation perceptions. Thus, although many firms quickly learn about the new 'state of the world' post-release, the learning process is not immediate for all firms.

(Figure 5)

Table 2 presents these results in tabular form using the specification in Equation 2. To be clear, this regression essentially pools the pre- and post-release coefficients and compares their average difference. The first four columns in the table distinguish between one-day, two-day, five-day, and seven-day event windows. In all four columns, the results are highly significant and similar in magnitude: they suggest about a 70% pass-through of a CPI releases to CPI inflation perceptions in the days following a release. Finally, in Column 5 we also add *firm* fixed effects to our specification. Although this decreases our estimation sample relative to column 4, the effects of CPI inflation changes on current CPI inflation perceptions remains highly statistically significant.

(Table 2)

**Hourly event window** In Figure 6, we present the results of the hourly event window specification on the effects of CPI releases on current CPI inflation perceptions. The horizontal axis shows hours around the 7am releases.[15] We estimate the results over a five-day ($\pm$2 day) window, similar to the daily event studies presented above. The omitted category is 3-4pm on the day before the release (i.e. t-16), as this is an hour with a high number of observations. Strikingly, we find that only a few hours after the release, firms are responding to the new CPI data when reporting their inflation perceptions. All point estimates in the post-release hours are positive, indicating that firms are updating their perceptions in line with changes in CPI inflation. The horizontal red line and shaded area denote the pooled coefficient estimate and 95% confidence interval of the effect of CPI inflation changes on current CPI inflation perceptions (the same as Column 2, Table 2). Meanwhile, in the hours before the release, the coefficients are close to zero, on average, consistent with no significant pre-trends or anticipation effects in our estimates.

(Figure 6)

**Extended window specification** To analyse how changes in headline CPI inflation affect CPI inflation perceptions over a longer horizon, we use the extended event window specification, as outlined in Section 3. This approach combines survey data across multiple months to form the event windows. We then re-estimate the specification in Equation 1, and present the results in Figure A13. The figure shows that the effects are very persistent and highly significant over the survey days post-release. It should be noted that the post-release period does *not* overlap with any future CPI releases. Overall, the results in Figure A13 confirm that firms learn about the new inflation rate over time, and update their current inflation perceptions before the following CPI release.

**Non-linearity of effects** The effects so far assume firms respond in the same (linear) way to positive and negative changes in headline CPI inflation. However, this does not necessarily need to be the case. Increases in inflation may be more salient, lead to more media coverage, and therefore be associated with a faster pass-through

[15]The ONS has released CPI data at 7:00am since April 2020.

to firm perceptions. We test this hypothesis in Table A1, which estimates separate coefficients for CPI inflation increases versus decreases. The coefficients are statistically significant across all three columns, suggesting firms respond to both increases and decreases in CPI inflation. The differences between the coefficient values are not statistically significant at the 10% level across all three specifications (as indicated by the bottom row of the table). Overall, we conclude that there is no strong evidence of a non-linear responsiveness of CPI perceptions to CPI releases. As we will show in the next section, however, there *is* a significant non-linear effect when firms update their own-price expectations.

## 4.2 CPI releases and own-price expectations

After documenting that firms are attentive to CPI inflation changes, in this section we analyse whether these changes have meaningful effects on their own-price expectations. We begin by estimating the event study specification (Equation 1), but with own-price expectations as the dependent variable. The results are presented in Figure 7.

(Figure 7)

As before, we find no significant effect of CPI inflation changes on own-price expectations prior to the release. However, following the release, the coefficients become positive and statistically significant. At $t+1$, the result suggests that a one percentage point increase in CPI inflation is associated with a 0.6 percentage point increase in year-ahead own-price expectations. On the second day after the release, the coefficient value remains around 0.6, and is still significant at the 5% level.

One reason for the wide confidence intervals in Figure 7 is likely the number of responses on the respective days. As documented in Figure 3, these vary quite a bit over the event window. The significant effects on $t+1$ coincide with the day when firms receive a reminder email, which leads to more responses on average, and hence the more precisely estimated coefficients. For this reason, we also present the results in table format by estimating Equation 2. These results are shown in Table 3. Panel A shows the results for the 2022-2024 period. They suggest that firms' own-price expectations respond significantly to CPI inflation changes, even in the narrow $\pm 1$ day event window (Column 1). Based on the specification with a two-

day event window (Column 2), a one percentage point increase in CPI inflation is associated with a 0.6 percentage point increase in expected own-price growth in the days following the release date. Columns 3 and 4 show that the results are robust to expanding the estimation window to five and seven days around the CPI release, respectively. This does not affect the significance of the results, although it makes the point estimates smaller quantitatively. Finally, in Column 5 we show that the results are also highly significant when we include the more demanding *firm* fixed effects, instead of industry fixed effects.

(Table 3)

In contrast to the data on CPI inflation perceptions, the DMP collects data on own-price expectations from the end of 2016. In Panel B of Table 3 we re-estimate the same specification over this larger sample. The results are robust across all specifications, although the coefficient values are smaller in magnitude in each column. As we show later, our results are driven exclusively by the period of higher inflation, and not significant for the years 2017-2021.

It is important to point out that the results on the impact of CPI releases on own-price expectations are unlikely to be driven by a priming effect. This would be the case if the question on expected own-price growth was asked following the question on CPI inflation perceptions, making firms conscious of the latest data releases. However, the DMP has a rotating panel structure with three separate panels. Firms answer one panel of questions each month, such that over a quarter they have answered all questions. The questions on own-prices and CPI perceptions/expectations are located in separate panels, so firms are not already primed to think about CPI when answering questions about their own prices. We next present several extensions of this main result, before turning to potential mechanisms.

**Hourly event window** In Figure 8, we present the results on changes in CPI inflation and own-price expectations using the hourly event window specification. As in the daily event studies, we focus on the day of the CPI release, and two days before/after the release. As the figure shows, the results on own-price expectations are noisier than those for inflation perceptions. Nevertheless, the vast majority of coefficients in the period after the release are positive, indicating that firms are increasing

own-price expectations in response to positive changes in CPI inflation. By the second day after the release, all estimated coefficients are positive and concentrated around the average. The horizontal dashed line in the post-release period indicates that the average estimated impact is around 0.63 over this period, and highly significant (this is the same estimate as Column 2 from Table 3, Panel A).

(Figure 8)

**Extended event windows** We also consider the persistence of the effects of CPI releases on own-price expectations. We test this by estimating the effects using the extended event window specification and present these results in Figure A14. The results are not precisely estimated in some of the days post-release, but they remain positive and still within the same range as the initial effect, suggesting that CPI releases continue to have an effect beyond the first few days.

**Non-linearity of effects** We can also test whether the responsiveness of own-price expectations is symmetric for positive versus negative CPI inflation changes. In Table A1 we found no significant evidence of such a non-linearity for CPI inflation perceptions. In Table A2 we present the corresponding results for own-price expectations. In this instance, we do find evidence of a non-linearity. Firms respond to positive changes in CPI inflation by significantly increasing their own-price expectations, almost in parallel with the changes in CPI. Meanwhile, the coefficients on CPI inflation decreases are smaller quantitatively (and insignificant in the five-day and seven-day event window specifications). Nevertheless, we also see a significant response to CPI inflation decreases in the two-day specification (Column 1), although the magnitude of the effect is smaller.

**Results for 2022-2024 vs. 2017-2021** In Table 3 we showed that the effects of changes in CPI inflation on own-price expectations were present over the 2022-2024 period and also over the full sample from 2017.[16] We now test whether the responsiveness of firms is different in 2022-2024 compared with the relatively low-inflation period of 2017-2021. These results are reported in Table A3. They indicate that there is an important difference in how firms update their price expectations in these two

[16]The survey was launched in late 2016, but the number of observation was relatively low in the first few months, which makes analysis at the daily frequency challenging. For this reason, we begin the analysis in 2017.

periods. In the 2017-2021 years, there was no significant effect of changes in CPI inflation on own-price expectations. Meanwhile, the effects are positive and significant for the 2022-2024 period. The difference between these coefficients is statistically significant at the 1% in Column 1, but not as clear in Columns 2 and 3. These results are consistent with firms paying more attention to inflation dynamics over the high-inflation period and therefore adjusting their own-price expectations. However, the absence of a significant effect over the earlier years could also be explained by the small variation in CPI inflation during this period, making it difficult to identify significant impacts.

Overall, this section finds evidence that firms respond actively to changes in past CPI inflation by updating their own-price expectations. Furthermore, their responsiveness is persistent and noticeably stronger when inflation rates increase rather than decrease. This behaviour is statistically significant when inflation is high, but not in the years 2017 to 2021. In the next section, we try to rationalise these findings by analysing the interaction of firm responsiveness with inflation media coverage. We also investigate the effects on firm expectations for their real sales, unit costs, as well as expectations for CPI inflation.

## 4.3 Mechanisms

Why might firms increase their own-price expectations in response to positive changes in CPI inflation? In this section, we explore three potential hypotheses.

**Inflation media coverage** First, firms may be more responsive when inflation is high because media coverage of inflation is elevated. It is probably reasonable to assume that most businesses obtain information about CPI inflation from newspapers (and related media outlets) rather than following the release of official statistics on the ONS website. As the coverage of inflation has increased, firms become more likely to observe the latest release and adjust their own-price expectations.

To test this hypothesis more formally, we construct a measure of 'inflation media chatter' using data from all UK newspapers gathered from Access World News' NewsBank service. In particular, we obtain *daily* counts of articles which mention one of the following three keywords: (1) 'inflation', (2) 'CPI', or (3) 'Consumer Price Index' over the period 2010-2023. We then scale these by the total number of articles published on each day, and finally normalise the index to have an average value of

100 over the 2010-2019 period. Figure 9 presents the evolution of inflation media chatter, along with annual UK CPI inflation.

(Figure 9)

As the figure shows, the two series are highly correlated. Specifically, since the end of 2021, CPI inflation started to increase sharply, and inflation media chatter also increased. Although the two series are shown on separate vertical axes, the *magnitude* of the increases are strikingly similar. CPI inflation increased five-sixfold between 2019 and the peak of 11.1% in October 2022. Inflation media chatter also increased by around the same magnitude from its average level over 2010-2019.

Since our inflation media index is measured at the daily frequency, we can test whether months with higher inflation coverage in the days *just before the release* are associated with a higher responsiveness of firm own-price expectations. We create three versions of the index, capturing the average inflation coverage in the three-, five-, and seven-day periods prior to a CPI release. We also standardise these to have 0 mean and unit standard deviation. The results are presented in Table 4, for both the full sample and the more recent high-inflation period.

(Table 4)

In Columns 1-3, we find a significant interaction between CPI releases and the inflation media chatter in the days preceding. Column 1, for example, suggests that a one standard deviation increase in media coverage increases the effect on own-price expectations by 0.3 percentage points, more than doubling the effect from baseline (0.17). This result is robust to five-day and seven-day specifications for media coverage (Columns 2-3). In columns 4-6, we perform a similar exercise but only in the recent high-inflation environment. Two key results stand out. First, even with an average level of media coverage, there is a significant effect of CPI releases on own-price expectations. This may be because firms are particularly attentive to inflation over the past two years, and following additional information sources as well, even when newspaper coverage is not particularly high. However, when coverage is elevated, the interaction is again statistically significant, and also larger in magnitude compared with the estimates from Columns 1-3. Overall, the results from this table

suggest that news media is likely an important source of information about aggregate inflation, and periods of elevated coverage are an important mechanism to explain firm expectation formation.

**Response of additional firm expectations** In addition to the effects on expectations for own-price growth, firms may interpret changes in CPI inflation as signals about the future persistence of aggregate inflation rates. In other words, firms may revise their expectations about CPI inflation in the near term (one year in the future) or medium term (three years in the future). As discussed in Section 2, DMP panel members have been asked about CPI inflation expectations since May 2022, which allows us to test this hypothesis within our estimation framework. Columns 1 and 2 in Table 5 show the effects of changes in CPI inflation on one-year ahead CPI inflation expectations. These effects are positive and also statistically significant in both columns. The coefficient in Column 1 suggests a one percentage point increase in CPI inflation increases CPI inflation expectations around 0.25 percentage points a year in the future.[17] Thus, the increase in firms' own-price expectations can be interpreted as firms attempting to (at least party) maintain their relative prices constant, given they also expect higher aggregate inflation (similar to the canonical Lucas, 1972 model).[18]

(Table 5)

In Table A5 we analyse the impact on medium-term (three-year ahead) CPI expectations. We do not find a significant effect on these expectations from changes in CPI inflation, on average across all changes (Columns 1-2). When splitting by positive/negative changes in headline inflation, there is some evidence of an effect for negative changes in CPI inflation in Column 3, but only significant at 10%. This is also visually plausible, given that three-year CPI expectations have been relatively stable (Panel C of Figure 2). It is also a reassuring finding, as lower sensitivity to data releases likely signals more well-anchored expectations (see Anderson and Maule, 2014).

Beyond inflation expectations, CPI releases may affect firms' expectations for other variables as well. For example, higher CPI inflation may be a signal of a positive

[17]The perceived persistence of CPI inflation is slightly lower than in the data. A simple regression of CPI on its 12th lag over the period 2017-2024 gives a persistence of 0.48.

[18]This could be in addition to firms adjusting their own-price expectation in order to catch up to recent aggregate inflation dynamics.

demand shock, which would raise output as well as prices. Conversely, it may signal a negative supply shock, which would push output and prices in opposite directions. Negative supply shocks could also be associated with higher firm input costs. We can test these competing hypotheses in the DMP using firm expectations about real sales growth and unit cost growth. These results are presented in Columns 3-6 of Table 5.

Columns 3 and 4 show that there is a positive effect of CPI inflation changes on expected year-ahead unit cost growth.[19] The question on unit costs was asked to DMP panel members between May 2022 and July 2023, and again in May-June 2024. The effect is only significant at 15% with industry fixed effects in Column 3, but the becomes significant at 10% once we include firm fixed effects in Column 4. The relationship suggests firms may perceive higher CPI inflation as leading to higher input costs from their suppliers.[20]

In Columns 5 and 6, we test the effects of CPI inflation changes on expected *real* sales growth. The data on real sales growth are constructed using firm responses about nominal sales growth expectations (one of the standard questions in the DMP) and price growth expectations. The results show that higher CPI inflation is associated with *lower* expected sales volume growth by firms, which is consistent with negative supply-side dynamics, rather than inflation driven by a demand boom.[21] Indeed, as the estimation is based on data over 2022-2024, this is not an unreasonable conclusion. As shown in Bunn et al. (2022), energy input prices, recruitment difficulties, and supply disruptions have been the main factors driving inflation over the last two years, with a limited role of demand-side factors.

Finally, it is interesting to analyse whether firms expect higher inflation rates to impact their own borrowing costs in the future. Firms have been asked about the interest rate they expect on their borrowing (both bank and market-based) one year in the future. This has not been a regular question in the survey; it was asked be-

[19] In addition, Figure A15 shows the event study on the effects of changes in CPI inflation on expected cost growth.

[20] Wages are also an important component of unit costs for firms. Firms have been asked about their realised and expected wage growth over the period between May 2022 and June 2024. In Table A4, we test for the effect of changes in CPI inflation on wage expectations. We only find a weak *negative* effect in Column 2, which suggests lower CPI inflation is associated with higher expected wage growth. This could be the case if firms expect some catch-up in real wage growth as CPI declines. However, when splitting the sample by CPI inflation increases/decreases (Columns 3-4), the results are no longer statistically significant.

[21] Figure A16 shows the corresponding results using our event study framework.

tween November 2022 and April 2023, and again between August 2023 to June 2024. Nevertheless, in Column 7 of Table 5, we do find a positive and significant effect of changes in CPI inflation on firms' own expected borrowing cost.[22] In other words, firms likely anticipate higher CPI inflation to lead the central bank to increase policy rates, which would affect own-borrowing costs thereafter.[23] Still, the anticipated effect on borrowing rates is significantly lower than standard interest rate rules, where the coefficient on inflation is usually set to be above 1 (e.g. Taylor, 1993).

Overall, the results in this section provide an explanation for why firms change their own-price expectations in response to changes in headline CPI inflation rates. Firms revise their near-term CPI inflation expectations upward in response to positive CPI inflation changes. Furthermore, firms expected higher cost growth and lower sales volume growth in response to higher inflation, consistent with a supply-side interpretation of the data releases since 2022. The combination of higher input costs and a desire to maintain relative prices stable provide a reasoning for increasing own-price expectations. However, firms also seem to understand that higher inflation will lead to monetary policy response, as they also revise their expectations for borrowing costs upward following positive changes in headline inflation.

## 4.4 Additional results and robustness checks

In this section, we provide several additional results on the impact of changes in CPI inflation, as well as several robustness checks.

**Further test of identification assumption** A key assumption in our empirical approach is that firms which respond before and after the CPI releases are not systematically different. We showed already in Table 1 that there is no average difference across a number of observables. Furthermore, in Figure 4 we showed that firm response patterns are very stable in months with and without a CPI release during the survey window. We present a further exercise here, by dropping all firms which have responded both before and after a CPI release in different months. Over 2022-2024, this corresponds to 30% of the sample. The results from this exercise are presented in Table A6. Column 1 presents the full sample, and in Column 2 we drop all firms

[22] We do not present the results with firm fixed effects here. Adding this reduces our sample dramatically.

[23] In Figure A17, we present the results on expected borrowing costs using our event study estimation.

which have responded both before and after a release. Dropping these firms does not affect the main result. Indeed, the point estimate increases and remains significant at 1%. Thus, we conclude that our results are likely not driven by firms endogenously choosing to respond on different sides of the CPI release in different months.

**Responsiveness to CPI news** So far, the analysis in the paper has focused on changes in headline CPI inflation as the main treatment variable. However, it is important to highlight that these changes contain both an expected component, as well as an unexpected, 'surprise' component. We have assumed that firms react to changes in CPI inflation, as this is what is most often covered in popular media outlets. However, we can also construct a measure of 'CPI news' and use this as the treatment in our specification. As outlined in Section 2, we use median CPI forecasts from Bloomberg to proxy for market expectations. In Table A7, we present the effects of CPI news (i.e. the difference between expectations and outturns) on own-price expectations using our standard difference-in-differences framework. We find only a weak positive effect in Column 1, which is significant at the 10% level, but no significant effect across the remaining three columns. Thus, firms' own-price expectations appear to be more responsive to the changes in the headline CPI inflation rates, rather than their deviation from market expectations.

In Table A8, we test the effects of CPI inflation news (based on Bloomberg forecasts) on CPI inflation expectations, both one year and three years ahead. We find significant effects on year-ahead CPI inflation expectations from *unexpected* changes in CPI inflation (Columns 1-2). However, we find no significant effect on three-year ahead CPI expectations, which appear to be more stable and unaffected by short-term data releases. These results are similar to the effects of changes in CPI inflation on CPI inflation expectations, as previously shown in Tables 5 and A5, respectively.

**Responsiveness to PPI changes** Similarly, one concern may be that we are putting too much focus on changes in *CPI* in the paper, whereas changes in other inflation rates may be more informative for firms. For example, producer price inflation (PPI) may be a more important guide for firms, if it informs them about average input and output price trends of *producers* in particular. We offer several responses here. First, based on direct questions asked to DMP firms in May-July 2023, we have evidence that CPI inflation is indeed an important factor in pricing decision for around 60%

of firms (Figure A5). This justifies our focus in particular on CPI. Furthermore, it is important to note that PPI inflation rates are based on trends for UK manufacturers only, and therefore may not be representative of trends across the whole economy. Services PPI are also published by the ONS, but only at the quarterly frequency, and generally based on a much smaller sample of firms. Nevertheless, we can test for the effects of changes in PPI inflation on own-price expectations of firms, and we report these results in Table A9. CPI and PPI data are generally released on the same day of the month, allowing us to test for these effects in the same specification. Changes in Input PPI (Column 2) and changes in Output PPI inflation (Column 3) have no effect on own-price expectations. In Column 4, we regress own-price expectations on changes in CPI and both PPI indices. Only the changes in headline CPI inflation remain a significant determinant of own-price expectations.

**Additional controls** So far, the only controls we have considered are the industry, event window, and month fixed effects in the regressions. This is already a fairly demanding specification, but we can add further controls at the daily and firm level to the main specification. In Table A10, we test the robustness of our main results on own-price expectations to the inclusion of both firm-level variables, as well as stock market data, exchange rates, and daily economic policy uncertainty. In Column 2, we see that expected own-price growth is significantly related to firms' *realised* annual price growth. Firm-level inflation uncertainty (calculated as the standard deviation of expected price growth scenarios) is also positively related to expected price growth. However, the effects of CPI inflation changes (shown in the first row) remain robust to these additional firm-level covariates. Likewise, in Column 3, we show that the main result is also robust to the inclusion of economic policy uncertainty, stock market changes, stock market volatility, and changes in the US/GBP exchange rate. Interestingly, changes in the exchange rate are also highly significant in this specification, suggesting firms increase their own-price expectations in response to currency depreciations.

**Additional heterogeneity results** In Table A11, we present several additional results on the impact of CPI inflation changes on own-price expectations. In particular, we analyse whether the results differ by sector, firm size, and by the importance of CPI inflation and competitor price growth in firm pricing decisions (a potential proxy

for strategic complementarities). Column 1 in the table reproduces the main result across all firms for ease of comparison. In Column 2, we see that the effects are statistically significant and of a similar magnitude for both goods producers and services providers. Therefore, the results are not driven only by one sector of the sample. In Column 3, we test for the effects by firm size. We find significant effects for both large and small firms, and the coefficients have a similar magnitude.

Firms in the DMP were asked between May to July 2023 about the importance of CPI inflation and competitors' prices for their own pricing decisions. Around 17% of firms reported CPI inflation to be the most important factor (Figure A5), and 30% reported competitors prices to be the most important (Figure A18). In order to analyse the differential effect of CPI releases depending on the importance of CPI and competitor prices, we create *industry-level* indicators based on the industries in which the respective factors were most important. Specifically, we create indicator variables for industries where more than 20% of businesses reported CPI inflation to be the most important factor, and 25% of businesses reported the same for competitors prices. This is based on the industrial breakdowns presented in Figure A19.

Column 4 of Table A11 shows that the effects of CPI releases are significant at 5% both for sectors which cite CPI inflation as most important and those which do not. Column 5 presents the corresponding result for competitors prices. The effects are positive for both, but only statistically significant for sectors where more than 25% of firms consider competitor prices as the most important factor. The effect for firms which view competitors prices as most important may suggest that in more competitive markets or markets with higher strategic complementarities, firms are more attentive to aggregate inflation trends when setting their own prices. This result is similar to the recent findings in Afrouzi (2023) on how competition affects firm expectations.

**Impact on inflation uncertainty and skewness** In addition to the effects on average expected own-price growth, the DMP allows us to also test for the effects of CPI inflation changes on higher moments of expectations, such as inflation uncertainty and skewness *at the firm level*. These are calculated as the second and third moments, respectively, of expectations based on the five-bin distributions reported by firms. Figure A20 shows the evolution of these series over the period 2017-2024. Both series

are normalised to their average levels in 2019 for ease of comparison. Inflation uncertainty increased sharply around the onset of the pandemic in 2020, and reached a peak around the end of 2022, when it was around 60% above pre-pandemic levels. Meanwhile, inflation skewness decreased slightly in the start of 2020, as firms put higher weights on lower price growth in the initial months of the pandemic. However, expectations became positively skewed in 2021 and also reached a peak near the end of 2022. In 2024, both series have declined significantly, but inflation uncertainty remains above pre-pandemic levels. In Table A12, we test for the effect of CPI inflation changes on inflation uncertainty and skewness. We find no significant effect on either the second or third moments of the inflation distribution, and also no evidence of a non-linearity by the sign of CPI inflation changes.

**Daily dataset results** Finally, in Table A13, we test the robustness of our results in a dataset collapsed at the daily level (as described in Section 3). In this specification, we also weight the daily observations by the square root of the number of firm responses on that day. The sample sizes are much smaller, because we focus on tight windows around each CPI release. Nevertheless, the coefficients are statistically significant and of a similar magnitude as our main findings in Table 3.

# 5 Conclusion

Inflation rates across most of the developed world increased sharply in 2022. This paper uses high-frequency firm-level data from the UK to analyse the effects of changes in CPI inflation on firms' inflation perceptions and expectations. Firms pay close attention to changes in inflation rates, and they update their current CPI inflation perceptions quickly in the days and even *hours* following data releases. More importantly, firms increase their *own-price* expectations in response to higher headline inflation rates. However, we do not find evidence of the same sensitivity in response to decreases in CPI inflation. To rationalise these findings, we first create an index of inflation media coverage, and show that firm own-price expectations are particularly responsive when there is more news about inflation in the media. Firms also increase their near-term CPI inflation expectations in response to positive CPI inflation changes. Together with the results on own-price expectations, this indicates a desire to keep relative prices stable. Finally, firms associated higher headline inflation with

higher expected cost growth and lower expected sales volume growth over the period since 2022, consistent with a supply-side view of the economy.

# References


Afrouzi, H. (2023). Strategic inattention, inflation dynamics, and the non-neutrality of money. *NBER Working Paper 31796*.

Anderson, G. and B. Maule (2014). Assessing the risk to inflation from inflation expectations. *Bank of England Quarterly Bulletin*, Q2.

Andre, P., C. Pizzinelli, C. Roth, and J. Wohlfart (2022). Subjective models of the macroeconomy: Evidence from experts and representative samples. *The Review of Economic Studies 89*(6), 2958–2991.

Baumann, U., A. Ferrando, D. Georgarakos, Y. Gorodnichenko, and T. Reinelt (2024). Safe to update inflation expectations? new survey evidence on euro area firms. *NBER Working Paper 32504*.

Binder, C., R. Kamdar, and J. M. Ryngaert (2024). Partisan expectations and covid-era inflation. *NBER Working Paper 32650*.

Binder, C. C. (2021). Household expectations and the release of macroeconomic statistics. *Economics Letters 207*, 110041.

Binetti, A., F. Nuzzi, and S. Stantcheva (2024). People's understanding of inflation. *NBER Working Paper 32497*.

Bottone, M. and A. Rosolia (2019). Monetary policy, firms' inflation expectations and prices: causal evidence from firm-level data. *Bank of Italy Temi di Discussione (Working Paper) No 1218*.

Bracha, A. and J. Tang (2022). Inflation levels and (in) attention. *FRB of Boston Working Paper*.

Bunn, P., L. S. Anayi, N. Bloom, P. Mizen, G. Thwaites, and I. Yotzov (2022). Firming up price inflation. *NBER Working Paper 30505*.

Candia, B., O. Coibion, and Y. Gorodnichenko (2021). The inflation expectations of us firms: Evidence from a new survey. *National Bureau of Economic Research Working Paper 28836*.

Cavallo, A., G. Cruces, and R. Perez-Truglia (2017). Inflation expectations, learning, and supermarket prices: Evidence from survey experiments. *American Economic Journal: Macroeconomics 9*(3), 1–35.

Coibion, O., Y. Gorodnichenko, and S. Kumar (2018). How do firms form their expectations? new survey evidence. *American Economic Review 108*(9), 2671–2713.

Coibion, O., Y. Gorodnichenko, and M. Weber (2022). Monetary policy communications and their effects on household inflation expectations. *Journal of Political Economy 130*(6), 1537–1584.

D'Acunto, F., U. Malmendier, and M. Weber (2023). What do the data tell us about inflation expectations? In *Handbook of economic expectations*, pp. 133–161. Elsevier.

Di Pace, F., G. Mangiante, and R. Masolo (2023). Do firm expectations respond to monetary policy announcements? *Bank of England Staff Working Paper 1014*.

Enders, Z., F. Hünnekes, and G. J. Müller (2019). Monetary policy announcements and expectations: Evidence from german firms. *Journal of Monetary Economics 108*, 45–63.

Gorodnichenko, Y., R. Melnick, and A. Kutai (2023). Information and the formation of inflation expectations by firms: Evidence from a survey of israeli firms. *National Bureau of Economic Research Working Pape 31507*.

Korenok, O., D. Munro, and J. Chen (2022). Inflation and attention thresholds. *Available at SSRN 4230600*.

Lamla, M. J. and D. V. Vinogradov (2019). Central bank announcements: Big news for little people? *Journal of Monetary Economics 108*, 21–38.

Lewis, D. J., C. Makridis, and K. Mertens (2019). Do monetary policy announcements shift household expectations? *FRB of New York Staff Report* (897).

Link, S., A. Peichl, C. Roth, and J. Wohlfart (2023). Information frictions among firms and households. *Journal of Monetary Economics 135*, 99–115.

Lucas, R. E. (1972). Expectations and the neutrality of money. *Journal of economic theory 4*(2), 103–124.

Macaulay, A. (2022). Shock transmission and the sources of heterogeneous expectations. *Working Paper*.

Mann, C. L. (2022). Inflation expectations, inflation persistence, and monetary policy strategy. In *Speech at "Reassessing Constraints on the Economy and Policy," an economic policy symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming*.

McClure, E. M., O. Coibion, and Y. Gorodnichenko (2022). The macroeconomic expectations of us managers. *National Bureau of Economic Research Working Paper 29986*.

Mikosch, H., C. Roth, S. Sarferaz, and J. Wohlfart (2024). Uncertainty and information acquisition: Evidence from firms and households. *American Economic Journal: Macroeconomics 16*(2), 375–405.

Pfäuti, O. (2023). The inflation attention threshold and inflation surges. *arXiv preprint arXiv:2308.09480*.

Pfäuti, O. (2024). Inflation - who cares? monetary policy in times of low attention. *Journal of Money, Credit and Banking*.

Powell, J. (2022). Monetary policy and price stability. In *At "Reassessing Constraints on the Economy and Policy," an economic policy symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming*.

Rast, S. (2021). Central bank communication with the general public: survey evidence from germany. *unpublished, European University Institute*.

Reis, R. (2023a). Expected inflation in the euro area: Measurement and policy responses. *Centre for Economic Policy Research Discussion Paper 17849*.

Reis, R. (2023b). Four mistakes in the use of measures of expected inflation. *AEA Papers and Proceedings 113*, 47–51.

Savignac, F., E. Gautier, Y. Gorodnichenko, and O. Coibion (2021). Firms' inflation expectations: New evidence from france. *National Bureau of Economic Research Working Paper 29376*.

Stantcheva, S. (2024). Why do we dislike inflation? *NBER Working Paper 32300*.

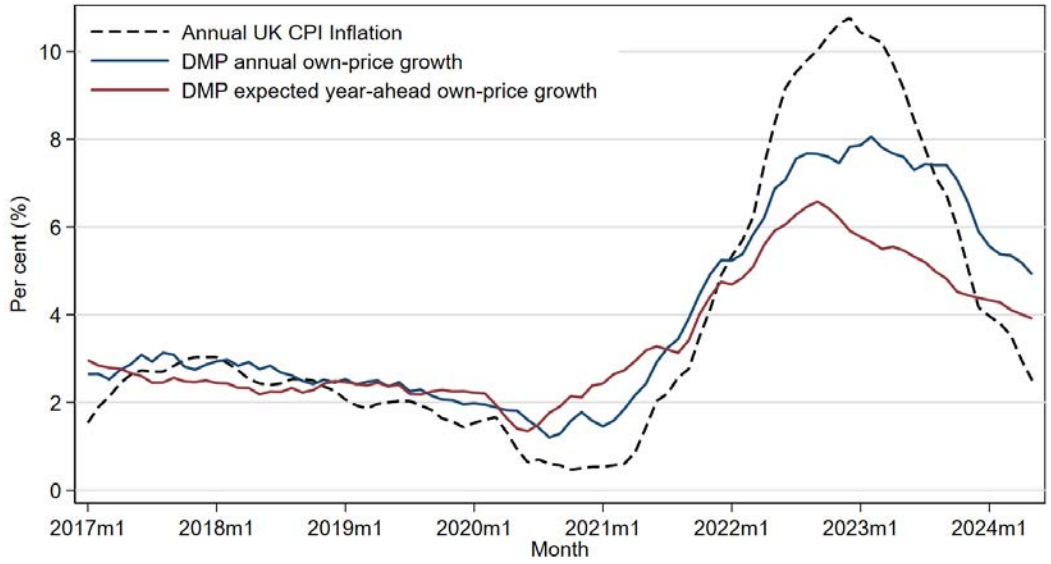
Taylor, J. B. (1993). Discretion versus policy rules in practice. In *Carnegie-Rochester conference series on public policy*, Volume 39, pp. 195–214. Elsevier.

Weber, M., B. Candia, T. Ropele, R. Lluberas, S. Frache, B. H. Meyer, S. Kumar, Y. Gorodnichenko, D. Georgarakos, O. Coibion, et al. (2023). Tell me something i don't already know: Learning in low and high-inflation settings. *National Bureau of Economic Research Working Paper 31485*.

Yotzov, I., L. Anayi, N. Bloom, P. Bunn, P. Mizen, O. Ozturk, and G. Thwaites (2023). Firm inflation uncertainty. *AEA Papers and Proceedings 113*, 56–60.

# 6 Figures

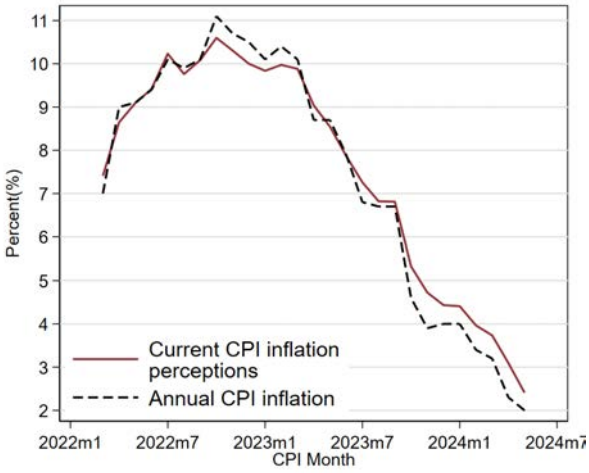
Figure 1: Firm annual price growth, expected price growth, and annual CPI inflation



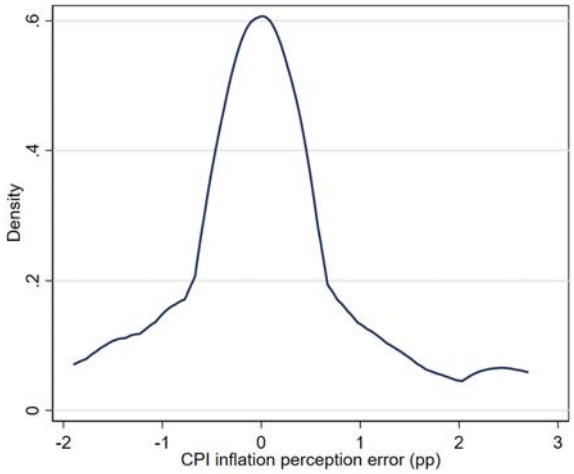

**Notes:** The data on annual own-price growth and expected year-ahead own-price growth are based on data from the Decision Maker Panel. The data on annual CPI inflation is taken from the Office for National Statistics. The series are three-month moving averages.

Figure 2: Current CPI inflation perceptions and CPI inflation expectations

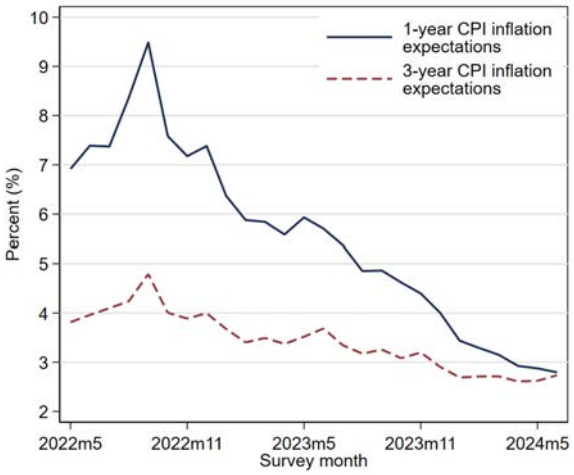
*Panel A:* CPI inflation perceptions




*Panel B:* CPI inflation perception errors

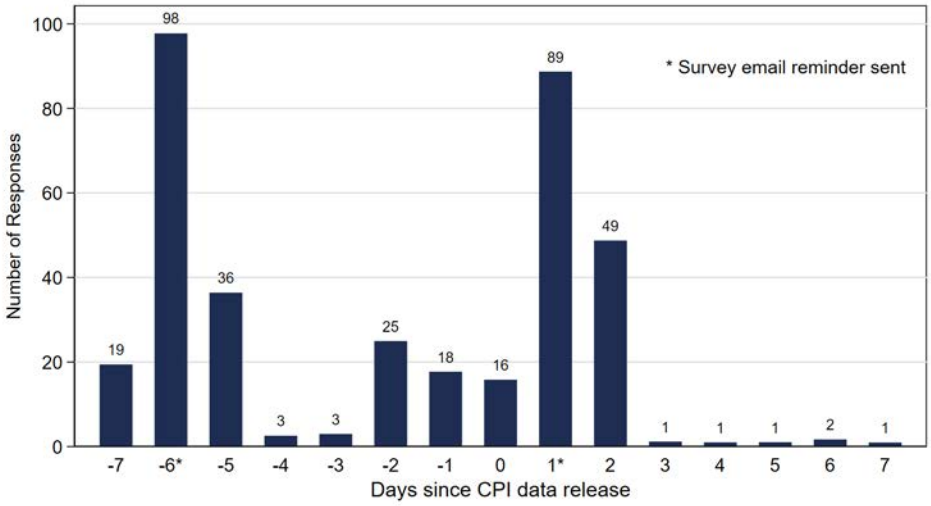



*Panel C:* CPI inflation expectations



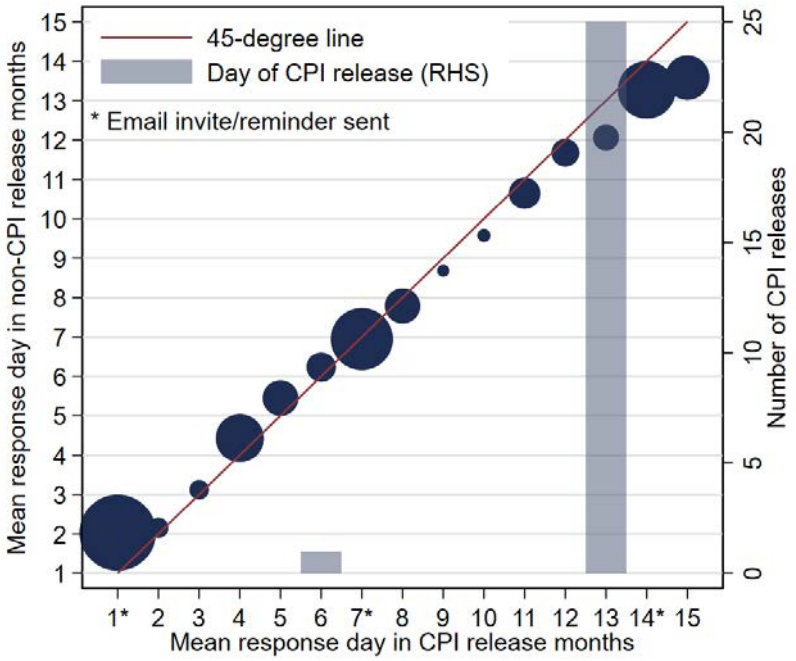

**Notes:** This figure shows the evolution of CPI inflation perceptions (Panel A) and the distribution of CPI inflation perception errors (Panel B). Perception errors are calculated as the difference between reported CPI inflation perceptions and actual CPI inflation on the day the response is submitted. Panel C shows the evolution CPI inflation expectations among firms in the DMP. In Panel A, the horizontal axis is the CPI month, rather than the survey month, to reflect the fact that CPI releases often happen during the survey window.

Figure 3: Average number of survey responses around CPI release dates (2022-2024)



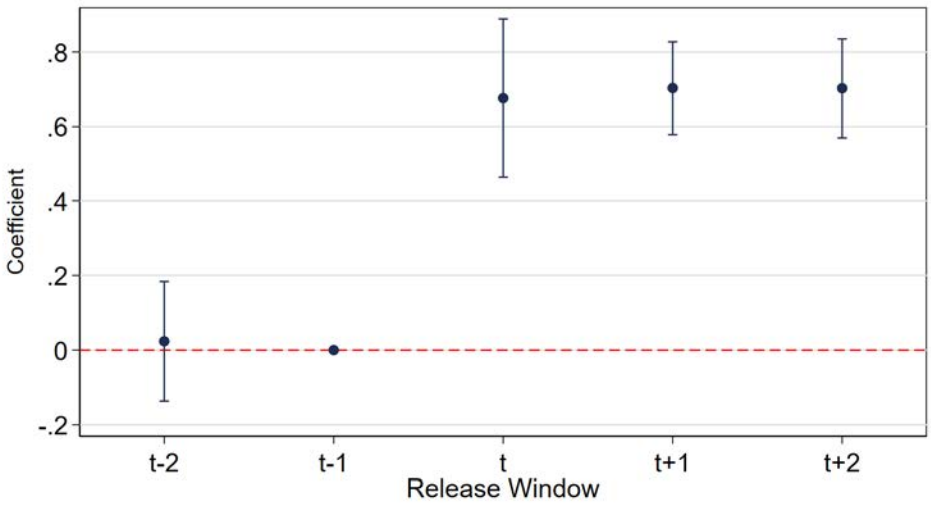

**Notes:** This figure shows the average number of survey responses for the question on expected own-price growth around CPI release dates (indicated by 0 on the horizontal axis) in the DMP. These data are based on the period 2022-2024.

Figure 4: Average response patterns in months with and without a CPI release (2022-2024)



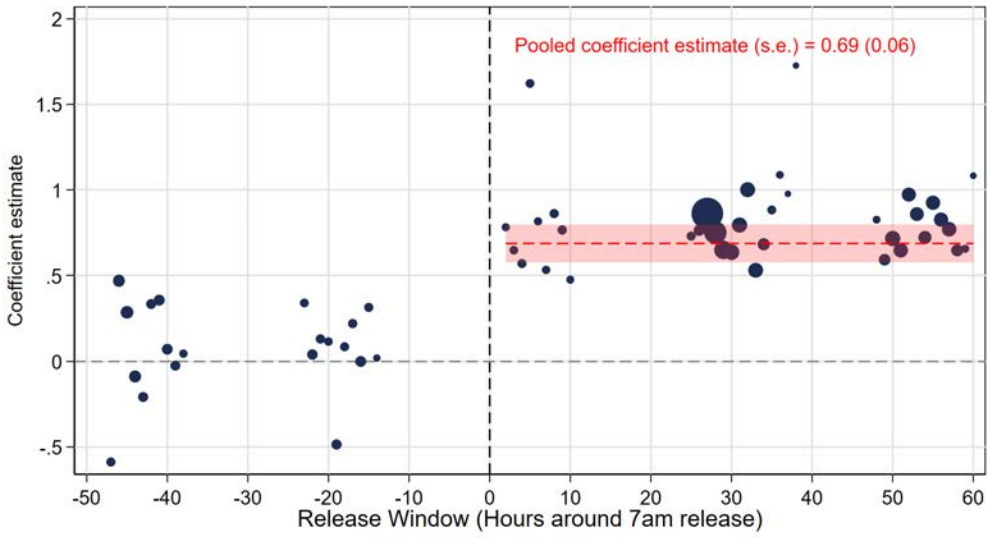

**Notes:** This figure shows the average days of response to the survey for months with a CPI release during the survey window (x-axis) and months without a CPI release (y-axis). Over 2022-2024, there were four months without a release: March 2022, March 2023, May 2023, December 2023. The size of the dots corresponds to the number of responses on each day. Email invite/reminders are sent on days 1,7,14.

Figure 5: Impact of CPI inflation changes on current CPI inflation perceptions



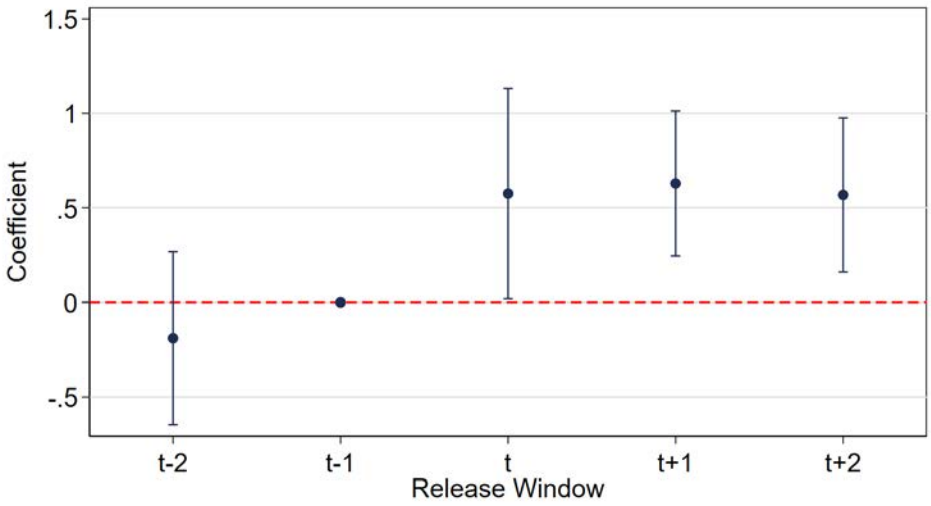

**Notes:** This figure plots the impact of CPI inflation changes on current CPI inflation perceptions based on the methodology outlined in Section 3. The omitted category is the day before the CPI release. 90% confidence intervals are reported around the point estimates.

Figure 6: Impact of CPI inflation changes on current CPI inflation perceptions: Hourly window specification



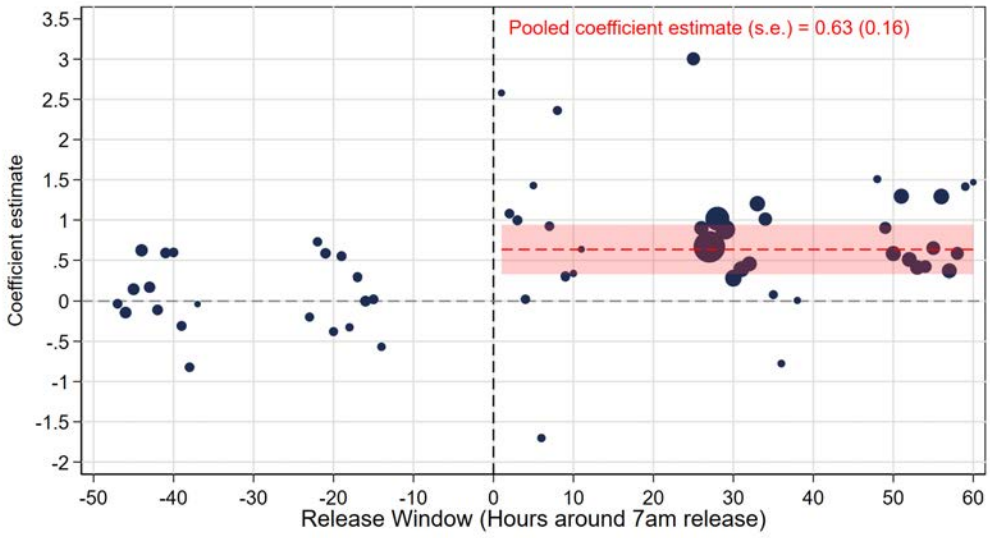

**Notes:** This figure plots coefficient estimates of the impact of CPI inflation changes on current CPI inflation perceptions based on the methodology outlined in Section 3, but applied to the hourly frequency. The omitted category is 3-4pm on the day before the CPI release (t-16). Each coefficient value is scaled by the average number of observations in the corresponding hour in the sample. The red horizontal line in the post-CPI release hours is the pooled coefficient estimate of the change in CPI inflation on CPI inflation perceptions (column 2 from Table 2). The shaded area denotes the 95% confidence interval. Months in which the CPI release is outside the survey window are dropped - March 2022, March 2023, May 2023, December 2023. Hours with fewer than 15 observations on average are not reported in the figure.

Figure 7: Impact of CPI inflation changes on expected own-price growth (2022-2024)



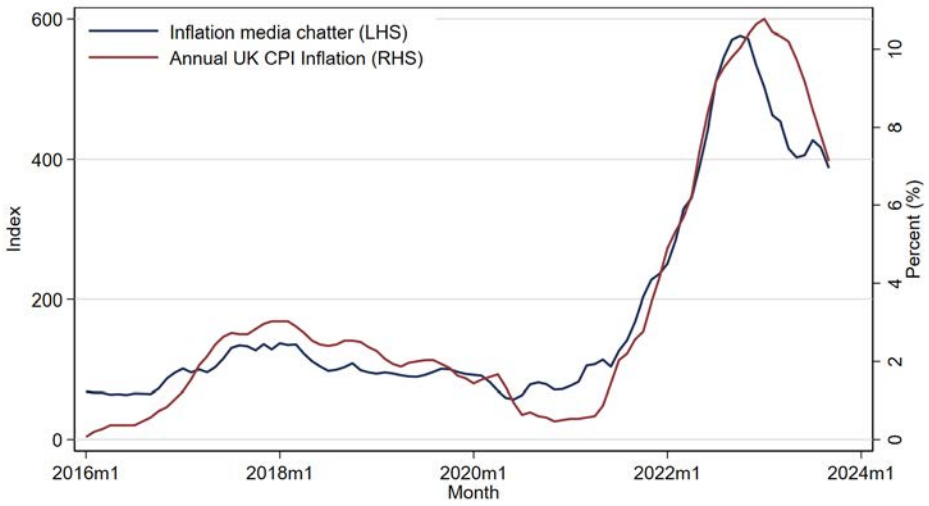

**Notes:** This figure plots the impact of CPI inflation changes on expected year-ahead own-price growth based on the methodology outlined in Section 3. The omitted category is the day before the CPI release. 90% confidence intervals are reported around the point estimates.

Figure 8: Impact of CPI inflation changes on expected own-price growth: Hourly window specification (2022-2024)




**Notes:** This figure plots coefficient estimates of the impact of CPI inflation changes on expected own-price growth based on the methodology outlined in Section 3, but applied to the hourly frequency. The omitted category is 3-4pm on the day before the CPI release (t-16). Each coefficient value is scaled by the average number of observations in the corresponding hour in the sample. The red horizontal line in the post-CPI release hours is the pooled coefficient estimate of the change in CPI inflation on expected own-price growth (column 2 from Table 3, Panel A). The shaded area denotes the 95% confidence interval. Months in which the CPI release is outside the survey window are dropped - March 2022, March 2023, May 2023, December 2023. Hours with fewer than 15 observations on average are not reported in the figure.

Figure 9: CPI inflation and inflation media chatter (2016-2023)




**Notes:** Inflation media chatter is the share of articles in British newspapers which mention the terms 'inflation' or 'CPI' or 'Consumer Price Index'. This measure has been normalised to have an average value of 100 over the period 2010-2019. Both series are three-month moving averages

# 7 Tables

Table 1: Balance test across survey window

| Dependent variable: | (1) log Labour Productivity | (2) log Assets | (3) log Sales | (4) log Employment | (5) Survey Duration |
|---|---|---|---|---|---|
| Sample: | | | 2022-2024 | | |
| Event Window: | | | ±2 Day | | |
| =1 Post-release | -0.019 | 0.010 | 0.013 | 0.061 | 0.444 |
| | (0.030) | (0.070) | (0.064) | (0.053) | (0.896) |
| Constant | 3.983*** | 9.111*** | 9.793*** | 4.235*** | 22.600*** |
| | (0.026) | (0.062) | (0.056) | (0.046) | (0.791) |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.258 | 0.182 | 0.175 | 0.106 | 0.030 |
| Observations | 3,771 | 5,082 | 4,022 | 5,075 | 5,089 |

Notes: The dependent variables in Columns 1-4 are based on FY2021 accounting data from the Bureau Van Dijk FAME database. Labour productivity (Column 1) is calculated as the ratio of real gross value added to the number of employees. The sample of firms are those which respond to the question on expected own-price growth. Robust standard errors are reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2: Impact of CPI inflation changes on current CPI inflation perceptions

| Dependent variable: | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Current CPI inflation perceptions | | | | |
| Event Window: | ±1 Day | ±2 Day | ±5 Day | ±7 Day | ±7 Day |
| Sample: | 2022-2024 | | | | |
| Δ CPI Inflation × Post | 0.702*** | 0.687*** | 0.670*** | 0.689*** | 0.700*** |
| | (0.076) | (0.057) | (0.048) | (0.037) | (0.037) |
| Constant | 7.740*** | 7.675*** | 7.683*** | 7.775*** | 7.783*** |
| | (0.026) | (0.020) | (0.018) | (0.016) | (0.002) |
| Firm fixed effects | No | No | No | No | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | No |
| Release window fixed effects | Yes | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes | Yes |
| Test coefficient = 1 (p-value) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| $R^2$ | 0.822 | 0.821 | 0.801 | 0.771 | 0.880 |
| Observations | 3,268 | 5,347 | 6,679 | 10,562 | 8,893 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: Impact of CPI inflation changes on expected own-price growth

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Dependent variable: | Expected own-price growth | | | | |
| Event Window: | ±1 Day | ±2 Day | ±5 Day | ±7 Day | ±7 Day |
| *Panel A: 2022-2024* | | | | | |
| Δ CPI Inflation × Post | 0.523** | 0.634*** | 0.382*** | 0.285*** | 0.306*** |
| | (0.223) | (0.157) | (0.125) | (0.099) | (0.100) |
| Constant | 5.411*** | 5.347*** | 5.342*** | 5.376*** | 5.312*** |
| | (0.078) | (0.067) | (0.062) | (0.052) | (0.002) |
| $R^2$ | 0.122 | 0.107 | 0.101 | 0.094 | 0.631 |
| Observations | 3,172 | 5,090 | 6,457 | 9,991 | 8,387 |
| *Panel B: 2017-2024* | | | | | |
| Δ CPI Inflation × Post | 0.358** | 0.445*** | 0.328*** | 0.220*** | 0.215*** |
| | (0.176) | (0.122) | (0.095) | (0.074) | (0.067) |
| Constant | 3.497*** | 3.457*** | 3.383*** | 3.493*** | 3.470*** |
| | (0.038) | (0.034) | (0.031) | (0.028) | (0.001) |
| $R^2$ | 0.261 | 0.245 | 0.241 | 0.241 | 0.624 |
| Observations | 9,484 | 15,423 | 21,065 | 30,036 | 27,136 |
| Firm fixed effects | No | No | No | No | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | No |
| Release window fixed effects | Yes | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes | Yes |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Impact of CPI inflation changes on own-price expectations: Interaction with inflation media chatter

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Dependent variable: | Expected own-price growth | | | Expected own-price growth | | |
| Event Window: | ±2 Day | | | ±2 Day | | |
| Sample: | 2017-2023 | | | 2022-2023 | | |
| $\Delta$ CPI Inflation $\times$ Post | 0.166 | 0.159 | 0.169 | 0.664*** | 0.671*** | 0.676*** |
| | (0.161) | (0.161) | (0.161) | (0.209) | (0.209) | (0.211) |
| $\Delta$ CPI Inflation $\times$ Post $\times$ Inflation Media Chatter$_{-3}$ | 0.295** | | | 0.536* | | |
| | (0.130) | | | (0.312) | | |
| $\Delta$ CPI Inflation $\times$ Post $\times$ Inflation Media Chatter$_{-5}$ | | 0.302** | | | 0.485* | |
| | | (0.130) | | | (0.268) | |
| $\Delta$ CPI Inflation $\times$ Post $\times$ Inflation Media Chatter$_{-7}$ | | | 0.293** | | | 0.431 |
| | | | (0.132) | | | (0.284) |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Release window fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.259 | 0.259 | 0.259 | 0.093 | 0.093 | 0.093 |
| Observations | 13,726 | 13,726 | 13,726 | 3,559 | 3,559 | 3,559 |

Notes: Inflation media chatter is the share of articles in British newspapers which mention the terms 'inflation' or 'CPI' or 'Consumer Price Index'. The variable Inflation Media Chatter$_{-3}$ is the average inflation media index in the three days prior to a CPI release, normalised to have 0 mean an unit standard deviation. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Impact of CPI inflation changes: Mechanisms

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Dependent variable: | One-year ahead expected CPI | | Expected cost growth | | Expected real sales growth | | Expected interest rate |
| Event Window: | ±2 Day | | ±2 Day | | ±2 Day | | ±2 Day |
| Sample: | 2022-2024 | | 2022-2024 | | 2022-2024 | | 2022-2024 |
| Δ CPI Inflation × Post | 0.247** | 0.321*** | 0.453 | 0.669* | -1.203** | -0.042 | 0.305* |
| | (0.097) | (0.108) | (0.312) | (0.363) | (0.577) | (0.735) | (0.179) |
| Constant | 5.766*** | 5.730*** | 7.583*** | 7.228*** | 3.238*** | 3.021*** | 6.130*** |
| | (0.039) | (0.012) | (0.109) | (0.015) | (0.223) | (0.033) | (0.077) |
| Firm fixed effects | No | Yes | No | Yes | No | Yes | No |
| Industry fixed effects | Yes | No | Yes | No | Yes | No | Yes |
| Release window fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.443 | 0.768 | 0.096 | 0.683 | 0.045 | 0.581 | 0.092 |
| Observations | 5,347 | 3,728 | 3,383 | 1,951 | 4,973 | 3,458 | 1,869 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

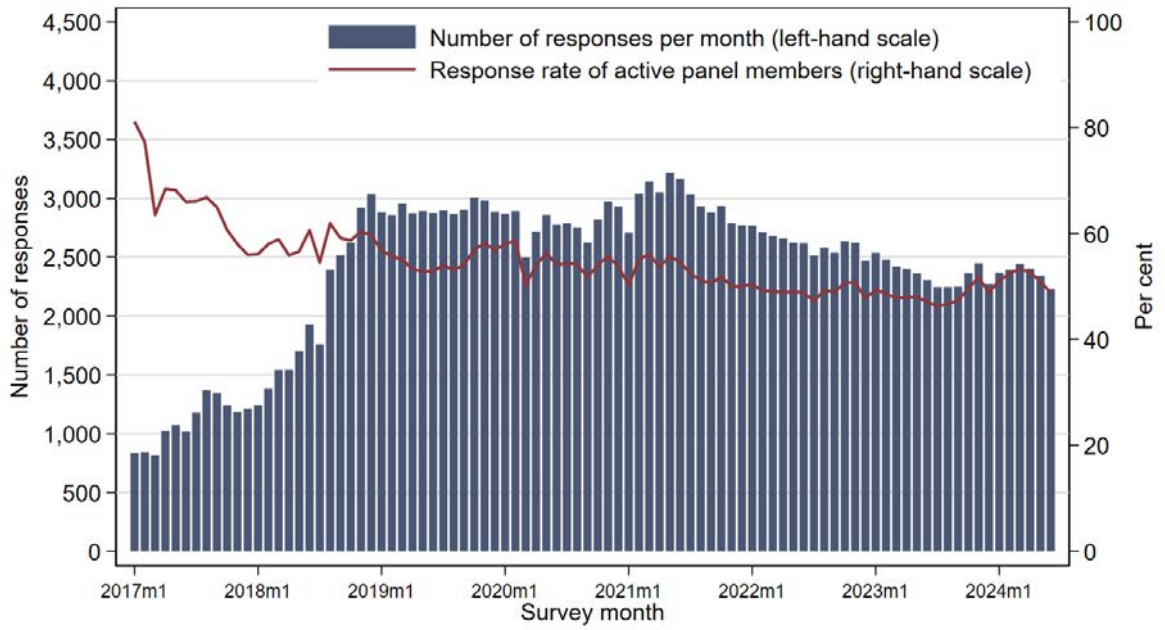
# Online Appendix
# The Speed of Firm Response to Inflation

For Online Publication

July 15, 2024

## A Figures

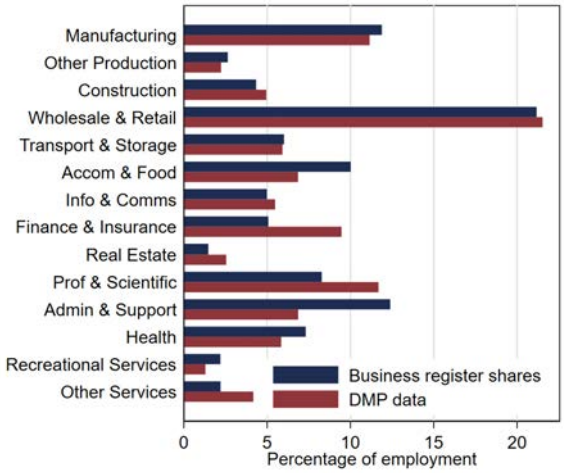
Figure A1: DMP response rate



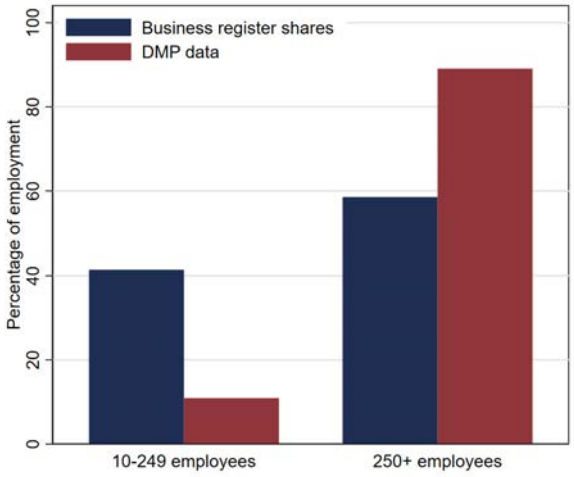

**Notes:** This figure presents the number of monthly responses to the DMP. The solid line shows the *active* response rate, referring to the response rate among firms which have responses at least once over the past 12 months.

Figure A2: Coverage of DMP survey by industry and firm size

*Panel A:* Industry



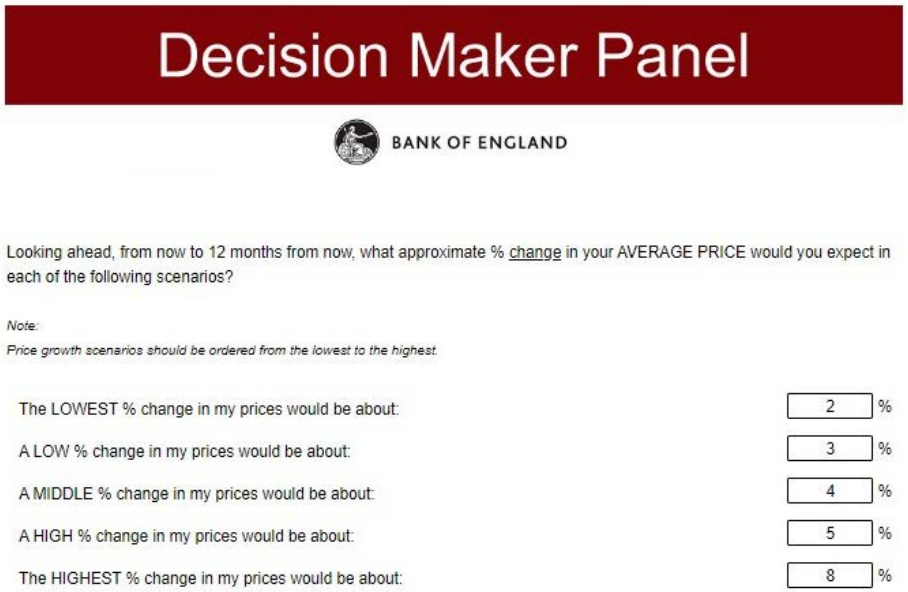

*Panel B:* Firm Size




**Notes:** This figure compares the coverage of the DMP survey across industries (Panel A) and by firm size (Panel B).

Figure A3: Format of question on expected own-price growth

*Panel A:* Scenarios



Decision Maker Panel

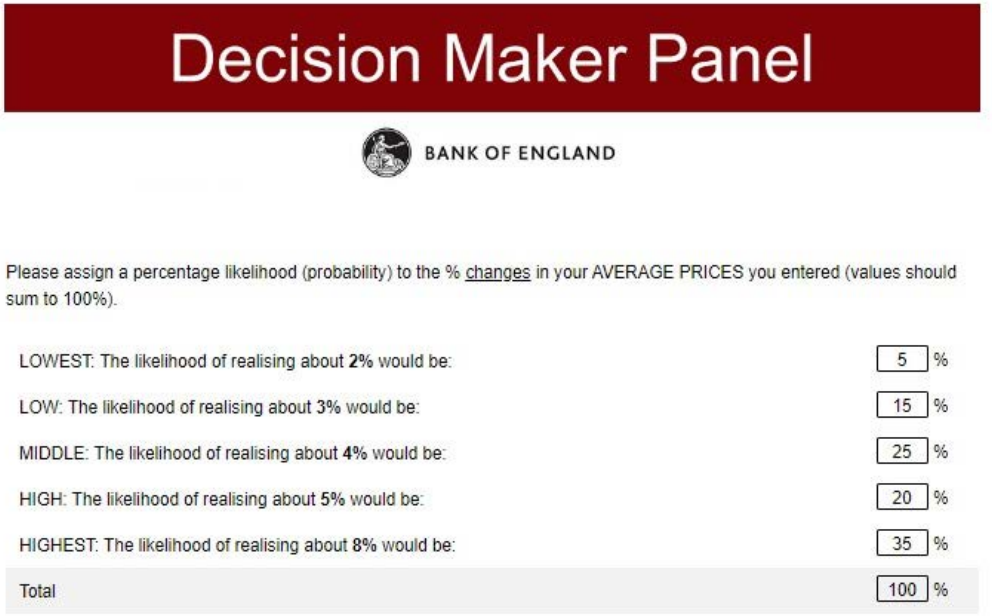
BANK OF ENGLAND

Looking ahead, from now to 12 months from now, what approximate % change in your AVERAGE PRICE would you expect in each of the following scenarios?

*Note:*
*Price growth scenarios should be ordered from the lowest to the highest.*

| | |
|---|---|
| The LOWEST % change in my prices would be about: | 2 % |
| A LOW % change in my prices would be about: | 3 % |
| A MIDDLE % change in my prices would be about: | 4 % |
| A HIGH % change in my prices would be about: | 5 % |
| The HIGHEST % change in my prices would be about: | 8 % |

*Panel B:* Probabilities



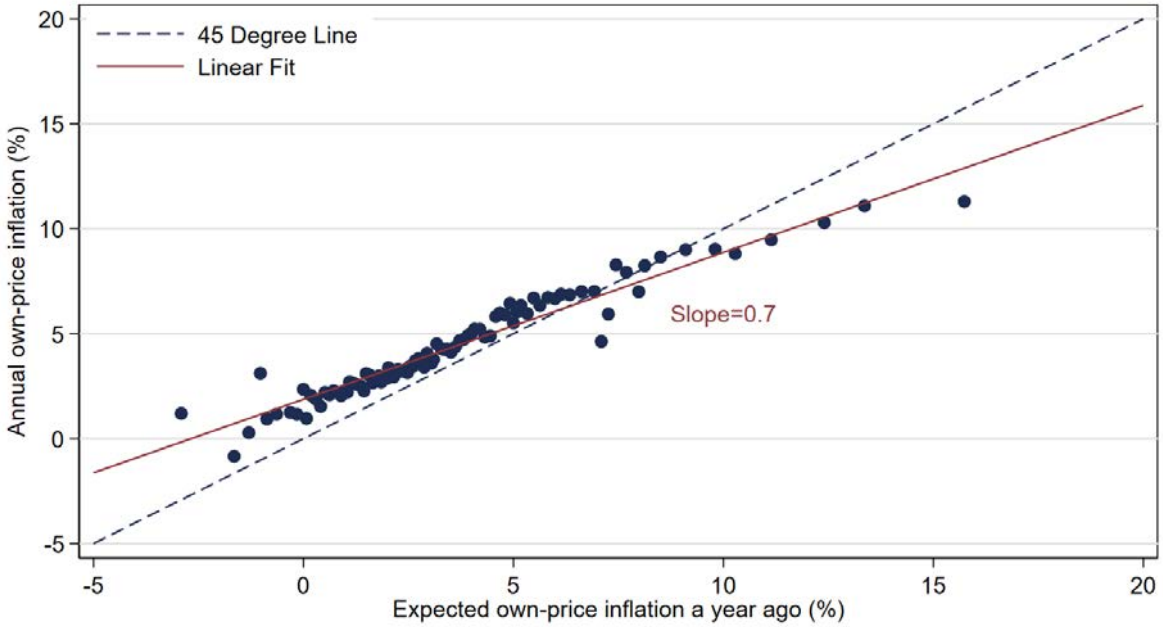
Decision Maker Panel

BANK OF ENGLAND

Please assign a percentage likelihood (probability) to the % changes in your AVERAGE PRICES you entered (values should sum to 100%).

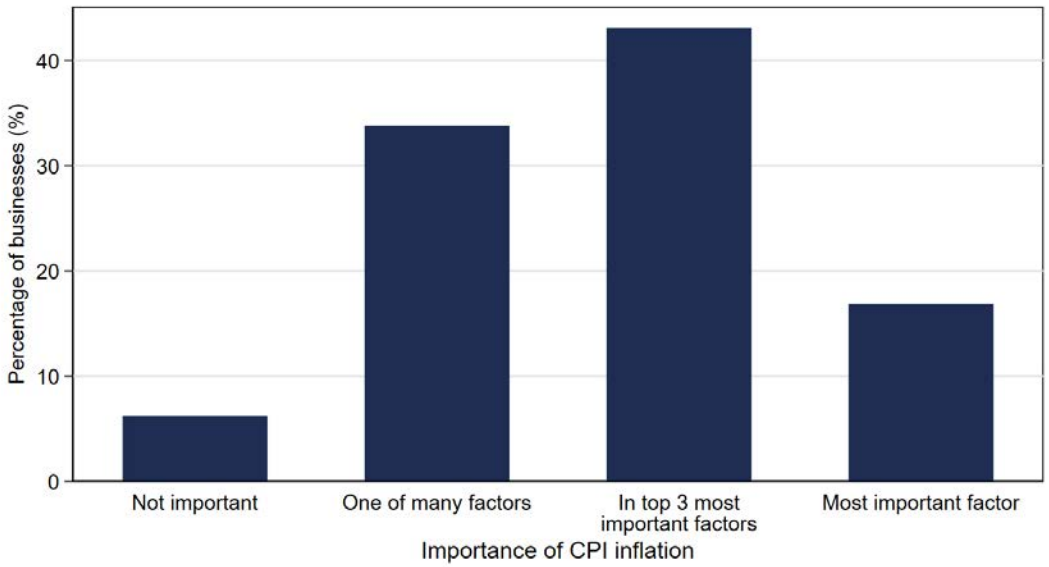
| | |
|---|---|
| LOWEST: The likelihood of realising about **2%** would be: | 5 % |
| LOW: The likelihood of realising about **3%** would be: | 15 % |
| MIDDLE: The likelihood of realising about **4%** would be: | 25 % |
| HIGH: The likelihood of realising about **5%** would be: | 20 % |
| HIGHEST: The likelihood of realising about **8%** would be: | 35 % |
| Total | 100 % |

Figure A4: Expected and realised firm own-price growth




**Notes:** This figure presents a binned scatterplot of the relationship between expected year-ahead own-price growth and realised own-price growth *a year later* for the same firms. Each dot represents approximately 1% of the sample of firms. The figure is based on data from November 2017 to June 2024.

Figure A5: Importance of CPI inflation for current pricing decisions




**Notes:** This figure presents the importance of CPI inflation for current pricing decisions of firms in the DMP. The data are based on a survey question asked between May to July 2023.

Figure A6: Format of question on current CPI inflation perceptions and CPI inflation expectations

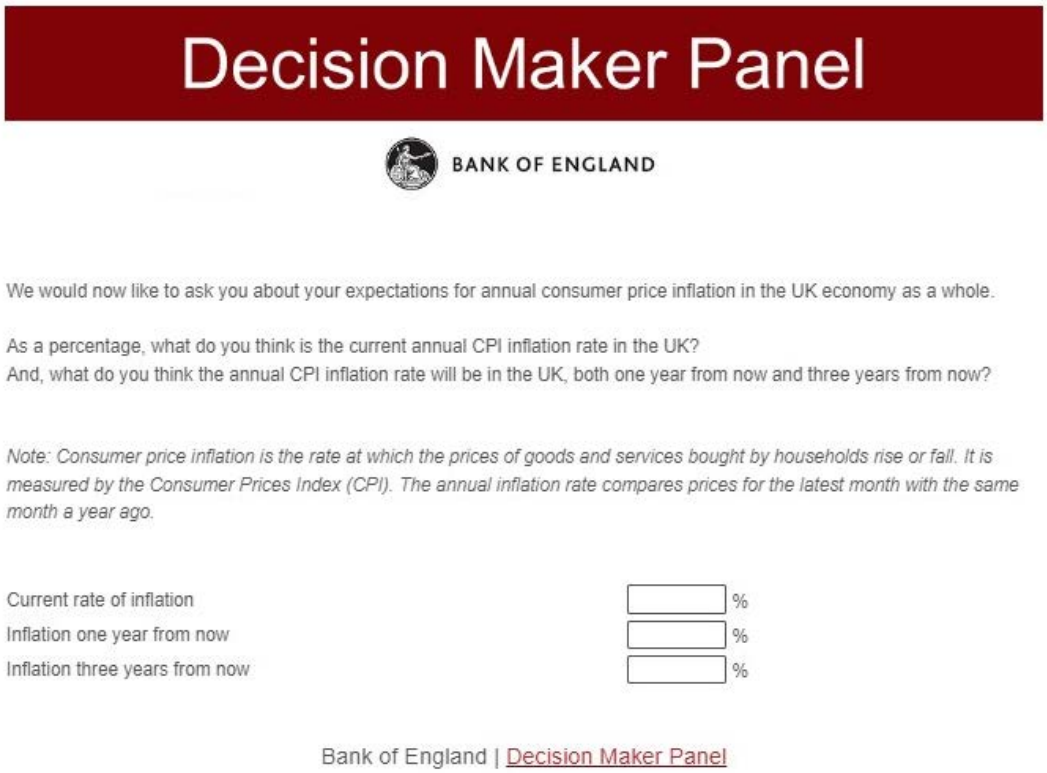
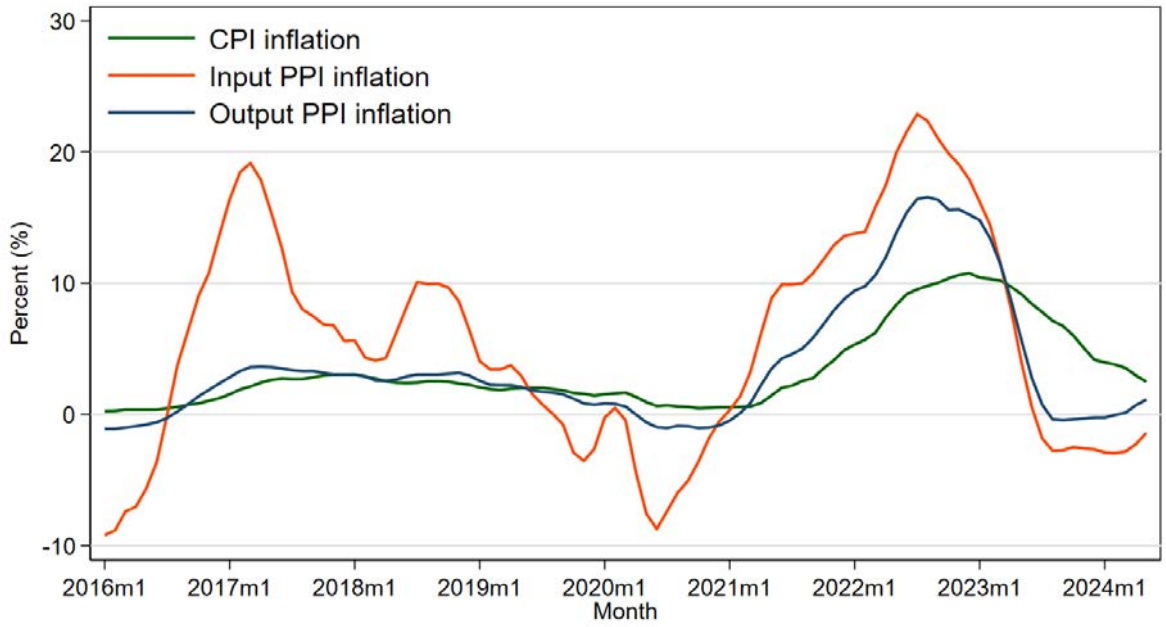


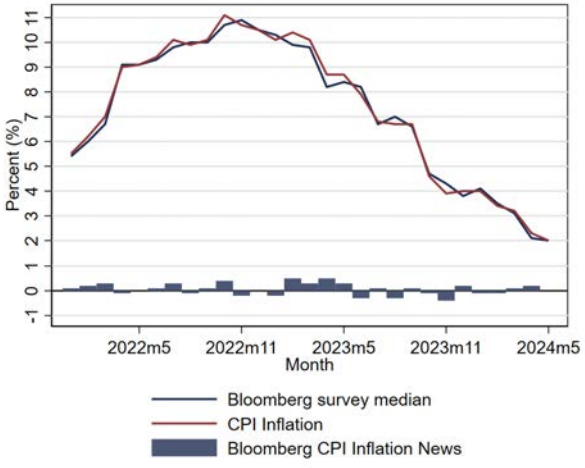
Figure A7: Trends in CPI inflation and PPI inflation rates



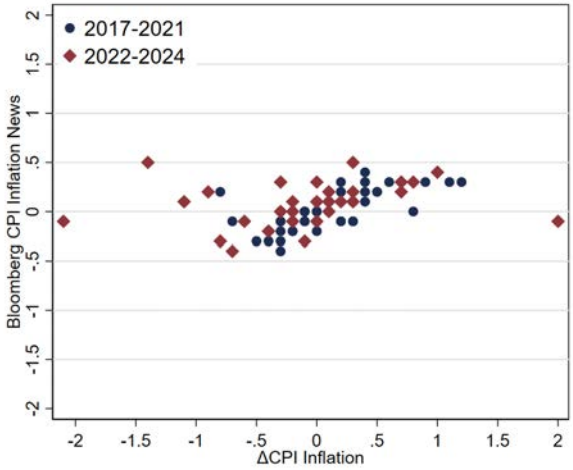

**Notes:** This figure shows the trends in CPI inflation, PPI input inflation, and PPI output inflation rates. The data are taken from the Office for National Statistics. The series are all three-month moving averages.

Figure A8: CPI Inflation Changes, Bloomberg Forecasts, and Bloomberg CPI Inflation News

*Panel A:* CPI Inflation and Bloomberg Forecasts

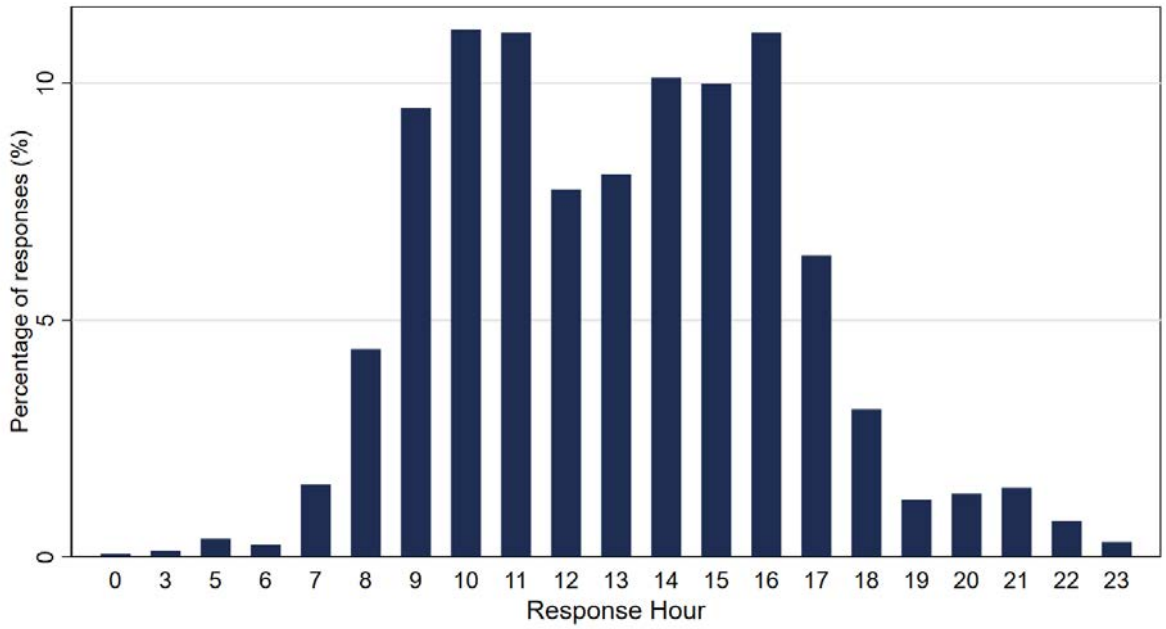



*Panel B:* CPI Inflation Outturns vs. Bloomberg CPI Inflation News



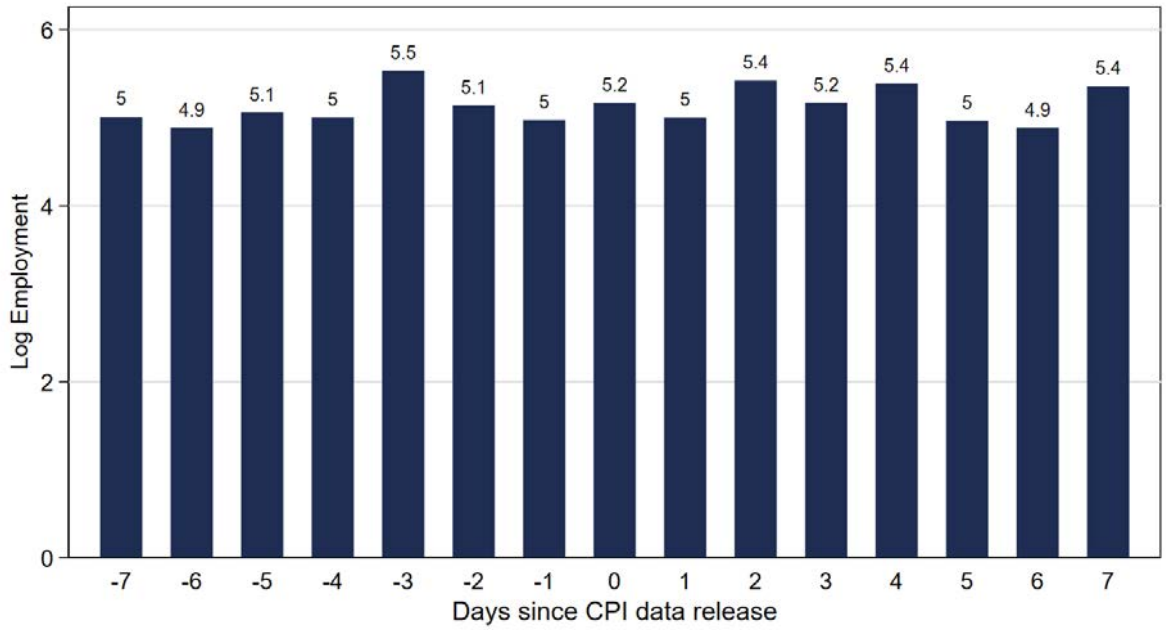

**Notes:** Panel A presents the time series in CPI inflation and the Bloomberg median forecasts for each month. Panel B presents a scatterplot of changes in headline CPI inflation rates (horizontal axis) and CPI inflation news (vertical axis). Bloomberg CPI inflation news is defined as the difference between the CPI outturns and the Bloomberg survey median forecast for CPI inflation.

Figure A9: Distribution of responses by hour on CPI release dates (2022-2024)



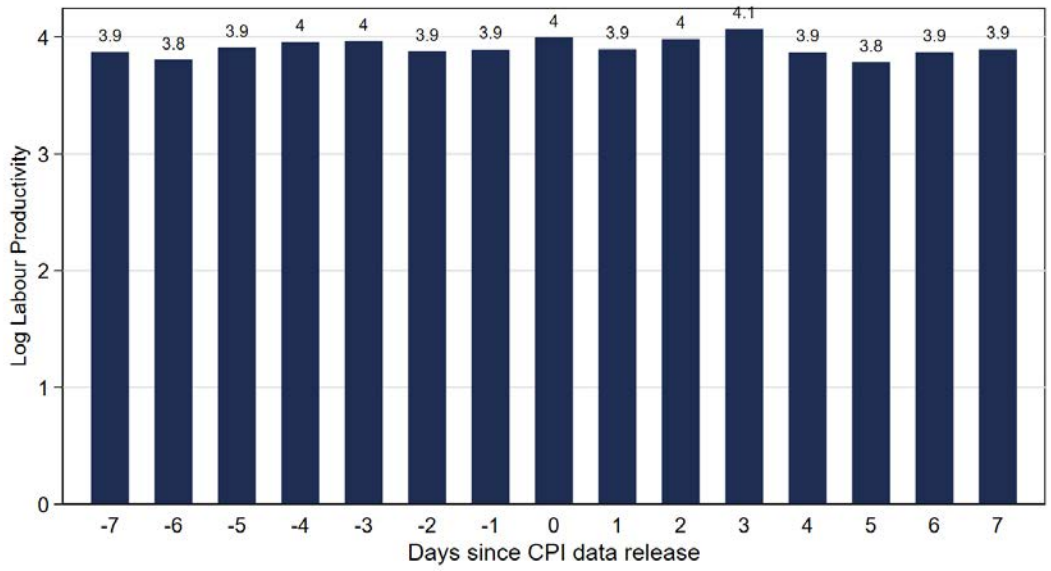

**Notes:** This figure shows the distribution of firm responses by hour on the day of the CPI release. These data are based on the period 2022-2024.

Figure A10: Average firm employment around CPI release dates



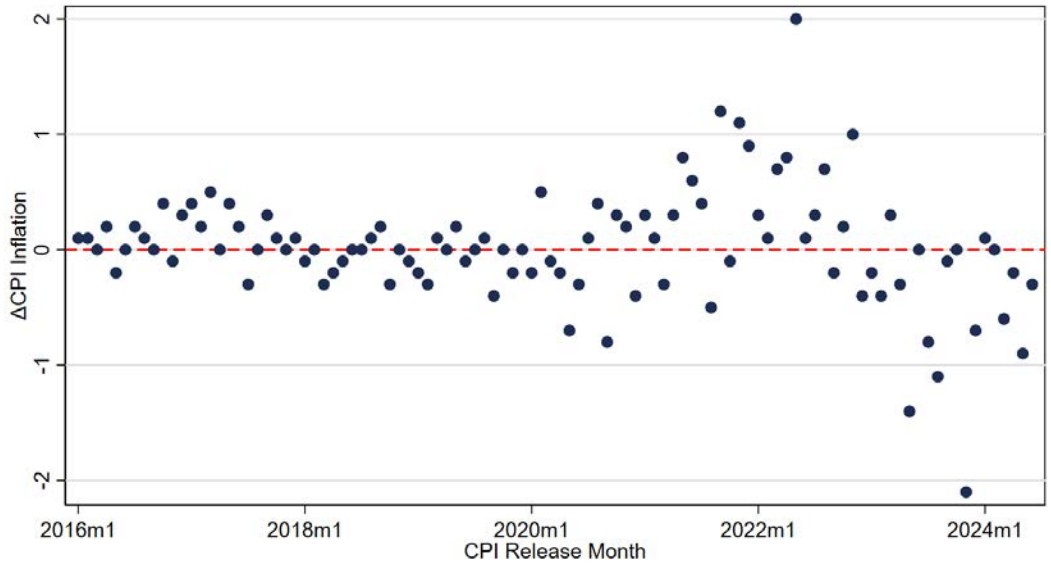

**Notes:** This figure shows the average firm employment (in natural logarithms) around CPI release dates (indicated by 0 on the horizontal axis). The period of CPI releases covers 2022 to 2024.

Figure A11: Average firm labour productivity around CPI release dates



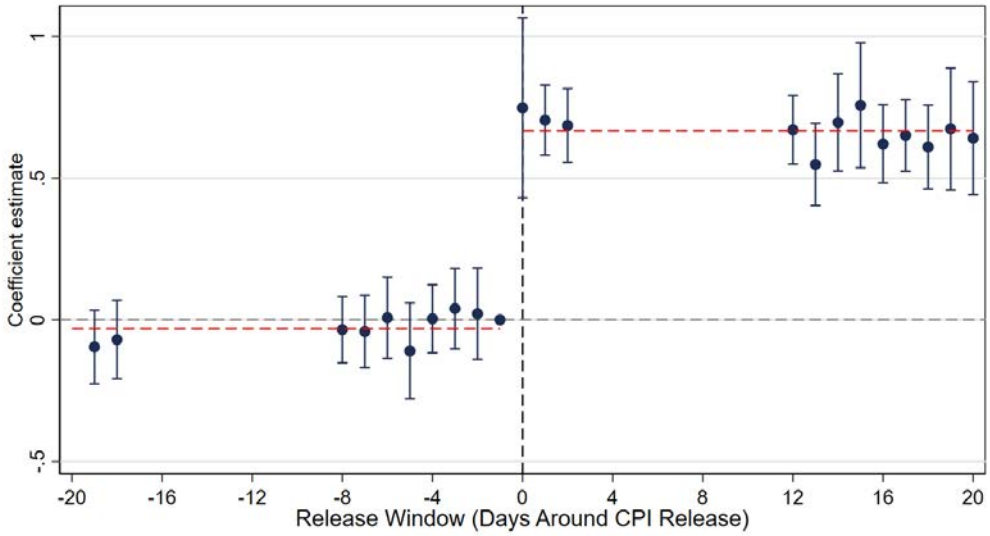

**Notes:** This figure shows the average firm labour productivity around CPI release dates (indicated by 0 on the horizontal axis). The period of CPI releases covers 2022 to 2024. Labour productivity is defined as the ratio of real gross value added to the number of employees. This is calculated using FY2021 accounting data from the Bureau Van Dijk FAME database.

Figure A12: UK annual CPI inflation changes



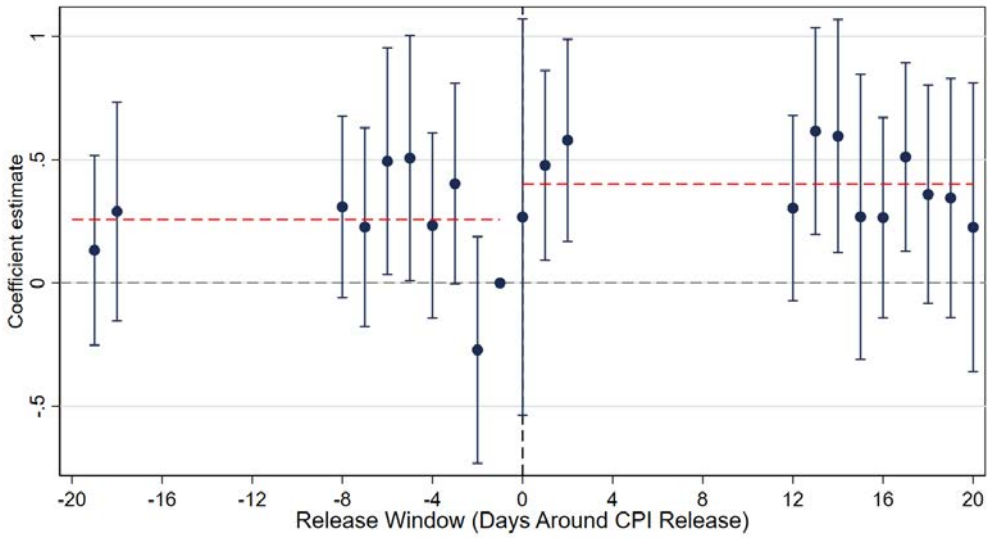

**Notes:** This figure plots monthly changes in UK annual CPI inflation between January 2016 and June 2024. The data are taken from the Office for National Statistics.

Figure A13: Impact of CPI inflation changes on current CPI inflation perceptions: Extended window specification



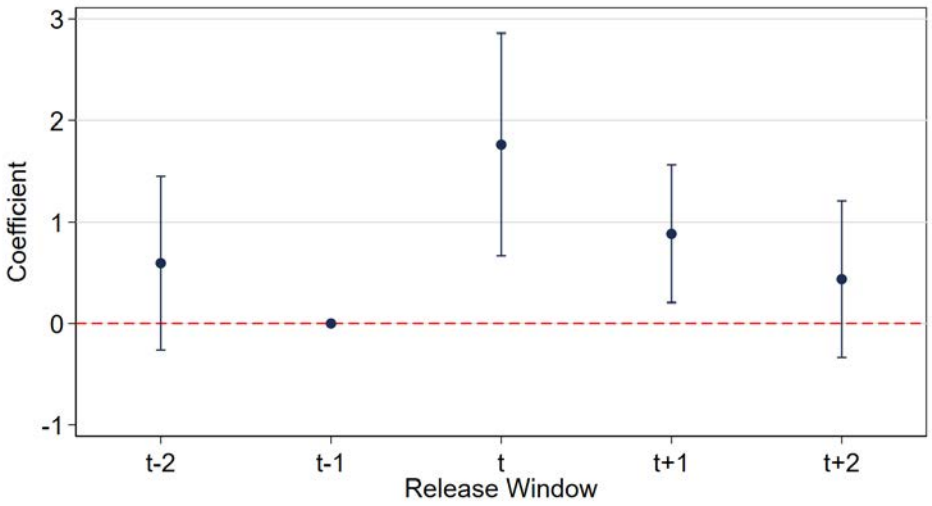

**Notes:** This figure plots the impact of CPI inflation changes on current CPI inflation perceptions based on the methodology outlined in Section 3. The omitted category is the day before the CPI release. 90% confidence intervals are reported around the point estimates. The red horizontal lines denote the average of the coefficients in the pre and post CPI release periods. Weekend responses are merged with the previous Friday. Months in which the CPI release is outside the survey window are dropped - March 2022, March 2023, May 2023, December 2023. Days with fewer than 30 responses are dropped.

Figure A14: Impact of CPI inflation changes on expected own-price growth: Extended window specification



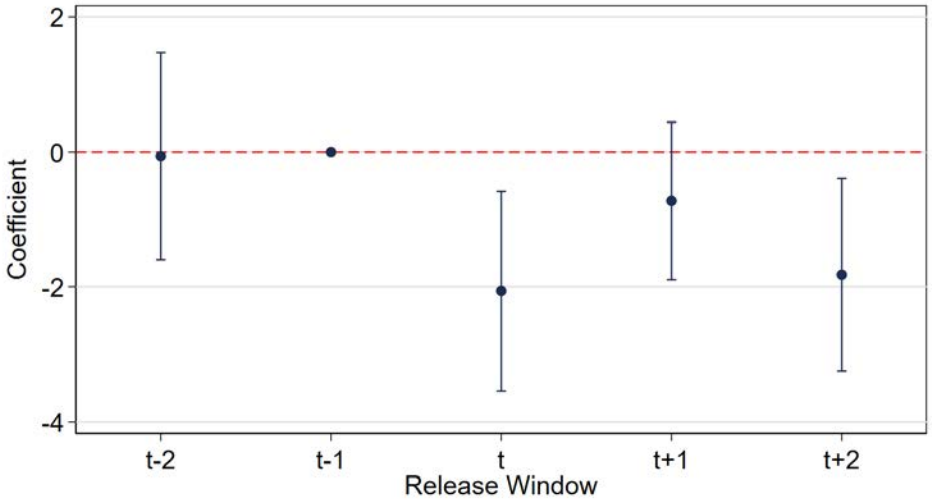

**Notes:** This figure plots the impact of CPI inflation changes on year-ahead own-price growth based on the methodology outlined in Section 3. The omitted category is the day before the CPI release. 90% confidence intervals are reported around the point estimates. The red horizontal lines denote the average of the coefficients in the pre and post CPI release periods. Weekend responses are merged with the previous Friday. Months in which the CPI release is outside the survey window are dropped - March 2022, March 2023, May 2023, December 2023. Days with fewer than 30 responses are dropped.

Figure A15: Impact of CPI inflation changes on cost growth expectations



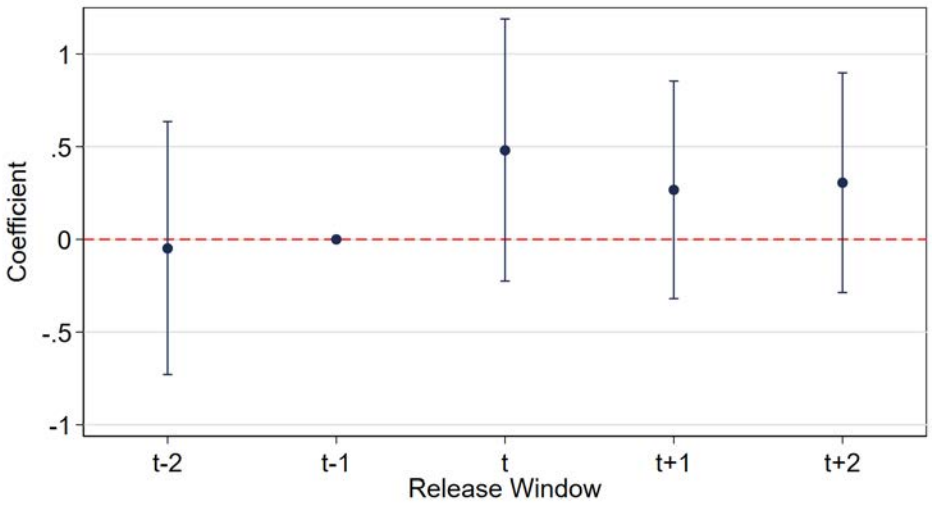

**Notes:** This figure plots the impact of CPI inflation changes on expected year-ahead unit cost growth growth based on the methodology outlined in Section 3. The question on expected unit cost growth was asked between May 2022 and July 2023, and again in May-June 2024. The omitted category is the day before the CPI release. 90% confidence intervals are reported around the point estimates.

Figure A16: Impact of CPI inflation changes on real sales growth expectations



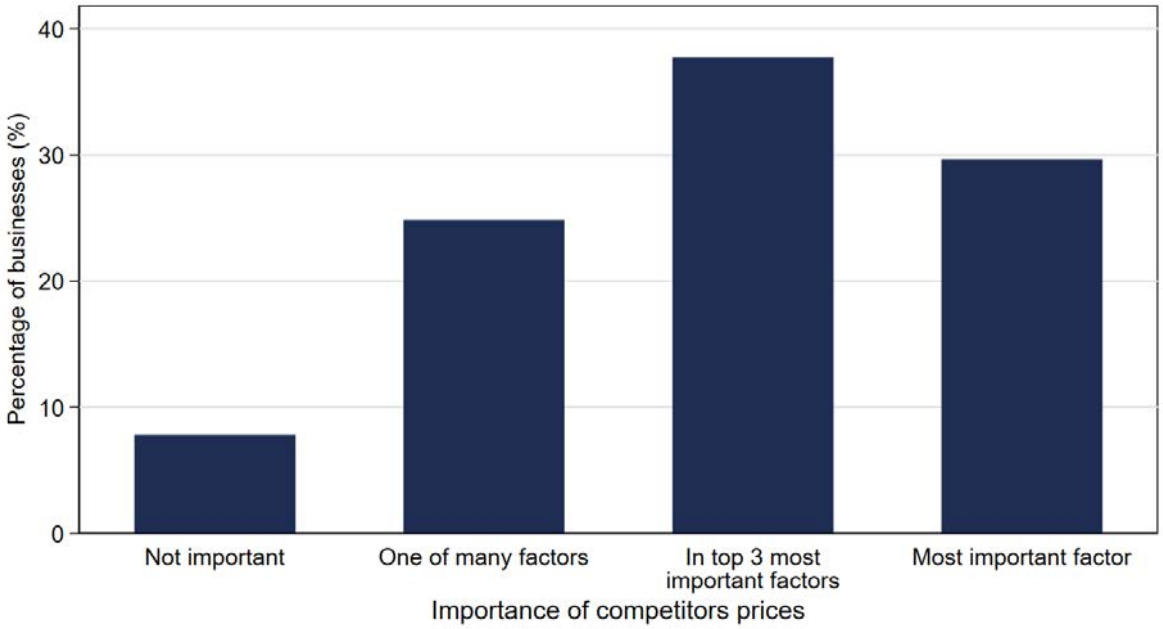

**Notes:** This figure plots the impact of CPI inflation changes on expected year-ahead real sales growth based on the methodology outlined in Section 3. The omitted category is the day before the CPI release. 90% confidence intervals are reported around the point estimates.

Figure A17: Impact of CPI inflation changes on interest rate expectations




**Notes:** This figure plots the impact of CPI inflation changes on expected interest rate one year from now based on the methodology outlined in Section 3. The omitted category is the day before the CPI release. 90% confidence intervals are reported around the point estimates.

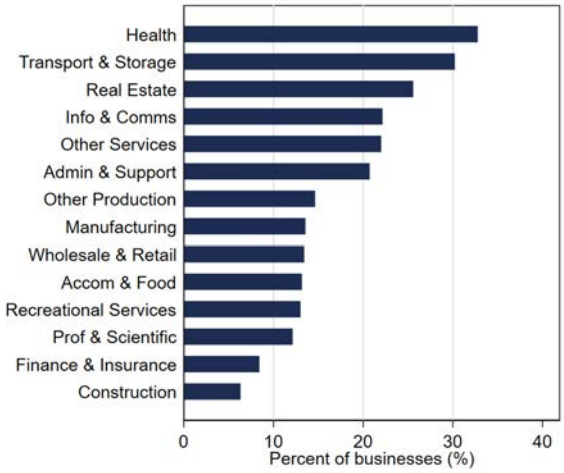
Figure A18: Importance of competitors prices for current pricing decisions



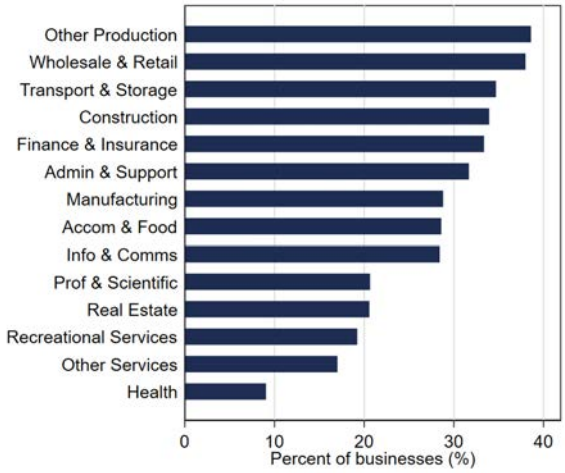

**Notes:** This figure presents the importance of competitors prices for current pricing decisions of firms in the DMP. The data are based on a survey question asked between May to July 2023.

Figure A19: Importance of CPI inflation and competitors prices for own pricing decisions by industry

*Panel A:* CPI Inflation

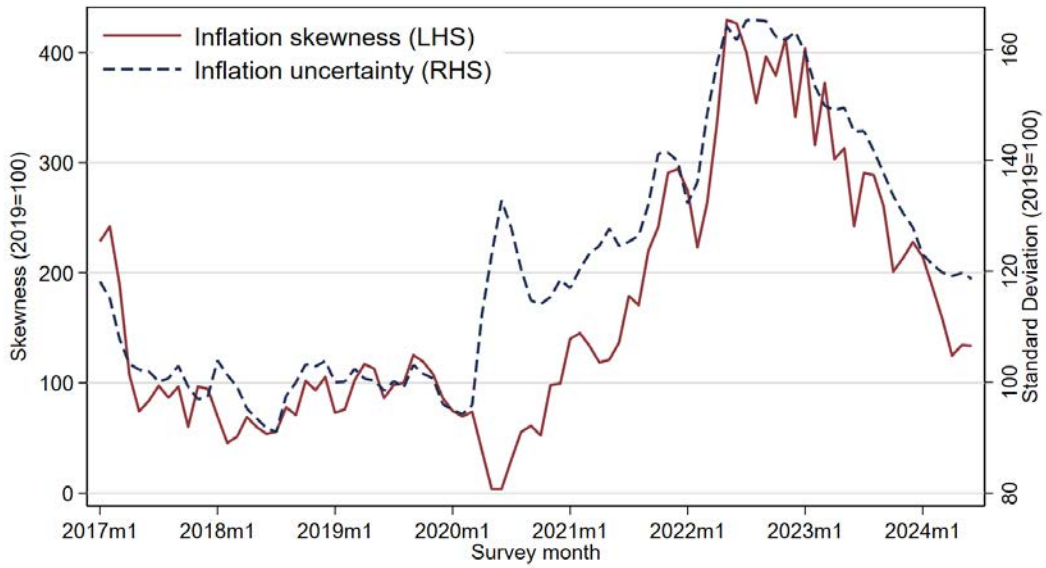



*Panel B:* Competitors Prices




**Notes:** This figure shows the percentage of businesses in each industry who cite CPI inflation (Panel A) and competitors prices (Panel B) as the *most important* factor affecting their current pricing decisions. The data are based on a survey question asked between May and July 2023.

Figure A20: Subjective inflation uncertainty and skewness




**Notes:** The series are three-month moving averages.

# B Tables

Table A1: Impact of CPI inflation changes on current CPI inflation perceptions: Test for nonlinearities

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | Current CPI inflation perceptions | | |
| Event Window: | ±2 Day | ±5 Day | ±7 Day |
| Sample: | 2022-2024 | | |
| Δ CPI Inflation × Post ×Δ CPI Inflation $< 0$ | 0.646*** | 0.630*** | 0.632*** |
| | (0.088) | (0.069) | (0.054) |
| Δ CPI Inflation × Post ×Δ CPI Inflation $\geq 0$ | 0.630*** | 0.704*** | 0.673*** |
| | (0.132) | (0.110) | (0.086) |
| Constant | 7.735*** | 7.675*** | 7.794*** |
| | (0.084) | (0.057) | (0.030) |
| Industry fixed effects | Yes | Yes | Yes |
| Release window fixed effects | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.821 | 0.801 | 0.771 |
| Observations | 5,347 | 6,679 | 10,562 |
| Test coefficients equal (p-value) | 0.923 | 0.572 | 0.689 |

Notes: This table tests whether the responsiveness of CPI inflation perceptions to CPI inflation changes is different for positive vs. negative changes. The estimation period is 2022 to 2024. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A2: Impact of CPI inflation changes on own-price expectations: Test for non-linearities

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | Expected own-price growth | | |
| Event Window: | ±2 Day | ±5 Day | ±7 Day |
| Sample: | 2022-2024 | | |
| Δ CPI Inflation × Post ×Δ CPI Inflation $< 0$ | 0.590** | 0.250 | 0.154 |
| | (0.269) | (0.203) | (0.155) |
| Δ CPI Inflation × Post ×Δ CPI Inflation $\geq 0$ | 1.148*** | 1.010*** | 0.671*** |
| | (0.341) | (0.287) | (0.226) |
| Constant | 4.986*** | 5.019*** | 5.256*** |
| | (0.207) | (0.140) | (0.082) |
| Industry fixed effects | Yes | Yes | Yes |
| Release window fixed effects | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.107 | 0.102 | 0.094 |
| Observations | 5,090 | 6,457 | 9,991 |
| Test coefficients equal (p-value) | 0.200 | 0.034 | 0.065 |

Notes: This table tests whether the responsiveness of own-price expectations to CPI inflation changes is different for positive vs. negative changes. The estimation period is 2022 to 2024. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A3: Impact of CPI inflation changes on own-price expectations: 2017-2021 vs. 2022-2024

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | Expected own-price growth | | |
| Event Window: | ±2 Day | ±5 Day | ±7 Day |
| Sample: | 2017-2024 | | |
| Δ CPI Inflation × Post × 2017-2021 | 0.020 | 0.190 | 0.082 |
| | (0.191) | (0.142) | (0.112) |
| Δ CPI Inflation × Post × 2022-2024 | 0.668*** | 0.400*** | 0.288*** |
| | (0.157) | (0.125) | (0.098) |
| Constant | 3.436*** | 3.372*** | 3.472*** |
| | (0.079) | (0.055) | (0.040) |
| Industry fixed effects | Yes | Yes | Yes |
| Release window fixed effects | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes |
| Test equality of coefficients (p-value) | 0.009 | 0.262 | 0.166 |
| $R^2$ | 0.246 | 0.241 | 0.241 |
| Observations | 15,423 | 21,065 | 30,036 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A4: Impact of CPI inflation changes on expected wage growth

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable: | Expected wage growth | | Expected wage growth | |
| Event Window: | ±2 Day | | ±2 Day | |
| Sample: | 2022-2024 | | 2022-2024 | |
| Δ CPI Inflation × Post | -0.070 | -0.213* | | |
| | (0.118) | (0.125) | | |
| Δ CPI Inflation × Post ×Δ CPI Inflation $< 0$ | | | -0.099 | -0.194 |
| | | | (0.211) | (0.182) |
| Δ CPI Inflation × Post ×Δ CPI Inflation $\geq 0$ | | | 0.167 | 0.218 |
| | | | (0.254) | (0.273) |
| Constant | 5.121*** | 5.049*** | 4.952*** | 4.715*** |
| | (0.050) | (0.012) | (0.180) | (0.193) |
| Firm fixed effects | No | Yes | No | Yes |
| Industry fixed effects | Yes | No | Yes | No |
| Release window fixed effects | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes |
| $R^2$ | 0.061 | 0.657 | 0.061 | 0.658 |
| Observations | 5,586 | 3,873 | 5,586 | 3,873 |
| Test coefficients equal (p-value) | | | 0.425 | 0.183 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A5: Impact of CPI inflation changes on three-year ahead CPI inflation expectations

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable: | 3-year CPI expectations | | 3-year CPI expectations | |
| Event Window: | ±2 Day | | ±2 Day | |
| Sample: | 2022-2024 | | 2022-2024 | |
| Δ CPI Inflation × Post | 0.038 | 0.050 | | |
| | (0.084) | (0.086) | | |
| Δ CPI Inflation × Post ×Δ CPI Inflation < 0 | | | 0.238* | 0.123 |
| | | | (0.128) | (0.114) |
| Δ CPI Inflation × Post ×Δ CPI Inflation ≥ 0 | | | -0.073 | -0.196 |
| | | | (0.213) | (0.235) |
| Constant | 3.670*** | 3.594*** | 3.683*** | 3.760*** |
| | (0.037) | (0.010) | (0.146) | (0.151) |
| Firm fixed effects | No | Yes | No | Yes |
| Industry fixed effects | Yes | No | Yes | No |
| Release window fixed effects | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes |
| $R^2$ | 0.115 | 0.669 | 0.116 | 0.669 |
| Observations | 5,347 | 3,728 | 5,347 | 3,728 |
| Test coefficients equal (p-value) | | | 0.221 | 0.228 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A6: Impact of CPI inflation changes on own-price expectations: Robustness to firms responding only before or after CPI release

| | (1) | (2) |
|---|---|---|
| Dependent variable: | Expected own-price growth | |
| Event Window: | ±2 Day | |
| Sample: | 2022-2024 | |
| Δ CPI Inflation × Post | 0.634*** | 0.954*** |
| | (0.157) | (0.263) |
| Constant | 5.347*** | 5.412*** |
| | (0.067) | (0.078) |
| Industry fixed effects | Yes | Yes |
| Release window fixed effects | Yes | Yes |
| Month fixed effects | Yes | Yes |
| $R^2$ | 0.107 | 0.114 |
| Observations | 5,090 | 3,493 |

Notes: Column 1 presents the results for the full sample of firms. Column 2 is the sub-sample of firms which have responded either only before the release or only after the release. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A7: Impact of Bloomberg CPI inflation news on own-price expectations

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable: | Expected own-price growth | | | |
| Event Window: | ±2 Day | ±5 Day | ±7 Day | ±7 Day |
| Sample: | 2022-2024 | | | |
| Bloomberg CPI Inflation News × Post | 1.142* | 0.294 | 0.165 | 0.307 |
| | (0.648) | (0.512) | (0.402) | (0.375) |
| Constant | 5.275*** | 5.320*** | 5.368*** | 5.299*** |
| | (0.072) | (0.064) | (0.053) | (0.009) |
| Firm fixed effects | No | No | No | Yes |
| Industry fixed effects | Yes | Yes | Yes | No |
| Release window fixed effects | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes |
| $R^2$ | 0.104 | 0.100 | 0.093 | 0.630 |
| Observations | 5,090 | 6,457 | 9,991 | 8,387 |

Notes: CPI inflation news is defined as the difference between the CPI inflation outturns and the Bloomberg survey median forecast for CPI inflation. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A8: Impact of Bloomberg CPI inflation news on CPI inflation expectations

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable: | 1-year CPI expectations | | 3-year CPI expectations | |
| Event Window: | ±2 Day | | ±2 Day | |
| Sample: | 2022-2024 | | 2022-2024 | |
| Bloomberg CPI Inflation News × Post | 1.058*** | 1.177** | 0.478 | 0.556 |
| | (0.402) | (0.456) | (0.368) | (0.341) |
| Constant | 5.712*** | 5.662*** | 3.654*** | 3.574*** |
| | (0.039) | (0.012) | (0.037) | (0.009) |
| Firm fixed effects | No | Yes | No | Yes |
| Industry fixed effects | Yes | No | Yes | No |
| Release window fixed effects | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes |
| $R^2$ | 0.443 | 0.768 | 0.115 | 0.669 |
| Observations | 5,347 | 3,728 | 5,347 | 3,728 |

Notes: CPI inflation news is defined as the difference between the CPI inflation outturns and the Bloomberg survey median forecast for CPI inflation. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A9: Impact of CPI inflation changes and PPI inflation changes on own-price expectations

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable: | Expected own-price growth | | | |
| Event Window: | ±2 Day | | | |
| Sample: | 2022-2024 | | | |
| Δ CPI Inflation × Post | 0.634*** | | | 0.650*** |
| | (0.157) | | | (0.183) |
| Δ PPI Input Inflation × Post | | 0.027 | | -0.002 |
| | | (0.058) | | (0.116) |
| Δ PPI Output Inflation × Post | | | 0.121 | -0.020 |
| | | | (0.084) | (0.182) |
| Constant | 5.347*** | 5.331*** | 5.333*** | 5.346*** |
| | (0.067) | (0.070) | (0.067) | (0.073) |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Release window fixed effects | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes |
| $R^2$ | 0.107 | 0.104 | 0.104 | 0.107 |
| Observations | 5,090 | 5,090 | 5,090 | 5,090 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A10: Impact of CPI inflation changes on own-price expectations: Additional controls

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | Expected own-price growth | | |
| Event Window: | ±2 Day | | |
| Sample: | 2022-2024 | | |
| $\Delta$ CPI Inflation $\times$ Post | 0.634*** | 0.443*** | 0.651*** |
| | (0.157) | (0.139) | (0.168) |
| Annual own-price growth$_{it}$ | | 0.213*** | |
| | | (0.014) | |
| Inflation uncertainty$_{it}$ | | 0.633*** | |
| | | (0.052) | |
| Annual real sales growth$_{it}$ | | 0.007*** | |
| | | (0.002) | |
| Expected real sales growth$_{it}$ | | -0.035*** | |
| | | (0.006) | |
| Sales uncertainty$_{it}$ | | -0.019 | |
| | | (0.015) | |
| $\Delta \ln$ EPU$_t$ | | | -0.068 |
| | | | (0.077) |
| $\Delta \ln$(FTSE)$_{t-1}$ | | | 4.447 |
| | | | (11.162) |
| $\Delta \ln$(USD/GBP Rate)$_{t-1}$ | | | 28.953** |
| | | | (14.311) |
| $\Delta \ln$(FTSE Volatility)$_{t-1}$ | | | 1.402 |
| | | | (2.600) |
| Industry fixed effects | Yes | Yes | Yes |
| Release window fixed effects | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.107 | 0.327 | 0.112 |
| Observations | 5,090 | 4,724 | 4,861 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A11: Impact of CPI inflation changes on own-price expectations: Further heterogeneity results

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Dependent variable: | Expected own-price growth | | | | |
| Event Window: | ±2 Day | | | | |
| Sample: | 2022-2024 | | | | |
| Δ CPI Inflation × Post | 0.634*** | | | | |
| | (0.157) | | | | |
| Δ CPI Inflation × Post × Goods | | 0.637** | | | |
| | | (0.254) | | | |
| Δ CPI Inflation × Post × Services | | 0.583*** | | | |
| | | (0.200) | | | |
| Δ CPI Inflation × Post × Firm size < 250 | | | 0.653*** | | |
| | | | (0.184) | | |
| Δ CPI Inflation × Post × Firm size ≥ 250 | | | 0.637** | | |
| | | | (0.296) | | |
| Δ CPI Inflation × Post × CPI not most important | | | | 0.631*** | |
| | | | | (0.198) | |
| Δ CPI Inflation × Post × CPI most important | | | | 0.683*** | |
| | | | | (0.255) | |
| Δ CPI Inflation × Post × Competitor prices not most important | | | | | 0.411 |
| | | | | | (0.277) |
| Δ CPI Inflation × Post × Competitor prices most important | | | | | 0.730*** |
| | | | | | (0.191) |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes |
| Release window fixed effects | Yes | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.107 | 0.111 | 0.115 | 0.111 | 0.108 |
| Observations | 5,090 | 5,090 | 5,090 | 5,090 | 5,090 |
| Test coefficients equal (p-value) | | 0.867 | 0.963 | 0.872 | 0.343 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A12: Impact of CPI inflation changes on inflation uncertainty and skewness

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable: | Inflation uncertainty | | Inflation skewness | |
| Event Window: | ±2 Day | | ±2 Day | |
| Sample: | 2022-2024 | | 2022-2024 | |
| Δ CPI Inflation × Post | 0.102 | | 0.871 | |
| | (0.074) | | (1.232) | |
| Δ CPI Inflation × Post ×Δ CPI < 0 | | 0.155 | | 1.991 |
| | | (0.125) | | (2.237) |
| Δ CPI Inflation × Post ×Δ CPI ≥ 0 | | 0.132 | | 1.190 |
| | | (0.164) | | (2.588) |
| Constant | 2.626*** | 2.590*** | 9.758*** | 9.213*** |
| | (0.032) | (0.096) | (0.426) | (1.483) |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Release window fixed effects | Yes | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes | Yes |
| $R^2$ | 0.107 | 0.107 | 0.038 | 0.038 |
| Observations | 5,090 | 5,090 | 5,090 | 5,090 |
| Test coefficients equal (p-value) | | 0.909 | | 0.815 |

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A13: Impact of CPI inflation changes on own-price expectations: Daily dataset

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | Expected own-price growth | | |
| Event Window: | ±2 Day | ±5 Day | ±7 Day |
| Sample: | 2022-2024 | | |
| Δ CPI Inflation × Post | 0.722*** | 0.453*** | 0.344*** |
| | (0.179) | (0.167) | (0.121) |
| Constant | 5.344*** | 5.333*** | 5.359*** |
| | (0.060) | (0.055) | (0.045) |
| Release window fixed effects | Yes | Yes | Yes |
| Month fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.687 | 0.670 | 0.661 |
| Observations | 129 | 155 | 217 |

Notes: Robust standard errors are reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.