

# Inflation expectations of Austrian households and firms amid high inflation

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*Inflation expectations are a key indicator of monetary policy as they can be used to predict the future evolution of inflation and help central banks assess the credibility of their policies. Furthermore, according to economic theory, they determine the real interest rate, thus affecting agents' consumption and investment decisions. We analyze novel and existing survey data on Austrian firms' and households' inflation expectations to better understand the formation and the determinants of these expectations, especially in the current high-inflation environment. We find the following five stylized facts: We confirm (1) earlier evidence that households' and firms' inflation expectations are rather similar, and that there is less disagreement among firms than among households. Furthermore, (2) household and firm characteristics that likely influence inflation expectations, e.g. education and age of households and size of firms, point to varying degrees of how informed, rational and experienced respondents are. For firms, we provide evidence that (3) sectoral characteristics, i.e. the extent to which firms are exposed to energy price fluctuations and supply chain pressures, affect inflation expectations as well. Another finding is that (4) overall, firms' expectations of aggregate inflation are somewhat correlated with their own expected selling prices, but firm- or sector-specific factors and cost-related price developments may shape firms' price setting more. Lastly, differences between the current and previous survey waves show that (5) households may have become more rationally attentive during the high-inflation period, as indicated by a decrease in their subjective uncertainty about inflation expectations.*

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How do firms and households in Austria expect inflation to evolve in the current high-inflation environment and what drives their expectations? Is there any evidence that they form their expectations differently when inflation is high? Are expectations of firms and households similar, or are there structural differences driven by, e.g., different expectations about the general economic outlook or the (un-)certainty surrounding their forecasts? To answer these questions, this paper draws on the first results of the new question module in the Business Survey of the Austrian Institute of Economic Research (WIFO-Konjunkturtest, in the following WIFO-KT) on Austrian firms' inflation expectations from June 2022 and on the results of the OeNB Barometer survey on Austrian households' inflation expectations which was conducted at about the same time.

Inflation expectations are among the most important forward-looking economic indicators for monetary policy. The most common sources used for deriving such expectations are market-based measures, e.g. inflation compensation of market-traded assets, such as inflation-linked swaps, which are available at high frequency, and compilations of inflation forecasts made by professional forecasters

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or economists. Still, it is also worth looking at firms' and households' inflation expectations; their importance for monetary policy has been vastly discussed in the literature. Inflation expectations are key drivers of households' and firms' economic decisions. They affect perceived and expected real interest rates, which, in turn, affect consumption and investment decisions. Inflation expectations should remain stable around the inflation target in the longer term for real interest rates to remain close to their natural level. For this to happen, central banks need to monitor, steer and anchor expectations, e.g. through forward guidance, even though there is some evidence that in a low-inflation environment, monetary policy announcements likely do not affect expectations much (Coibion et al., 2020).

Plenty of evidence suggests that inflation expectations influence households' economic decisions, such as consumption and savings decisions (D'Acunto et al., 2018), whether or not and what kind of mortgage households take out (Malmendier and Nagel, 2015), or whether and how households participate in the stock market (Das et al., 2020). When it comes to how households form their expectations, several aspects have been found to be relevant: (1) What is the content of central bank communication targeting households and firms? For instance, is there a focus on policy targets and objectives rather than instruments (D'Acunto et al., 2020)? (2) What is the source of information, e.g. newspapers or central banks (Coibion et al., 2022a)? (3) Who is the sender of information, e.g. central banks or politicians? It has been found that even the sender's race can influence expectations (D'Acunto et al., 2021a). Furthermore, households are likely to base their inflation expectations predominantly on specific goods (energy, gasoline and food prices) or individual baskets (frequently purchased items; D'Acunto et al., 2021b), and there is also vast evidence for strong differences in expectations across socio-demographic characteristics of survey respondents, such as gender, household size, income, education, etc. (D'Acunto et al., 2021c; D'Acunto et al., 2022).

There is less, but increasing, evidence on firms' inflation expectations. Generally, firms' inflation expectations are found to be similar to households' expectations and to also affect economic decisions, e.g. on price setting and investment (Coibion et al., 2018; Weber et al., 2022, for the US; Coibion et al., 2020, for Italy). On the other hand, Coibion et al. (2022b) find that firms in France have less upward-biased inflation expectations than households and that expectations are less dispersed among firms than among households. Also, the more inflation levels rise, the more inflation expectations converge. Furthermore, inflation expectations of firms differ according to respondents' position in the firm, with CEOs or CFEs having lower inflation expectations than lower-level employees. Similarly, providing firms with additional information on inflation affects expectations and, ultimately, to some degree firms' economic performance (Coibion et al., 2020). Finally, there is evidence that inflation expectations are weakly correlated with wage expectations, whereas changes in inflation expectations do not affect wage expectations at all (Coibion et al., 2022b).

We use inflation expectations derived from novel WIFO-KT survey data on firms' inflation expectations and from data of the OeNB Barometer survey on households' inflation expectations. We aim at drawing a more complete picture of expectations in the current high-inflation environment in Austria. Based on the results obtained, we draw first conclusions on the formation of inflation expectations and economic decisions of firms. We also assess whether Austrian firms, mainly

small and medium-sized companies (SMEs), have expectations that are similar to those of households. Furthermore, we link inflation expectations to firm and household characteristics to see whether explanatory factors often cited in the literature also apply to our data. For firms, we are particularly interested in whether inflation expectations are linked to firms' expectations about their own selling prices, as this can ultimately affect firms' price setting (Coibion et al., 2020). For households, we compare the results of the latest survey wave to those of the previous wave and analyze whether households' uncertainty about their expectations has changed in the current high-inflation environment.

This paper is structured as follows: In section 1, we describe the data and the empirical strategy on which we based our analysis. Section 2 presents the results for firms' and households' inflation expectations and investigates the main determinants of these expectations, and section 3 draws some policy conclusions.

## 1 Survey data and empirical analysis

We analyze novel data on firms' inflation expectations from the WIFO-KT survey. In June 2022, the WIFO added a module to the survey asking firms about their qualitative inflation expectations ("the price level is going to increase, stay the same or fall") and quantitative inflation expectations (year-on-year rate of change in %) for the next 12 months and the next 3 to 5 years. The exact wording of the questions on firms' inflation expectations can be found in the annex to this study. For the analysis of households' inflation expectations, we use data from the long-standing biannual OeNB Barometer survey.<sup>2</sup>

The survey periods are Q2 2022 (specifically June 2022) for the WIFO-KT survey and H1 2022 (specifically June and July 2022) for the OeNB Barometer survey.<sup>3</sup> The results of a previous survey wave from H2 2021 for households were available for comparison. Therefore, both surveys are roughly comparable in terms of survey period. We analyze a representative sample of approximately 1,700 firms in the goods, construction, retail and services sectors and approximately 1,400 households located in all Austrian provinces. The qualitative and quantitative questions on short- and long-term inflation expectations are phrased almost identically in both surveys so that the answers are directly comparable.<sup>4</sup>

Given the novelty and timeliness of the data, our analysis at this stage is confined to descriptive statistics. We calculate mean and median short- and long-run inflation expectations overall and for different firm and household characteristics. The medians are interpolated according to the method of Cox (2019), which accounts for bunching of expectations at integer values and multiples of five. From interpolated quartiles, we also calculate the interquartile range (IQR), which is a measure of the distribution of the expectations.

<sup>2</sup> Respondents of the WIFO-KT answer questions in an online questionnaire sent by e-mail. The main questions on the business outlook have been part of the survey for decades and are the basis for the Austrian contribution to the European Commission's business and consumer surveys. The OeNB Barometer survey is conducted through personal interviews (two-thirds of the sample) as well as online questionnaires (one-third).

<sup>3</sup> Normally, interviews for the first wave of the OeNB Barometer survey are conducted in May and June each year, but in 2022 the interviews dragged into July due to problems in the sampling.

<sup>4</sup> There is one small difference in the question design between the WIFO-KT and the OeNB Barometer surveys: the former asks participants for their expectations for the next 3 to 5 years, eliciting medium- to long-run inflation expectations, the latter asks households for expectations for the next 5 years.

## 2 Results

In this section, we present descriptive results of the two surveys introduced above. The outlook for prices at the current juncture is rather grim. We find that households and firms expect inflation to be 8.7% and 8.2%, respectively, in 12 months' time (until Q2 2023) and to average 5.9% and 4.9% p.a., respectively, in the longer run (over the next 3 to 5 years; see first rows in tables 1 and 2), which is far from the Eurosystem's price stability objective. In the following, we first analyze and discuss firms' inflation expectations and their determinants, and subsequently those of households.

### 2.1 Firms' inflation expectations vary with firm characteristics

According to the recent literature, firms' inflation expectations are rather similar to those of households. As the typical Austrian firm is a small or medium-sized enterprise, respondents answering this survey are not necessarily highly educated managers who monitor economic developments regularly (and, ideally, have fully informed rational expectations; see Coibion et al., 2018); rather, respondents may be following the news less regularly, just like any member of a household. Indeed, in our sample, households and firms have remarkably similar inflation expectations, both in the short and longer run, with firms' inflation expectations being only slightly lower. However, the interquartile range of expectations, a measure for dispersion, is lower for firms (in absolute terms and also relative to the respective medians), both in the short and long run, confirming earlier evidence for France that there is less disagreement in inflation expectations among firms (see Coibion et al., 2022b).

Which household and firm characteristics drive the aggregate results? Tables 1 and 2 provide descriptive results on firms' and households' inflation expectations by different firm and household characteristics. Looking at table 1, we find evidence that firm size matters for firms' inflation expectations. Larger firms (>250 employees) have somewhat lower median inflation expectations (short-term: 7.2%; long-term: 3.7%) than medium-sized firms (50 to 249 employees: 8.0% and 4.7%, respectively) and small firms (<50 employees: 9.1% and 5.4%, respectively). This would corroborate our conjecture that survey respondents of small and large firms may have different ways of obtaining information on inflation. Whether respondents' level of information really plays a role in inflation expectations remains an open question, as we do not have any information on the persons who answered the questionnaire on behalf of their firms. However, the somewhat smaller IQRs (in absolute terms and relative to the median) give the impression that the agreement with respect to their expectations is larger among respondents of relatively larger firms, which could be due to the fact that they are more homogenous in their characteristics.

Table 1 shows that the sectors with the most pessimistic short-term inflation outlook are tourism, with the median year-on-year rate of expected inflation in 12 months' time at 10.6%, retailers and firms producing consumer goods (9.5%), construction (9.3%) and transportation (9.2%). This result is in line with the higher exposure of these firms to the strong increase in energy and food prices as well as to pent-up demand and still hampered supply chains. Firms in other services sectors, on the other hand, have somewhat lower inflation expectations: information and communication technology (ICT) services, business services, and other services (7.7% to 7.8%), just like firms producing intermediate goods (7.4%) or investment goods (8.1%). Not surprisingly, these sectors have been less affected by supply

Table 1

**Firms' inflation expectations in Q2 2022**

	Number of firms	Short-term expectations				Long-term expectations			
		Share $\pi+$	Mean $\pi$	Median $\pi$	IQR of $\pi$	Share $\pi+$	Mean $\pi$	Median $\pi$	IQR of $\pi$
		%	%	%	Percentage points	%	%	%	Percentage points
<b>Overall</b>	1,325	94.4	9.4	8.2	5.5	90.7	6.8	4.9	6.1
<b>Firm size</b>									
<50 employees	934	95.6	10.1	9.1	6.7	92.9	7.5	5.4	6.9
50 to 249 employees	289	93.7	8.7	8.0	5.2	87.5	6.5	4.7	4.2
$\geq 250$ employees	102	90.1	7.8	7.2	4.6	86.6	5.2	3.7	3.0
<b>Sector</b>									
Construction	186	94.7	10.1	9.3	7.1	92.5	7.7	5.3	7.0
Services	643	94.6	9.2	8.2	5.6	92.2	7.0	5.1	6.6
Business services	213	95.8	8.9	7.7	5.1	93.5	6.6	4.8	6.0
ICT	78	96.2	9.0	7.8	4.8	96.2	7.5	4.9	7.0
Tourism	105	95.3	11.5	10.6	7.8	91.5	8.3	5.9	6.0
Transportation	93	96.8	10.4	9.2	6.0	92.3	8.0	5.7	7.0
Other	148	89.9	8.7	7.8	5.5	88.4	6.7	5.1	7.0
Retail	205	96.5	10.7	9.5	9.1	94.4	10.2	8.5	12.4
Manufacturing	291	93.2	9.0	8.1	5.2	86.2	5.1	4.5	3.8
Consumer goods	76	93.5	10.6	9.5	6.8	93.4	7.4	5.3	4.7
Intermediate goods	132	93.1	8.6	7.4	5.3	82.4	4.9	3.8	3.6
Investment goods	80	92.6	9.2	8.1	5.3	85.0	5.0	4.7	3.7

Source: WIFO.

Note: This table presents aggregate results of the WIFO Business Survey on inflation expectations conducted in June 2022. Short-term expectations refer to the annual rate of inflation expected in 12 months' time, and long-term expectations refer to the average annual rate of inflation expected over the next 3 to 5 years. Number of firms refers to how many firms in the sample answered the survey questions. Share of  $\pi+$  refers to the share of respondents in the survey expecting the price level to increase (significantly or slightly); mean  $\pi$  reflects the firm size-weighted average of the expected annual rate of inflation in % (winsorized at the 2<sup>nd</sup> and 98<sup>th</sup> percentiles); median  $\pi$  reflects the interpolated median of the expected annual rate of inflation in % (according to the method of Cox, 2019); IQR of  $\pi$  refers to the interquartile range of survey responses on the expected annual rate of inflation in percentage points. Business services refers to the NACE sector M "Professional, scientific and technical activities," which comprises lawyers, architects, consultants, designers, photographers, etc. Mean values on subsectors are unweighted.

chain disruptions and/or increases in input costs. Also, expectations in services may be influenced by second-round effects of wages. However, for French firms, Coibion et al. (2022b) found that wage expectations and inflation expectations are only loosely linked.

For medium-term expectations, the sectoral pattern looks roughly the same. One exception are retail firms, whose median year-on-year rate of expected inflation in 3 to 5 years' time is substantially higher at 8.5% than the median expectations of all firms (4.9%). This may be related to the heterogeneity of retail firms in the sample (ranging from small corner shops and specialized stores to very large supermarkets), the high share of small firms in this sector as well as the particularly high dispersion of the expectations, both in the short and the long run, as documented by a high IQR.

The data from the WIFO-KT also allow us to look at the relationship between firms' inflation and other economic expectations. Specifically, we are interested in the relationship between inflation expectations and firms' expectations of their own selling prices<sup>5</sup>, which could be informative about how likely or feasible it may be

<sup>5</sup> Selling price expectations are queried in a qualitative manner with three response options: "selling prices are expected to (1) increase, (2) stay the same or (3) decrease in the next three months".

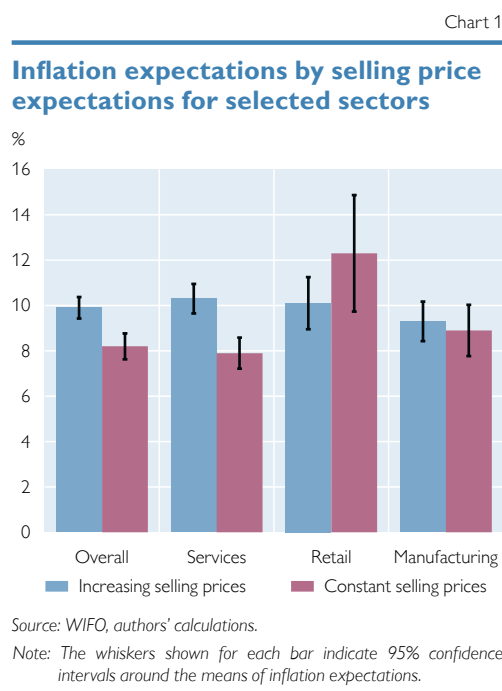
for firms to change their prices given their expectations of changes in the general price level.

Overall, we find that around 54% of firms in our sample (excluding the construction sector) expect their selling prices to increase in the next three months, while 43% expect them to remain the same. In both cases, a majority of firms (81% and 61%, respectively) expects the aggregate price level to increase strongly in the short run. That is, despite the expectation of strongly increasing overall prices, a large part of the economy will not (or cannot) adjust their prices as swiftly.<sup>6</sup> This points to the existence of nominal price rigidity at the micro level, as documented by Gautier et al. (2022). Quantitatively, however, as can be seen from chart 1, firms expecting to raise their selling prices within the next three months have significantly higher average short-term inflation expectations than those expecting to keep their prices constant (mean inflation expectations in the short run of 9.9% compared to 8.2%, medians: 9.0% compared to 7.4%).<sup>7</sup>

Unlike qualitative inflation expectations, which are rather homogenous across sectors, (qualitative) selling price expectations vary quite a bit across sectors: The share of firms intending to increase their prices in the next three months is the highest in retail (70%), followed by manufacturing (57%) and services (48%). Analyzing quantitative inflation expectations by groups of selling price expectations, we only observe significant differences in the services sector (chart 1): Firms

expecting their selling prices to increase have significantly higher short-run inflation expectations than those expecting their selling prices to remain constant (10.3% and 7.9%, respectively), as indicated by the non-overlapping whiskers in the chart. In the manufacturing and retail sectors, mean inflation expectations do not differ significantly among firms expecting increasing or constant selling prices, respectively. In contrast, in the retail sector, the inflation expectations of firms expecting their selling prices to remain constant are found to be higher than those of firms expecting increasing selling prices, but the difference is not statistically significant.

These results indicate that some sectors are more likely to adjust their selling prices than others, despite all



<sup>6</sup> For longer-run inflation expectations, only 55% of firms which expect their selling prices to increase and 37% of firms which expect their selling prices to remain constant expect a strong increase in the aggregate price level. However, we can hardly presume a correlation or even less a causality, given the different time horizons of the questions (3 months versus 3 to 5 years).

<sup>7</sup> With only 22 observations, it is difficult to make any statistically reliable statements about quantitative inflation expectations for firms expecting to reduce their selling prices. Thus, we omit the group expecting decreasing selling prices from chart 1.

sectors having comparably similar expectations about the overall price level. This, in turn, would suggest that firm- and industry-specific cost developments influence firms' price-setting decisions more than expectations of aggregate inflation. Almost all firms expect the aggregate price level to rise, but a considerably smaller share of firms intends to increase their own prices in the short run. This inconsistency points to price stickiness at the firm level or strong competition among firms impeding immediate price increases.<sup>8</sup> These findings are in line with evidence documented by Gautier et al. (2022).

## 2.2 Households' inflation expectations are similar, but more dispersed than firms' expectations

Turning to households' inflation expectations, our results shown in table 2 confirm earlier evidence that, on average, older and female respondents have higher inflation expectations than younger and male respondents, both in the short and the long run. The literature explains this fact as follows: Older people may remember episodes of high inflation in their lifetime, e.g. the oil crisis in the 1970s (see, e.g., Malmendier and Nagel, 2015), while women more often do the day-to-day shopping and are therefore more aware of price increases in frequently purchased goods (Bruine de Bruin et al., 2010; D'Acunto et al., 2021b).

Another common finding in the literature suggesting that people with higher education and incomes tend to have lower inflation expectations is only confirmed for long-run expectations in our data. People with higher education are usually better informed, have a better understanding of basic macroeconomic principles and of the inflation process itself and therefore hold more realistic inflation expectations (D'Acunto et al., 2019; Das et al., 2020; Angelico and Di Giacomo, 2022). Household size only appears to play a role for long-run expectations, with people living in one-person households having higher inflation expectations than people living in multi-person households. The professional status, i.e. whether people have or do not have a job or are retired, does not seem to affect inflation expectations in any way.

We find that long-run inflation expectations of Austrian households are consistently lower than short-run expectations, which matches the finding for firms. This indicates that households, on average, expect inflation to decline over the coming years but to remain above the Eurosystem's price stability target of 2%.

Compared to the last round of the OeNB Barometer survey for households conducted in November and December 2021 (table 2), the median rate of inflation expected in the short run climbed from 4.8% in H2 2021 to 8.7% in H1 2022, and long-run expectations from 4.1% to 5.9%. Likewise, the share of people who think that the general price level will rise strongly or moderately over the coming 12 months increased from 85.3% to 93.5%, while the share for long-run expectations, i.e. in the coming 5 years, went up only slightly. The substantial increase in short-run expectations is not surprising, given the surge in actual inflation from around 4% at the time of the previous survey to about 8% at the time of the most

<sup>8</sup> In principle, the inconsistency could arise from the different time reference of the questions, i.e. inflation expectations referring to a 12-month period and selling price expectations only to a 3-month period. However, at the current juncture, it is unlikely that respondents expect aggregate prices to increase at a considerably lower rate in the first 3 months than in the remaining 9 months of the year.

recent survey. Longer-term expectations are affected less by the recent surge in actual inflation.<sup>9</sup>

In addition to questions on short- and long-run inflation expectations, respondents of the OeNB Barometer survey are also asked how certain they are about their inflation expectations for the next 12 months (“very certain, rather certain, rather uncertain or very uncertain”). Interestingly, in the most recent survey wave, when the rate of inflation was much higher than before, consumers became substantially more certain about their expectations. The share of respondents who reported to be very or rather certain about their expectations increased by 11 percentage points from 67.7% in H2 2021 to 78.7% in H1 2022. This indicates that in the fall of 2021, when the COVID-19 pandemic was perceived to come to its end

Table 2

### Households' inflation expectations in Q2 2022

	Number of households	Short-term expectations				Long-term expectations			
		Share $\pi+$	Mean $\pi$	Median $\pi$	IQR of $\pi$	Share $\pi+$	Mean $\pi$	Median $\pi$	IQR of $\pi$
		%	%	%	Percentage points	%	%	%	Percentage points
<b>Overall</b>	1,431	93.5	11.6	8.7	9.3	88.9	11.2	5.9	10.1
<b>Last round: H2 2021</b>	1,404	85.3	7.0	4.8	6.3	86.5	7.2	4.1	7.7
<b>Household size</b>									
1 person	487	93.2	11.3	8.5	9.8	87.8	12.7	6.5	12.7
2 persons	572	94.2	12.3	9.1	9.6	90.1	12.0	6.4	11.7
3 and more	372	93.0	11.0	8.4	6.8	88.4	8.4	5.4	6.4
<b>Age</b>									
Under 30	115	90.0	10.8	7.8	10.4	86.3	12.7	5.6	16.4
30 to 49	378	93.9	12.7	8.9	12.2	91.9	11.8	6.3	9.4
50 to 64	479	95.0	11.6	9.1	7.2	86.4	10.8	5.8	10.6
65 and above	459	93.9	10.8	8.4	7.0	90.8	9.6	5.8	7.5
<b>Gender</b>									
Male	688	93.9	11.1	8.2	9.3	88.9	11.0	5.6	9.1
Female	743	93.2	12.1	9.2	9.4	88.8	11.4	6.5	11.0
<b>Profession</b>									
Not working	85	92.0	11.6	7.6	10.3	88.4	10.0	5.8	7.9
Working	780	94.0	11.7	8.9	9.6	88.6	11.7	5.8	11.5
Retired	566	92.9	11.4	8.7	7.4	89.7	10.4	6.1	8.3
<b>Education</b>									
Primary	824	93.7	12.2	9.1	9.6	88.9	12.2	6.3	11.4
Secondary	377	91.3	10.4	7.9	9.3	88.5	10.2	5.7	9.6
Tertiary	230	97.3	11.5	8.8	6.7	89.4	8.8	5.2	6.8
<b>Income</b>									
Low	420	95.2	12.8	9.2	11.4	90.4	14.2	7.2	16.1
Medium	534	91.9	10.4	8.0	7.0	89.4	10.1	5.7	6.8
High	255	93.1	10.5	8.3	6.0	85.7	7.3	5.0	6.3

Source: OeNB.

Note: This table presents aggregate results of the OeNB Barometer survey conducted in June and July 2022. Short-term expectations refer to the annual rate of inflation expected in 12 months' time, and long-term expectations refer to the average annual rate of inflation expected over the next 5 years. The number of households refers to how many households in the sample answered the survey questions. Share of  $\pi+$  refers to the share of respondents in the survey expecting the price level to increase (significantly or slightly); mean  $\pi$  reflects the weighted average of the expected annual rate of inflation in % (winsorized at the 2<sup>nd</sup> and 98<sup>th</sup> percentiles); median  $\pi$  reflects the interpolated median of the expected annual rate of inflation in % (according to the method of Cox, 2019); IQR of  $\pi$  refers to the interquartile range of survey responses on the expected annual rate of inflation in percentage points.

<sup>9</sup> As respondents are asked for their long-run expectations for the next 5 years and their short-run expectations for the next 12 months, the implicit average inflation rate for the years 2 to 5 can be calculated. Based on our results, the median inflation expectations for that period amount to 5.2%.



and supply disruptions were expected to ease, people were less certain whether inflation would ease or increase further over the coming 12 months. Compared to the current situation with the ongoing war in Ukraine, there seems to be more agreement that inflation will remain elevated also in the future.

### 3 Conclusions

In this article, we show that firms and households held a rather pessimistic view about consumer price inflation in the spring and summer of 2022, with short- and long-run inflation expectations having been far from the price stability objective of the Eurosystem.

Analyzing novel firm and existing household survey data, we document the following five stylized facts: First, we confirm earlier evidence that households and firms have rather similar expectations of inflation in the short run (8.7% and 8.2%, respectively) and the medium to long run (5.9% and 4.9%, respectively), with firms showing less disagreement about their estimates than households. This is not too surprising as the respondents in the firm survey, in particular those representing smaller firms, have similar characteristics as a typical household member in the household survey.

Second, as regards the determinants of expectations across agents, we find several firm and household characteristics which indicate that respondents' level of information, rational assessment and experience matter: For firms, we observe that firm size appears to have an effect on inflation expectations, with representatives of larger firms giving lower forecasts of future inflation than representatives of smaller firms. This is in line with the assumption that survey respondents in larger firms may differ in educational attainment or the position they hold (highly educated CFOs or CEOs) from respondents in smaller firms, who may be less required to closely follow economic news. For households, on the other hand, we confirm earlier evidence that relatively older and female respondents have higher inflation expectations than younger household members and men. Household size seems to matter as well, with single households holding higher expectations than larger households. The commonly found relationship of more educated and wealthier respondents reporting relatively lower inflation expectations is confirmed in our data only for long-run expectations, but not for short-run expectations.

Third, for firms, sectoral differences appear to matter for the formation of inflation expectations: Firms with a higher share of energy inputs (e.g. tourism, transportation) as well as those depending on (international) supply chains (e.g. construction, retail and production of consumer goods) on average seem to expect stronger price increases. In contrast, other service and manufacturing firms higher up in the supply chain seem to have a more benign price outlook. This pattern is roughly the same for short- and longer-term inflation expectations.

Fourth, looking at the relationship between inflation and firms' own selling price expectations, we observe that despite an overall grim inflation outlook, many firms do not expect to adjust their prices in the near future. While we do find that in general, firms that expect to raise their selling prices also have relatively higher quantitative inflation expectations, firms differ relatively less in their expectations about the increase in the aggregate price level compared to the expectations about their own selling prices. This indicates that the direct cost channel, which is determined by differences in inputs, energy intensity, supply

chain disruptions, etc., is likely more important for firms' price setting than expectations about future aggregate inflation. The relatively muted outlook for selling prices could also indicate the existence of price rigidity in the short run or strong competition hampering the swift adjustment of prices to economic conditions.

Finally, during high inflation periods, households are likely to be more rationally attentive (see Sims, 2003). We document that the uncertainty of inflation expectations of households is notably lower during a high-inflation period than during a period with more normal inflation rates. Whether this is due to respondents being better informed about inflation when inflation is exceptionally high (due to broader media coverage) or respondents facing markedly higher prices in their daily lives (e.g. gasoline prices, electricity costs, groceries) is difficult to determine and requires further investigation.

Our findings add to the vast literature on firms' and households' inflation expectations, which have been shown to affect agents' economic decisions. The new inflation expectations module in the WIFO-KT can be of particular value, as inflation expectations may be linked to various other economic expectations of firms and can thus be used to investigate the relationship between changes in aggregate (perceived and expected) inflation and firm behavior. For monetary policymakers, the evidence provided in this article can be useful for the analysis of the effects of their policy decisions and effective and well-designed policy communication. Another implication of our results is that (ex ante perceived) real interest rates, which affect agents' spending and investment decisions, can be vastly different across agents and sectors, which ultimately has an effect on the transmission of monetary policy.

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## Annex

### Questionnaire

Excerpt from the questionnaire of the WIFO Business Survey on inflation expectations (translated from German):

The following questions are about the future overall level of prices for goods and services as measured by the consumer price index. An increase in the overall price level is referred to as inflation, a decrease as deflation.

#### **1 In the next 12 months, the price level is going to...**

- increase significantly
- increase slightly
- remain stable
- decrease slightly
- decrease significantly

#### **1a By how much do you estimate the overall price level to increase/decrease in the next 12 months? (You may provide decimals.)**

Approximately \_\_\_\_\_ %

#### **2 Over the next 3 to 5 years (medium term), the price level is going to, on average, ...**

- increase significantly
- increase slightly
- remain stable
- decrease slightly
- decrease significantly

#### **2a By how much, on average, do you estimate the overall price level to increase/decrease per year over the next 3 to 5 years (medium term)? (You may provide decimals.)**

Approximately \_\_\_\_\_ %