FEDERAL RESERVE BANK OF SAN FRANCISCO

WORKING PAPER SERIES

Do Inflation Expectations Become More Anchored During a Disinflation Episode? Evidence for Euro Area Firms

Ursel Baumann
European Central Bank

Annalisa Ferrando
European Central Bank

Dimitris Georgarakos
European Central Bank

Yuriy Gorodnichenko
University of California, Berkeley

Timo Reinelt
Federal Reserve Bank of San Francisco

January 2025

Working Paper 2025-02

https://doi.org/10.24148/wp2025-02

Suggested citation:

Baumann, Ursel, Annalisa Ferrando, Dimitris Georgarakos, Yuriy Gorodnichenko, and Timo Reinelt. 2024. "Do Inflation Expectations Become More Anchored During a Disinflation Episode? Evidence for Euro Area Firms." Federal Reserve Bank of San Francisco Working Paper 2025-02. https://doi.org/10.24148/wp2025-02

Do inflation expectations become more anchored during a disinflation episode? Evidence for euro area firms

Ursel Baumann
European Central Bank

Annalisa Ferrando
European Central Bank

Dimitris Georgarakos
European Central Bank

Yuriy Gorodnichenko
UC Berkeley

Timo Reinelt
Federal Reserve Bank of San Francisco

January 2025

Abstract

Does a successful disinflation contribute to the anchoring of inflation expectations? We provide novel survey evidence on the dynamics of euro area firms' inflation expectations during the disinflation episode since 2022. We show that firms' short-term inflation expectations declined steadily towards the inflation target as the disinflation progressed. However, we also document a thick tail in longer-term inflation expectations, substantial disagreement about the inflation outlook, and an increased sensitivity of longer-term inflation expectations to short-term inflation expectations. These findings suggest that it may take more time to bring inflation expectations fully in line with central bank objectives.

JEL: E31, E52

Keywords: inflation expectations, firms, surveys, anchoring

We thank our discussant Philippe Andrade for insightful comments. The views expressed are those of the authors and do not necessarily reflect those of the ECB, the Eurosystem, the Federal Reserve Bank of San Francisco, or the Federal Reserve System.

1. Introduction

Post-COVID19 adjustments, the Russian full-scale invasion of Ukraine, and other factors led to a dramatic surge in inflation in the euro area. The European Central Bank's tight monetary policy contributed to a steep disinflation trajectory: inflation fell from 10.6% in October 2022 to 2.2% in November 2024. However, since experiences of high inflation could have a scarring effect (Malmendier and Nagel 2016), it remains to be seen how the inflation cycle has affected the anchoring of inflation expectations. This issue is of first-order importance because "fluid" expectations can amplify future inflationary shocks and thus can result in another inflation spike, which would undermine the credibility of the central bank. To shed more light on the matter, we examine the evolution of firms' inflation expectations in the euro area during the recent disinflation episode. We document clear progress in bringing inflation expectations towards the target, but this process has not been complete yet and thus policymakers should proceed with caution.

2. Survey on the Access to Finance of Enterprises (SAFE)

To analyze the evolution of inflation expectations anchoring, we use a novel survey covering firms' inflation expectations in the euro area. This survey is a new module of the Survey on the Access to Finance of Enterprises (SAFE) which is run by the European Central Bank and the European Commission. From 2009 to 2023, the survey was conducted biannually and focused on firms' financial and economic conditions. The survey is administered by phone (for first-time participants) and online and firms are randomly selected from several business registers, stratified by country, sector, and firm size class. Survey weights ensure that the sample is representative of the distribution of employment across countries, sectors, and firm size classes.

The survey was enriched with questions on inflation expectations in June 2023 and has been run quarterly with these questions since December 2024. The questions cover inflation expectations at the one-, three-, and five-year horizons. The unique strengths of the SAFE include its representativeness, consistent measurement across all countries in a major monetary union, and elicitation of firms' inflation expectations at short- and longer-term horizons. The survey also includes additional questions on the risks around the five-year inflation outlook as well as on firms' plans about their price, wage, non-labor cost, and employment decisions, that we don't use in this paper. Baumann et al. (2024) provide more details.

3. Average Short-Run Inflation Expectations during the Disinflation

Figure 1 shows the dynamics of firms' inflation expectations at the one-, three-, and five-year horizons throughout the disinflation episode. We examine five survey waves covering an 18-month period from June 2023 through September 2024, using survey-weighted medians (computed by linear interpolation of the mid-distribution function; Panel A) and means (Panel B) as our measures of average expectations.

Firms' one-year-ahead median inflation expectations stood at 5.0% in June 2023, when actual HICP inflation was 5.5%. As disinflation progressed and inflation approached two percent in 2024, one-year-ahead median inflation expectations declined to 2.7% by September 2024. Mean one-year-ahead inflation expectations also declined steadily. These results suggest that the disinflation episode helped bring inflation expectations closer to the target. Importantly, lower inflation expectations are in turn disinflationary due to their effect on firms' price setting behavior (Coibion, Gorodnichenko, and Ropele 2020).

4. Did Expectations Become More Anchored During the Disinflation?

Is a convergence of average expectations sufficient for central banks to claim victory over high inflation? While short-run expectations close to target are crucial for a successful disinflation, a large literature argues that anchored inflation expectations are instrumental for the successful conduct of inflation-targeting monetary policy. In the following, we use the SAFE data to assess how the anchoring of inflation expectations has changed over the disinflation cycle.

We consider three notions of anchoredness in inflation expectations (Kumar, Afrouzi, Gorodnichenko, and Coibion 2015). Although there is no unique definition of anchored expectations, these three notions capture distinct aspects of anchoring which we can analyse with our survey data: (1) firms expecting inflation to converge to the inflation target over the longer run; (2) limited dispersion in expectations; and (3) the insensitivity of longer-run expectations to short-term expectations.

a. Longer-term inflation expectations have fallen slightly

The first notion of anchored inflation expectations posits that expectations are anchored if agents, on average, believe that inflation will approach the central bank's target in the medium- to long-run, even when current inflation and short-run expectations deviate. This aligns with

central banks' policy objectives, particularly the ECB's medium-term inflation targeting framework (ECB 2021).

Panel A of Figure 1 shows that even in 2023, when inflation still was far above target, median longer-run inflation expectations stood at 3.0%, significantly lower than short-run expectations. This downward-sloping term structure indicates that the median firm indeed expected inflation to decline toward the two percent target. Over time, median five-year-ahead inflation expectations fell slightly from 3.0% in June 2023 to 2.9% in September 2024. Despite the gap to the 2% inflation target of the ECB, the continuous decline in median longer-run inflation expectations suggests convergence over time. Moreover, survey biases may warrant some caution in interpreting levels of expectations in isolation.

At the same time, mean inflation expectations (Panel B of Figure 1) paint a more nuanced picture. The profile of term structure of mean expectations in June 2023 conveyed that firms project inflation to fall but not as dramatically as suggested by median expectations. More importantly, the slope of the term profile for mean expectations flipped from negative to positive. For example, in December 2023, average inflation expectations predicted a rise of inflation from roughly 5% in 2024 to almost 6% in 2025. This upward-sloping profile has been shifting down over time and the inflation projected for 2030 fell to 4.5%.

While this development suggests that the anchoring of inflation expectations has strengthened, the difference between median and mean expectations reflects the skewness of inflation expectations, particularly the mass of firms with very high inflation expectations. This warrants attention, as Reis (2021) documents that the right tail in the distribution of inflation expectations can be a leading indicator of future increases in inflation and a higher sensitivity of inflation to incoming information and shocks.

For comparison, professional forecasters in the euro area project inflation to converge to the 2% inflation target in 2025 and stay there for years to come (Appendix Figure 4). There is also little difference between their median and mean inflation expectations. The contrast between firms and professional forecasters underscores the value of surveying firm managers for informing policymakers about the inflation outlook.

b. Disagreement in inflation expectations has not fallen further

The second notion of anchored inflation expectations posits that dispersion in expectations should be low under anchored expectations, as anchoring for all agents implies low disagreement about expected inflation outcomes.

Figure 2 plots disagreement over time, measured as the standard deviation or interquartile range of firms' inflation expectations for each of the three horizons. In general, disagreement is higher for longer horizons. Since 2023, one-year-ahead disagreement has modestly declined. However, relative to median expectations, short-run disagreement has increased (Appendix Figure 3). Disagreement at the three- and five-year-ahead horizons has remained stable. Taken together, these observations suggest that firms' inflation expectations have not become more anchored during the disinflation.

Again, disagreement among professional forecasters is not only much lower but also decreasing over time (Appendix Figure 5). In effect, their disagreement largely converged to the pre-COVID19 levels.

c. Sensitivity of longer-run inflation expectations has increased

The third notion of anchored inflation expectations postulates that firms' longer-run expectations, which should be mostly pinned down by the inflation target, should not be related to their short-run inflation expectation, which is subject to transitory business cycle shocks. This implies a low correlation between short- and longer-run expectations in the cross-section of firms.

Figure 3 presents binned scatterplots relating individual firms' one-year-ahead inflation expectations to their three- and five-year-ahead expectations in June 2023 and September 2024. The sensitivity of longer-run to short-run expectations increased between surveys: the regression coefficient increased from 0.38 (SE = 0.01) to 0.67 (SE = 0.01) for the case of five-year-ahead expectations, with similar increases for three-year expectations. That is, firm managers projecting inflation in one year to be one percentage point higher than other firms, they expect, on average, inflation in five years to be 0.67 percentage points higher. Similarly to the disagreement among firms documented above, the heightened sensitivity of longer-run inflation expectations suggests that firms' inflation expectations have not become more anchored.

For comparison, when we regress five-year inflation expectations on one-year inflation expectations for professional forecasters, we find that the estimated slope was relatively stable at 0.15 (Appendix Figure 6). Furthermore, as of 2024Q3, the estimated slope is not statistically different from zero.

5. Conclusion

Inflation in the euro area has fallen rapidly. However, there are signs that the battle is not over yet. Unlike professional forecasters, firms' managers appear to harbor concerns about future inflation. There is a thick tail of managers expecting inflation to increase over the longer run. Managers show much disagreement in their outlook and especially so for longer horizons. Finally, there is a strong correlation between long-term and short-term inflation expectations. These indicators of limited anchoring in inflation expectations may warrant attention during the "last mile" of the disinflation and suggest that more time is needed to fully align inflation expectations with central bank objectives.

Our analysis highlighting the differences between firms' and professional forecasters' inflation expectations underscores the importance of monitoring the expectations of all types of economic agents. Therefore, the access to firms' inflation expectations in the euro area through the SAFE is key for a comprehensive assessment of where inflation expectations are in the economy.

References

Baumann, Ursel, Annalisa Ferrando, Dimitris Georgarakos, Yuriy Gorodnichenko, and Timo Reinelt. "SAFE to Update Inflation Expectations? New Survey Evidence on Euro Area Firms." No. w32504. National Bureau of Economic Research, 2024.

Coibion, Olivier, Yuriy Gorodnichenko, and Tiziano Ropele. "Inflation expectations and firm decisions: New causal evidence." Quarterly Journal of Economics 135, no. 1 (2020): 165-219.

ECB (2021). "An overview of the ECB's monetary policy strategy." Available at https://www.ecb.europa.eu/home/search/review/pdf/ecb.strategyreview_monpol_strategy_overview.en.pdf.

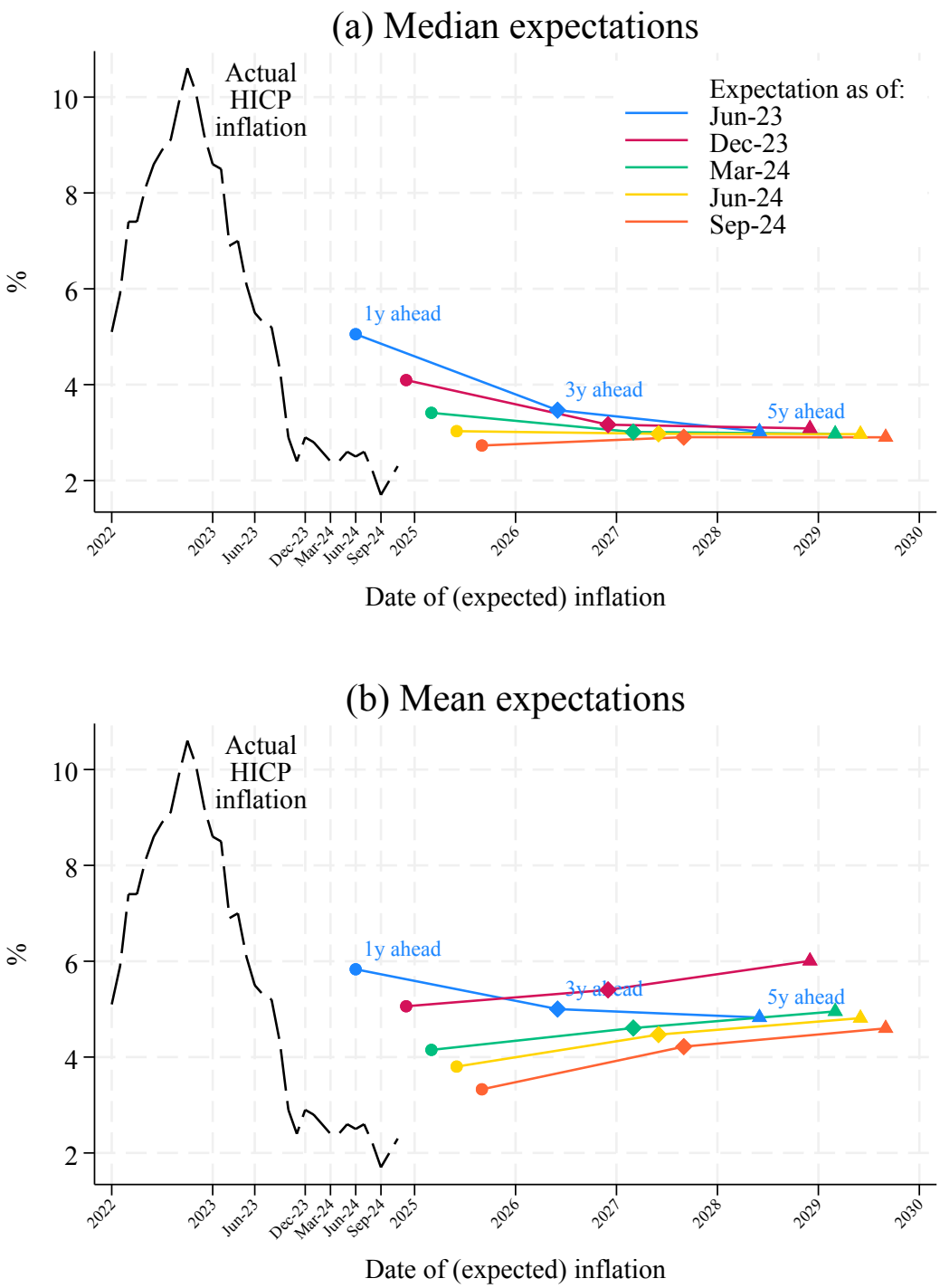
Kumar, Saten, Hassan Afrouzi, Olivier Coibion, and Yuriy Gorodnichenko, 2015. "Inflation targeting does not anchor inflation expectations: Evidence from firms in New

Zealand.” Brookings Papers on Economic Activity 2015(2): 151-225.

Ricardo Reis, 2021. “Losing the Inflation Anchors.” Brookings Papers on Economic Activity 52(2 (Fall)): 307-379.

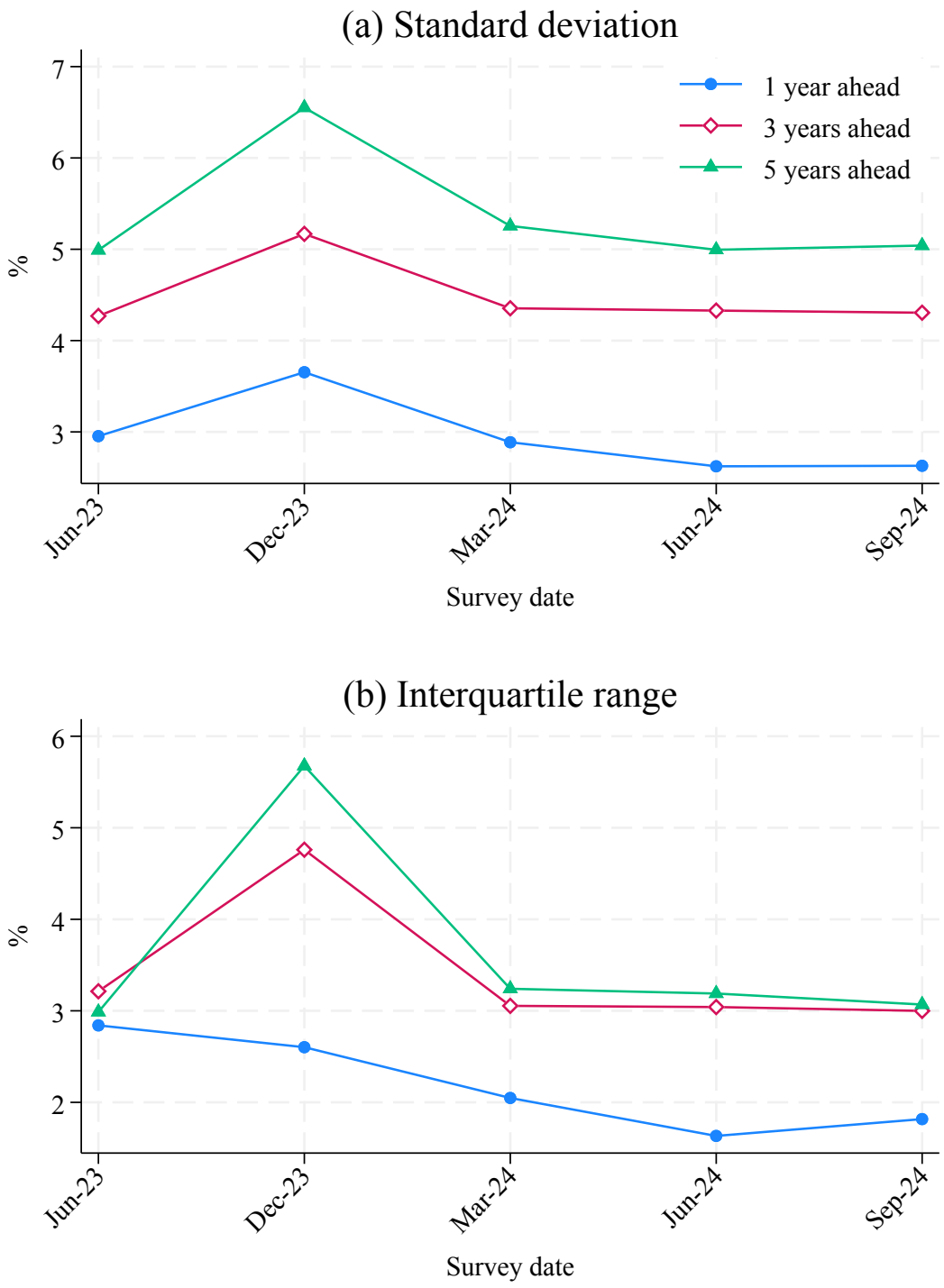
Malmendier, Ulrike, and Stefan Nagel, 2016. “Learning from Inflation Experiences.” Quarterly Journal of Economics 131(1): 53-87.

Figure 1. The evolution of firms' inflation expectations in the euro area



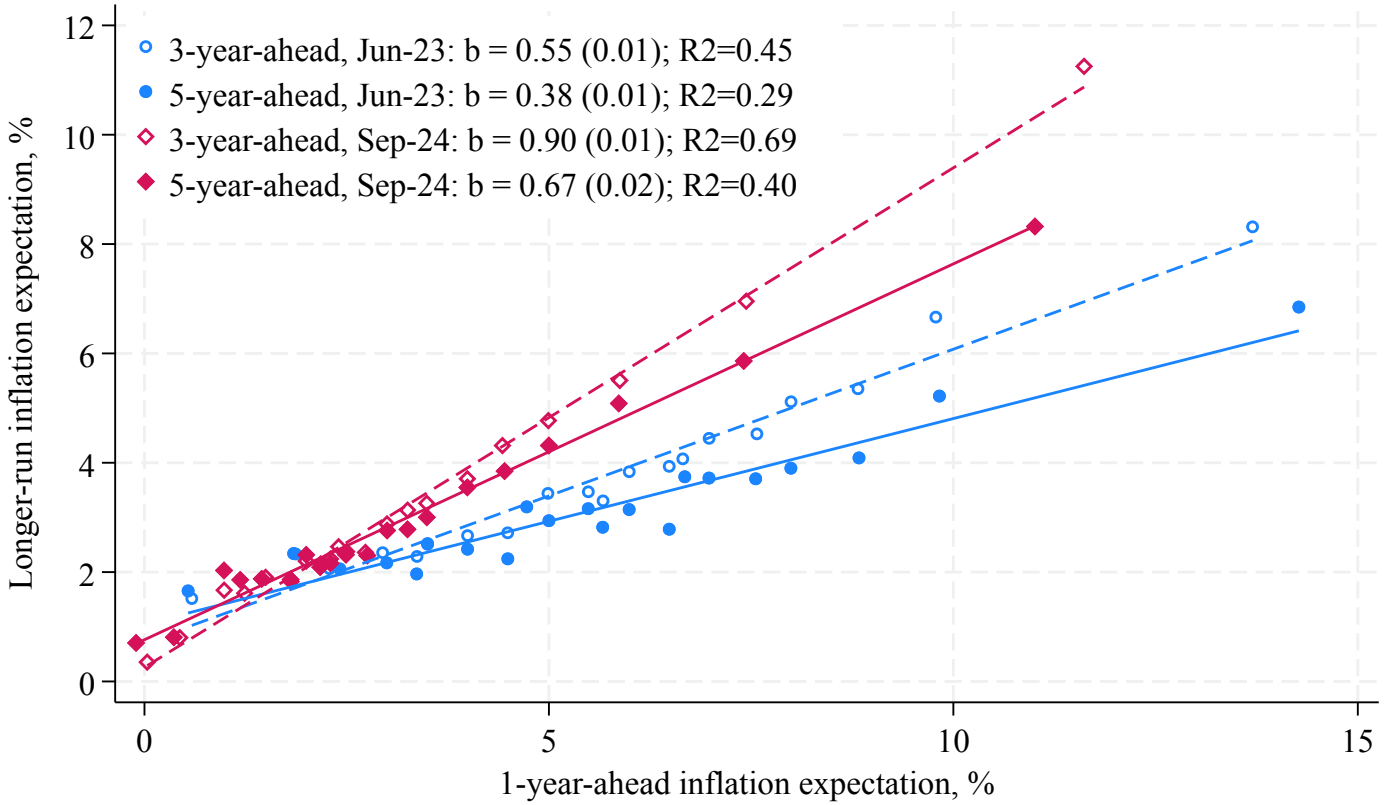
Notes: This figure plots firms' median and mean euro area inflation expectations by one-, three-, and five-year-ahead horizon and survey date. Medians are computed by linear interpolation of the mid-distribution function. All statistics are computed using survey weights.

Figure 2. Disagreement in firms' inflation expectations



Notes: This figure plots the standard deviation and the interquartile range of firms' euro area inflation expectations at the one-, three-, and five-year-ahead horizons for each survey date. Quartiles are computed by linear interpolation of the mid-distribution function. All statistics are computed using survey weights.

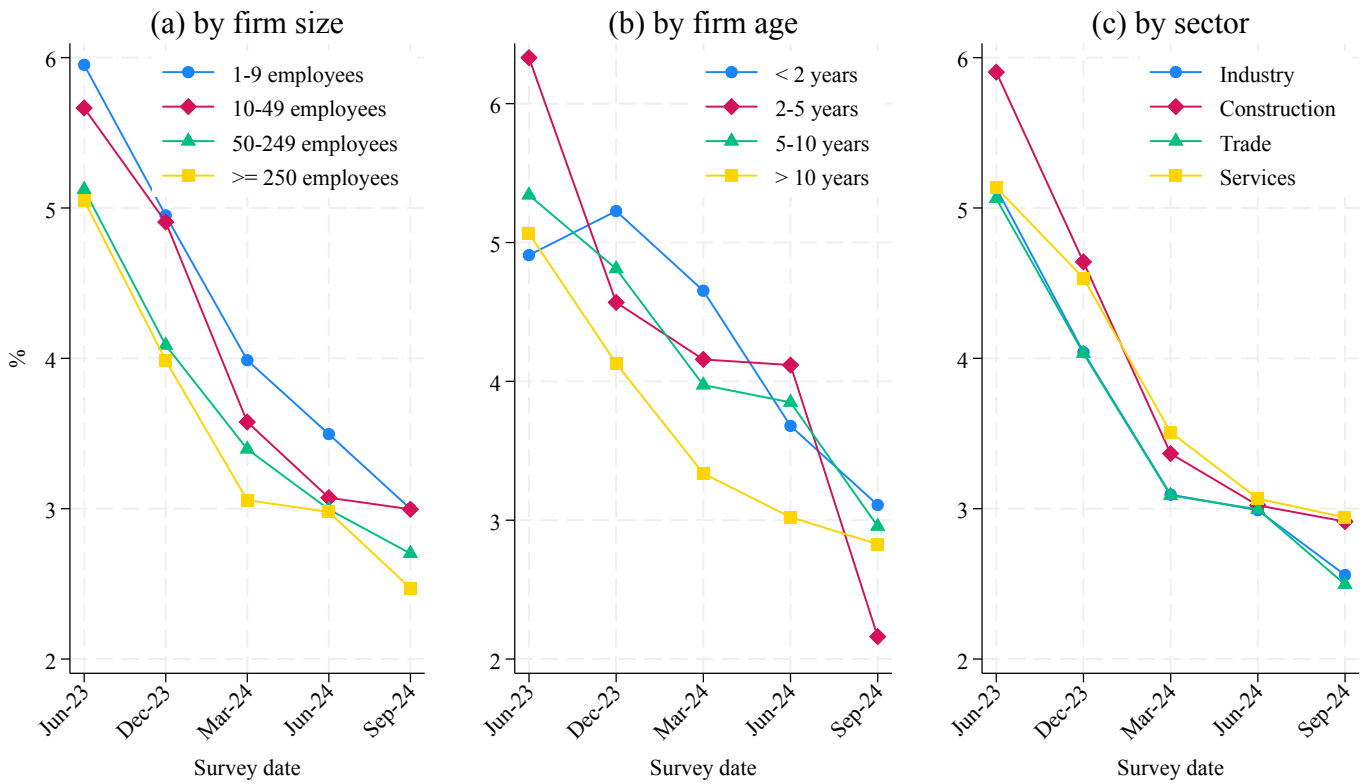
Figure 3. Time-varying sensitivity of longer-term inflation expectations



Notes: This figure plots binned scatterplots relating firms' one-year-ahead inflation expectations to their three-year-ahead (hollow markers) and five-year-ahead expectations (full markers), for the surveys in June 2023 (blue) and September 2024 (red). The lines represent linearly fitted lines with regression statistics reported in the respective legends.

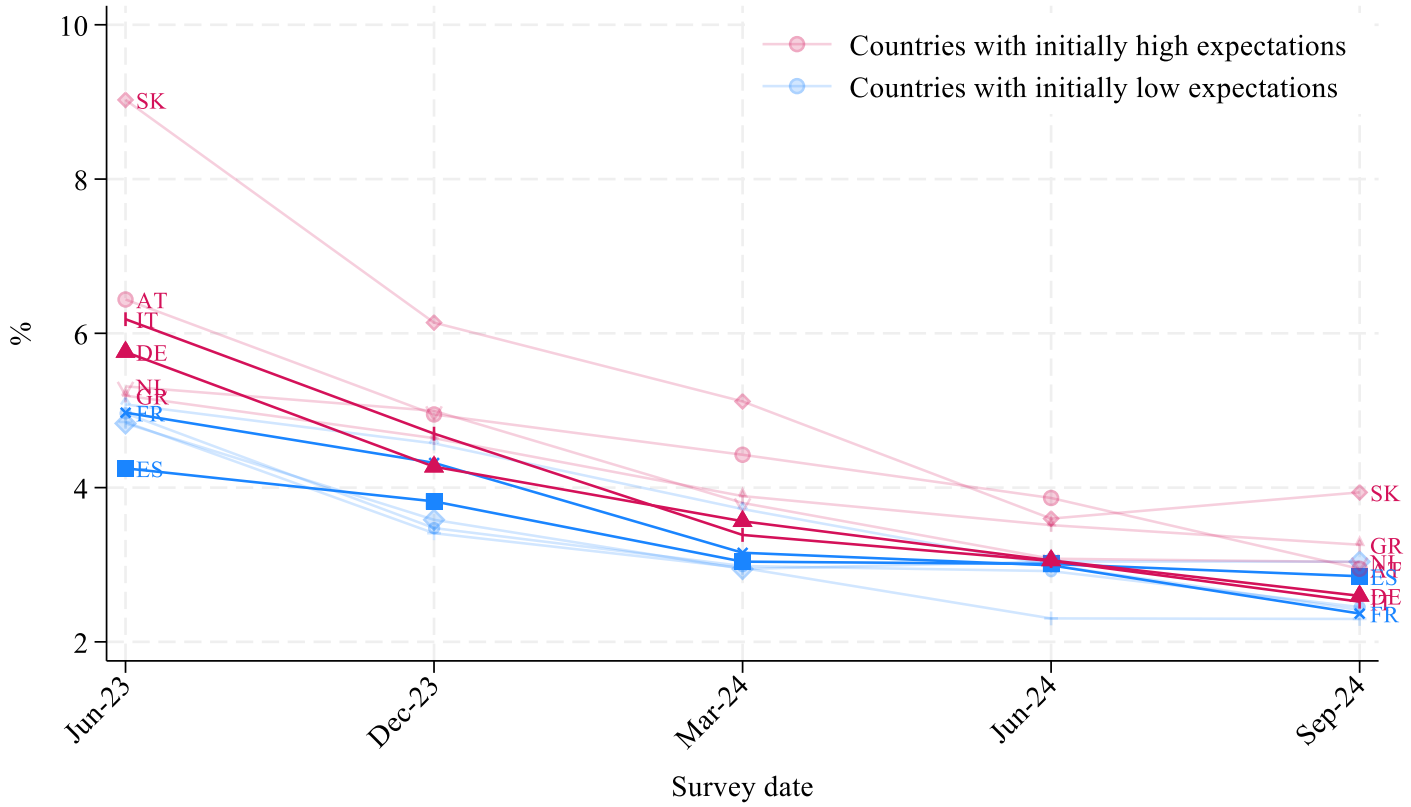
ONLINE APPENDIX

Appendix Figure 1. One-year-ahead inflation expectations by firm size, age, and sector



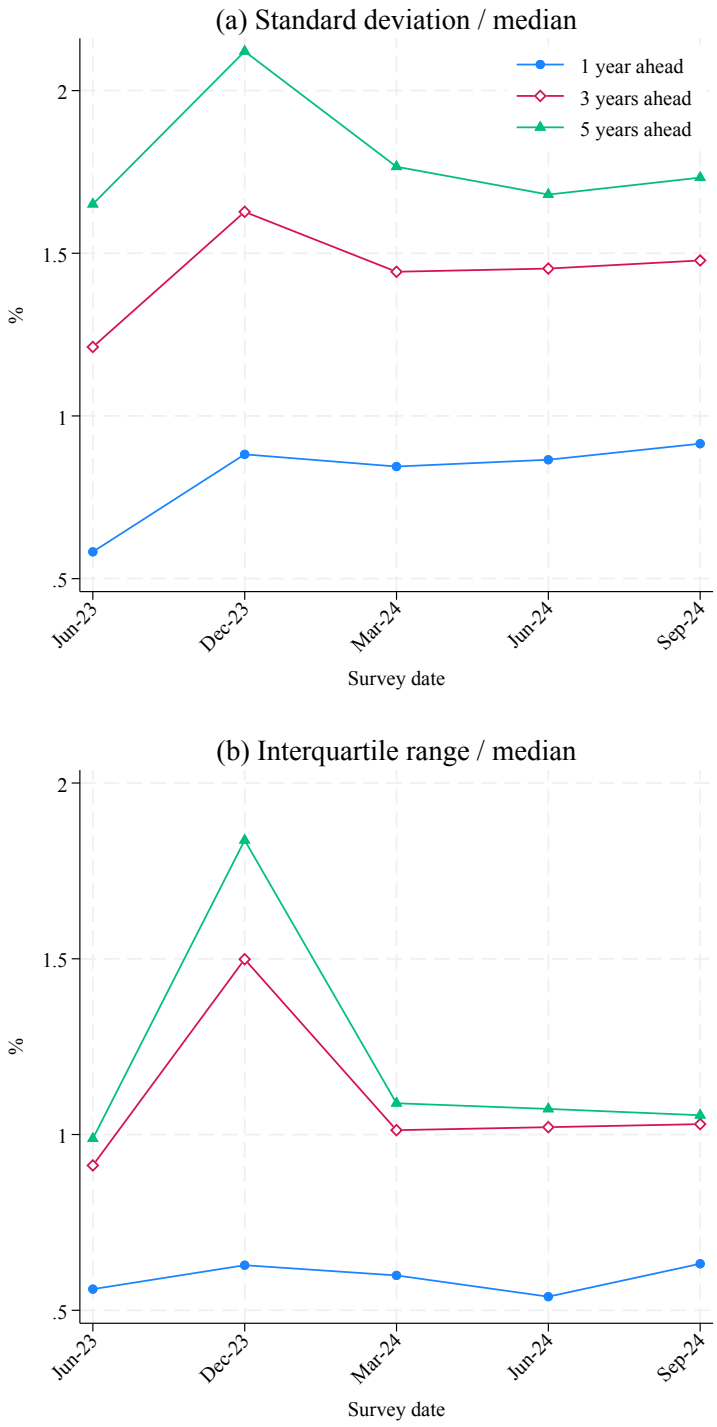
Notes: This figure plots median one-year-ahead inflation expectations by firm size, firm age, and sector for each survey date. Medians are computed by linear interpolation of the mid-distribution function and using survey weights.

Appendix Figure 2. One-year-ahead inflation expectations by country (and initial expectation)



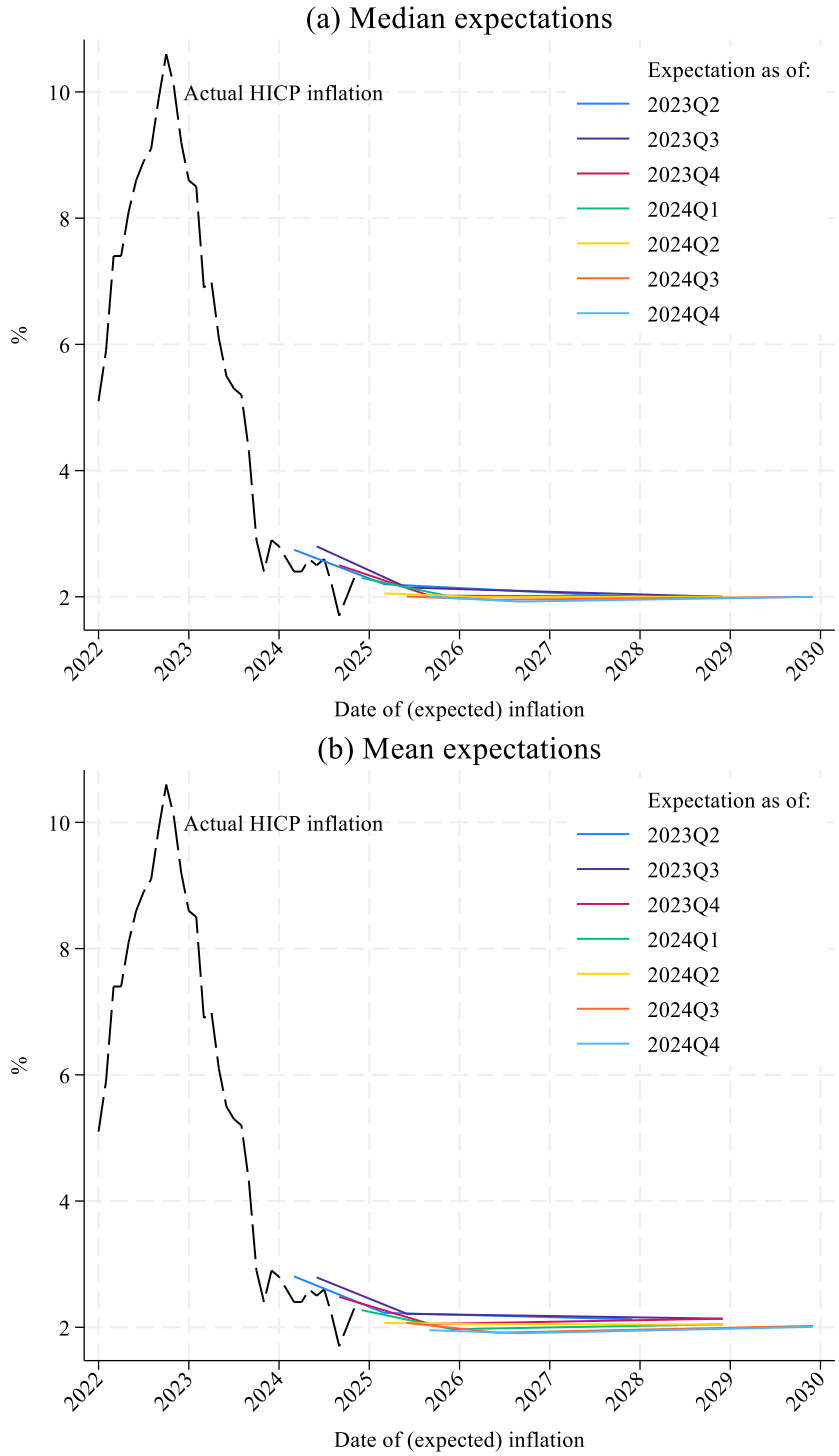
Notes: This figure plots median one-year-ahead inflation expectations for each survey date by country. Coloring is according to initial expectation: The six countries with the highest median inflation expectations in June 2023 are in red. The other six countries with the lowest median inflation expectations in June 2023 are in blue. Medians are computed by linear interpolation of the mid-distribution function and using survey weights.

Appendix Figure 3. Disagreement in inflation expectations.



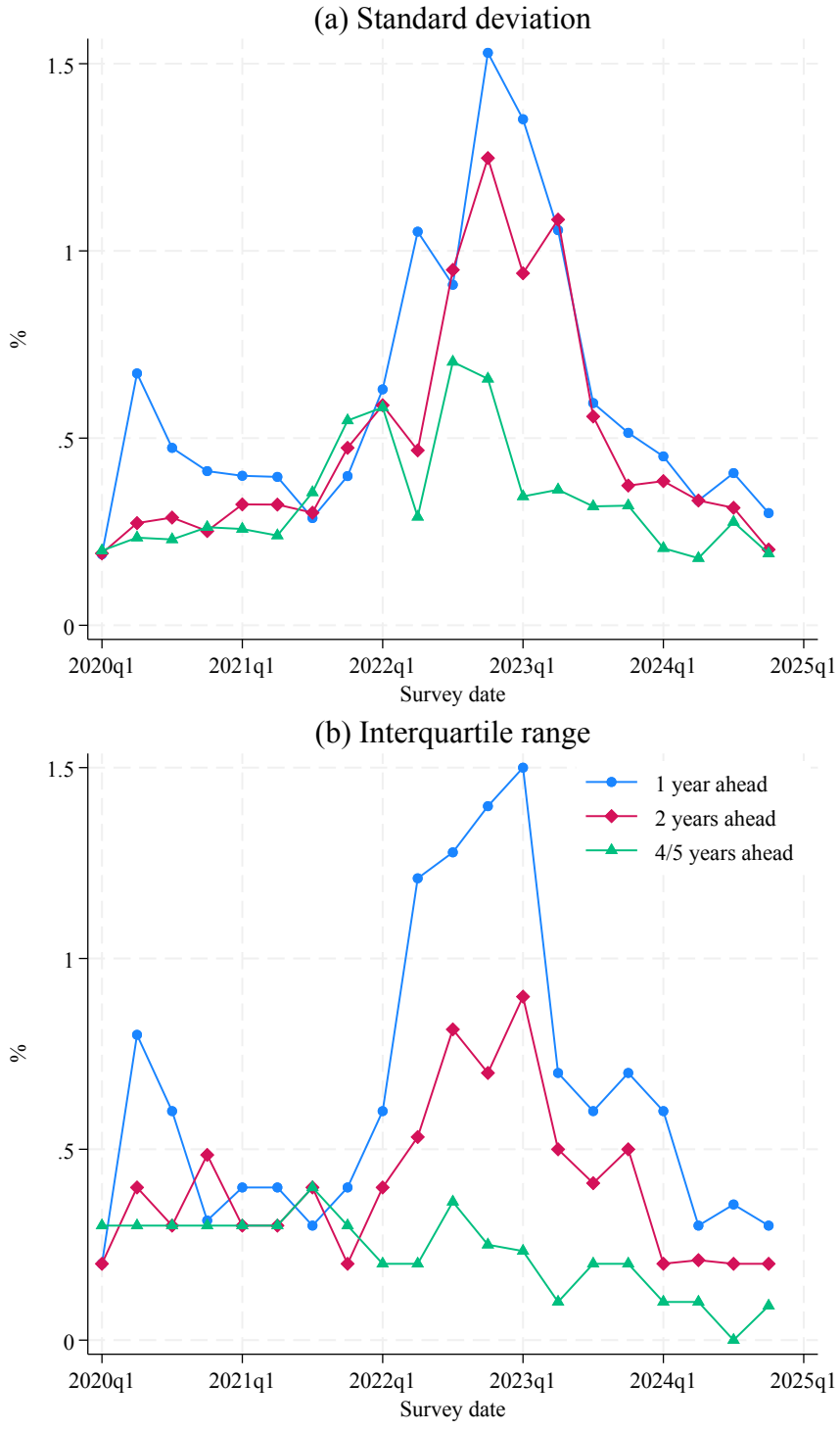
Notes: This figure plots the standard deviation and the interquartile range, normalized in each case with the median, of firms' euro area inflation expectations at the one-, three-, and five-year-ahead horizons for each survey date. Quartiles and medians are computed by linear interpolation of the mid-distribution function. All statistics are computed using survey weights.

Appendix Figure 4. Average inflation expectations in the Survey of Professional Forecasters.



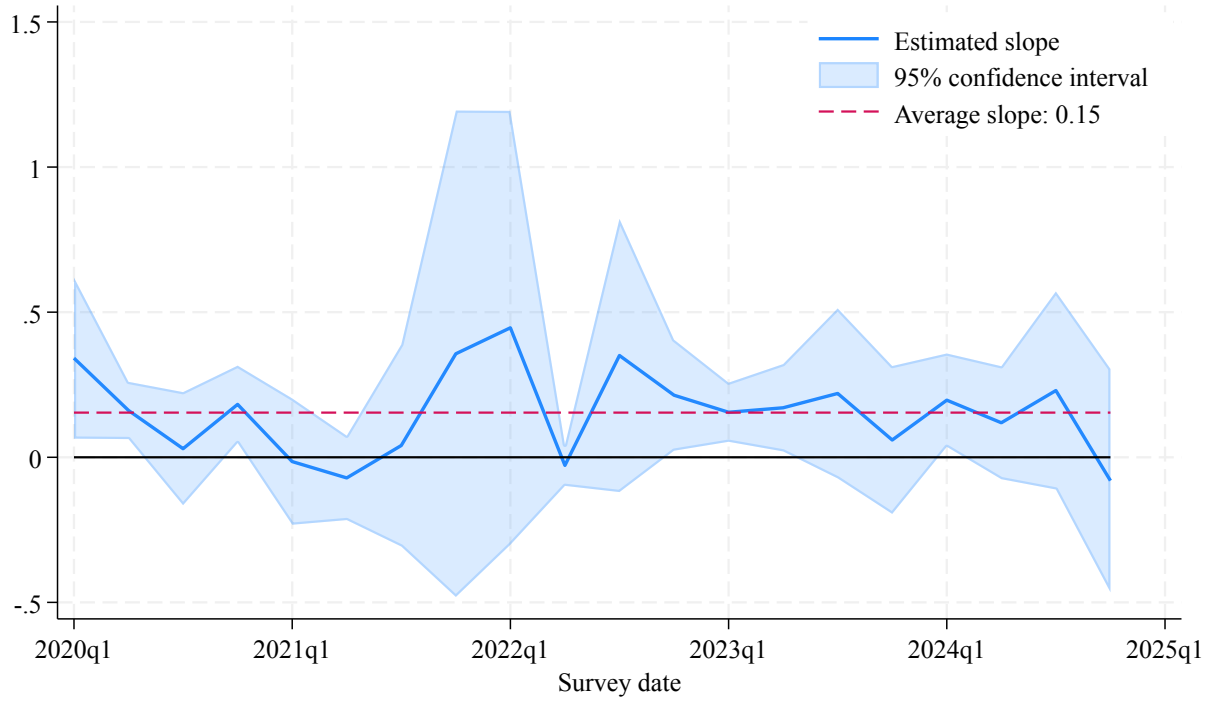
Notes: This figure plots median and mean euro area inflation expectations from the Survey of Professional Forecasters by one-, two-, and four-/five-year-ahead and survey date. The long-term horizon is four calendar years ahead for surveys waves conducted in the first and second quarter of a year and five calendar years ahead for surveys waves conducted in the third and fourth quarter of a year.

Appendix Figure 5. Disagreement in inflation expectations in the Survey of Professional Forecasters.



Notes: This figure plots the standard deviation and the interquartile range of inflation expectations from the Survey of Professional Forecasters at the one-, two-, and four-/five-year-ahead horizon for each survey date. The long-term horizon is four calendar years ahead for surveys waves conducted in the first and second quarter of a year and five calendar years ahead for surveys waves conducted in the third and fourth quarter of a year.

Appendix Figure 6. Slope for the regression of four-/five-year-ahead inflation expectations on one-year-ahead inflation expectations in the Survey of Professional Forecasters.



Notes: This figure reports quarter-by-quarter regression coefficients of four-/five-year-ahead inflation expectations (four calendar years ahead for surveys waves conducted in the first and second quarter of a year and five calendar years ahead for surveys waves conducted in the third and fourth quarter of a year) on one-year-ahead inflation expectations at the individual forecaster level in the Survey of Professional Forecasters. The shaded area represents 95% confidence intervals based on heteroskedasticity-robust standard errors.