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Heterogeneity in Consumers' Economic Expectations across Euro Area Countries*

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Abstract

This paper examines cross-country differences in consumer expectations about macroeconomic outcomes and mortgage borrowing conditions within a monetary union. Using harmonized microdata from the ECB Consumer Expectations Survey for eleven euro area countries, we document significant national disparities. By sequentially adding a rich set of consumer- and country-specific macro controls to pooled regressions with country fixed effects, we find that these factors account for much, but not all, of the cross-country heterogeneity in expectations. These remaining differences likely reflect unobserved country-specific factors, highlighting the need for country-tailored monetary policy communication to effectively stabilize consumer expectations.

Keywords: Country heterogeneity, Expectations, Consumer Expectations Survey.

JEL: E31, E52, D30, D84.

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1. Introduction

The recent episode of high inflation has reinforced the importance of consumers' macroeconomic expectations, particularly about inflation, for macroeconomic stability. A large literature documents how expectations are distributed within countries, how they deviate from professional forecasts, and how they shape spending and saving decisions (see, e.g., D'Acunto et al., 2023 and D'Acunto and Weber, 2024). Much less is known, however, about the factors associated with systematic cross-country differences in consumers' views about future inflation and the broader economic outlook, even when they share a common monetary policy (D'Acunto et al., 2025). This paper investigates the sources of these cross-country gaps in expectations within the euro area, and their implications for monetary policymaking.

Persistent cross-country differences in expectations matter especially in a monetary union such as the euro area. If consumers in some member states consistently expect higher inflation, weaker growth, or higher unemployment than others, this may be related to divergent consumption and saving patterns, wage demands, and reactions to common monetary policy, potentially undermining monetary policy transmission. A key question is therefore whether expectation gaps within a monetary union are associated with differences in population composition across member states — such as demographics, income, or homeownership — as well as differences in business cycle dynamics, or more persistent differences in beliefs, such as trust in institutions, consumers' economic sentiment, and inflation experiences, and whether country-specific residuals remain important even after accounting for these factors.

To this end, this paper provides a systematic decomposition of cross-country differences in consumer macroeconomic expectations within the euro area. We use harmonized microdata from the ECB Consumer Expectations Survey (CES) for eleven euro area member states. Respondents in each country answer an identical questionnaire on their country-specific economic outlook and provide information on socio-demographics, economic situation, and attitudes, allowing a unified cross-country

comparison. We extend these data with country-specific macro variables and group-specific measures, such as cohort-based inflation and unemployment experiences over the life cycle. Our setting therefore combines a common monetary policy with rich, harmonized micro and macro information, which allows us to go beyond documenting heterogeneity and to assess which factors are most strongly associated with cross-country gaps in expectations.

We study a broad set of quantitative expectations: short- and medium-term inflation expectations, perceived inflation over the past year, and short-term expectations on unemployment, mortgage interest rates, and economic growth. Because mortgage expectations uniquely capture households' views on future borrowing conditions and monetary policy transmission, they complement the broader macroeconomic measures.

We start with four simple hypotheses. First, individual characteristics such as age, education, income, homeownership, or access to credit may correlate systematically with macroeconomic expectations at the micro-level, but differences in population composition alone may not fully account for cross-country dispersion. Second, cross-country differences in behavioral traits of the population — particularly trust in the ECB and national institutions, economic sentiment, and inflation experiences — could be closely associated with expectation gaps under a common monetary policy. Third, differences in country-specific macroeconomic outcomes and long-term trends may be associated with country differences in expectations. Finally, even after conditioning on population composition, beliefs, and macroeconomic conditions, persistent residual country fixed effects may remain, suggesting the presence of difficult-to-measure country-specific heterogeneity, potentially related to persistent differences in historical experiences, institutional environments, or broader belief structures.

Our empirical strategy is straightforward. We first estimate pooled regressions with country fixed effects to measure raw cross-country differences in expectations. We then sequentially add blocks of controls — demographics, consumer characteristics, housing and employment situation, indicators of financial vulnerability and access to credit,

financial literacy, economic sentiment, trust measures, personal inflation, past inflation and unemployment experiences, professional forecasts, national macroeconomic conditions, attention to inflation, and year fixed effects — and track how country effects change. We use the rich CES microdata, augmented with country-specific macro variables and experience measures, to assess how much of the observed cross-country dispersion is associated with each set of factors and how much residual heterogeneity remains.

We obtain three main results. First, we document large and statistically significant cross-country differences in expectations. One-year-ahead inflation expectations in some countries are on average more than two percentage points higher than in others, and similarly pronounced gaps arise for unemployment and growth expectations, despite a common currency and central bank. Second, individual characteristics are strongly associated with expectations within countries, but they account for only part of the cross-country dispersion. Demographics and economic situation matter in broadly similar ways across member states, so differences in composition by themselves do not materially reduce the gaps in country fixed effects. Measures of trust, sentiment, and inflation experiences are more strongly associated with reductions in estimated cross-country differences. Countries whose residents report lower trust or a more pessimistic economic outlook tend to have higher inflation expectations on average, and controlling for these beliefs and for professional forecasts appreciably reduces dispersion. Third, however, even after conditioning on a rich set of controls — demographics, economic conditions, sentiment, institutional trust, personal experiences, personal inflation rate, macroeconomic conditions, and time fixed effects — sizable residual country effects remain. In some countries, consumers report systematically higher expected inflation and more pessimistic views of unemployment and growth than otherwise similar consumers elsewhere even after controlling for differences in business cycles, suggesting the presence of persistent country-level heterogeneity beyond observable household and macroeconomic characteristics, potentially related to institutional environments, historical experiences, or broader country-specific belief structures within

a monetary union. In fact, country fixed effects for macroeconomic expectations may even increase after controlling for country-specific macro variables, suggesting that cross-country differences in expectations follow distinct dynamics.

To probe whether these residuals simply reflect unmeasured institutional or informational factors, we augment the model with a large set of country-level proxies for institutional quality, the media environment, and public economic concern, compressed into orthogonal indices via principal component analysis. The country fixed effects remain large and jointly significant even after conditioning on these indices, indicating that the residual heterogeneity cannot be attributed to multicollinearity or to the omission of measurable institutional characteristics.

Our analysis has implications for both research and policy. For research, we provide, to our knowledge, one of the first comprehensive cross-country comparisons of consumer macroeconomic expectations within a monetary union based on harmonized microdata.[1] We show that expectation gaps under a common monetary policy are more strongly correlated with differences in beliefs than differences in population composition, with important residual country-specific components. These patterns can inform models of expectation formation that place greater weight on institutional trust, information frictions, and country-specific belief structures. For policy, our findings underscore that in a monetary union consumers in member states may not interpret economic conditions and central bank communication in the same way. We also provide direct experimental evidence on this point. Using a randomized information module in the survey (ECB, 2025), we find that informing consumers about the ECB's 2% inflation target partially narrows cross-country differences in inflation expectations, although substantial heterogeneity remains even after the treatment. Hence, where expectations are persistently higher or more pessimistic, targeted communication, public education, and broader efforts to strengthen trust in monetary institutions may be needed to better align consumer expectations with policy objectives.

[1] Firms' inflation expectations in a monetary policy union have been recently analyzed by Baumann et al. (2025, 2026).

This paper is linked to several strands of literature. First, because we evaluate the importance of consumer-specific controls for expectations, including demographics, household characteristics, sentiment, trust, experience, or attention, our work relates to previous studies documenting their relevance (see, among others, Jonung, 1981, Malmendier and Nagel, 2016, D'Acunto and Weber, 2024, and D'Acunto et al., 2023). Second, recent work has begun to examine the global differences in expectations. In particular, D'Acunto et al. (2025) introduce a harmonized global survey of household perceptions and expectations across 31 economies. They document that household inflation expectations are systematically upward biased relative to both prevailing inflation and professional forecasts, and that perceived post-pandemic price and real wage losses are key correlates of elevated expectations. The same survey evidence indicates that high and dispersed household inflation expectations are a global phenomenon (D'Acunto and Weber, 2025). At the same time, the global survey is designed to provide broad comparative facts rather than an in-depth decomposition of cross-country gaps within a single monetary regime. Evidence for Europe likewise points to substantial heterogeneity. Consumers in Central and Eastern Europe, for example, tend to overestimate inflation more than those in Western Europe (Allinger and Rumler, 2025), and qualitative data reveal marked country differences in euro-area expectations that earlier assessments of well-anchored inflation largely overlooked (Bonam and Goy, 2019). Taken together, these studies show that cross-country differences in expectations are economically meaningful, yet they leave open what factors are linked to them within a common monetary framework and the extent to which they can be traced to observable characteristics, beliefs, and macroeconomic conditions. This is where our paper steps in. Third, our finding of sizable residual country gaps even in the fully controlled model points to the importance of country-tailored monetary policy communication (De Fiore et al., 2022; Wabitsch, 2025; Coibion et al., 2022; Guillochon and ter Ellen, 2025).

The remainder of the paper is organized as follows. Section 2 introduces our data and empirical approach, and Section 3 presents our main results. The following sections

probe robustness and extend the analysis. Section 4 adds respondent-level personal inflation rates, Section 5 traces the cross-country heterogeneity over a longer horizon across distinct inflation subperiods, and Section 6 summarizes the country-level proxies using principal component analysis. Section 7 turns to a survey experiment, assessing how information about the ECB's inflation target affects heterogeneity across euro area countries. Finally, Section 8 concludes with a discussion of the implications for monetary policy.

2. Empirical approach

We leverage harmonized micro-level survey data alongside macroeconomic variables to analyze the sources of cross-country variation in consumer expectations. By sequentially introducing blocks of covariates, we assess the extent to which different sets of factors account for the observed dispersion in expectations across countries.

2.1. Data and sample coverage

The analysis uses data from the European Central Bank's Consumer Expectations Survey (CES) covering eleven euro area countries: Austria (AT), Belgium (BE), Finland (FI), France (FR), Germany (DE), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT) and Spain (ES). These countries have been surveyed monthly since April 2022. For a robustness check, we also utilize the original six pilot countries (BE, DE, ES, FR, IT, NL) for a longer period starting in April 2020. Thus, the baseline sample spans April 2022 – December 2024 for eleven countries, with an extended sample for six countries back to April 2020.

The CES provides individual-level data on consumers' inflation expectations (open-ended quantitative forecasts for future inflation) along with rich information on demographics, finances, and attitudes. For further details, see ECB (2021) and Georgarakos and Kenny (2022).[2] Our analysis focuses on the mean expected inflation (point fore-

[2]The full questionnaire and further information on the CES are available here: https://www.ecb.europa.eu/stats/ecb_surveys/consumer_exp_survey/html/index.en.html.

casts) one and three years ahead for each respondent as the key outcome, rather than on distributional measures, since the format of the density questions changed over time—from 8 bins to 10 bins starting in July 2022. The recent 3–5 year window is sufficient to capture the major shift in the inflation environment, including the surge in 2021–2022 and subsequent moderation. We further analyze perceptions of current inflation, one-year-ahead expectations of the unemployment rate, economic growth rate expectations for the next year and expectations about future mortgage borrowing costs. These macroeconomic expectations can be explained by a large set of individual as well as country-specific controls, which we define in the next section.

2.2. Regression model specifications

We estimate a common sequence of linear regression models for several expectation variables. Specifically, we consider six outcome variables: one-year-ahead inflation expectations, three-year-ahead inflation expectations, perceived inflation over the past 12 months, as well as short-term unemployment expectations, GDP growth expectations, and mortgage interest rate expectations. Let Y_{ict}^k denote the expected or perceived outcome k for individual i in country c at time t. For each outcome k we estimate an identical set of ten OLS specifications with robust standard errors[3] on the pooled sample of individuals from eleven euro area countries. To address outliers, we truncate point estimates by setting values below the 2nd percentile or above the 98th percentile to missing prior to estimation.

2.2.1 Model 1

The starting point is a baseline model with only country fixed effects:

$$Y_{ict}^k = \alpha^k + \gamma_c^k + \varepsilon_{ict}^k, \tag{1}$$

[3]We report heteroskedasticity-robust rather than country-clustered standard errors since the country dummies are perfectly collinear with the cluster identifier. Therefore, their standard errors would collapse to zero by construction, as would those of all country-level regressors.

where γ_c^k are country dummies with Germany used as the reference country. This specification measures the raw cross-country differences in each expectation outcome without conditioning on any individual or macroeconomic characteristics.

2.2.2 Model 2

The existing literature indicates that the cross-sectional dispersion in consumer inflation expectations is systematically linked to consumers' demographic characteristics. For example, the upward bias in inflation expectations is systematically higher for women than for men (Jonung, 1981; Bryan and Venkatu, 2001; de Bruin et al., 2010; Armantier et al., 2016; ECB, 2021) and falls with rising socioeconomic status (education and income)(Souleles, 2004; de Bruin et al., 2010; Conrad et al., 2022; D'Acunto et al., 2023). Similar results are also found for other macroeconomic expectations (Das et al., 2020).

Against this background, the second specification adds a vector of basic demographic controls, X_i^{demo}, including gender and partner dummies, age groups, household income categories, and educational attainment:

$$Y_{ict}^k = \alpha^k + \gamma_c^k + \beta_{\text{demo}}^k X_i^{\text{demo}} + \varepsilon_{ict}^k. \tag{2}$$

This allows us to assess how far simple differences in sociodemographic composition across countries account for the dispersion in expectations.

2.2.3 Model 3

The third specification augments the model further with financial literacy,[4] household structure, housing tenure, employment status and indicators of financial vulnerability and access to credit, collected in the vectors X_i^{hh}, X_i^{finlit}, and X_i^{credit}. The household

[4]Financially literate consumers tend to have systematically lower inflation expectations than other consumers (Souleles, 2004; de Bruin et al., 2010; Burke and Manz, 2014; D'Acunto et al., 2019; Rumler and Valderrama, 2020; Stanisławska and Paloviita, 2024). Dräger and Nghiem (2025) provide evidence that increasing financial literacy improves consumers' trust in the central bank and makes them more confident in their ability to forecast future inflation.

block, X_i^{hh}, includes household size, an indicator for having no children, and dummies for homeownership with and without a mortgage relative to renting. Employment status enters via dummies for full-time, part-time, on leave, and not working, with a residual omitted category. Financial literacy, X_i^{finlit}, is captured by an objective quiz-based score. X_i^{credit} includes a liquidity buffer indicator and two measures of perceived ease of obtaining credit (current and one-year ahead). These variables capture whether households face binding constraints in smoothing shocks and financing expenditures. The regression becomes

$$Y_{ict}^k = \alpha^k + \gamma_c^k + \beta_{\text{demo}}^k X_i^{\text{demo}} + \beta_{\text{hh}}^k X_i^{\text{hh}} + \beta_{\text{finlit}}^k X_i^{\text{finlit}} + \beta_{\text{credit}}^k X_i^{\text{credit}} + \varepsilon_{ict}^k. \tag{3}$$

This step controls for differences in economic vulnerability and financial knowledge.

2.2.4 Model 4

The fourth specification introduces indicators of consumer sentiment and expectations about macroeconomic conditions and personal finances, X_i^{sent}. These variables capture the respondent's expectations about the general economic situation, perceived current financial situation, expected future financial situation, and a measure of consumption propensity (plans for major purchases).[5] The model is

$$\begin{aligned} Y_{ict}^k =& \alpha^k + \gamma_c^k + \beta_{\text{demo}}^k X_i^{\text{demo}} + \beta_{\text{hh}}^k X_i^{\text{hh}} + \beta_{\text{finlit}}^k X_i^{\text{finlit}} + \beta_{\text{credit}}^k X_i^{\text{credit}} \\ &+ \beta_{\text{sent}}^k X_i^{\text{sent}} + \varepsilon_{ict}^k. \end{aligned} \tag{4}$$

Comparing this to the previous specification shows to what extent cross-country differences in expectations are mediated by differences in general and household-specific sentiment.

[5] The ECB's consumer confidence indicator (CES CCI) is based on these four variables: https://www.ecb.europa.eu/press/economic-bulletin/focus/2025/html/ecb.ebbox202505_01~304c94491d.en.html.

2.2.5 Model 5

The fifth specification adds a block of trust variables, X_i^{trust}, namely trust in the ECB and generalized trust in other people:

$$\begin{aligned} Y_{ict}^k =& \alpha^k + \gamma_c^k + \beta_{\text{demo}}^k X_i^{\text{demo}} + \beta_{\text{hh}}^k X_i^{\text{hh}} + \beta_{\text{finlit}}^k X_i^{\text{finlit}} + \beta_{\text{credit}}^k X_i^{\text{credit}} \\ &+ \beta_{\text{sent}}^k X_i^{\text{sent}} + \beta_{\text{trust}}^k X_i^{\text{trust}} + \varepsilon_{ict}^k. \end{aligned} \tag{5}$$

This step assesses the association of institutional and social trust with the observed gaps in expectations since trust and inflation expectations are systematically negatively correlated (see, e.g., Ehrmann et al., 2013; Christelis et al., 2020; van der Cruijsen and Samarina, 2023 and Stanisławska and Paloviita, 2024).[6]

2.2.6 Model 6

Earlier lifetime experiences matter when consumers form macroeconomic expectations (see, e.g., Malmendier and Nagel, 2016; Braggion et al., 2024; Conrad et al., 2022 and Goldfayn-Frank et al., 2026). Therefore, the sixth specification extends the analysis further by adding explicit experience variables, X_i^{exp}, which proxy respondents' macroeconomic experience with inflation and unemployment (inflation- and unemployment-experience indicators):

$$\begin{aligned} Y_{ict}^k =& \alpha^k + \gamma_c^k + \beta_{\text{demo}}^k X_i^{\text{demo}} + \beta_{\text{hh}}^k X_i^{\text{hh}} + \beta_{\text{finlit}}^k X_i^{\text{finlit}} + \beta_{\text{credit}}^k X_i^{\text{credit}} \\ &+ \beta_{\text{sent}}^k X_i^{\text{sent}} + \beta_{\text{trust}}^k X_i^{\text{trust}} + \beta_{\text{exp}}^k X_i^{\text{exp}} + \varepsilon_{ict}^k. \end{aligned} \tag{6}$$

This allows us to compare the associations of contemporaneous perceptions and salient past experiences with expectations.

The experience variables are constructed in a life-cycle manner. We first group respondents into four age bands: 18–34, 35–49, 50–70, and 71+ in line with the CES age groups. For each band we assign a representative age equal to the midpoint of the

[6] See also https://www.ecb.europa.eu/press/economic-bulletin/articles/2024/html/ecb.ebart202403_01~05b13dbf02.en.html.

interval (26, 42, 60, and 80 years, respectively). For an individual observed in calendar year t and belonging to age group g, we proxy their birth year as $t - a_g$, where a_g is the representative age of group g. We then trace their macroeconomic history from age 20 onward and compute, for each macro variable $z \in \{\text{inflation}, \text{unemployment}\}$, the simple average of z over the subsequent 50 years or up to year t if fewer than 50 years of data are available. Thus, inflation experience is the average inflation rate observed between ages 20 and 70 or up to the current year, and unemployment experience is defined analogously.

For inflation, we use monthly national inflation data from the BIS database and aggregate them to annual averages when mapping into the life-cycle window. For unemployment, long monthly series are not available, so we rely on annual unemployment rates from the European Commission and from the Bundesbank for Germany. Our baseline experience measures use equal weights over the life window and can therefore be interpreted as average exposure to inflation and unemployment over the respondent's adult life.

2.2.7 Model 7

The seventh specification incorporates professional forecasts, X_{ct}^{cons}, namely Consensus Economics forecasts for inflation and GDP growth relevant for country c at time t:[7]

$$\begin{aligned} Y_{ict}^{k} =& \alpha^{k} + \gamma_{c}^{k} + \beta_{\text{demo}}^{k} X_{i}^{\text{demo}} + \beta_{\text{hh}}^{k} X_{i}^{\text{hh}} + \beta_{\text{finlit}}^{k} X_{i}^{\text{finlit}} + \beta_{\text{credit}}^{k} X_{i}^{\text{credit}} \\ &+ \beta_{\text{sent}}^{k} X_{i}^{\text{sent}} + \beta_{\text{trust}}^{k} X_{i}^{\text{trust}} + \beta_{\text{exp}}^{k} X_{i}^{\text{exp}} + \beta_{\text{cons}}^{k} X_{ct}^{\text{cons}} + \varepsilon_{ict}^{k}. \end{aligned} \tag{7}$$

These variables proxy the experts' views of future macroeconomic conditions within a country.

[7] Following Gerlach (2007), short-term forecasts are constructed as weighted averages of forecasts for the current and next calendar years.

2.2.8 Model 8

The specification number eight adds a block of contemporaneous monthly country-specific macroeconomic conditions, X_{ct}^{macro}, at the country level: headline HICP y-o-y inflation, industrial production, the unemployment rate, and a short-term interest rate on savings:

$$\begin{aligned} Y_{ict}^{k} =& \alpha^{k} + \gamma_{c}^{k} + \beta_{\text{demo}}^{k} X_{i}^{\text{demo}} + \beta_{\text{hh}}^{k} X_{i}^{\text{hh}} + \beta_{\text{finlit}}^{k} X_{i}^{\text{finlit}} + \beta_{\text{credit}}^{k} X_{i}^{\text{credit}} \\ &+ \beta_{\text{sent}}^{k} X_{i}^{\text{sent}} + \beta_{\text{trust}}^{k} X_{i}^{\text{trust}} + \beta_{\text{exp}}^{k} X_{i}^{\text{exp}} + \beta_{\text{cons}}^{k} X_{ct}^{\text{cons}} \\ &+ \beta_{\text{macro}}^{k} X_{ct}^{\text{macro}} + \varepsilon_{ict}^{k}. \end{aligned} \tag{8}$$

This specification tests whether expectations co-move with current macroeconomic conditions, whether dispersion in macroeconomic variables accounts for the disparities in expectations beyond information conveyed in the information set of professional forecasters, or whether additional factors remain important.

2.2.9 Model 9

The focus of the ninth specification is on attention to inflation, which tends to be state-dependent (Weber et al., 2025). It adds a proxy for attention to inflation, attention_{ct}, based on Google search intensity for inflation-related terms in country c at time t:

$$\begin{aligned} Y_{ict}^{k} =& \alpha^{k} + \gamma_{c}^{k} + \beta_{\text{demo}}^{k} X_{i}^{\text{demo}} + \beta_{\text{hh}}^{k} X_{i}^{\text{hh}} + \beta_{\text{finlit}}^{k} X_{i}^{\text{finlit}} + \beta_{\text{credit}}^{k} X_{i}^{\text{credit}} \\ &+ \beta_{\text{sent}}^{k} X_{i}^{\text{sent}} + \beta_{\text{trust}}^{k} X_{i}^{\text{trust}} + \beta_{\text{exp}}^{k} X_{i}^{\text{exp}} + \beta_{\text{cons}}^{k} X_{ct}^{\text{cons}} \\ &+ \beta_{\text{macro}}^{k} X_{ct}^{\text{macro}} + \theta^{k} \text{attention}_{ct} + \varepsilon_{ict}^{k}. \end{aligned} \tag{9}$$

The variable attention_{ct}, capturing how intensively households in country c are searching for inflation-related news at time t, is constructed as follows. For each country we collect the absolute Google search volumes for the term "inflation" in English and in the main local language (e.g. "inflation" and "inflaatio" for Finland), sum these search volumes, and normalize by the country's average population over 2020–2024. The re-

sulting measure can be interpreted as per-capita attention to inflation in that country and month, with higher values indicating periods when inflation is more salient in public information. Google searches have been used recently as a proxy for inflation attention for instance by Korenok et al. (2023) or Buelens (2025).

2.2.10 Model 10

Finally, the tenth and most saturated specification introduces time fixed effects, λ_t, in the form of year dummies:

$$\begin{aligned} Y_{ict}^k =& \alpha^k + \gamma_c^k + \lambda_t + \beta_{\text{demo}}^k X_i^{\text{demo}} + \beta_{\text{hh}}^k X_i^{\text{hh}} + \beta_{\text{finlit}}^k X_i^{\text{finlit}} + \beta_{\text{credit}}^k X_i^{\text{credit}} \\ &+ \beta_{\text{sent}}^k X_i^{\text{sent}} + \beta_{\text{trust}}^k X_i^{\text{trust}} + \beta_{\text{exp}}^k X_i^{\text{exp}} + \beta_{\text{cons}}^k X_{ct}^{\text{cons}} \\ &+ \beta_{\text{macro}}^k X_{ct}^{\text{macro}} + \theta^k \text{attention}_{ct} + \varepsilon_{ict}^k. \end{aligned} \tag{10}$$

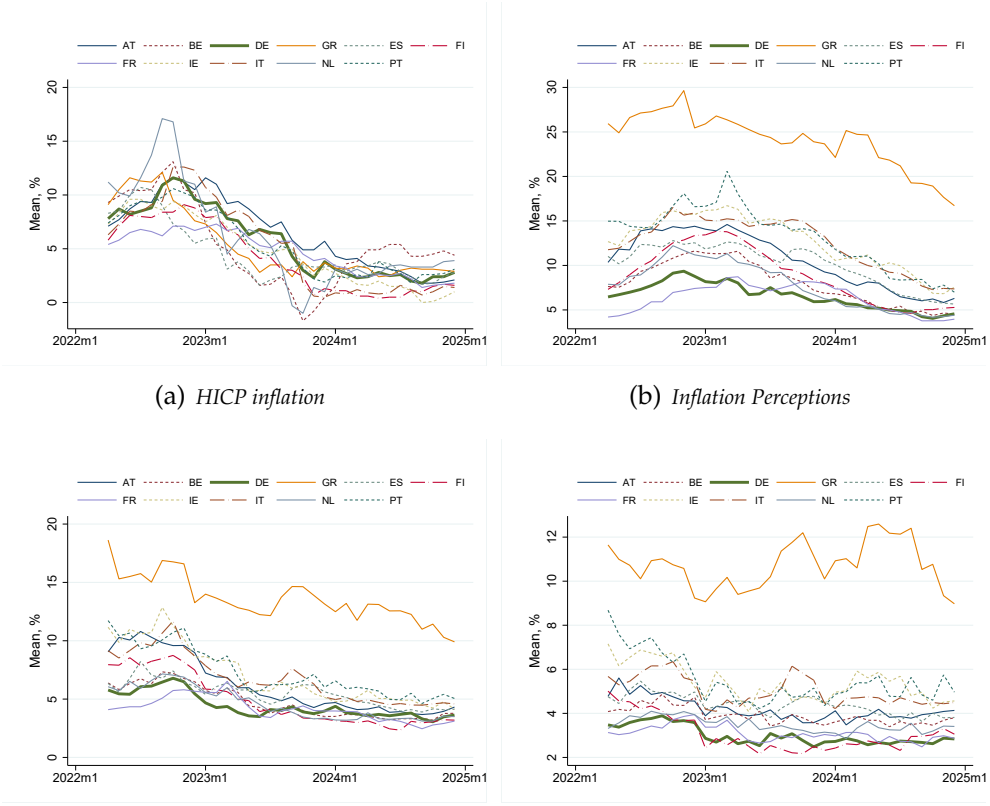
The year effects absorb common shocks and trends over the sample period, such as the inflation surge and subsequent disinflation.

Comparing the country fixed effects across specifications, and in particular between the baseline and the fully saturated model, shows how much of the cross-country heterogeneity in each expectation outcome is accounted for by demographics, household structure, financial literacy, sentiment, trust, personal inflation and past experiences, expert forecasts, macroeconomic conditions, attention, and common time shocks, and how much residual heterogeneity remains.

2.3. Summary statistics

We begin our analysis by presenting summary statistics for our key variables of interest. Figure 1 shows the evolution of actual HICP inflation and the mean perceived and expected inflation rates from the CES for eleven euro area countries, while Figure 2 depicts the dispersion (standard deviations) of these variables from April 2022 to December 2024. In the appendix, Figure A1 and Figure A2 further show the evolution and dispersion of actual GDP growth, unemployment, and mortgage rates, as well as

Figure 1: Actual, Perceived, and Expected Inflation in Euro Area



(a) *HICP inflation*

(b) *Inflation Perceptions*

(c) *Inflation Expectations 1 year ahead*

(d) *Inflation Expectations 3 years ahead*

Notes: This figure shows the evolution of actual HICP inflation as well as the mean perceived and expected inflation rates from the CES for eleven euro area countries—Austria (AT), Belgium (BE), Finland (FI), France (FR), Germany (DE), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES)—covering April 2022 to December 2024. We exclude the top and bottom 2% of perceived and expected inflation observations in each survey wave across countries in the CES.

the corresponding mean expectations from the CES over the same period. Figures A9 to A12 visualize time-series summary statistics for these variables for the six original CES countries, covering the longer period from April 2020 to December 2024.

These figures indicate that euro area member countries experienced broadly similar macroeconomic developments over time—for example, the inflation surge in 2022, the disinflationary period in 2023, and more persistent inflation in 2024. Mortgage rates likewise increased markedly across all euro area countries from 2022 to 2023 during the monetary policy tightening cycle, before declining in 2024 as policy began to ease. Consumers' macroeconomic expectations also exhibit similar dynamics.

However, despite these common trends, consumers' expectations differ substantially across member countries. We observe that dispersion in HICP inflation across the euro

area peaks at the height of the inflation surge in autumn 2022, with a standard deviation of nearly 3 percentage points, and then declines during the subsequent disinflationary (October 2022–February 2024) and sticky inflation (March 2024–December 2024) periods. Over the same period, dispersion in consumers' inflation perceptions across euro area countries also peaks in October 2022, but reaches around 6 percentage points—about twice as large as the dispersion in actual HICP inflation. Although this dispersion falls after the inflation surge, it remains roughly two to three times larger than the dispersion in HICP inflation over the same periods. Dispersion in consumers' one-year-ahead inflation expectations is smaller than dispersion in inflation perceptions, but follows a similar pattern over time. By contrast, dispersion in three-year-ahead inflation expectations remains relatively stable throughout the sample period. For the other macroeconomic variables, we find that—except for GDP growth—the dispersion of consumers' expectations about unemployment and mortgage rates is substantially higher than the dispersion in the corresponding actual variables.

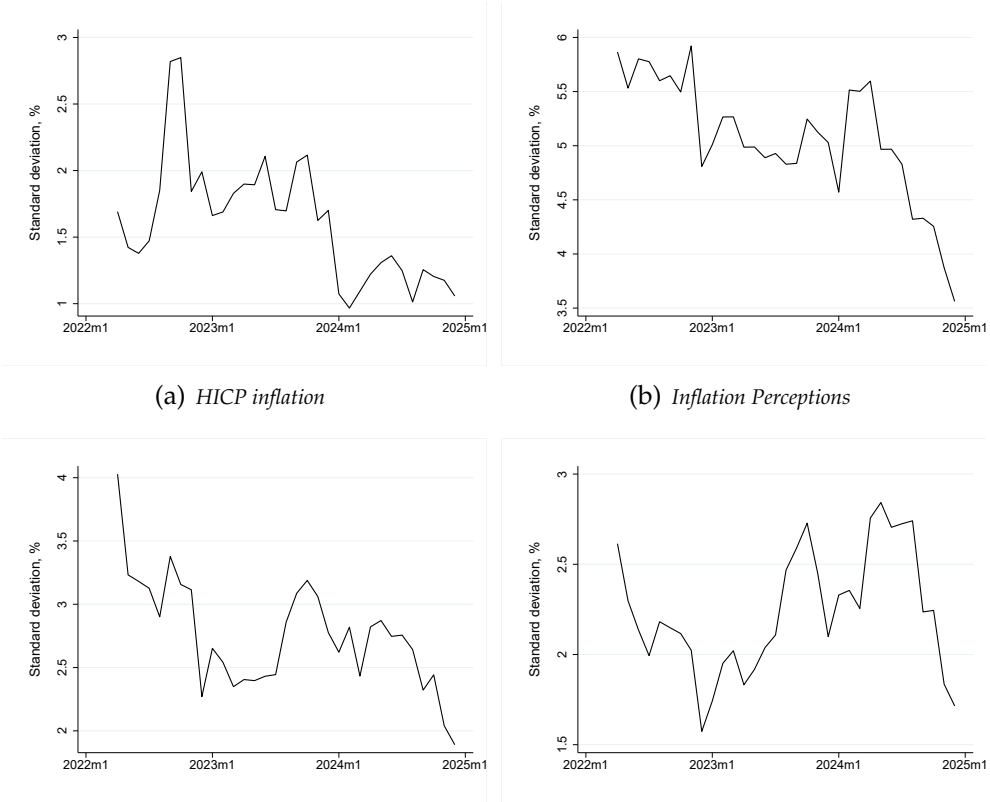
3. Results: decomposing cross-country heterogeneity in macroeconomic expectations

3.1. Inflation expectations

Figure 3 plots the estimated country fixed effects for one-year-ahead inflation expectations from the sequence of regressions described in Section 2 relative to Germany as the benchmark country. Detailed regression results underlying Figure 3 are reported in Appendix B. Country differences vis-à-vis Germany are economically sizeable and highly statistically significant. In the baseline specification with only country dummies (Model 1), several coefficients exceed two percentage points in absolute value, with Greece being a remarkable outlier.

As we sequentially add controls for demographics, household characteristics, financial literacy, sentiment, trust, experience, and professional forecasts, the estimated country

Figure 2: Dispersion of Actual, Perceived, and Expected Inflation in Euro Area



(a) *HICP inflation*

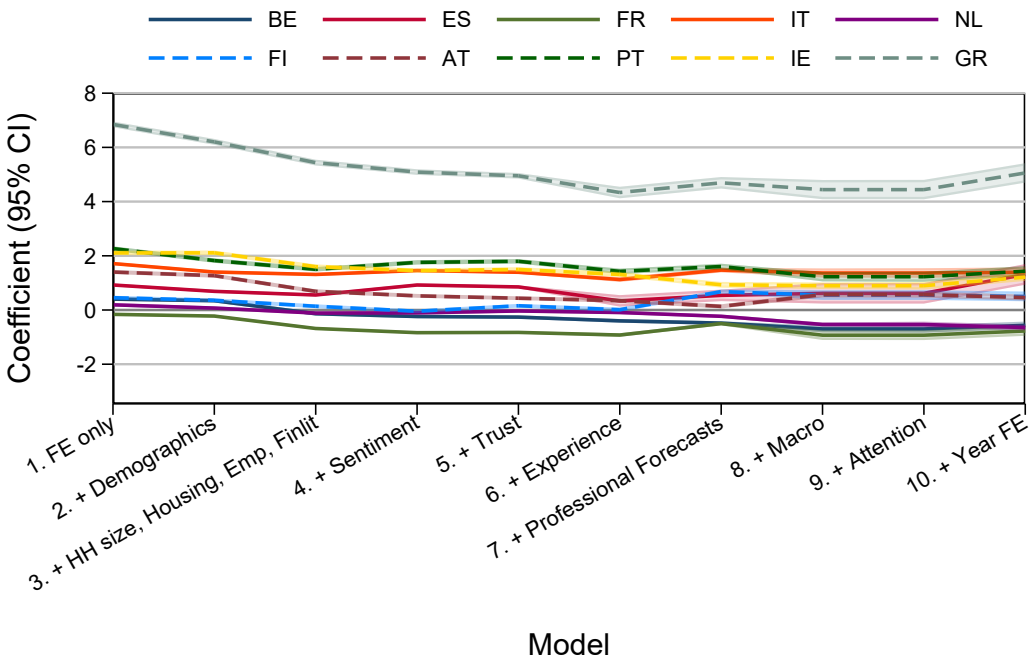
(b) *Inflation Perceptions*

(c) *Inflation Expectations 1 year ahead*

(d) *Inflation Expectations 3 years ahead*

Notes: This figure shows the dispersion (standard deviations) of actual HICP inflation and the mean perceived and expected inflation rates from the CES across eleven euro area countries—Austria (AT), Belgium (BE), Finland (FI), France (FR), Germany (DE), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES)—from April 2022 to December 2024.

Figure 3: Country fixed effects: inflation expectations 12 months ahead



Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

gaps shrink, but do not disappear. As shown in Table A1, country differences can even increase in magnitude again for some countries once we additionally control for macro dynamics, inflation attention, and time trends. Even in the most saturated model, several countries—most notably Greece, but also Portugal, Ireland, Italy and Spain—continue to exhibit substantially higher expected inflation than Germany, while France, the Netherlands and Belgium exhibit slightly lower expected inflation than Germany. Austria and Finland form a third group with short-term inflation expectations close to Germany. All of these fixed effects are highly statistically significant. The fact that sizable residual country effects remain after conditioning on a wide range of individual- and macro-level covariates suggests the presence of persistent country-level heterogeneity not fully captured by observable characteristics. One possible interpretation is that these residual differences are related to slow-moving country-specific factors, such as institutional environments, historical experiences, or broader belief structures.

The sequential specification also allows us to quantify, for each country, how much of its fixed effect relative to Germany is absorbed when adding controls. Table 1 therefore compares country fixed effects in Model 1 and Model 10 and reports the share of the initial gap that is accounted for when moving from the baseline to the fully saturated model.[8] The results highlight substantial cross-country differences in the extent to which observable factors account for expectation differences. For Austria, the covariates account for about two thirds of the initial country gap, while for Ireland and Portugal they account for roughly one third. In contrast, for Greece and Italy the reduction in the initial gap is much smaller, indicating that most of the initial gap remains even after conditioning on the full set of controls. For all countries with initial gaps smaller than one percentage point in absolute terms in Model 1 (Belgium, Spain, Finland, France and the Netherlands) we do not observe any improvement. In particular, for countries with a small gap (e.g., Finland) or where the fully controlled fixed effect becomes larger in absolute value or changes sign (e.g. Spain, Belgium, the Netherlands, and France), the reduction measure is zero by construction, indicating that the

[8]The explained share is computed as $100 \times (1 - |\text{Model } 10|/|\text{Model } 1|)$ and is truncated at zero if negative. Germany is the omitted benchmark country.

Table 1: Change in the magnitude of country fixed effects by adding regressors

Country	Model 1	Model 10	Explained share (%)
Austria	1.40	0.46	67.29
Ireland	2.11	1.21	42.45
Portugal	2.27	1.43	36.83
Greece	6.85	5.06	26.14
Italy	1.71	1.40	18.61
Finland	0.45	0.50	0.00
Belgium	0.40	-0.57	0.00
Spain	0.92	1.31	0.00
Netherlands	0.19	-0.65	0.00
France	-0.16	-0.77	0.00

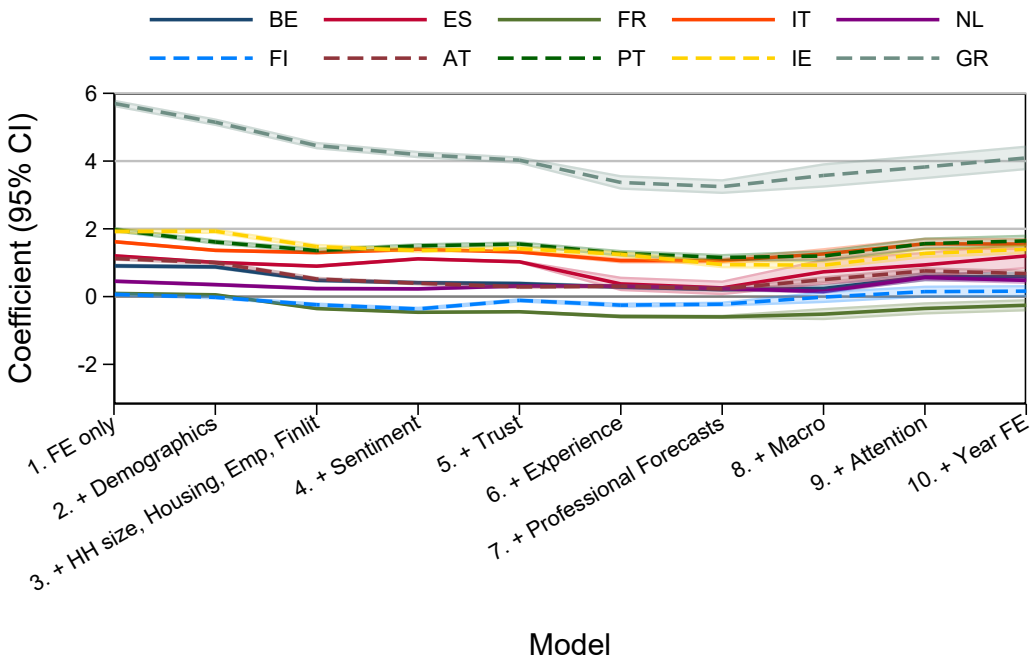
Notes: Change in country fixed effects from the baseline Model 1 to the richest Model 10 for the sample of eleven countries between April 2022 and December 2024. Germany is the omitted benchmark country. Full set of results can be found in Table A1 in the appendix. Countries are ranked by the share reduction in initial fixed effects from Model 1 (higher values indicate larger reductions after conditioning on covariates). The reduction measure is computed as $100 \times (1 - |\text{Model 10}|/|\text{Model 1}|)$. If this value is negative, it is reported as 0.

covariates do not systematically reduce the initial deviation from Germany.

To complement the country-by-country comparison, we also summarize cross-country heterogeneity using the max–min spread of the estimated country fixed effects reported in Table 1, computed both including and excluding Greece. The spread declines only slightly from Model 1 to Model 10, from 2.4 to 2.2 percentage points when excluding Greece and from 7.0 to 5.8 when including Greece, suggesting that overall dispersion changes little across specifications.

Overall, Figure 3 suggests that inflation expectations in our sample of 11 euro area countries can be broadly grouped into three clusters, with Greece as a clear outlier. A low-expectations group consists of France, the Netherlands, Belgium, and Germany once the full set of controls is included. Austria and Finland form an intermediate group, with expectations slightly above this first group. A high-expectations group consists of Portugal, Ireland, Italy and Spain, where consumers expect around one to two percentage points higher inflation even after controlling for observable individual

Figure 4: Country fixed effects: inflation expectations 3 years ahead



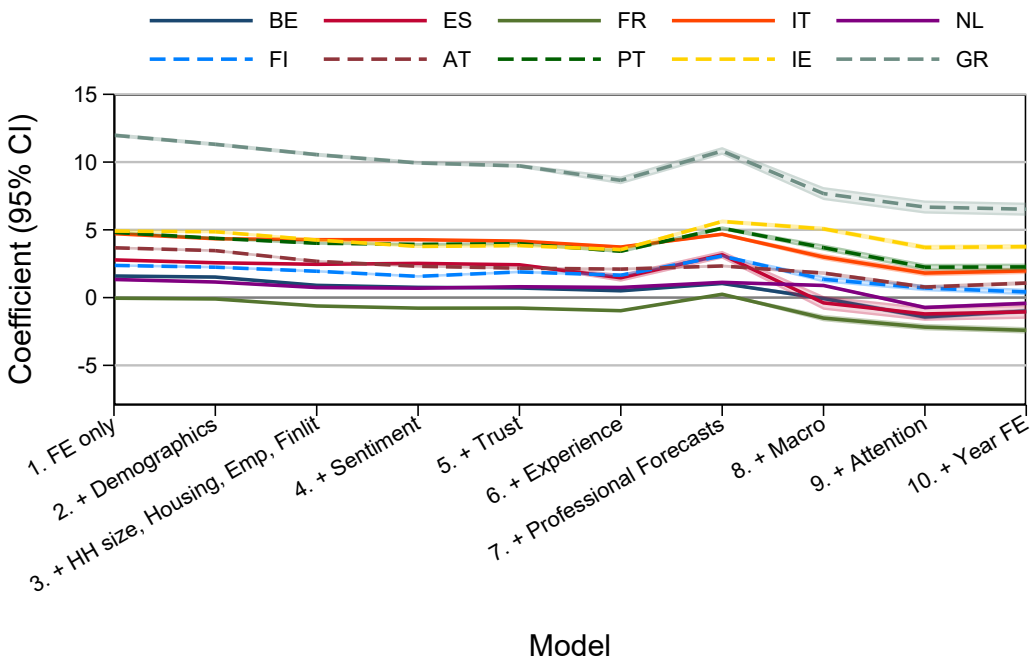
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

and macro factors. Spain is an instructive case: its country fixed effect is closer to Germany when controlling only for socio-demographics and later for experiences, but rises toward the high-expectations group once macro controls, inflation attention, and time trends are included.

Figure 4 shows analogous results for three-year-ahead inflation expectations. A comparison across horizons reveals that cross-country differences are more pronounced at the one-year horizon than at the three-year horizon. Visually, the fully controlled country fixed effects (Model 10) are more tightly clustered for three-year-ahead inflation expectations (Figure 4) than for one-year-ahead expectations (Figure 3). This is also borne out by a simple range comparison. In Model 10, the max–min spread across countries falls from about 5.8 percentage points at the one-year horizon to about 4.3 percentage points at the three-year horizon. Because Greece is an outlier at both horizons, it is

informative to compute the range excluding Greece. Even then, dispersion is lower for three-year-ahead expectations (about 1.9 percentage points) than for one-year-ahead expectations (about 2.2 percentage points). Taken together, these patterns suggest that while medium-term inflation expectations are more similar across euro area countries than short-term inflation expectations, differences in the anchoring of medium-term inflation expectations should be carefully monitored by monetary policymakers.

Figure 5: Country fixed effects: perceived inflation over the past 12 months



Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

Figure 5 reports country fixed effects for perceived inflation over the past year. The cross-country pattern in perceptions broadly mirrors that in expectations, suggesting a close link between what consumers believe inflation has been and what they expect it to be. At the same time, perceptions still differ markedly across countries, and the remaining max–min spread is larger for inflation perceptions than for any inflation-expectations measure. This suggests that slow-moving, difficult-to-measure

country-specific factors may be associated with persistent cross-country differences in perceived inflation.

In the following, we discuss the direction and magnitude of individual regressors on one-year ahead inflation expectations shown in Figure 3. The full set of regression results is provided in Table A1 in the appendix.

Demographics, income, education, and financial literacy. In terms of individual determinants, the demographic patterns are intuitive and robust and in line with the literature discussed in section 2.2. Men report significantly lower inflation expectations than women: in the full model, the male dummy is around -0.7 percentage points, implying that, across all eleven countries in the sample, men expect roughly three-quarters of a percentage point less inflation than otherwise similar women. Age also matters as middle-aged and older respondents forecast higher inflation than the young.

Income and education are negatively related to expected inflation. Compared to the lowest income group, mid-income consumers expect around 0.5–0.6 percentage points less inflation, and the highest income group around 0.6–0.7 points less. Higher education is also associated with lower inflation expectations in simpler specifications. Once we control for financial literacy and other covariates, the education coefficients become small and in some cases slightly positive, suggesting that much of the raw education gradient is captured by differences in financial knowledge and information.

Objective financial literacy is also an important correlate. Financial literacy enters as dummies for one, two, and three correct quiz answers, with zero correct as the omitted reference category (about 6% of the sample). In the full model, respondents with one or two correct answers (about 47% of the sample) report inflation expectations about 0.2 percentage points higher than those with three correct answers (about 47% of the sample), in line with prior evidence that more financially literate consumers report lower inflation expectations.

Household structure and employment. Household characteristics also matter. Larger households expect higher inflation: each additional household member is associated with roughly 0.1 percentage points higher expected inflation across all countries. Respondents without children have slightly lower expectations than those with children, presumably reflecting different expenditure profiles or planning horizons.

Housing tenure is strongly related to inflation beliefs. Compared with renters, homeowners with a mortgage expect about 0.4 percentage points less inflation, and outright owners around 0.2–0.25 percentage points less. Ownership may be associated with lower perceived exposure to housing-cost inflation or be correlated with greater financial stability and confidence in macroeconomic policy.

Employment status exhibits a similar pattern. Full-time and part-time workers have significantly lower inflation expectations than the reference group, which includes non-employed states such as the unemployed and retirees. In the full model, full-time workers expect around 0.18–0.20 percentage points less inflation than the base group, with part-time workers showing a similar but slightly smaller gap. These findings suggest that labor-market attachment and economic security are associated with more moderate inflation expectations.

Financial vulnerability and credit constraints. Notably, part of the reduction in the magnitude of some country fixed effects, in particular Greece and Austria, is driven by the inclusion of the credit-related variables. The estimates show predominantly negative coefficients on the liquidity and credit-access measures, suggesting that consumers who report having sufficient resources for an unexpected payment or facing no or easier credit constraints tend to have lower inflation expectations. This pattern is consistent with credit conditions being associated with some cross-country dispersion in expectations, over and above standard demographics and financial literacy.

Trust and sentiment. Institutional trust is closely related to lower inflation expectations. Trust in the ECB enters as an ordered categorical variable. Relative to respon-

dents with no trust at all, those with intermediate trust levels already expect about 1 percentage point less inflation, and those in the highest trust categories expect around 1.5–1.8 percentage points less. These differences are large in macroeconomic terms and remain highly significant even after controlling for income, education, financial literacy, perceptions, experience, macro conditions and time. Generalized trust in other people also matters: moving from low to high interpersonal trust is related with a reduction in expected inflation by roughly half a percentage point. Overall, both institutional and social trust are strongly negatively related to inflation expectations.

Consumer sentiment is another key channel. Respondents who assess their current financial situation as poor or who expect their finances or the general economy to deteriorate report substantially higher inflation expectations. Relative to those with neutral assessments, highly pessimistic respondents expect several percentage points higher inflation. These variables are consistent with broader pessimism about the economic outlook and are associated with heightened concern about future price increases.

Lifetime experience A central result concerns the role of personal experiences. A higher inflation experience over consumers' lifetime is associated with roughly 0.2 percentage points higher expected inflation across countries. As we add actual inflation in Model 8 and time fixed effects in Model 10, this coefficient declines a bit to around 0.15, but nevertheless remains highly significant. Hence, individuals with stronger past inflation experiences tend to report higher expectations. The impact of unemployment experience is captured by macro conditions and does not show up significantly in the models for inflation expectations.

Information, expert forecasts and macro conditions. We next consider informational variables. Consensus Economics forecasts for inflation have the expected sign: higher expert inflation forecasts are associated with higher household inflation expectations. In the richer specifications, a one-percentage-point increase in the Consensus Economics inflation forecast raises household expectations by roughly 0.2–0.3 percentage points. In contrast, higher consensus GDP growth forecasts are associated with slightly

lower inflation expectations, suggesting that favorable growth news may temper inflation fears.

The Google search index for inflation, our proxy for attention, enters negatively in the most saturated models: conditional on actual inflation, consensus forecasts and time effects, months with more inflation-related search activity are associated with somewhat lower expected inflation. This likely reflects the fact that the broad spikes in attention during the inflation surge are already absorbed by the macro variables and year dummies; within those macro conditions, additional search intensity may proxy for information acquisition associated with expectations being closer to realized inflation. It could also reflect the fact that inflation attention in Germany, our reference country, was by far the highest during the inflation surge in our country sample.

Current macroeconomic conditions have intuitive effects. Higher actual HICP inflation is associated with higher expected future inflation across countries: in the full model, the coefficient is around 0.09, so a one-percentage-point increase in current inflation is associated with about 0.1 percentage points higher expected inflation. The unemployment rate enters with a negative coefficient, suggesting that higher current unemployment translates to lower expected inflation, consistent with a Phillips-curve-type intuition. Industrial production growth has a small positive coefficient, and higher interest rates on savings are associated with lower expectations in most specifications, consistent with tighter monetary policy being linked to more anchored inflation expectations.

Finally, the year fixed effects capture the common evolution of expectations over time. Relative to the post-inflation reference year 2024, the years 2022 and 2023 are associated with significantly higher inflation expectations. The implied difference between 2022 and 2024 exceeds one percentage point, reflecting the sharp rise and subsequent decline in inflation and inflation expectations over this period. Including year dummies ensures that this common time pattern is not spuriously attributed to cross-sectional regressors.

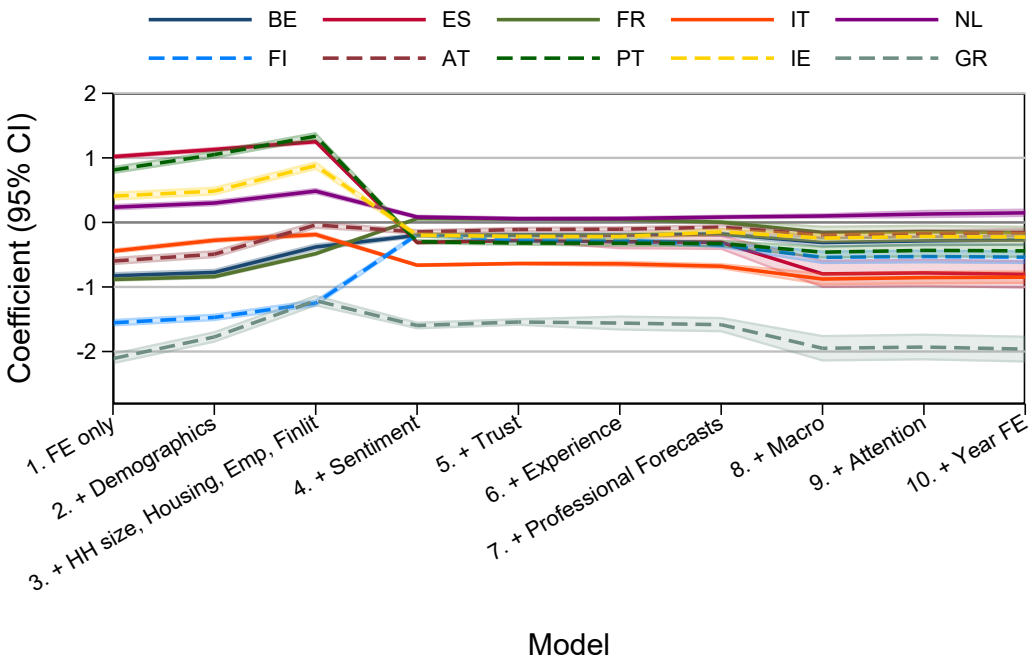
Summary. In sum, our stepwise regressions show that part of cross-country heterogeneity in inflation expectations can be accounted for by individual demographics, household characteristics, financial literacy, sentiment, trust, perceptions, and experience, as well as country-wide professional forecasts, macro conditions and inflation attention. The signs and magnitudes of the coefficients are economically meaningful and consistent with a view in which more vulnerable, pessimistic and less informed households expect significantly higher inflation, while trust in the central bank helps anchoring expectations. In addition, inflation expectations move with macroeconomic conditions and forecasts in meaningful ways. However, at the same time, sizable residual country fixed effects remain, indicating that substantial country-level heterogeneity remains even after conditioning on a rich set of observable covariates. It is noteworthy that these remaining country-specific factors for inflation expectations surpass most of the average correlates in terms of size, at least for some country groups.

3.2. Other macroeconomic expectations

We now turn to short-term expectations about GDP growth, unemployment and mortgage interest rates. Figures 6–8 report the country fixed effects from the same stepwise regressions as for inflation. Two broad messages emerge.

First, cross-country heterogeneity in macroeconomic expectations is not limited to inflation. The dispersion of country fixed effects is also sizable for expectations about growth, unemployment and mortgage rates. Households in some countries are systematically more optimistic about growth and employment prospects, while others are more pessimistic and expect higher unemployment and higher borrowing costs, relative to Germany. Comparing Figures 6 and 7 with Figure 3 shows that countries with relatively high inflation expectations often also display less favorable views about real activity (lower growth, higher unemployment). This suggests that households' narratives about the macroeconomy–whether they foresee a positive or adverse overall scenario–tend to be coherent across prices, growth and labor market conditions (Can-

Figure 6: Country Fixed Effects: Growth Expectations 12 Months Ahead

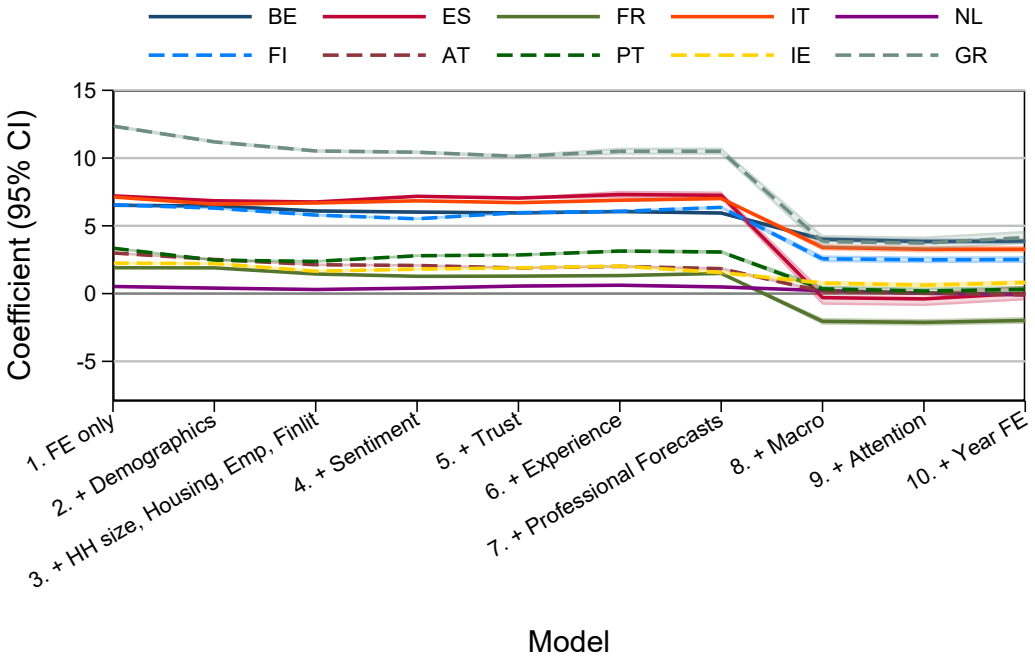


Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

dia et al., 2020).

Second, we observe marked differences across expectations measures in the factors associated with cross-country heterogeneity: Similarly to inflation expectations, but much more pronounced, country differences in growth expectations shrink sharply once individual economic sentiment is controlled for. By contrast, country differences in expected unemployment and mortgage rates are largely insensitive to individual-level variation. Moreover, controlling for macro-level variation reduces fixed effects relative to Germany for unemployment and mortgage rate expectations, while raising them slightly in the case of economic growth expectations.

Figure 7: Country Fixed Effects: Unemployment Rate Expectations 12 Months Ahead



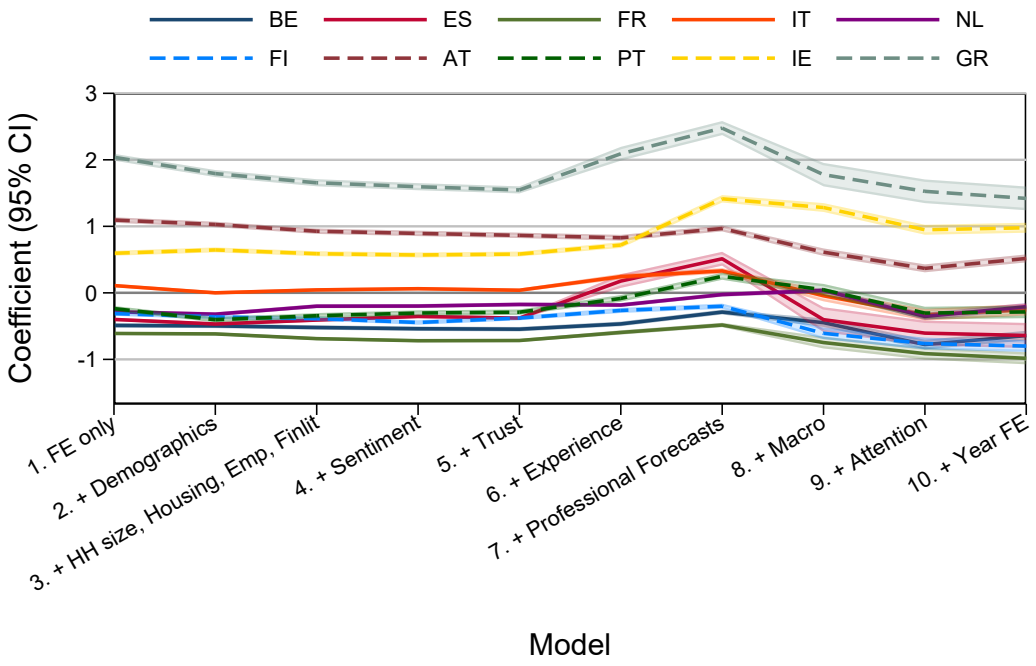
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

4. Including personal inflation in a quarterly specification

The CES includes, at the beginning of each quarter, a question on households' spending across categories over the past month. Marenčák and Nghiem (2025) use these responses to construct expenditure shares, which can be mapped to categories in the official inflation basket and used to compute a quarterly, respondent-level measure of personal inflation. Since contemporaneous, personally realized inflation can directly affect consumers' inflation expectations, it may also contribute to cross-country heterogeneity if personal inflation rates differ systematically across countries.[9]

[9] A growing literature focuses on household-level inflation experiences; see, e.g., Weber et al. (2023), Kaplan and Schulhofer-Wohl (2017) and Kukk et al. (2025) and https://www.ecb.europa.eu/press/economic-bulletin/articles/2025/html/ecb.ebart202507_01~8ded506fa3.

Figure 8: Country Fixed Effects: Mortgage Rate Expectations 12 Months Ahead



Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

To assess this channel, we conduct a robustness exercise in which we re-estimate our framework on a quarterly subsample and explicitly control for personal inflation as calculated in Marenčák and Nghiem (2025). Restricting the sample to the beginning-of-quarter months, we re-run the same sequential blocks-of-controls design as in the baseline. We introduce the personal inflation rate as a separate Model 6 and estimate eleven models in total. Moving from monthly to this quarterly subsample reduces the number of usable observations substantially, from roughly 600,000 in the monthly sample to about 200,000 observations. This mechanically lowers statistical precision and leads to wider confidence intervals.

Overall, the quarterly estimates confirm the key qualitative message of the main analysis: sizable and statistically significant country fixed effects persist even after control-

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ling for a rich set of observables. The results are presented in Section C in the appendix. Including personal inflation affects some country effects, consistent with the idea that cross-country differences partly reflect differences in inflation experiences, but it does not fully eliminate them. Despite the loss of precision induced by the smaller quarterly subsample, the qualitative ordering and persistence of country gaps remain similar to the baseline patterns.

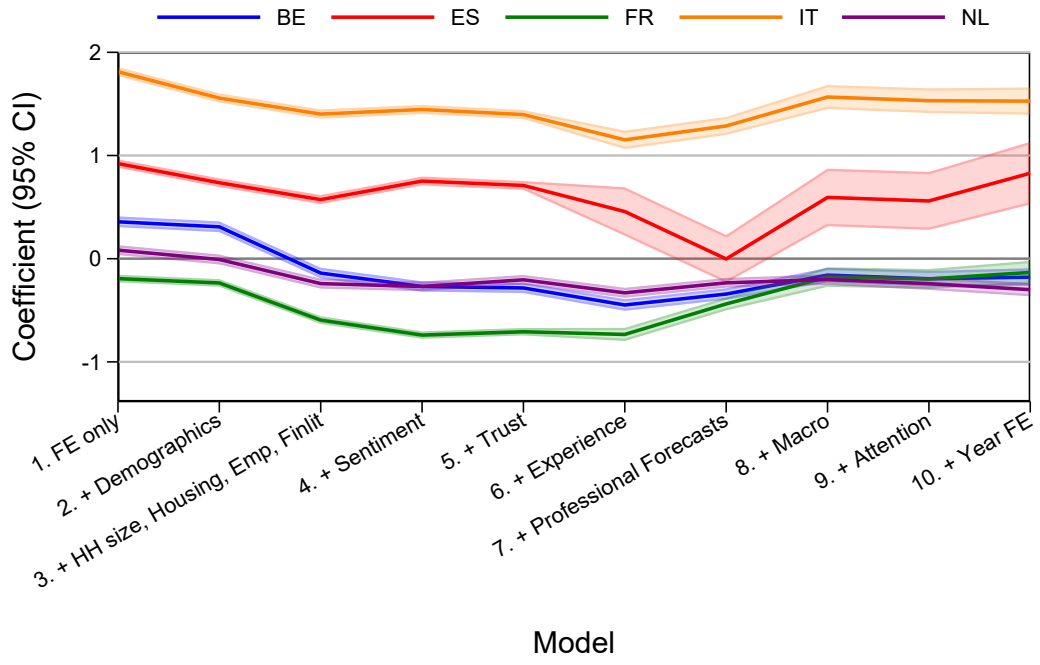
5. Cross-country heterogeneity over a longer horizon: evidence from the CES original countries

A complementary way to probe robustness is to ask whether the cross-country dispersion documented in the baseline is specific to the post-2022 high-inflation environment. For this purpose, we exploit the longer CES history available for the original CES countries (BE, DE, ES, FR, IT, NL), which can be tracked back to April 2020. This longer window spans distinct inflation environments and therefore allows us to examine how country fixed effects evolve over the inflation cycle and, crucially, whether cross-country heterogeneity has reverted to a "new normal" after the inflation surge.

Figure 9 replicates the baseline analysis for 12-month-ahead inflation expectations using the original six pilot countries, monthly data and ten model specifications presented in Section 2.2. The cross-country pattern is similar to the baseline: Belgium, France, and the Netherlands exhibit expectations closer to Germany, while Italy and Spain tend to feature higher expected inflation. The relative dispersion in country effects is as pronounced as in the shorter sample. Full results for the original-country sample over the full April 2020–December 2024 window are reported in Section E in the appendix.

To assess whether heterogeneity changed as inflation moved from the surge phase toward a more stable regime, we split the April 2020–December 2024 sample into four

Figure 9: Country Fixed Effects: Inflation Expectations 12 Months Ahead – Original-country sample

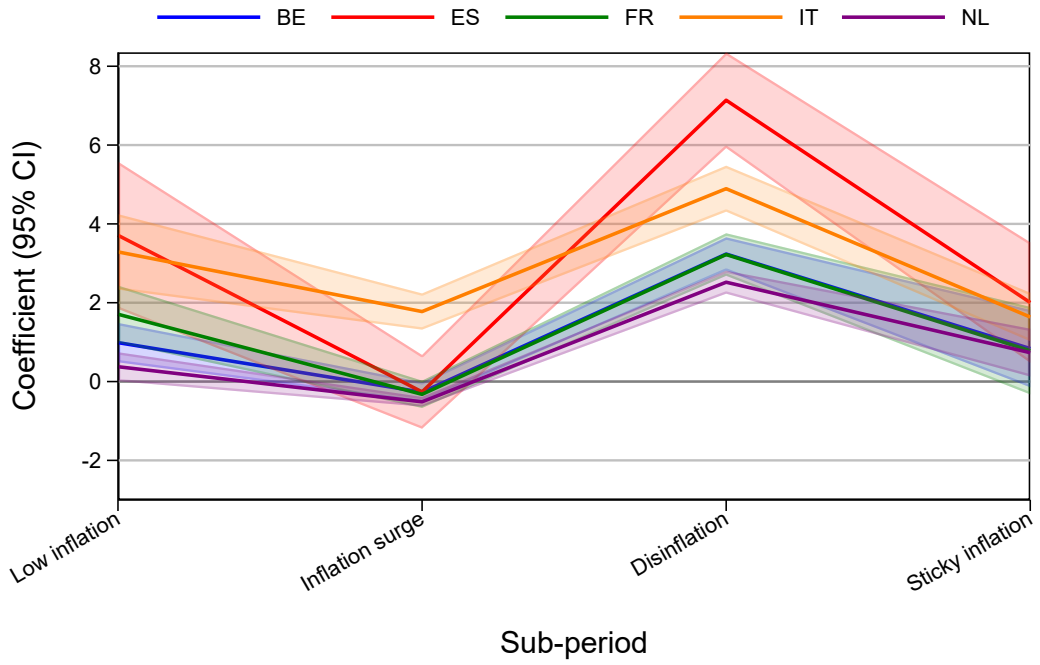


Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Belgium (BE), France (FR), Italy (IT), the Netherlands (NL), and Spain (ES). Quarterly sample period: April 2020 – December 2024.

macro-inflation regimes: (1) low inflation (April 2020–May 2021), (2) inflation surge (June 2021–September 2022), (3) disinflation (October 2022–February 2024), and (4) sticky inflation (March 2024–December 2024). For each sub-period, we estimate the richest Model 10 for 12-month-ahead inflation expectations and plot the implied country fixed effects, again with Germany as the omitted benchmark, in Figure 10.

Figure 10 shows that cross-country differences in 12-month-ahead inflation expectations are already present in the low-inflation period, with the largest positive gaps relative to Germany in Spain and Italy. Strikingly, these gaps compress markedly during the inflation-surge phase, with most coefficients close to zero, except for Italy. As shown in Figure A9, inflation expectations rose in all sample countries during this time, reflecting a higher attention of consumers to rising inflation (Weber et al., 2025).

Figure 10: Country Fixed Effects in Different Sub-Periods: Inflation Expectations 12 Months Ahead



Notes: The figure plots estimated country fixed effects from separate pooled OLS regressions (Model 10) for 12-month-ahead inflation expectations, estimated within four sub-periods that capture different macro-inflation regimes: low inflation (April 2020–May 2021), inflation surge (June 2021–September 2022), disinflation (October 2022–February 2024), and sticky inflation (March 2024–December 2024). Germany is the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 10 includes the full set of individual-level controls described in Section 2.2 (demographics; household characteristics; economic sentiment; trust; inflation experience; professional forecasts; macro controls; attention) and year fixed effects. Country labels: Belgium (BE), Spain (ES), France (FR), Italy (IT), and the Netherlands (NL). Sample period: April 2020 – December 2024 (original-country CES sample).

Dispersion then widens sharply during the disinflation period, when cross-country differences are most pronounced. Figure A9 suggests that part of this effect may be due to an earlier fall in inflation expectations in Germany compared to the other sample countries. In the subsequent sticky-inflation phase, the fixed effects decline again and several countries move closer to Germany, although the gaps remain significant for Spain and Italy. Comparing the pre-surge low-inflation regime with the post-peak sticky-inflation regime, cross-country dispersion is smaller in the latter, indicating partial normalization. However, the ranking and positive gaps for Spain and Italy persist, pointing to continued heterogeneity in the most recent regime. From a policy perspective, this suggests that short-term inflation expectations have not fully converged across euro area countries, while heterogeneity is lower than in the pre-surge low-

inflation period.

We implement the same sub-period exercise for other expectation variables (unemployment expectations, growth expectations, 3-year-ahead inflation expectations, and inflation perceptions) and report them in Section F in the appendix. Due to data limitations, we do not report mortgage rate expectations in the longer sample, as this series is unavailable for 2020.

Taken together, the longer-horizon evidence supports the central conclusion of the paper: even within a monetary union, substantial cross-country differences in consumer expectations persist after conditioning on a wide set of individual characteristics, beliefs, and macroeconomic controls, and this pattern is robust to different inflation regimes.

6. Robustness with Principal Component Analysis

The central result of our baseline analysis is that sizable country fixed effects persist even in the fully saturated model, indicating the presence of persistent country-level heterogeneity not captured by the observed covariates. A natural objection to this interpretation is that these mechanisms are never measured directly. Next, we therefore aim at bringing these mechanisms into the model explicitly, using country-level proxies for institutional quality, the media and information environment, and public concern about economic issues drawn from established international sources. If these proxies substantially reduce the residual country effects, this would suggest that the remaining heterogeneity is associated with observable institutional, informational, or attitudinal differences. If the country effects remain largely unchanged, this would indicate that the residual heterogeneity is not captured by the available proxies.

Pursuing this strategy, however, immediately runs into a second, methodological difficulty. The candidate proxies are numerous, slow-moving, and highly correlated, both with one another and with the trust, sentiment, and macroeconomic variables already

in the model. Entering them jointly produces severe multicollinearity. We therefore address both issues in a single robustness exercise using principal component analysis (PCA), which compresses the full set of correlated proxies into a small number of orthogonal indices and then examines whether those indices are associated with a reduction in the residual country heterogeneity.

To implement this, we assemble 27 additional country-level proxies: indicators of institutional quality (the World Bank's Worldwide Governance Indicators), media freedom and censorship (Varieties of Democracy and Reporters Sans Frontières), news salience (GDELT), and EU-level trust and public economic concern (Eurobarometer). In turn, we compress the full regressor set into principal components by aggregating all individual- and country-level regressors to the country$\times$month level, standardizing them, and extracting their principal components, retaining the twelve with eigenvalues above one, which together account for about 89.5% of the total variance. The first component is an index of institutional quality dominated by the six governance indicators (each loading above 0.90). The remaining components capture financial sentiment, EU trust, financial literacy, the information environment, and other dimensions. The full variable list, the construction of the components, the scree plot, and the complete loadings are reported in Appendix G. We then use these twelve components as regressors in place of the original variables and estimate a series of regressions on 12-month-ahead inflation expectations. Table 2 reports the results.

Column (1) reproduces the country-FE-only specification (Model 1), and column (2) the Model 9 specification, which includes the full set of individual-level controls, professional forecasts, macroeconomic conditions, and attention but no year fixed effects. For reference, entering all 27 additional country-level variables directly as regressors (not reported in the table) raises the adjusted R^2 only to 0.209 while rendering several country fixed effects implausibly large (e.g., Greece at 15.6 percentage points versus 4.4 in the baseline), showcasing the multicollinearity problem that motivates the PCA approach.

Table 2: Inflation expectations and principal components

	(1) Country FE only	(2) Baseline (Model 9)	(3) PCs only	(4) PCs + country FE	(5) PCs + FE + year FE
Country fixed effects (Germany = reference)					
Austria	1.400***	0.567***		0.366***	0.145
	(0.038)	(0.056)		(0.114)	(0.120)
Belgium	0.403***	−0.698***		−1.361***	−1.259***
	(0.035)	(0.071)		(0.167)	(0.172)
Greece	6.847***	4.442***		5.139***	5.154***
	(0.054)	(0.182)		(0.379)	(0.397)
Spain	0.923***	0.616***		1.853***	2.065***
	(0.027)	(0.194)		(0.332)	(0.352)
Finland	0.454***	0.552***		−4.038***	−3.557***
	(0.036)	(0.091)		(0.200)	(0.221)
France	−0.161***	−0.929***		−2.151***	−1.825***
	(0.024)	(0.092)		(0.202)	(0.220)
Ireland	2.106***	0.896***		−1.496***	−1.046***
	(0.043)	(0.071)		(0.215)	(0.225)
Italy	1.714***	1.366***		3.350***	3.138***
	(0.028)	(0.090)		(0.197)	(0.202)
Netherlands	0.191***	−0.533***		−2.095***	−1.865***
	(0.032)	(0.054)		(0.176)	(0.180)
Portugal	2.267***	1.226***		0.977***	1.022***
	(0.042)	(0.094)		(0.304)	(0.312)
Principal components					
PC1 (institutional quality)			−0.510***	−0.084***	−0.081***
			(0.003)	(0.027)	(0.028)
PC2 (financial sentiment)			−0.255***	−0.508***	−0.493***
			(0.003)	(0.020)	(0.021)
PC3 (EU trust / optimism)			−0.010**	−0.287***	−0.247***
			(0.004)	(0.019)	(0.021)
PC4 (fin. literacy / fiscal)			0.070***	0.653***	0.564***
			(0.005)	(0.027)	(0.030)
PC5 (econ. vulnerability)			−0.110***	0.240***	0.173***
			(0.005)	(0.022)	(0.024)
PC6 (education / information)			−0.087***	0.040	−0.008
			(0.006)	(0.034)	(0.034)
PC7 (housing / media access)			0.411***	−0.064***	−0.040
			(0.005)	(0.025)	(0.025)
PC8 (inflation attention / forecast)			0.142***	−0.375***	−0.354***
			(0.007)	(0.024)	(0.024)
PC9 (labor market concerns)			−0.089***	−0.132***	−0.142***
			(0.009)	(0.027)	(0.029)
PC10 (optimistic finances)			0.439***	0.230***	0.235***
			(0.019)	(0.033)	(0.033)
PC11 (economic activity)			−0.307***	−0.143***	−0.163***
			(0.017)	(0.043)	(0.044)
PC12 (ind. prod. / growth)			0.194***	−0.160***	−0.147***
			(0.011)	(0.021)	(0.024)
Year fixed effects (2024 = reference)					
Year 2022					0.314***
					(0.055)
Year 2023					0.071*
					(0.037)
Individual-level controls	No	Yes	No	No	No
Extended country-level	No	No		(via PCA)	
Country fixed effects	Yes	Yes	No	Yes	Yes
Year fixed effects	No	No	No	No	Yes
N (approx.)	601,000	601,000	601,000	601,000	601,000
Adj. R^2	0.057	0.205	0.088	0.094	0.094
Joint F-test: country FE				432.1***	401.3***
p-value				< 0.001	< 0.001

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Heteroskedasticity-robust standard errors in parentheses.

Notes: The dependent variable is 12-month-ahead inflation expectations (truncated at the 2nd and 98th percentiles). Germany is the omitted reference country. Column (1) replicates the baseline country-FE-only specification (Model 1). Column (2) is the Model 9 specification. Columns (3)–(5) replace all regressors with 12 principal components extracted at the country×month level: (3) PCs only, (4) PCs with country fixed effects, (5) PCs with country and year fixed effects. The principal components, the underlying variable set, and the loadings are described in Appendix G. The joint F-test in columns (4) and (5) tests the null hypothesis that all ten country fixed effects are jointly zero, conditional on the 12 principal components. Sample period: April 2022–December 2024.

Columns (3)–(5) report the PCA-based specifications. In column (3), the 12 principal components enter as the sole regressors (no country or year dummies). This parsimonious specification achieves an adjusted R^2 of 0.088—notably higher than the 0.057 obtained with 10 country dummies alone—demonstrating that the data-driven summary indices capture a meaningful share of cross-country variation without any country-specific parameters.

The central question is whether the principal components, which compress the information from 76 variables including institutional quality, media environment, and public economic concern, can reduce the residual country fixed effects. Columns (4) and (5) add country fixed effects (and, in column 5, year fixed effects) alongside the 12 PCs. The joint F-test for the significance of the ten country dummies yields $F = 432.1$ without year effects and $F = 401.3$ with year effects (both $p < 0.001$). Country fixed effects remain individually and jointly highly significant.

These results confirm the central finding of the paper. Even after compressing the entire observable information set—including institutional quality, governance, press freedom, news coverage, EU-level trust, and public economic concerns—into orthogonal summary indices, substantial and statistically significant country-level heterogeneity in inflation expectations persists. This could be related to deep, persistent country-specific factors—such as national narratives, historical memory, or cultural orientations toward inflation and institutions that are not fully captured even by a comprehensive set of governance, trust, and information-environment measures.

An important caveat is that the PCA-based specifications do not include individual-level controls, because the principal components are constructed at the country$\times$month level: individual-level dummy variables (such as gender or income group) become country-month shares after aggregation, which preserves compositional information but does not allow for within-country individual-level variation. Consequently, the R^2 of the PCA regressions (0.088–0.094) is substantially lower than that of the baseline micro model (0.205), which captures both individual-level and country-level variation.

The PCA exercise is therefore not a substitute for the baseline analysis but a complementary robustness check that specifically addresses multicollinearity and the role of institutional proxies at the country level.

7. The impact of ECB inflation target information on the heterogeneity of inflation expectations

In this section, we examine whether providing information about the ECB's 2% inflation target helps reduce the heterogeneity of consumers' inflation expectations across euro area countries relative to respondents who did not receive this information. To do so, we exploit the survey wave 60 conducted in December 2024 where the CES included an experimental module toward the end of the questionnaire. The control group (half of the sample) did not receive any additional information, whereas the treatment group (the remaining half of the sample) was provided with information about the ECB's symmetric 2% inflation target using the following wording:

> *Screen 1: We provide some information about the ECB's price stability objective. Please read this information carefully. It will be shown only once, and you will not be able to go back to it.*
>
> *Screen 2: The ECB aims for a 2% inflation target over the medium term as the best way to maintain price stability. This target is symmetric: inflation may sometimes be slightly above it or below. The ECB overlooks short-term deviations. Persistent negative and positive deviations are regarded as equally undesirable.*

Afterward, all respondents were asked about their inflation expectations for one, three, and five years ahead. Specifically, they were asked what they expected would happen to inflation or deflation in their country between (1) December 2024 and December 2025, (2) December 2026 and December 2027, and (3) December 2028 and December 2029, respectively. It is important to note that the wording of these posterior inflation

expectation questions differs slightly from that of the baseline expectation measures collected before the treatment. While the posterior questions refer explicitly to inflation or deflation, the baseline questions ask about changes in prices in general. To mitigate the influence of extreme outliers, we exclude the top and bottom 2% of the distribution of posterior inflation expectations.[10]

To estimate the effect of ECB inflation target information on the heterogeneity of inflation expectations, we augment Model 10 (which includes the full set of control variables) by adding a treatment dummy variable, with the control group serving as the reference category, as well as interaction terms between the treatment dummy and country fixed effects, with Germany as the reference country. Since this analysis is based on a single survey wave (December 2024), aggregate macroeconomic variables included in Model 10—such as expert forecasts, macroeconomic conditions, attention measures, and time fixed effects—are omitted because of collinearity. However, the specification still controls for a comprehensive set of individual characteristics, including demographics, housing status, access to credit, employment status, financial literacy, economic sentiment, trust, and inflation experience.

Table A3 presents the results. For the control group, which did not receive additional information, we find substantial cross-country heterogeneity in inflation expectations across all forecast horizons (one-, three-, and five-years ahead). The pattern of heterogeneity is broadly consistent with our previous findings. Greek respondents report inflation expectations approximately 2–2.3 percentage points higher than German respondents, followed by respondents in Italy and Ireland (around 1 percentage point higher), Spain (0.4–0.9 percentage points higher), and the Netherlands (around 0.6 percentage points higher).

For the treatment group that received information about the ECB's 2% inflation target, the degree of heterogeneity generally declines. The reduction is particularly pronounced for Italy, where the difference relative to Germany decreases by approxi-

[10]For a further description of the experiment and a comparison to firms' expectations, see Box 5 in ECB (2025), https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op372.de.pdf?26bfe8b1d35c90ecc2021976222bdca8.

mately 0.3-0.5 percentage points across all horizons. This is followed by Spain, where the gap declines by around 0.3 percentage points for the three- and five-year horizons, and the Netherlands, where the difference falls by around 0.3 percentage points for one-year-ahead expectations. The only exception is Belgium, where the difference relative to Germany increases by approximately 0.3 percentage points for one-year-ahead expectations; however, this effect is statistically significant only at the 10% level.

Overall, the analysis suggests that respondents who received information about the ECB's inflation target exhibited somewhat smaller cross-country differences in inflation expectations. Nevertheless, substantial heterogeneity in inflation expectations remains even after the information treatment.

8. Discussion and Conclusion

This paper uses harmonized CES microdata to examine cross-country differences in consumer expectations about inflation, macroeconomic conditions and mortgage borrowing costs in eleven euro-area countries sharing a common monetary policy. We document large and persistent cross-country gaps in expectations of euro area consumers. Sequentially adding covariate blocks shows that demographics and consumer characteristics leave the dispersion in country fixed effects largely unchanged. Economic sentiment is associated with narrower gaps; trust, personal inflation, and lifetime experiences are associated with keeping these gaps contained; professional forecasts are associated with a further compression of heterogeneity; and macro conditions, attention, and time effects are associated with an increase in residual dispersion. Thus, within a monetary union, cross-country heterogeneity in expectations remains substantial, both in low- and high-inflation periods.

The remaining country effects should not be interpreted as identifying specific causal mechanisms. Rather, the results indicate the presence of persistent country-level heterogeneity that is not fully captured by the observable characteristics included in the data. One possible interpretation is that expectations are associated with country-specific factors not fully captured by our data, including institutional environments,

historical experiences, inflation narratives, or broader belief structures that are difficult to measure directly, consistent with earlier evidence in Shiller (1997).[11] Importantly, this interpretation survives a direct attempt to measure these factors. When we bring institutional, governance, and media proxies explicitly into the model and summarize them with principal components, the residual country effects persist, suggesting that the remaining heterogeneity is not well captured by the observable country-level variables available in our analysis.

Recent evidence shows that consumers' inflation attention, inflation concern, and trust in the central bank differ across countries (Guillochon and ter Ellen, 2025). Our findings complement this literature by showing that substantial cross-country heterogeneity also characterizes households' macroeconomic expectations themselves (see also D'Acunto et al., 2025, Allinger and Rumler, 2025 and Bonam and Goy, 2019). More specifically, we contribute to the literature by focusing on heterogeneity within a monetary union operating under a common monetary policy and by systematically assessing how observable household characteristics, beliefs, macroeconomic conditions, and experiences are associated with these differences.

Our findings have several implications for monetary policy communication in the multi-country and multi-cultural euro area context. First, they suggest that "one-size-fits-all" communication is unlikely to be fully effective in a monetary union, when consumers across member states enter with different priors, trust levels and information sets. In some countries and among some groups, expectations remain stubbornly higher and more pessimistic even after disinflation and intense communication. The experimental evidence is consistent with this. A one-off message about the ECB's inflation target reduces, but does not eliminate, the cross-country gaps, suggesting that this information treatment shifted expectations, but did not eliminate persistent country differences. This is consistent with the potential value of more granular, country-specific and group-specific communication strategies to manage expectations, poten-

[11] See Guiso et al. (2006) for broader evidence on persistent cross-country differences in beliefs and economic attitudes.

tially implemented through national central banks, that explicitly address local culture, concerns and narratives, perceptions and information gaps.

Our findings are in line with ECB recommendations. In its 2021 review of the monetary policy strategy, the ECB emphasized that effective monetary policy communication requires particular effort by the ECB and the national central banks, given country-specific institutional structures, languages, political processes, cultures, historical experiences, and macroeconomic conditions (Assenmacher et al., 2021). The ECB's 2025 assessment of the monetary policy strategy likewise stressed that monetary policy communication should be a "concerted effort by the ECB and national central banks" (Kamps et al., 2025).[12]

Our empirical analysis is also consistent with recent research on monetary policy communication. When assessing the prospects for central banks to use inflation expectations as a policy tool, Coibion et al. (2020) argue that targeted and differentiated communication strategies can address geographic or other economic imbalances in a monetary union. Using a multilingual dataset of over eight million tweets, Wabitsch (2025) finds that delegating monetary policy communication to national central banks makes communication more effective. According to Jung and Mongelli (2025), central banks should address consumers in their native language.

Second, the results highlight credibility and financial literacy as policy-relevant objects (Schnabel, 2025).[13] Trust in the ECB and in public institutions is strongly associated with lower and more moderate inflation expectations, while higher financial literacy is associated with less pronounced responses of inflation expectations to perceived price shocks. Efforts to build and maintain institutional credibility and to improve basic economic and financial understanding—through transparent explanations of inflation developments and targeted educational initiatives—are in line with the ECB's monetary policy strategy, which aims to strengthen the anchoring of expectations.

[12] See also the ECB 2025 strategy overview.

[13] The ECB is committed to supporting collaboration and innovation in financial literacy among central banks (see https://www.ecb.europa.eu/ecb-and-you/financial_literacy_europe/html/index.en.html for more details.)

Finally, heterogeneous expectations matter for the transmission of common monetary policy. If consumers in some countries systematically expect higher inflation and weaker growth than in other countries, an identical policy stance and communication may transmit unevenly across member states. Our analysis underscores that managing inflation expectations in a heterogeneous monetary union requires more than getting the average euro-area forecast right. It requires understanding how expectations differ across consumers and countries, and which observable factors are associated with those differences. Future work could study higher-frequency dynamics, the tails of the expectations distribution, and the impact of specific communication interventions. For now, our evidence suggests that heterogeneity in expectations is a central and pervasive feature of the euro area which should not be ignored in monetary policymaking.

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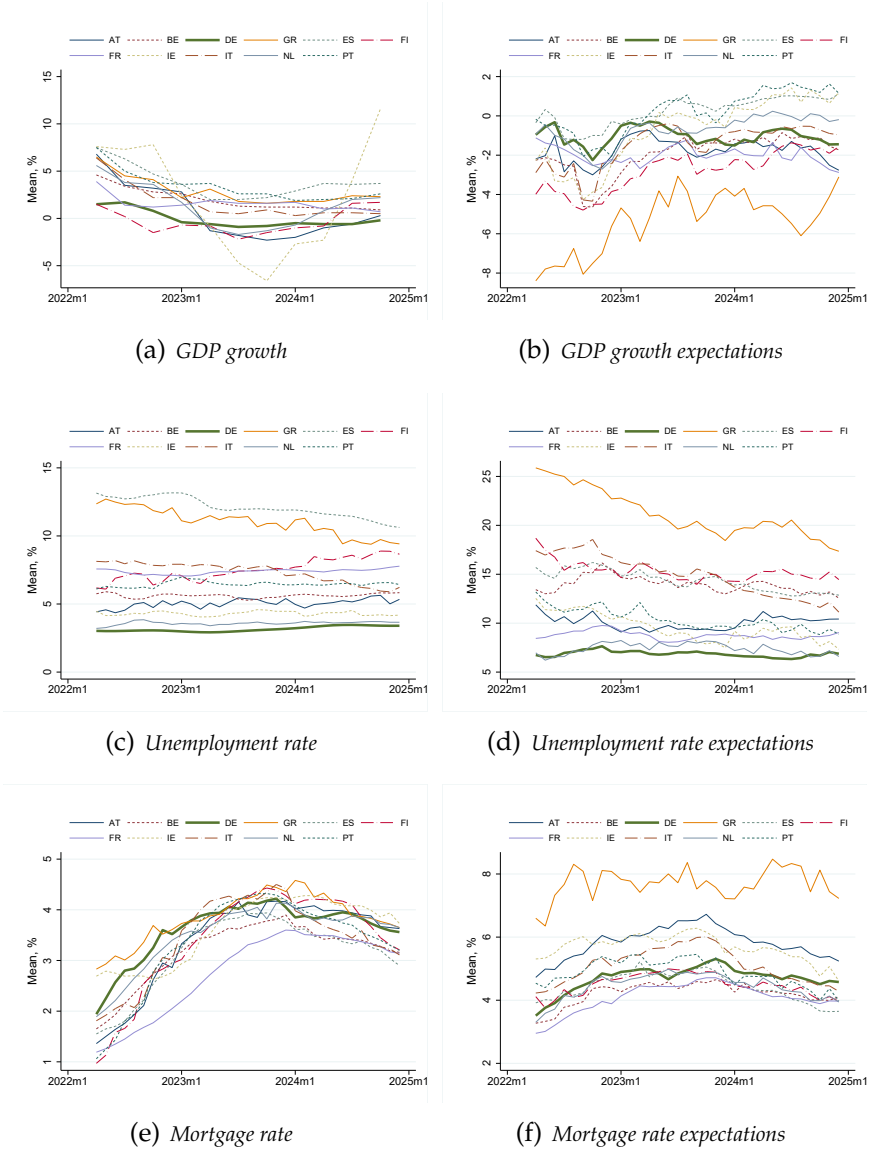
A. Summary Statistics

Figure A1: Actual and Expected Economic Growth, Unemployment Rate, and Mortgage Rate in Euro Area



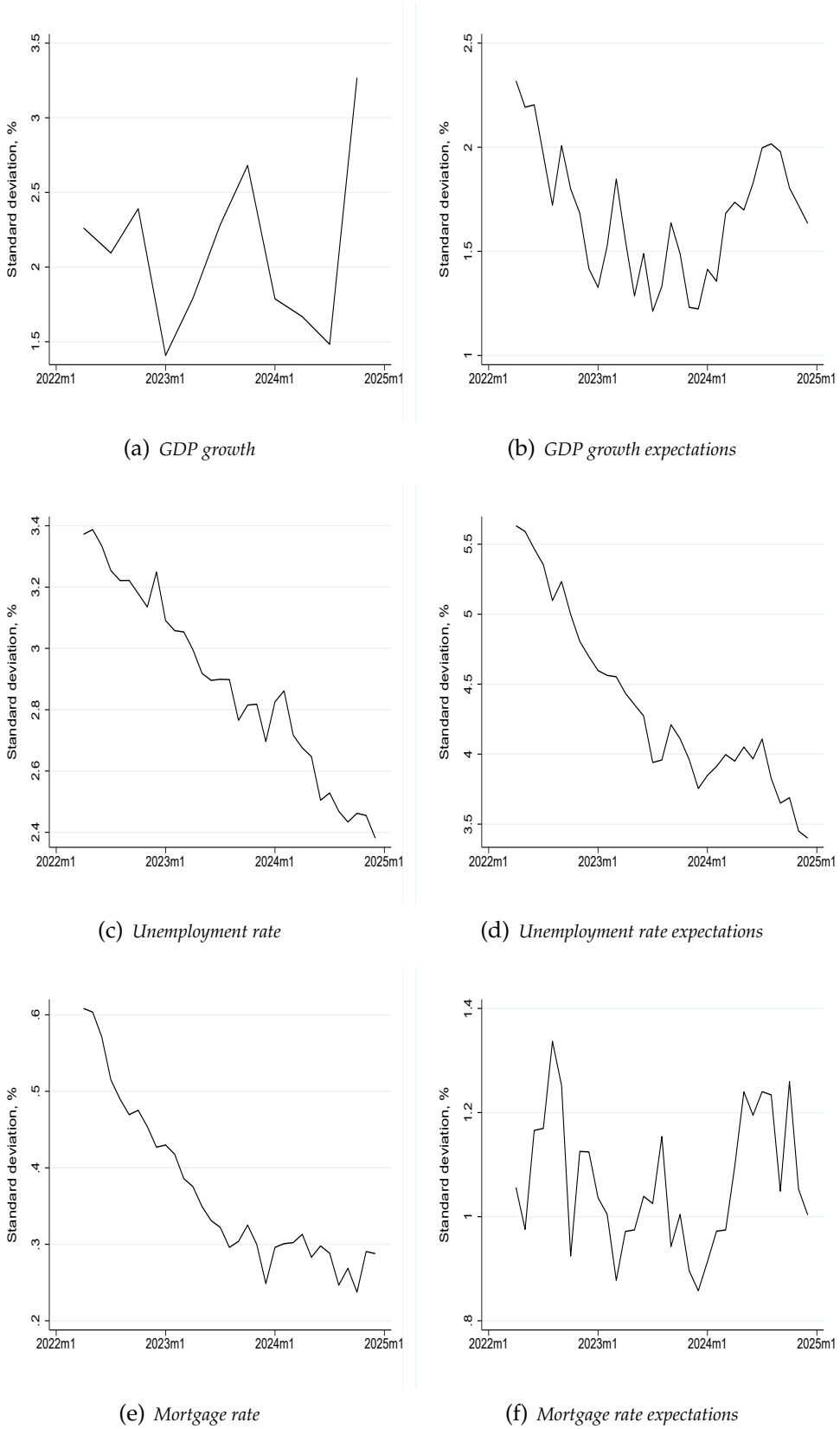
(a) *GDP growth* (b) *GDP growth expectations*

(c) *Unemployment rate* (d) *Unemployment rate expectations*

(e) *Mortgage rate* (f) *Mortgage rate expectations*

Note: This figure shows the evolution of actual GDP growth, unemployment, and mortgage rates, as well as the corresponding mean expectations from the CES for eleven euro area countries—Austria (AT), Belgium (BE), Finland (FI), France (FR), Germany (DE), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES)—from April 2022 to December 2024. We exclude the top and bottom 2% of expected values in each CES survey wave across countries.

Figure A2: Dispersion of Actual and Expected Economic Growth, Unemployment Rate, and Mortgage Rate in Euro Area



(a) *GDP growth*

(b) *GDP growth expectations*

(c) *Unemployment rate*

(d) *Unemployment rate expectations*

(e) *Mortgage rate*

(f) *Mortgage rate expectations*

Note: This figure shows the dispersion (standard deviations) of actual GDP growth, unemployment, and mortgage rates, as well as the corresponding mean expectations from the CES across eleven euro area countries—Austria (AT), Belgium (BE), Finland (FI), France (FR), Germany (DE), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES)—from April 2022 to December 2024.

B. Baseline regression results

In this section, Table A1 provides the full set of regression results underlying the Figure 3.

Table A1: Determinants of one-year-ahead inflation expectations

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Austria	1.400***	1.267***	0.689***	0.522***	0.435***	0.344***	0.133***	0.567***	0.567***	0.458***
	(0.038)	(0.038)	(0.037)	(0.036)	(0.036)	(0.039)	(0.039)	(0.051)	(0.056)	(0.056)
Belgium	0.403***	0.345***	-0.138***	-0.239***	-0.262***	-0.401***	-0.484***	-0.698***	-0.698***	-0.566***
	(0.035)	(0.035)	(0.034)	(0.033)	(0.033)	(0.035)	(0.035)	(0.063)	(0.071)	(0.071)
Greece	6.847***	6.203***	5.437***	5.088***	4.951***	4.334***	4.693***	4.442***	4.442***	5.057***
	(0.054)	(0.055)	(0.055)	(0.053)	(0.053)	(0.108)	(0.109)	(0.181)	(0.182)	(0.183)
Spain	0.923***	0.688***	0.554***	0.923***	0.852***	0.337***	0.540***	0.616***	0.616***	1.313***
	(0.027)	(0.027)	(0.028)	(0.027)	(0.027)	(0.108)	(0.108)	(0.193)	(0.194)	(0.194)
Finland	0.454***	0.359***	0.139***	-0.047	0.157***	0.011	0.677***	0.552***	0.552***	0.502***
	(0.036)	(0.036)	(0.036)	(0.035)	(0.035)	(0.040)	(0.040)	(0.090)	(0.091)	(0.091)
France	-0.161***	-0.223***	-0.681***	-0.836***	-0.827***	-0.923***	-0.502***	-0.929***	-0.929***	-0.773***
	(0.024)	(0.024)	(0.024)	(0.023)	(0.023)	(0.033)	(0.033)	(0.091)	(0.092)	(0.092)
Ireland	2.106***	2.111***	1.599***	1.453***	1.497***	1.311***	0.931***	0.896***	0.896***	1.212***
	(0.043)	(0.043)	(0.042)	(0.041)	(0.041)	(0.047)	(0.054)	(0.063)	(0.071)	(0.072)
Italy	1.714***	1.401***	1.312***	1.456***	1.392***	1.124***	1.472***	1.366***	1.366***	1.395***
	(0.028)	(0.028)	(0.029)	(0.028)	(0.028)	(0.044)	(0.044)	(0.086)	(0.090)	(0.090)
Netherlands	0.191***	0.071**	-0.113***	-0.105***	-0.037	-0.092***	-0.231***	-0.533***	-0.533***	-0.647***
	(0.032)	(0.032)	(0.032)	(0.031)	(0.031)	(0.032)	(0.032)	(0.037)	(0.054)	(0.054)
Portugal	2.267***	1.824***	1.501***	1.757***	1.797***	1.426***	1.604***	1.226***	1.226***	1.432***
	(0.042)	(0.042)	(0.042)	(0.041)	(0.041)	(0.052)	(0.053)	(0.088)	(0.094)	(0.094)
Male		-0.902***	-0.762***	-0.663***	-0.647***	-0.653***	-0.659***	-0.659***	-0.659***	-0.660***
		(0.016)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Age: 35-64 years		1.052***	0.879***	0.652***	0.643***	0.651***	0.732***	0.720***	0.720***	0.723***
		(0.020)	(0.021)	(0.020)	(0.020)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Age: 65+ years		1.015***	1.011***	0.812***	0.867***	0.417***	0.665***	0.646***	0.646***	0.651***
		(0.027)	(0.032)	(0.031)	(0.031)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Partner		0.328***	0.233***	0.214***	0.204***	0.189***	0.154***	0.156***	0.156***	0.156***
		(0.019)	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
N	601000	601000	601000	601000	601000	601000	601000	601000	601000	601000
Adj. R^2	0.057	0.074	0.076	0.175	0.181	0.182	0.200	0.201	0.201	0.202

* p¡.10, ** p¡.05, *** p¡.01

Table A1: Determinants of one-year-ahead inflation expectations (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Income: mid-low		-0.796***	-0.409***	-0.310***	-0.289***	-0.296***	-0.240***	-0.241***	-0.241***	-0.234***
		(0.024)	(0.025)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Income: mid-high		-1.323***	-0.699***	-0.499***	-0.454***	-0.471***	-0.362***	-0.367***	-0.367***	-0.351***
		(0.027)	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
Income: high		-1.780***	-0.981***	-0.666***	-0.604***	-0.625***	-0.415***	-0.422***	-0.422***	-0.398***
		(0.030)	(0.032)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Education: medium		0.148***	0.193***	0.122***	0.118***	0.129***	0.121***	0.123***	0.123***	0.122***
		(0.030)	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
Education: high		-0.088***	0.102***	0.027	0.087***	0.120***	0.113***	0.117***	0.117***	0.116***
		(0.028)	(0.028)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Household size			0.110***	0.119***	0.124***	0.118***	0.104***	0.103***	0.103***	0.102***
			(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
No children			-0.056***	-0.061***	-0.050***	-0.010	-0.014	-0.011	-0.011	-0.011
			(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Owner, mortgage			-0.352***	-0.393***	-0.392***	-0.394***	-0.390***	-0.392***	-0.392***	-0.391***
			(0.022)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Owner, no mortgage			-0.105***	-0.171***	-0.155***	-0.179***	-0.166***	-0.169***	-0.169***	-0.164***
			(0.021)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Employed full-time			-0.106***	-0.192***	-0.150***	-0.146***	-0.064*	-0.065*	-0.065*	-0.061*
			(0.038)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Employed part-time			-0.063	-0.092**	-0.064	-0.069*	0.002	-0.004	-0.004	0.002
			(0.044)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)
On leave			0.089	-0.201***	-0.192***	-0.200***	-0.287***	-0.281***	-0.281***	-0.285***
			(0.065)	(0.063)	(0.063)	(0.063)	(0.062)	(0.062)	(0.062)	(0.062)
Not working			-0.188***	-0.255***	-0.195***	-0.207***	-0.063	-0.070*	-0.070*	-0.064*
			(0.040)	(0.039)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
Fin. literacy (quiz): 1			0.374***	0.318***	0.306***	0.301***	0.287***	0.284***	0.284***	0.284***
			(0.045)	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
Fin. literacy (quiz): 2			0.532***	0.292***	0.246***	0.236***	0.276***	0.269***	0.269***	0.271***
			(0.042)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)
Fin. literacy (quiz): 3			0.270***	-0.017	-0.038	-0.054	0.086**	0.076*	0.076*	0.083**
			(0.041)	(0.041)	(0.041)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)
Liquidity constrained			-0.647***	-0.266***	-0.198***	-0.191***	-0.259***	-0.258***	-0.258***	-0.257***
			(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Credit constraint: today			-0.403***	-0.031**	-0.010	-0.011	-0.045***	-0.048***	-0.048***	-0.054***
			(0.013)	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Credit constraint: 1y			-1.123***	-0.518***	-0.486***	-0.485***	-0.470***	-0.471***	-0.471***	-0.466***
			(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
N	601000	601000	601000	601000	601000	601000	601000	601000	601000	601000
Adj. R^2	0.057	0.074	0.076	0.175	0.181	0.182	0.200	0.201	0.201	0.202

* p¡.10, ** p¡.05, *** p¡.01

Table A1: Determinants of one-year-ahead inflation expectations (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Econ. outlook: Grow				-0.051***	0.016	-0.000	0.000	-0.003	-0.003	0.012
				(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Econ. outlook: Shrink				1.378***	1.264***	1.270***	1.181***	1.186***	1.186***	1.163***
				(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Curr. fin. situation: Somewhat worse off				-0.863***	-0.771***	-0.760***	-0.771***	-0.777***	-0.777***	-0.777***
				(0.035)	(0.035)	(0.035)	(0.034)	(0.034)	(0.034)	(0.034)
Curr. fin. situation: About the same				-1.417***	-1.284***	-1.267***	-1.180***	-1.189***	-1.189***	-1.189***
				(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Curr. fin. situation: Somewhat better off				-1.199***	-1.054***	-1.038***	-0.867***	-0.875***	-0.875***	-0.868***
				(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)
Curr. fin. situation: Much better off				-0.668***	-0.541***	-0.528***	-0.330***	-0.333***	-0.333***	-0.335***
				(0.068)	(0.068)	(0.068)	(0.068)	(0.067)	(0.067)	(0.067)
Expected fin. situation: Somewhat worse off				-1.955***	-1.865***	-1.869***	-1.757***	-1.740***	-1.740***	-1.733***
				(0.041)	(0.041)	(0.041)	(0.040)	(0.040)	(0.040)	(0.040)
Expected fin. situation: About the same				-3.561***	-3.440***	-3.436***	-3.255***	-3.225***	-3.225***	-3.209***
				(0.042)	(0.042)	(0.042)	(0.041)	(0.041)	(0.041)	(0.041)
Expected fin. situation: Somewhat better off				-3.775***	-3.634***	-3.629***	-3.431***	-3.402***	-3.402***	-3.385***
				(0.046)	(0.046)	(0.046)	(0.045)	(0.045)	(0.045)	(0.045)
Expected fin. situation: Much better off				-3.108***	-3.012***	-3.004***	-2.795***	-2.755***	-2.755***	-2.741***
				(0.071)	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)
Consumption propensity				0.059***	0.099***	0.104***	0.202***	0.196***	0.196***	0.162***
				(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Trust ECB					-0.152***	-0.154***	-0.166***	-0.165***	-0.165***	-0.167***
					(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Trust people					-0.064***	-0.066***	-0.075***	-0.075***	-0.075***	-0.076***
					(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
N	601000	601000	601000	601000	601000	601000	601000	601000	601000	601000
Adj. R^2	0.057	0.074	0.076	0.175	0.181	0.182	0.200	0.201	0.201	0.202

* p¡.10, ** p¡.05, *** p¡.01

Table A1: Determinants of one-year-ahead inflation expectations (continued)

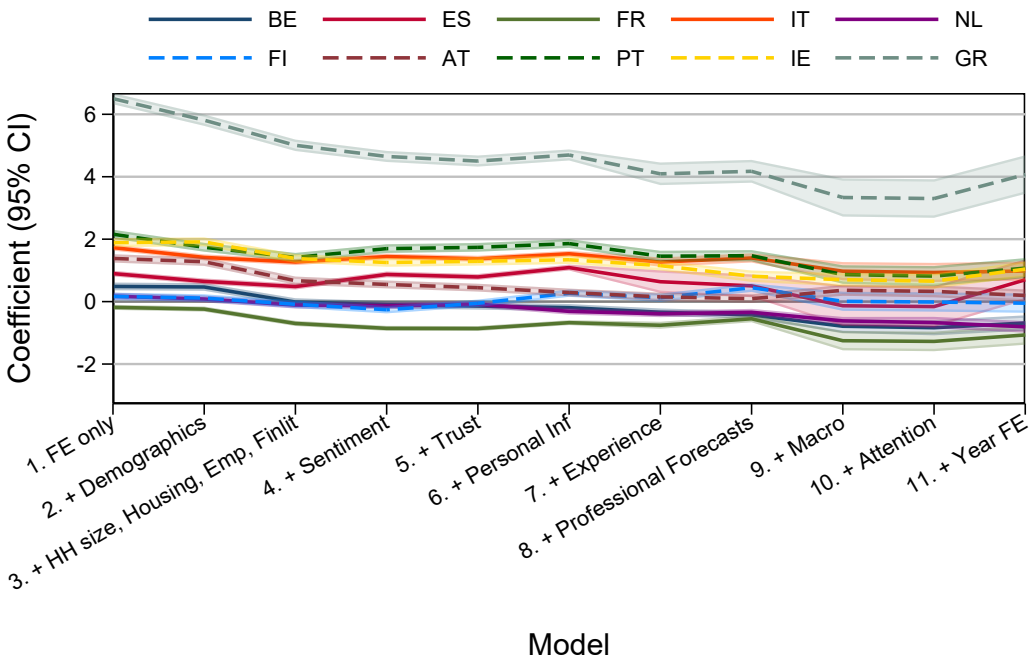
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Inflation experience						0.210***	0.141***	0.148***	0.148***	0.143***
						(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Unemployment experience						0.030***	0.005	0.010	0.010	0.007
						(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Consensus inflation forecast							0.624***	0.213***	0.213***	-0.001
							(0.006)	(0.016)	(0.016)	(0.020)
Consensus GDP forecast							0.276***	0.128***	0.128***	-0.069***
							(0.012)	(0.013)	(0.013)	(0.015)
Industrial production								0.006***	0.006***	0.013***
								(0.002)	(0.002)	(0.002)
HICP inflation								0.131***	0.131***	0.116***
								(0.006)	(0.006)	(0.007)
Unemployment rate								-0.033*	-0.033*	-0.128***
								(0.017)	(0.018)	(0.018)
Interest rate on savings								-1.422***	-1.422***	-1.107***
								(0.072)	(0.074)	(0.074)
Google searches: inflation									0.005	-20.795***
									(2.403)	(2.577)
Year 2022										1.293***
										(0.042)
Year 2023										0.527***
										(0.025)
Constant	4.606***	5.074***	9.038***	9.864***	10.529***	9.944***	7.338***	8.879***	8.879***	10.049***
	(0.017)	(0.038)	(0.069)	(0.072)	(0.073)	(0.103)	(0.105)	(0.121)	(0.133)	(0.139)
N	601000	601000	601000	601000	601000	601000	601000	601000	601000	601000
Adj. R^2	0.057	0.074	0.076	0.175	0.181	0.182	0.200	0.201	0.201	0.202

* p¡.10, ** p¡.05, *** p¡.01

Notes: The table reports the complete regression results from the pooled OLS specifications described in Section 2.2, with one-year-ahead inflation expectations as the dependent variable, and Germany as the omitted reference country. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Monthly sample period: April 2022 – December 2024. Heteroskedasticity-robust standard errors in parentheses.

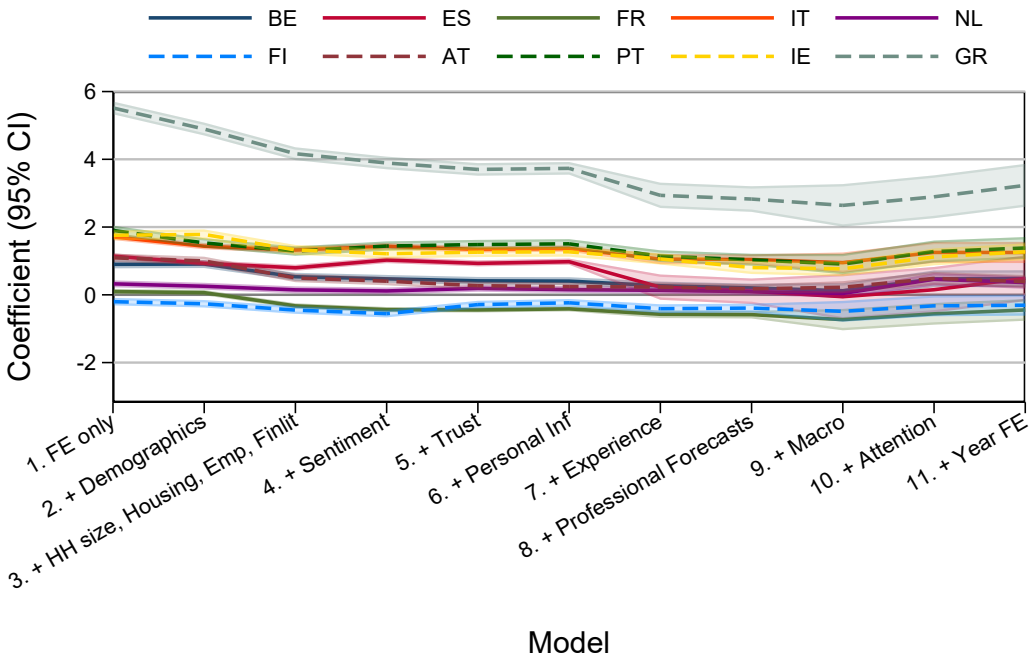
C. Country Fixed Effects: Eleven Countries with Personal Inflation Rate

Figure A3: Country Fixed Effects: Inflation Expectations 12 Months Ahead



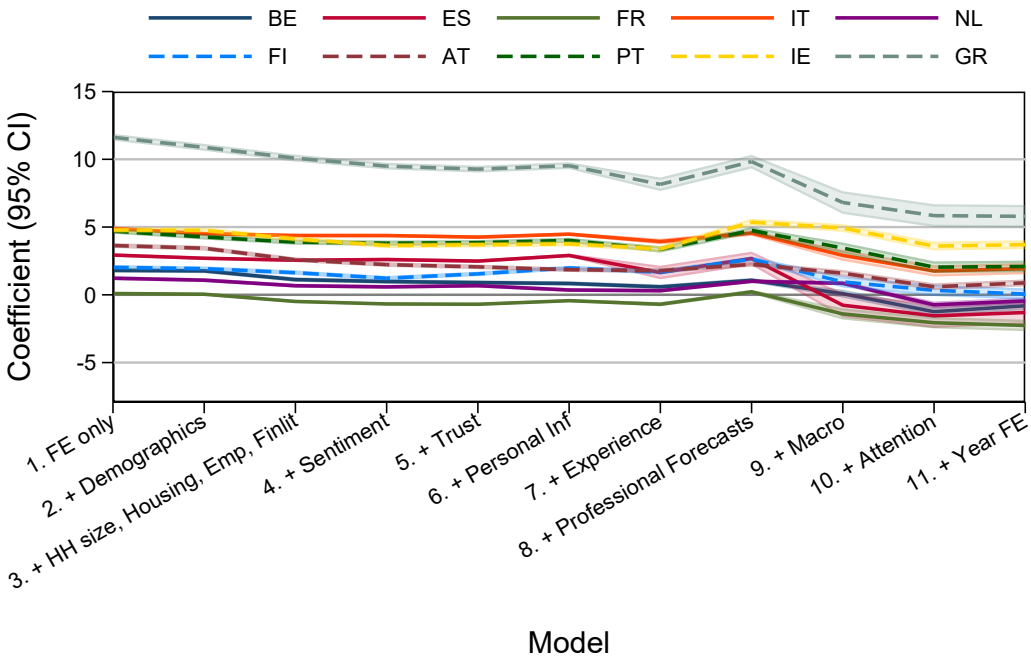
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2 and an OLS specification including the personal inflation rate introduced in Section 4, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–10 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; personal inflation rate; inflation experience; professional forecasts; macro controls; and attention), and Model 11 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

Figure A4: Country Fixed Effects: Inflation Expectations 3 Years Ahead



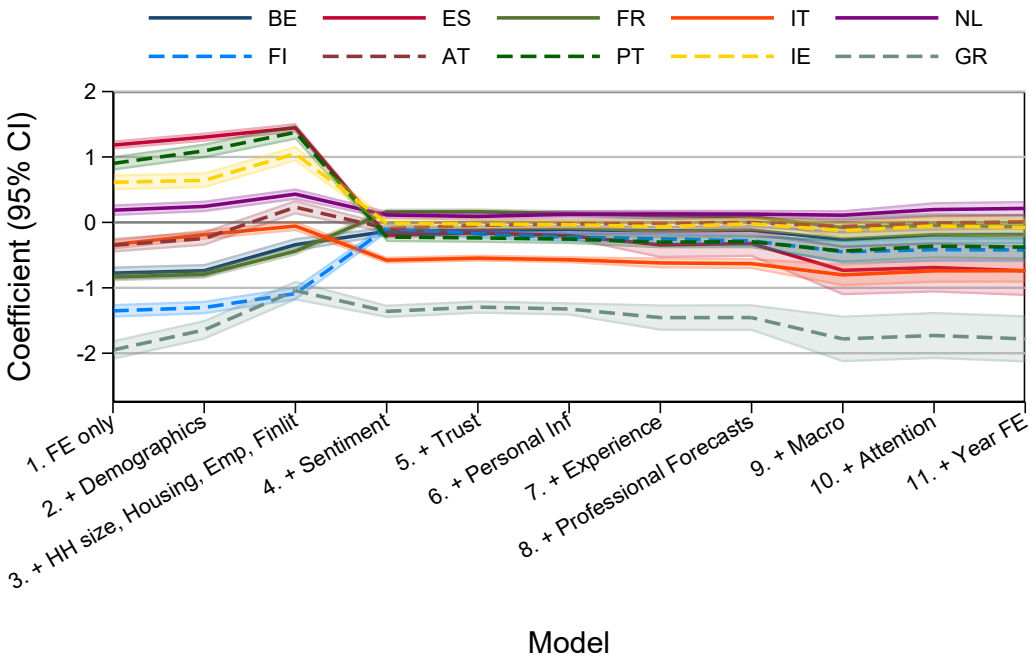
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2 and an OLS specification including the personal inflation rate introduced in Section 4, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–10 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; personal inflation rate; inflation experience; professional forecasts; macro controls; and attention), and Model 11 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

Figure A5: Country Fixed Effects: Inflation Perceptions Past 12 Months



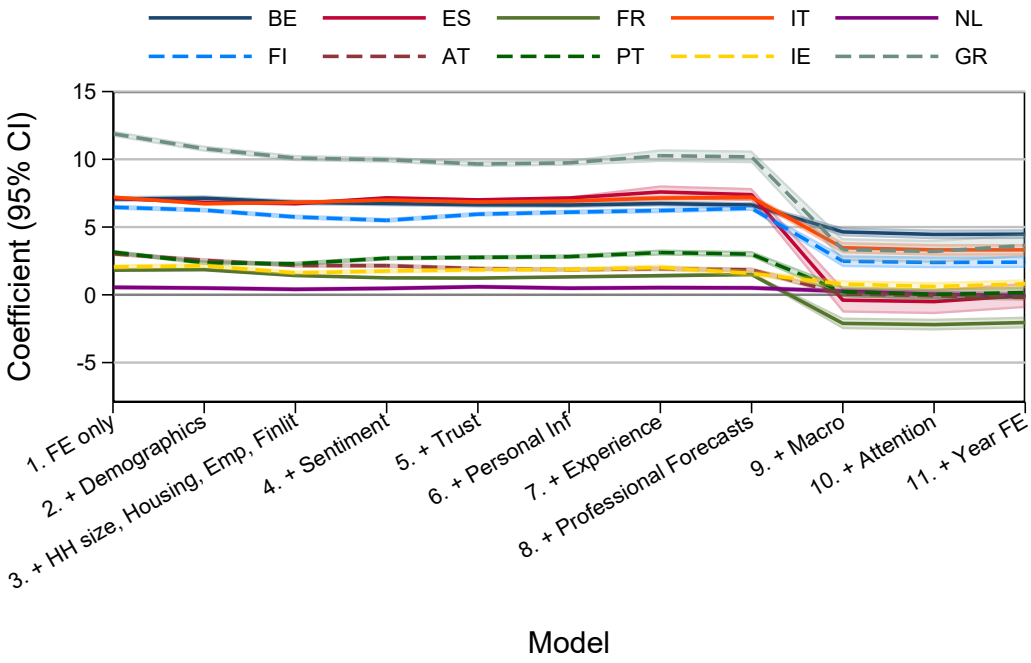
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2 and an OLS specification including the personal inflation rate introduced in Section 4, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–10 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; personal inflation rate; inflation experience; professional forecasts; macro controls; and attention), and Model 11 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

Figure A6: Country Fixed Effects: Growth Expectations 12 Months Ahead



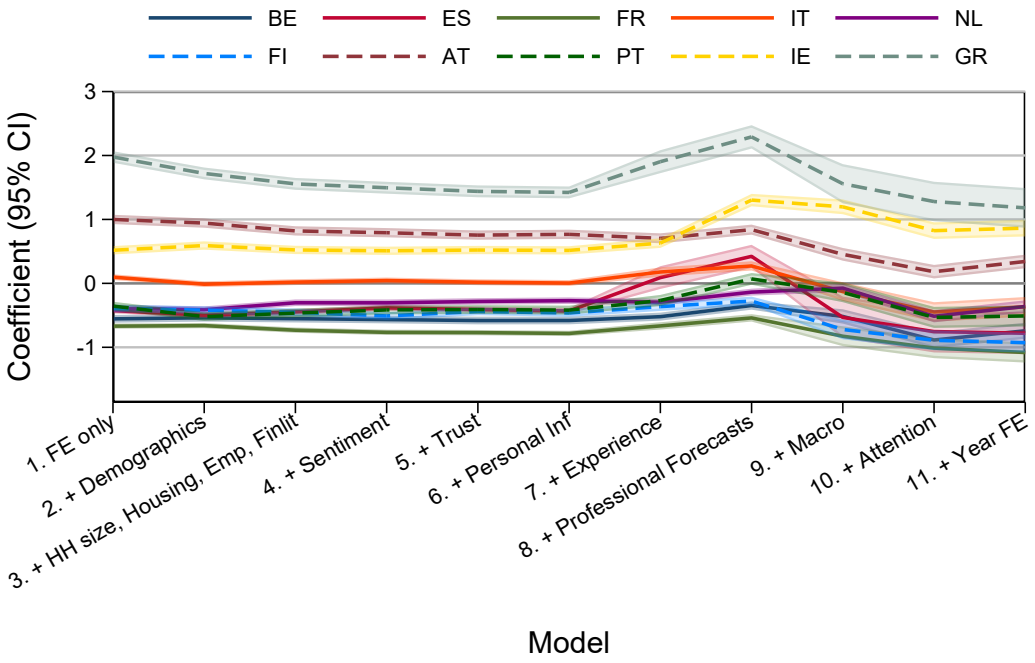
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2 and an OLS specification including the personal inflation rate introduced in Section 4, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–10 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; personal inflation rate; inflation experience; professional forecasts; macro controls; and attention), and Model 11 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

Figure A7: Country Fixed Effects: Unemployment Rate Expectations 12 Months Ahead



Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2 and an OLS specification including the personal inflation rate introduced in Section 4, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–10 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; personal inflation rate; inflation experience; professional forecasts; macro controls; and attention), and Model 11 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

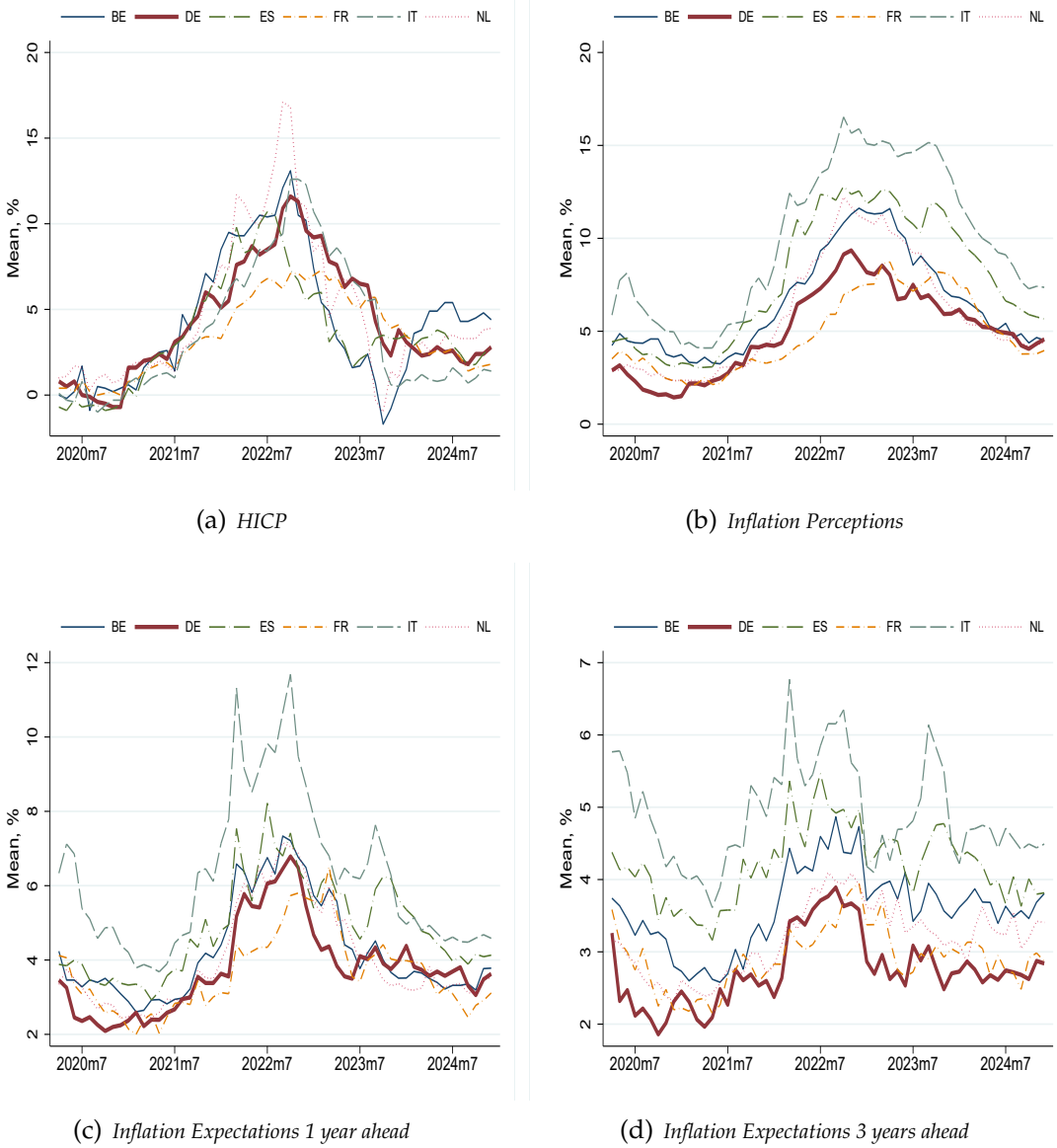
Figure A8: Country Fixed Effects: Mortgage Rate Expectations 12 Months Ahead



Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2 and an OLS specification including the personal inflation rate introduced in Section 4, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–10 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; personal inflation rate; inflation experience; professional forecasts; macro controls; and attention), and Model 11 additionally includes year fixed effects. Country labels: Austria (AT), Belgium (BE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES). Sample period: April 2022 – December 2024.

D. Summary Statistics for Six Original Countries

Figure A9: Actual, Perceived, and Expected Inflation in Euro Area



(a) *HICP*

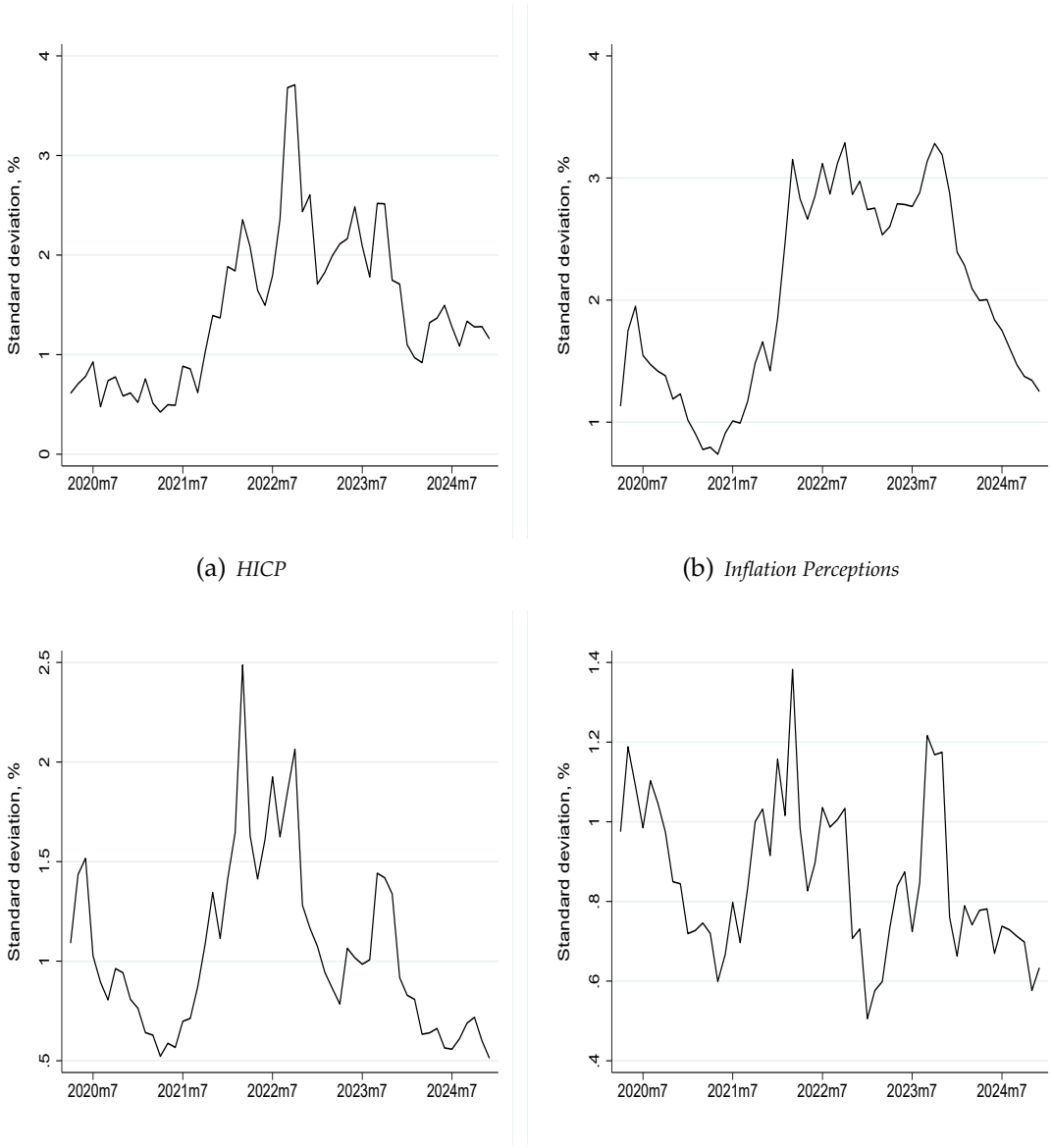
(b) *Inflation Perceptions*

(c) *Inflation Expectations 1 year ahead*

(d) *Inflation Expectations 3 years ahead*

Note: This figure shows the evolution of actual HICP inflation as well as the mean perceived and expected inflation rates from the CES for six euro area countries— Belgium (BE), France (FR), Germany (DE), Italy (IT), the Netherlands (NL), and Spain (ES)—covering April 2020 to December 2024. We exclude the top and bottom 2.5% of perceived and expected inflation observations in each survey wave across countries in the CES.

Figure A10: Dispersion of Actual, Perceived, and Expected Inflation in Euro Area



(a) *HICP*

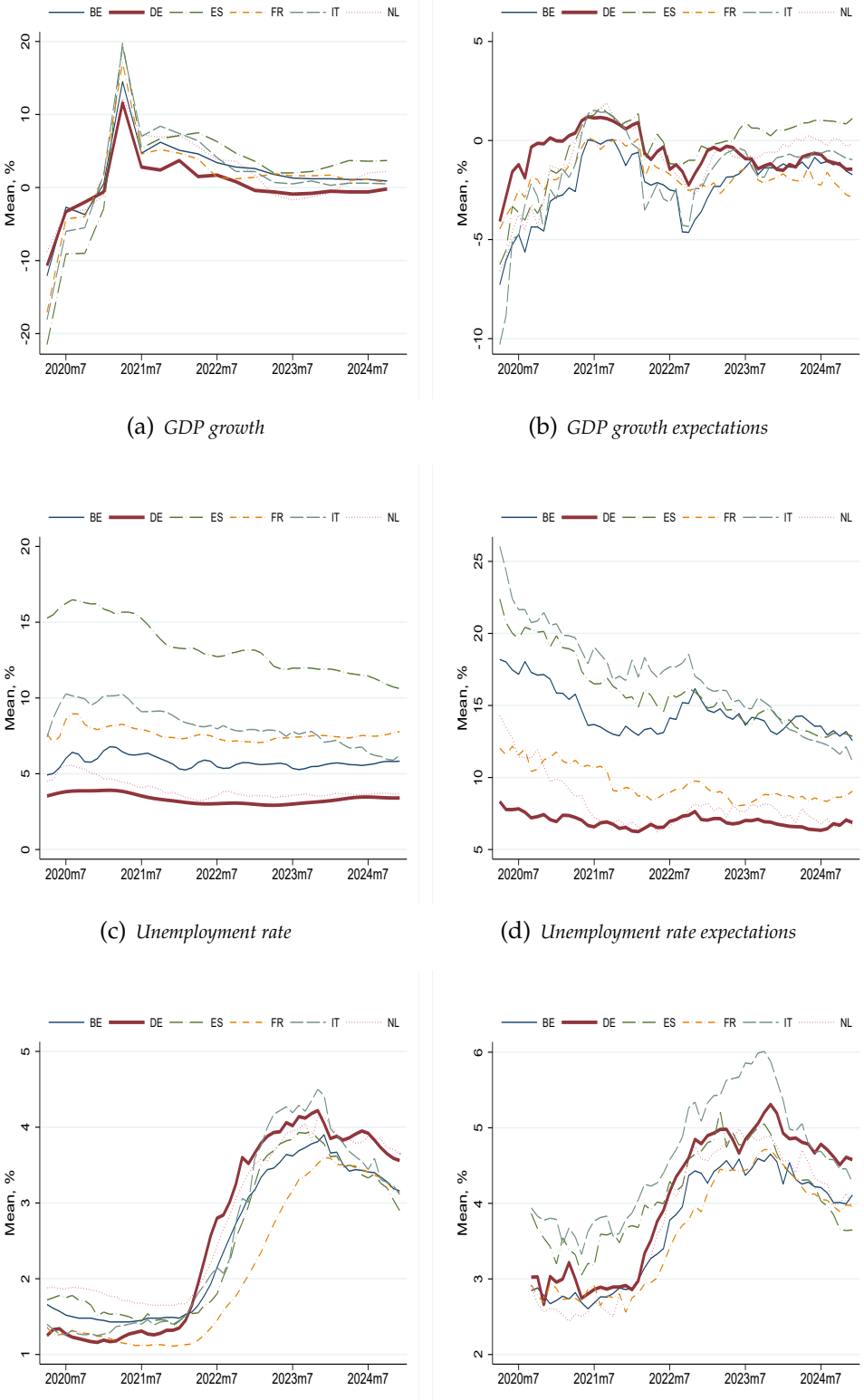
(b) *Inflation Perceptions*

(c) *Inflation Expectations 1 year ahead*

(d) *Inflation Expectations 3 years ahead*

Note: This figure shows the dispersion (standard deviations) of actual HICP inflation and the mean perceived and expected inflation rates from the CES across six euro area countries—Belgium (BE), France (FR), Germany (DE), Italy (IT), the Netherlands (NL), and Spain (ES)—from April 2020 to December 2024.

Figure A11: Actual and Expected Economic Growth, Unemployment Rate, and Mortgage Rate in Euro Area



(a) *GDP growth*

(b) *GDP growth expectations*

(c) *Unemployment rate*

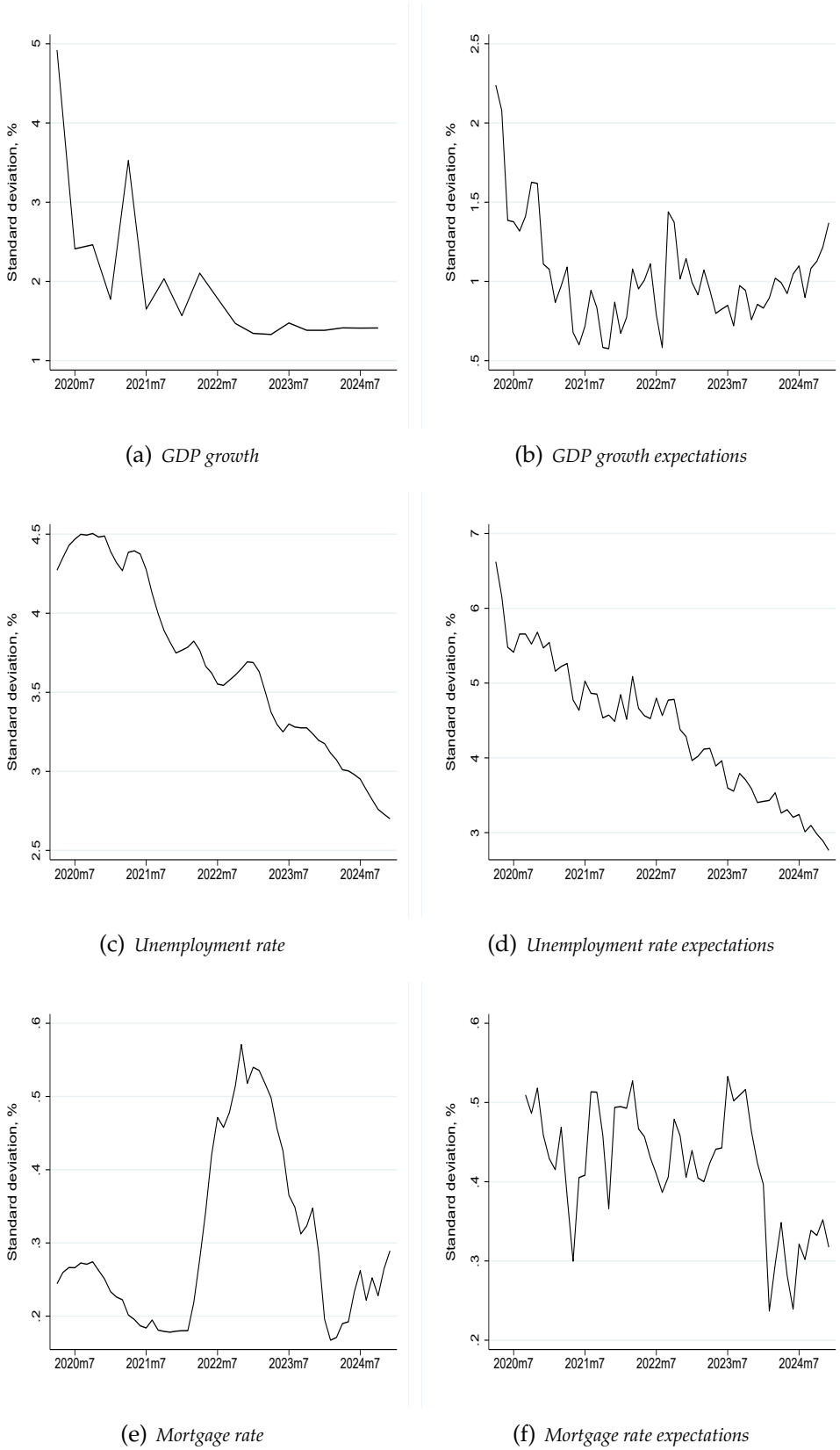
(d) *Unemployment rate expectations*

(e) *Mortgage rate*

(f) *Mortgage rate expectations*

Note: This figure shows the dispersion (standard deviations) of actual GDP growth, unemployment, and mortgage rates, as well as the corresponding mean expectations from the CES across six euro area countries—Belgium (BE), France (FR), Germany (DE), Italy (IT), the Netherlands (NL), and Spain (ES)—from April 2020 to December 2024.

Figure A12: Dispersion of Actual and Expected Economic Growth, Unemployment Rate, and Mortgage Rate in Euro Area



(a) *GDP growth*

(b) *GDP growth expectations*

(c) *Unemployment rate*

(d) *Unemployment rate expectations*

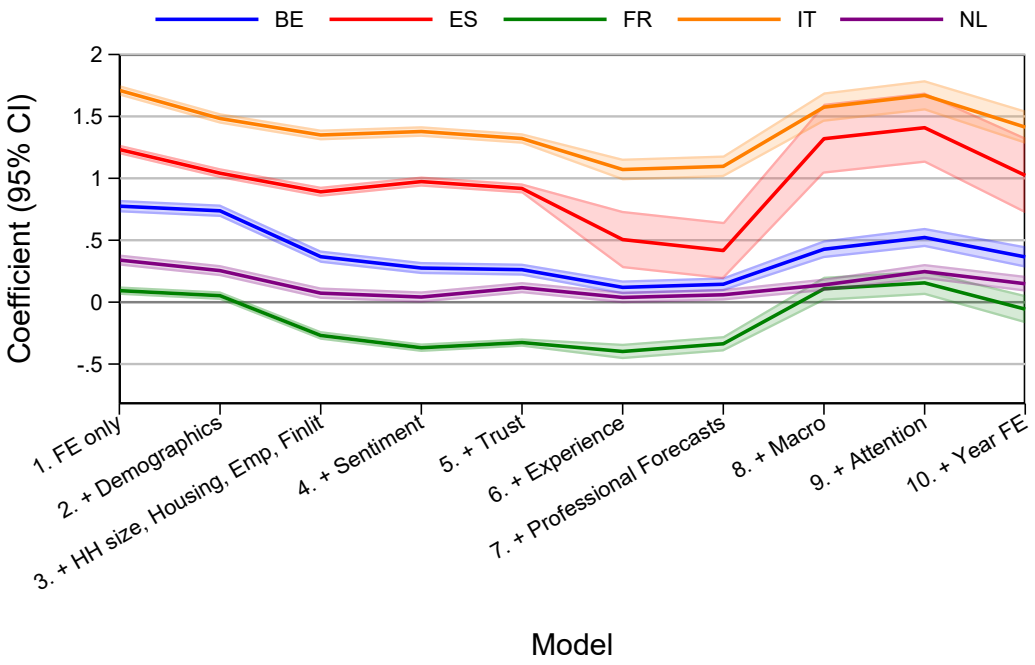
(e) *Mortgage rate*

(f) *Mortgage rate expectations*

Note: This figure shows the dispersion (standard deviations) of actual GDP growth, unemployment, and mortgage rates, as well as the corresponding mean expectations from the CES across six euro area countries—Belgium (BE), France (FR), Germany (DE), Italy (IT), the Netherlands (NL), and Spain (ES)—from April 2020 to December 2024.

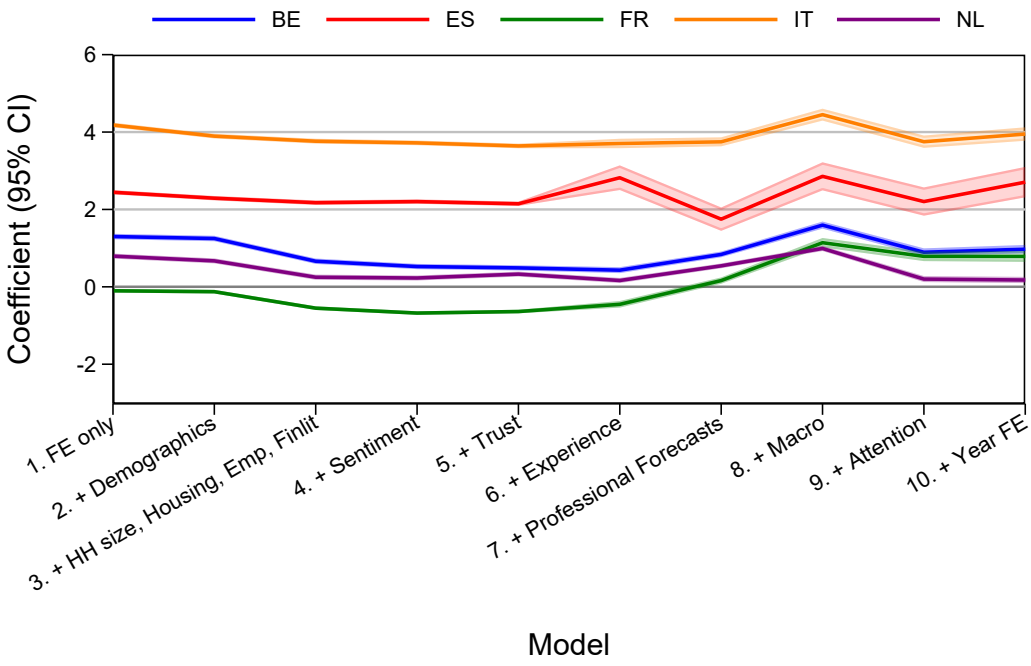
E. Country Fixed effects: Six Original Countries without Personal Inflation Rate

Figure A13: Country Fixed Effects: Inflation Expectations 3 Years Ahead



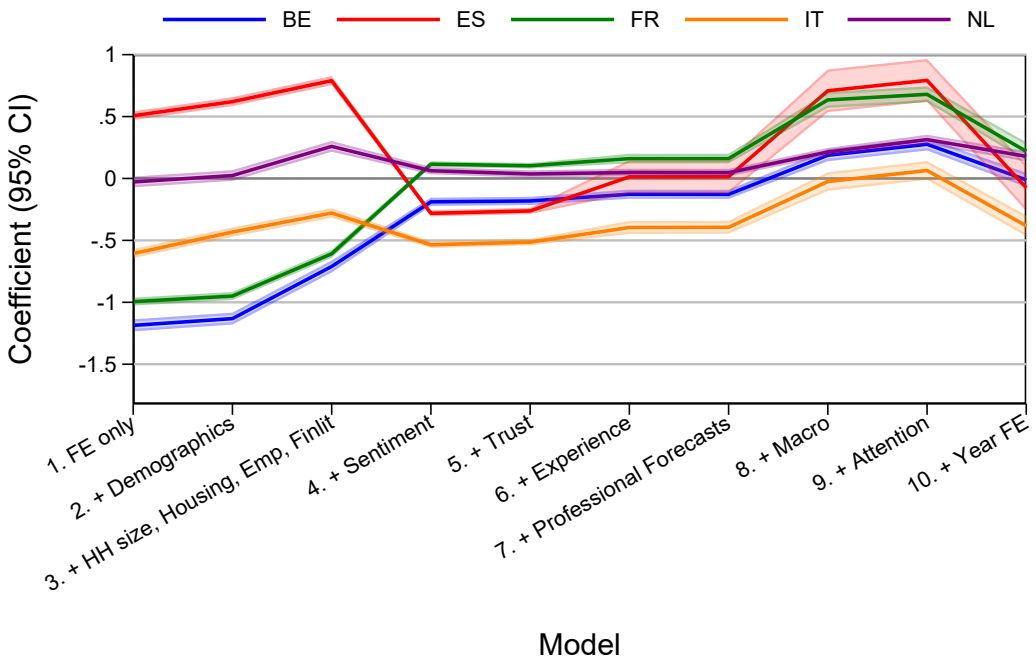
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Belgium (BE), France (FR), Italy (IT), the Netherlands (NL), and Spain (ES). Quarterly sample period: April 2020 – December 2024.

Figure A14: Country Fixed Effects: Inflation Perceptions Past 12 Months



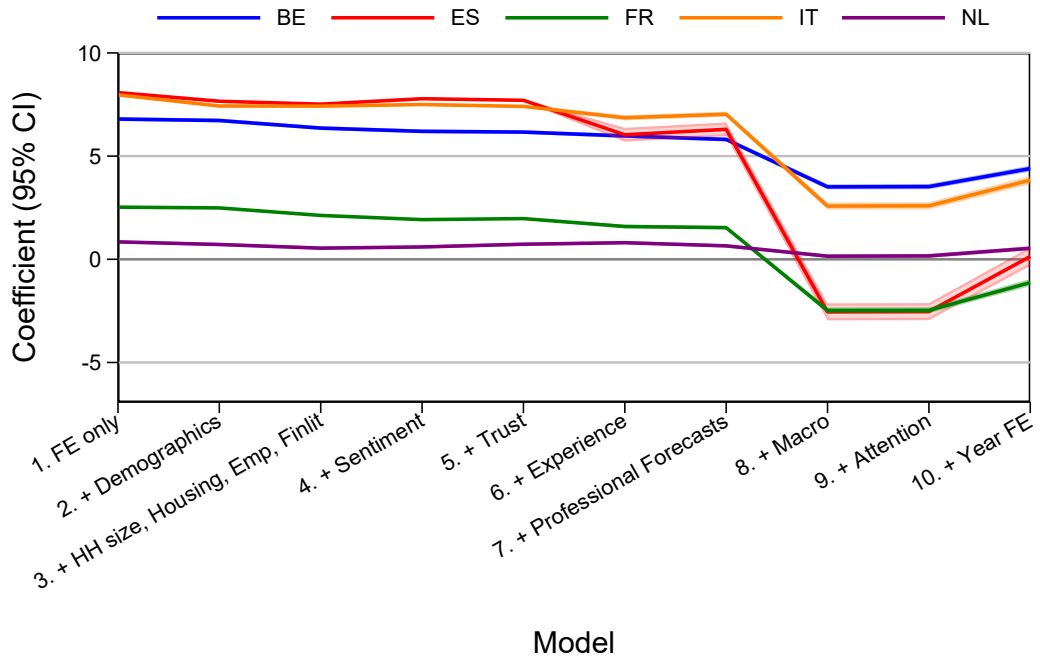
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Belgium (BE), France (FR), Italy (IT), the Netherlands (NL), and Spain (ES). Quarterly sample period: April 2020 – December 2024.

Figure A15: Country Fixed Effects: Growth Expectations 12 Months Ahead



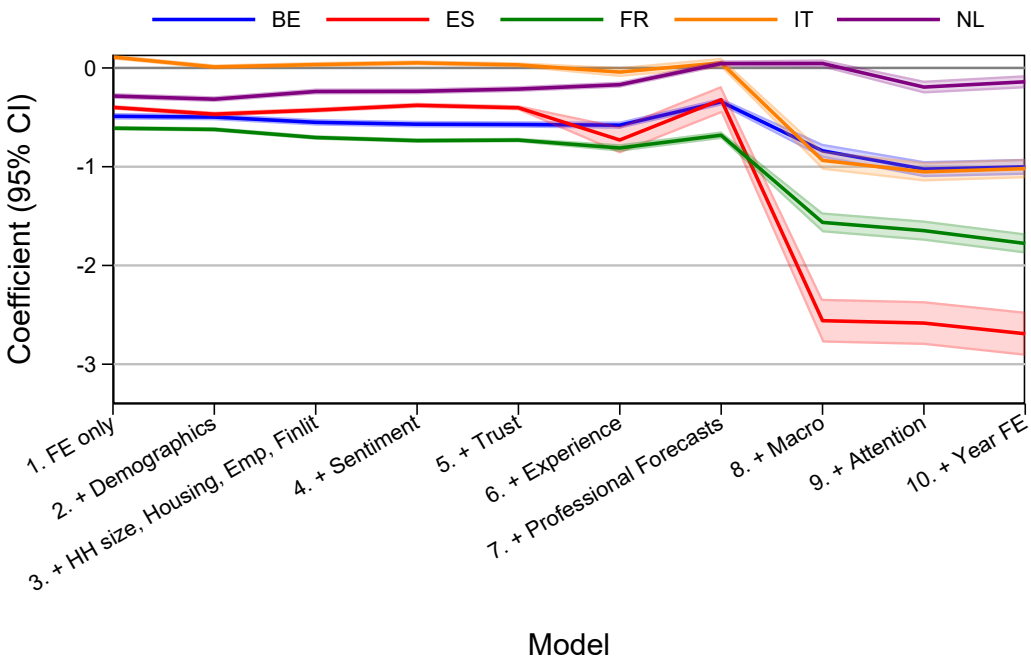
Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Belgium (BE), France (FR), Italy (IT), the Netherlands (NL), and Spain (ES). Quarterly sample period: April 2020 – December 2024.

Figure A16: Country Fixed Effects: Unemployment Rate Expectations 12 Months Ahead



Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Belgium (BE), France (FR), Italy (IT), the Netherlands (NL), and Spain (ES). Quarterly sample period: April 2020 – December 2024.

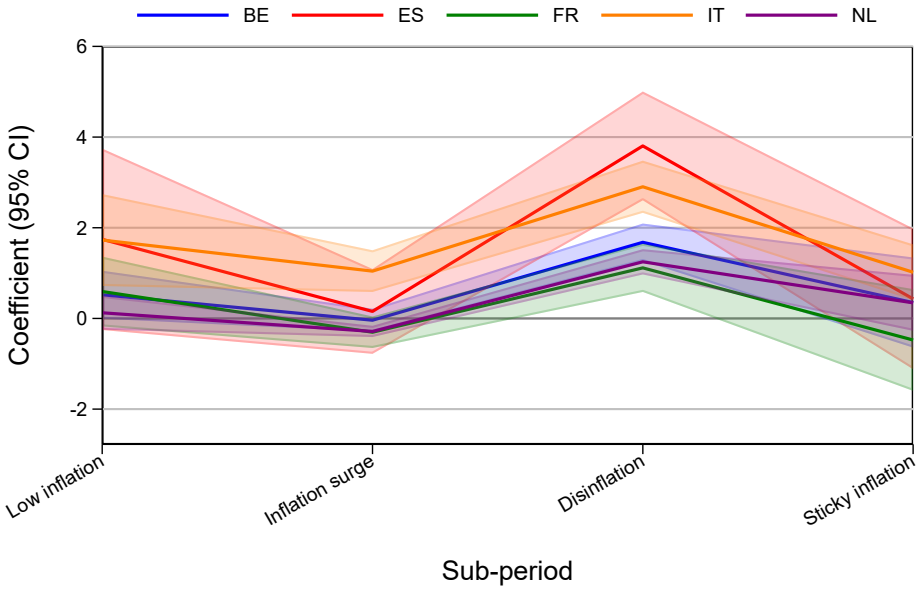
Figure A17: Country Fixed Effects: Mortgage Rate Expectations 12 Months Ahead



Notes: The figure plots estimated country fixed effects from the pooled OLS specifications described in Section 2.2, with Germany as the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 1 includes only country fixed effects. Models 2–9 sequentially add blocks of individual-level controls (demographics; household characteristics including housing, access to credit, employment status, financial literacy; economic sentiment; trust; inflation experience; professional forecasts; macro controls; and attention), and Model 10 additionally includes year fixed effects. Country labels: Belgium (BE), France (FR), Italy (IT), the Netherlands (NL), and Spain (ES). Quarterly sample period: April 2020 – December 2024.

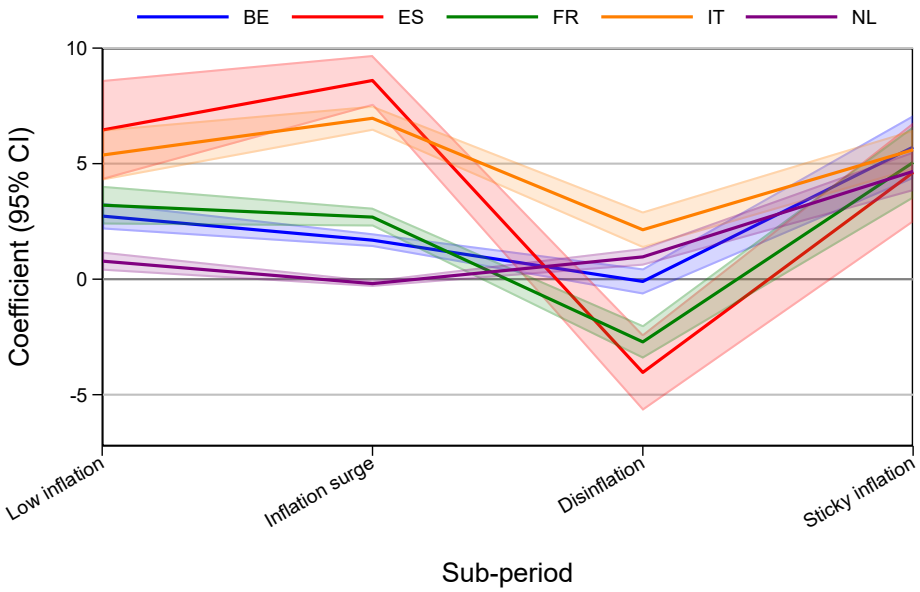
F. Sub-period analysis - further results

Figure A18: Country Fixed Effects In Different Sub-Periods: Inflation Expectations 3 Years Ahead



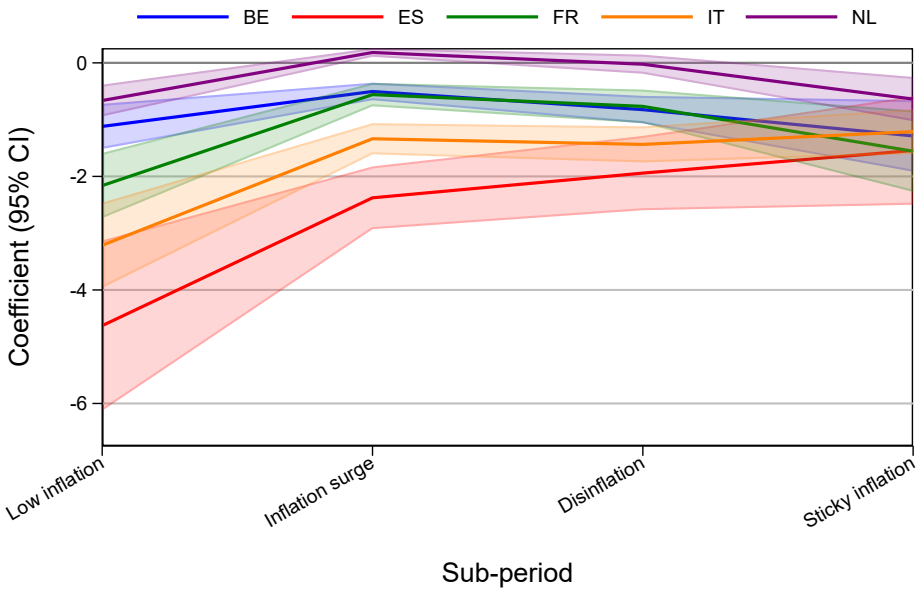
Notes: The figure plots estimated country fixed effects from separate pooled OLS regressions (Model 10) for 3-years-ahead inflation expectations, estimated within four sub-periods that capture different macro-inflation regimes: low inflation (April 2020–May 2021), inflation surge (June 2021–September 2022), disinflation (October 2022–February 2024), and sticky inflation (March 2024–December 2024). Germany is the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 10 includes the full set of individual-level controls described in Section 2.2 (demographics; household characteristics; economic sentiment; trust; inflation experience; professional forecasts; macro controls; attention) and year fixed effects. Country labels: Belgium (BE), Spain (ES), France (FR), Italy (IT), and the Netherlands (NL). Sample period: April 2020 – December 2024 (original-country CES sample).

Figure A19: Country Fixed Effects In Different Sub-Periods: Inflation Perceptions Past 12 Months



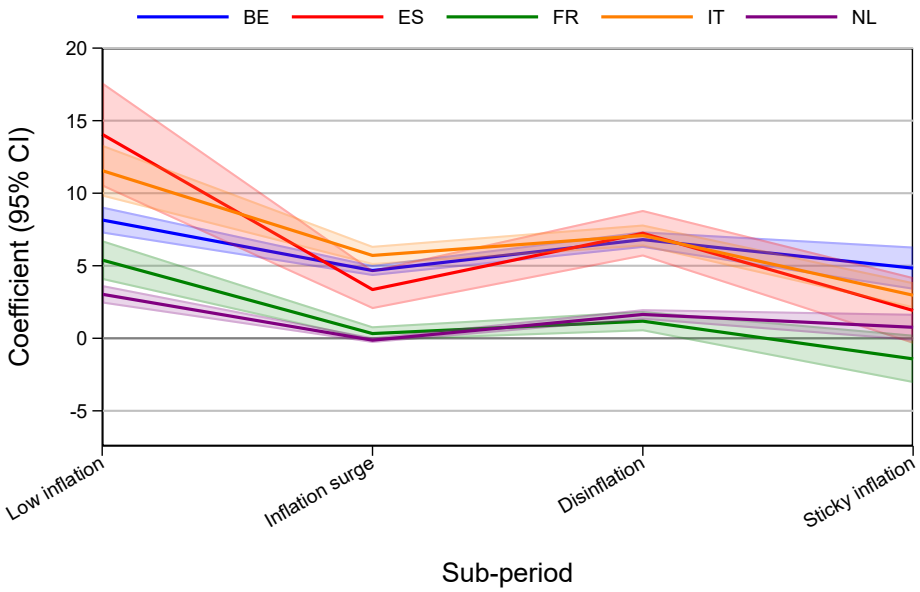
Notes: The figure plots estimated country fixed effects from separate pooled OLS regressions (Model 10) for inflation perceptions over last 12 months, estimated within four sub-periods that capture different macro-inflation regimes: low inflation (April 2020–May 2021), inflation surge (June 2021–September 2022), disinflation (October 2022–February 2024), and sticky inflation (March 2024–December 2024). Germany is the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 10 includes the full set of individual-level controls described in Section 2.2 (demographics; household characteristics; economic sentiment; trust; inflation experience; professional forecasts; macro controls; attention) and year fixed effects. Country labels: Belgium (BE), Spain (ES), France (FR), Italy (IT), and the Netherlands (NL). Sample period: April 2020 – December 2024 (original-country CES sample).

Figure A20: Country Fixed Effects In Different Sub-Periods: Economic Growth Expectations 12 Months Ahead



Notes: The figure plots estimated country fixed effects from separate pooled OLS regressions (Model 10) for 12-month-ahead growth expectations, estimated within four sub-periods that capture different macro-inflation regimes: low inflation (April 2020–May 2021), inflation surge (June 2021–September 2022), disinflation (October 2022–February 2024), and sticky inflation (March 2024–December 2024). Germany is the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 10 includes the full set of individual-level controls described in Section 2.2 (demographics; household characteristics; economic sentiment; trust; inflation experience; professional forecasts; macro controls; attention) and year fixed effects. Country labels: Belgium (BE), Spain (ES), France (FR), Italy (IT), and the Netherlands (NL). Sample period: April 2020 – December 2024 (original-country CES sample).

Figure A21: Country Fixed Effects In Different Sub-Periods: Unemployment Rate Expectations 12 Months Ahead



Notes: The figure plots estimated country fixed effects from separate pooled OLS regressions (Model 10) for unemployment rate expectations, estimated within four sub-periods that capture different macro-inflation regimes: low inflation (April 2020–May 2021), inflation surge (June 2021–September 2022), disinflation (October 2022–February 2024), and sticky inflation (March 2024–December 2024). Germany is the omitted reference country. Lines show coefficient estimates in percentage points and shaded areas indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Model 10 includes the full set of individual-level controls described in Section 2.2 (demographics; household characteristics; economic sentiment; trust; inflation experience; professional forecasts; macro controls; attention) and year fixed effects. Country labels: Belgium (BE), Spain (ES), France (FR), Italy (IT), and the Netherlands (NL). Sample period: April 2020 – December 2024 (original-country CES sample).

G. Principal component analysis: variable set, construction, and loadings

This appendix provides the details of the principal component analysis summarized in Section 6: the additional variables used, how the components are constructed, and the full set of component loadings.

G.1. Extended variable set

We augment the baseline set of regressors from Model 9 with 27 additional country-level variables from several external sources. These include six indicators from the *Worldwide Governance Indicators* (WGI) published by the World Bank—Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption—which are widely used as summary measures of institutional quality (Kaufmann et al., 2011). We further add two indicators from V-Dem capturing freedom of expression and media censorship, and the press freedom score from Reporters Sans Frontières (RSF). To capture the media information environment and news salience, we include three variables from the GDELT project measuring the share of national news coverage devoted to inflation, unemployment, and mortgage-related topics. We also add five trust measures from the Eurobarometer: trust in the ECB, trust in the EU, trust in national government, trust in national parliament, and the EU image index. Finally, we include ten indicators of public economic concern from the Eurobarometer's Standard Public Economic Sentiment (SPES) module, covering the salience of prices, unemployment, the economic situation, public debt, taxation, pensions, housing, health, immigration, and the environment.[14]

Including all 27 new variables as individual regressors in the micro model raises the adjusted R^2 from 0.205 to only 0.209 despite most coefficients being individually significant. This negligible gain in explanatory power despite many additional significant regressors is a classic symptom of multicollinearity: the new variables are highly correlated both with one another and with the existing controls, inflating standard errors and making individual coefficients difficult to interpret. Moreover, many of the country fixed effects in the extended model become implausibly large and change sign, suggesting severe coefficient instability. PCA addresses this problem by compressing all correlated information into a small number of uncorrelated summary indices.

G.2. Construction of the principal components

PCA is a standard dimension-reduction technique that extracts orthogonal linear combinations (principal components) from a set of correlated variables, ordered by the amount of variance each component explains. Rather than discarding variables or choosing among them, PCA retains the information content of the full variable set

[14] We deliberately exclude variables that would overlap with constructs already measured at the individual level in the CES. In particular, since the CES already contains a question on trust in the ECB at the respondent level, including the Eurobarometer aggregate of ECB trust as a separate regressor would amount to double-counting. The Eurobarometer trust variables are therefore included only in the PCA, where they contribute to the factor structure alongside other country-level measures, but not as stand-alone regressors in the micro regressions.

in a lower-dimensional representation. Each principal component is a weighted average of the original variables, with the weights (loadings) indicating which variables contribute most to that dimension. The resulting components are uncorrelated by construction, which eliminates the multicollinearity that plagues the raw regression.

We proceed as follows. First, we restrict the estimation sample to the same observations used in the baseline analysis (overlapping period, non-missing trust and country indicators; approximately 601,000 individual-level observations). We then collapse all regressors to the country$\times$month level by computing group means, yielding a panel of country-month observations. This aggregation step is necessary because individual-level dummies (e.g., gender or income categories) become country-month *shares* (e.g., the share of male respondents or the share of high-income respondents in a given country-month), which are suitable inputs for PCA.

Second, we standardize each variable to have mean zero and unit variance (z-scoring) so that all variables enter the PCA on a comparable scale. Third, we extract principal components from the full set of 76 standardized variables—comprising all regressors from Model 9 (demographics, household characteristics, financial literacy, sentiment, trust, experience, professional forecasts, macroeconomic conditions, attention) plus the 27 new country-level variables—excluding country and year fixed effects by design, since the goal is to ask whether data-driven summary indices can substitute for or complement the country dummies.

We retain components using the Kaiser criterion (eigenvalue > 1), which keeps components that explain more variance than any single original variable. This yields 12 principal components that jointly account for approximately 89.5% of total variance. Figure A22 shows the scree plot of eigenvalues; the sharp decline after the first few components and the flattening below the eigenvalue-one threshold confirm that 12 components provide a parsimonious summary of the 76-variable input space.

G.3. Interpretation of principal components

Table A2 reports the retained components, their eigenvalues and variance shares, and the five variables with the largest absolute loadings on each component. A loading above $|0.30|$ is conventionally regarded as substantively meaningful.

The first principal component, which alone accounts for almost 30% of total variance, is dominated by the six WGI governance indicators, all with loadings above 0.90. This component can be interpreted as a single index of *institutional quality*. It is noteworthy that unemployment, inflation experience, unemployment experience, and trust also load on PC1 (with loadings between 0.64 and 0.81), suggesting that these variables—already included in the baseline specification (Model 9)—are partly reflections of the same underlying institutional-quality dimension. This finding confirms the intuition that cross-country differences in trust, macroeconomic experience, and labor market outcomes are closely associated with the broader institutional environment.

The remaining components capture distinct aspects of the data: PC2 reflects household financial sentiment, PC3 captures trust in the EU and economic optimism, PC4 combines financial literacy with fiscal-concern salience, PC5 and PC6 capture economic vulnerability and the education-information environment, PC7–PC8 relate to housing

Table A2: Retained principal components: eigenvalues and top loadings

Component	Eigenvalue (% var.)	Top-5 loadings (variable: loading)
PC1	22.6 (29.7%)	WGI Control of Corruption: 0.93; WGI Voice & Accountability: 0.92; WGI Rule of Law: 0.91; WGI Government Effectiveness: 0.90; WGI Regulatory Quality: 0.90
PC2	10.3 (13.6%)	Expected financial situation (somewhat worse): 0.82; Expected financial situation (much worse): 0.78; Expected financial situation (about the same): −0.77; Current financial situation (about the same): −0.75; Current financial situation (much worse): 0.73
PC3	9.0 (11.9%)	EB EU image: 0.85; EB trust in EU: 0.76; Economic outlook (grow): 0.75; SPES health salience: 0.69; Expected financial situation (somewhat better): 0.64
PC4	6.6 (8.7%)	Financial literacy (score 2): 0.87; SPES debt salience: 0.84; Financial literacy (score 3): −0.84; Partner: −0.74; SPES housing salience: −0.57
PC5	4.5 (6.0%)	Income (mid-low): 0.74; GDELT mortgage news share: −0.62; SPES tax salience: 0.61; SPES pension salience: 0.60; V-Dem media censorship: 0.52
PC6	4.2 (5.5%)	Education (medium): −0.78; Education (high): 0.64; Interest rate on savings: −0.59; GDELT inflation news share: 0.44; Financial literacy (score 1): 0.43
PC7	3.0 (4.0%)	Homeowner (mortgage): 0.56; V-Dem media censorship: −0.50; Income (mid-low): 0.39; GDELT inflation news share: 0.37; SPES environment salience: 0.37
PC8	2.3 (3.0%)	Google inflation searches: 0.53; Consensus inflation forecast: 0.43; Financial literacy (score 1): 0.41; Financial literacy (score 0): 0.35; HICP inflation: 0.34
PC9	1.9 (2.5%)	Homeowner (no mortgage): 0.45; GDELT unemployment news: −0.39; SPES unemployment salience: 0.33; Age (35–64): 0.33; Male: −0.28
PC10	1.4 (1.9%)	Expected financial situation (much better): 0.53; Current financial situation (much better): 0.43; On leave: 0.36; GDELT mortgage news: −0.34; Interest rate on savings: 0.29
PC11	1.2 (1.6%)	On leave: −0.51; Industrial production: 0.45; SPES health salience: 0.26; Economic outlook (shrink): −0.23; Male: 0.22
PC12	1.0 (1.3%)	Industrial production: 0.47; Current financial situation (much better): 0.28; Consensus GDP forecast: 0.26; SPES price salience: −0.23; Consumption propensity: −0.23

Notes: The table reports the 12 retained principal components (Kaiser criterion: eigenvalue > 1) extracted from 76 z-scored country×month-level variables. Loadings are scaled as eigenvector $\times \sqrt{\text{eigenvalue}}$, following the standard correlation-loading convention; $|\text{loading}| > 0.30$ is typically considered substantively meaningful. Only the five variables with the largest absolute loadings are shown for each component. EB = Eurobarometer; SPES = Standard Public Economic Sentiment (Eurobarometer); WGI = World Governance Indicators (World Bank); V-Dem = Varieties of Democracy; GDELT = Global Database of Events, Language, and Tone; HICP = Harmonized Index of Consumer Prices. All input variables exclude country and year fixed effects.

Figure A22: Scree plot of eigenvalues from PCA on the extended variable set

Notes: The figure plots the eigenvalues of all principal components extracted from 76 standardized country×month-level variables. The horizontal line marks eigenvalue = 1 (Kaiser criterion). Components to the left of the threshold are retained; 12 components explain approximately 89.5% of total variance. The sharp decline after the first few components indicates that most variation is concentrated in a small number of dimensions.

tenure and inflation attention (PC8 also picking up the Consensus inflation forecast), and PC9–PC12 pick up labor market news, optimistic ("much better off") financial situations, and real economic activity, with the Consensus GDP forecast and industrial production forming the final component. The new variables—governance indicators, Eurobarometer trust, SPES salience, GDELT news shares, and press freedom measures—appear prominently in the loadings, confirming that the extended dataset captures dimensions of cross-country variation that were previously unobserved.

It is also instructive to note where the conventional regressors land. The country-level macroeconomic variables do not form a single "macro" component but are distributed across several dimensions: unemployment loads on the institutional-quality axis (PC1), HICP inflation and the Consensus inflation forecast on PC2 and PC8, the interest rate on savings on PC6, and industrial production together with the Consensus GDP forecast on the final components (PC11–PC12). Demographics are similarly dispersed—age and higher income on PC1, gender on PC2, low income on PC5, and education on PC6—while financial literacy is concentrated almost entirely on PC4. This pattern indicates that, among all the inputs, only the governance block forms a tight, self-contained dimension; the household-level and macroeconomic variables do not co-move strongly enough to collapse into a single factor.

For comparison, when PCA is applied to only the baseline regressors from Model 9 (without the 27 additional country-level measures), the first component is a less interpretable mix of demographics, income, trust, and macroeconomic experience (its largest loadings are on inflation experience, income, and age rather than on any institutional measure). Adding the governance and institutional variables reorganizes the factor structure: institutional quality emerges as a distinct, dominant dimension, and the previously entangled demographic and sentiment content is pushed into subse-

quent components. This reorganization underscores that the new institutional-quality proxies carry substantial information about cross-country differences that was not captured by the original set of regressors.

H. Survey experiment results

Table A3: Treatment effects on the heterogeneity of inflation expectations across country members

	(1) 1 year ahead	(2) 3 years ahead	(3) 5 years ahead
AT	0.35***	0.47***	0.56***
	(0.12)	(0.13)	(0.14)
BE	0.22*	0.46***	0.47***
	(0.13)	(0.15)	(0.15)
GR	1.98***	2.30***	1.92***
	(0.35)	(0.38)	(0.40)
ES	0.77**	0.95***	0.40
	(0.31)	(0.34)	(0.35)
FI	-0.33***	-0.31**	-0.51***
	(0.12)	(0.12)	(0.14)
FR	-0.088	-0.15	-0.25**
	(0.10)	(0.10)	(0.11)
IE	0.79***	1.10***	1.01***
	(0.17)	(0.17)	(0.18)
IT	0.90***	1.03***	1.01***
	(0.13)	(0.14)	(0.16)
NL	0.55***	0.65***	0.61***
	(0.11)	(0.13)	(0.13)
PT	0.0044	-0.0050	-0.20
	(0.15)	(0.16)	(0.17)
treatment_target	-0.084	-0.046	0.011
	(0.06)	(0.06)	(0.07)
AT × treatment	0.021	-0.070	-0.21
	(0.14)	(0.16)	(0.18)
BE × treatment	0.30*	0.23	0.20
	(0.18)	(0.21)	(0.23)
GR × treatment	0.46	0.34	-0.030
	(0.36)	(0.40)	(0.41)
ES × treatment	-0.072	-0.27**	-0.28**
	(0.11)	(0.11)	(0.12)
FI × treatment	0.27	0.26	0.29
	(0.16)	(0.16)	(0.19)
FR × treatment	0.14	0.12	0.13
	(0.10)	(0.10)	(0.12)
IE × treatment	-0.21	-0.21	-0.16
	(0.20)	(0.22)	(0.23)
IT × treatment	-0.32**	-0.33**	-0.46***
	(0.13)	(0.14)	(0.15)
NL × treatment	-0.26*	-0.26	-0.26
	(0.14)	(0.16)	(0.17)
PT × treatment	0.12	0.022	0.10
	(0.17)	(0.17)	(0.19)
Adj. R^2	0.080	0.096	0.092
N observations	19,877	19,867	19,872
Micro controls	yes	yes	yes

Notes: The table reports OLS regressions with Germany as the omitted reference country. Control variables include demographics, household characteristics (housing, access to credit, employment status, financial literacy), economic sentiment, trust, and inflation experience. Sample period: December 2024. Heteroskedasticity-robust standard errors in parentheses. Country labels: Austria (AT), Belgium (BE), Greece (GR), Finland (FI), France (FR), Ireland (IE), Italy (IT), the Netherlands (NL), Portugal (PT), and Spain (ES).