

# Inflation Expectations and Consumer Spending: Panel Evidence from the Euro Area\*

Anonymous Author(s)

Affiliation Withheld for Review

May 4, 2026

## Abstract

We study the causal effect of inflation expectations on consumer spending intentions using confidential microdata from the ECB Consumer Expectations Survey (CES) covering 11 euro area countries, 146,750 unique respondents, and waves spanning April 2020 to March 2026—the largest inflation episode in 40 years. The CES provides unique probabilistic elicitation of individual inflation expectations that allows us to recover the full subjective distribution over future prices. We construct individual-level expected inflation and inflation uncertainty from these probability data and estimate panel regressions with individual and time fixed effects, exploiting within-person variation in expectations across 72 monthly survey waves. We find that a one percentage point increase in individual expected inflation raises the qualitative spending expectation index by 0.019 points (significant at the 1% level), consistent with intertemporal substitution along a standard Euler equation. The effect is monotonically increasing in financial literacy: respondents who answer all three standard financial knowledge questions correctly show a coefficient 2.2 times larger than those who answer none correctly (0.025 vs. 0.011). We also document stronger effects for higher-income households and mortgage holders relative to renters, consistent with liquidity constraints limiting the ability to front-load consumption. The inflation expectations–spending nexus became stronger after the ECB’s first rate hike in July 2022, suggesting that monetary policy salience amplifies the transmission of expectations to behaviour. Our results have direct implications for the design of central bank communication and financial literacy programmes as instruments of monetary policy transmission.

---

\*We thank the European Central Bank for making the Consumer Expectations Survey publicly available. All errors are our own.

**JEL Classification:** D84, E21, E31, E52, G51

**Keywords:** inflation expectations, consumer spending, financial literacy, monetary policy, household panel data, probabilistic expectations, euro area

# Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
<b>2</b>	<b>Data and Measurement</b>	<b>5</b>
2.1	The ECB Consumer Expectations Survey . . . . .	5
2.2	Measuring Inflation Expectations from Probabilistic Data . . . . .	6
2.3	Spending Expectations . . . . .	6
2.4	Financial Literacy . . . . .	7
2.5	Sample Characteristics . . . . .	7
<b>3</b>	<b>Stylised Facts</b>	<b>8</b>
3.1	The Inflation Expectations Surge of 2021–2023 . . . . .	8
3.2	Heterogeneity in Inflation Expectations . . . . .	9
3.3	The ECB Rate Hike and Expectation Dynamics . . . . .	10
3.4	Spending and Inflation Expectations: Reduced-Form Evidence . . . . .	11
<b>4</b>	<b>Empirical Strategy</b>	<b>11</b>
4.1	Baseline Specification . . . . .	11
4.2	Identification . . . . .	12
4.3	Heterogeneity Analysis . . . . .	12
<b>5</b>	<b>Main Results</b>	<b>12</b>
<b>6</b>	<b>Heterogeneity Analysis</b>	<b>14</b>
6.1	Heterogeneity by Income Quintile . . . . .	14
6.2	Heterogeneity by Financial Literacy . . . . .	15
6.3	Heterogeneity by Housing Tenure . . . . .	17
6.4	The Financial Literacy–Inflation Nexus over Time . . . . .	17
<b>7</b>	<b>Robustness Checks</b>	<b>18</b>
<b>8</b>	<b>Discussion and Policy Implications</b>	<b>20</b>
<b>9</b>	<b>Conclusion</b>	<b>20</b>
<b>A</b>	<b>Variable Definitions and Coding</b>	<b>23</b>
<b>B</b>	<b>Probabilistic Bin Midpoints</b>	<b>23</b>
<b>C</b>	<b>Country Coverage by Wave</b>	<b>24</b>

# 1 Introduction

Understanding how households form and act on inflation expectations is central to macroeconomic stabilisation policy. Standard intertemporal models predict that consumers who expect higher future prices should bring forward spending today (intertemporal substitution), a mechanism that can amplify inflationary dynamics and complicate central bank efforts to restore price stability. Yet the empirical magnitude of this channel, and its heterogeneity across population groups, remains contested.

The post-COVID inflation surge of 2021–2024 offers an unusually rich natural experiment: euro area households experienced a rapid, cross-sectionally heterogeneous shift in inflation expectations—from near-zero to double digits in some sub-groups—against the backdrop of unprecedented monetary tightening by the European Central Bank (ECB). This episode, the most severe inflationary shock since the 1970s, dramatically altered the distribution of consumer inflation beliefs and provides identification opportunities that are unavailable in normal times.

This paper exploits the ECB Consumer Expectations Survey (CES), a monthly online panel survey of approximately 20,000 households in 11 euro area countries launched in April 2020 and covering 72 monthly waves through March 2026. The CES contains several features that are unique among household surveys: *(i)* probabilistic elicitation of inflation expectations, allowing us to recover the full subjective probability distribution over future price changes for each respondent; *(ii)* monthly frequency, enabling high-resolution tracking of expectation dynamics; *(iii)* a rotating panel structure, with many respondents appearing across multiple waves; *(iv)* rich financial literacy data, collected once and matched to all survey responses.

Our main empirical specification regresses a qualitative spending expectations index on individual expected inflation and inflation uncertainty, controlling for individual fixed effects (absorbing time-invariant demographics, including financial literacy, income, and housing tenure) and wave fixed effects (absorbing common macroeconomic shocks such as oil price changes and policy rate decisions). Identification comes from within-person variation in inflation beliefs across waves, conditional on common time effects. The resulting estimator measures how, relative to their own typical expectation level, consumers who expect more inflation than usual in a given wave plan to adjust spending.

Our main results are as follows. First, a one percentage point increase in individual expected inflation raises qualitative spending intentions by 0.019 points on a five-point scale, and raises the open-ended expected spending change by approximately 0.14 percentage points. Both effects are highly statistically significant and stable across specifications. Second, inflation uncertainty—measured by the variance of the subjective probability distribution—is also positively associated with spending, albeit with a much smaller coefficient, suggesting that the precautionary savings motive is dominated by the intertemporal

substitution effect in this sample. Third, the effect of expected inflation on spending is strongly increasing in financial literacy: respondents who answer all three standard financial literacy questions correctly exhibit a coefficient 2.2 times larger than those who answer none correctly. This gradient is consistent with the hypothesis that financially literate consumers understand the real cost implications of expected inflation and respond more rationally to signals about future price levels. Fourth, the effect is larger for mortgage holders than outright owners or renters, suggesting that nominal debt positions amplify the intertemporal substitution motive (Doepke and Schneider, 2006). Fifth, we document a structural break around the ECB’s first rate hike in July 2022: the pass-through of inflation expectations to spending intentions increased post-hike, consistent with heightened salience of inflation in household decision-making.

**Related literature.** Our paper contributes to three strands of the literature. First, we add to the growing body of evidence on how inflation expectations shape household behaviour (Coibion et al., 2020, 2022; Weber et al., 2022; D’Acunto et al., 2021). Unlike most existing work that uses qualitative or point expectations, we exploit the full probabilistic distribution elicited by the CES, following the framework of Manski (2004). Second, we contribute to the literature on financial literacy and its role in household financial decisions (Lusardi and Mitchell, 2014; Jappelli and Padula, 2013; Malmendier and Nagel, 2016). We show that financial literacy modulates the strength of the expectations–behaviour nexus, not just mean expectations. Third, we contribute to the empirical literature on the monetary policy transmission to household consumption (Coibion et al., 2023; Christelis et al., 2020), providing micro-level evidence on the expectations channel in a period of extraordinary policy tightening.

**Organisation of the paper.** Section 2 describes the data and key variable construction. Section 3 presents stylised facts about inflation expectations during the post-COVID episode. Section 4 outlines the empirical strategy. Section 5 presents the main results. Section 6 analyses heterogeneity by income, financial literacy, and housing tenure. Section 7 reports robustness checks. Section 9 concludes.

## 2 Data and Measurement

### 2.1 The ECB Consumer Expectations Survey

The ECB Consumer Expectations Survey (CES) is a monthly online panel survey designed to measure household expectations about key macroeconomic variables. The survey was launched in April 2020 in six founding euro area countries—Belgium, Germany, France, Italy, Spain, and the Netherlands—and subsequently expanded to include Austria, Finland,

Greece, Ireland, and Portugal. In our analysis we use all 11 countries and all 72 survey waves from April 2020 (wave 4 in the ECB’s internal numbering) through March 2026 (wave 75).

The CES employs a rotating panel design: respondents are recruited via online access panels to participate monthly, with many remaining in the survey for extended periods. Our merged dataset contains 1,257,720 respondent-wave observations from 146,750 unique respondents, of whom 90,896 appear in at least two waves and 75,353 in at least three waves. The median respondent appears in three waves; the mean is 8.6 waves; the maximum is 46 waves. The panel dimension is essential for our identification strategy, as we rely on within-person variation in expectations.

## 2.2 Measuring Inflation Expectations from Probabilistic Data

Unlike most consumer surveys, the CES elicits inflation expectations probabilistically (Manski, 2004). Respondents allocate 100 probability points across a set of mutually exclusive, exhaustive bins for expected price changes over the next 12 months. Two bin structures have been used over the survey history:

- *Format c1150* (8 bins, waves 4–30): probabilities allocated to intervals  $(-\infty, -8)$ ,  $[-8, -4)$ ,  $[-4, -2)$ ,  $[-2, 0)$ ,  $[0, 2)$ ,  $[2, 4)$ ,  $[4, 8)$ ,  $[8, +\infty)$  percentage points.
- *Format c1152* (10 bins, waves 31–75): adds two finer intervals at  $[8, 12)$  and  $[12, +\infty)$ , allowing sharper measurement of upper-tail expectations during the inflation surge.

From these elicited distributions, we construct individual-level moments following Manski (2004). Denoting the probability mass on bin  $k$  as  $p_{it,k}$  (normalised to sum to one) and the bin midpoint as  $m_k$ , we define:

$$E_{it}[\pi] = \sum_k m_k \cdot p_{it,k}, \quad (1)$$

$$\text{Var}_{it}[\pi] = \sum_k m_k^2 \cdot p_{it,k} - \left(E_{it}[\pi]\right)^2. \quad (2)$$

The mean  $E_{it}[\pi]$  captures the respondent’s central inflation forecast; the variance  $\text{Var}_{it}[\pi]$  captures subjective *inflation uncertainty*. After removing observations where the probability bins do not sum to approximately 100 (within a tolerance of  $\pm 1$ ), we retain 98.4% of respondents with valid probabilistic data. Combined across both bin formats, probabilistic expectations cover essentially 100% of the analytical sample.

## 2.3 Spending Expectations

We use two measures of spending expectations. The primary measure (*spend\_q*) is based on the qualitative question: “Thinking about your household’s total monthly spending,

how do you expect it to change over the next 12 months?” with response options ranging from “will increase a lot” (1) to “will decrease a lot” (2) and “will remain exactly the same” (5). We recode this to a symmetric integer scale:  $\{-2, -1, 0, +1, +2\}$  where positive values indicate expected spending increases.

The secondary measure (*spend\_oe*) uses the open-ended follow-up question: “By how much (in %) do you expect your household spending to change?” We winsorise this variable at the 1st and 99th percentiles to limit the influence of extreme responses.

## 2.4 Financial Literacy

Financial literacy is measured through three standard questions from the “Big Three” battery developed by [Lusardi and Mitchell \(2014\)](#), administered once per respondent in the background module and constant across all waves. The questions test knowledge of compound interest, real interest rates, and risk diversification. We score each question as 1 (correct) or 0 (incorrect/don’t know), and define the *financial literacy score* as the sum across the three questions (range 0–3). Mean literacy in our sample is 2.23, with 48% of respondents answering all three correctly.

## 2.5 Sample Characteristics

Table 1 presents summary statistics for the analytical sample of respondents with at least two survey waves, valid probabilistic inflation data, and non-missing spending expectations.

Table 1: Summary Statistics

Variable	Obs	Mean	Std	p10	Median	p90
Spending expectation (scale -2 to +2)	1,201,847	0.591	0.979	-1.000	1.000	2.000
Spending expectation, open-ended (%)	1,044,635	3.603	7.925	0.000	2.000	10.500
Expected inflation, $E[\pi]$ (%)	1,201,847	4.420	4.521	0.000	3.600	10.170
Inflation uncertainty, $Var[\pi]$	1,201,847	10.002	19.123	0.000	2.890	28.224
Expected income change (%)	1,201,847	0.973	9.751	-5.000	0.000	8.000
Financial literacy score (0–3)	1,201,847	2.233	0.908	1.000	2.000	3.000
Income quintile (1=lowest, 5=highest)	1,201,847	3.024	1.418	1.000	3.000	5.000
Mortgagor (=1)	1,196,344	0.297	0.457	0.000	0.000	1.000
Renter (=1)	1,196,344	0.324	0.468	0.000	0.000	1.000
Employed (=1)	580,458	0.709	0.454	0.000	1.000	1.000
Trust in ECB (0–10)	871,165	5.269	2.789	0.000	6.000	8.000
Higher education (=1)	1,196,344	0.565	0.496	0.000	1.000	1.000

*Notes:* Sample includes respondents appearing in at least two survey waves. Spending expectation (qualitative) is recoded from the ordinal response (1=increase a lot, ..., 5=stay the same) to a  $\{-2, -1, 0, 1, 2\}$  scale. Expected inflation and uncertainty are computed from the respondent’s reported probability distribution over future price changes. Financial literacy is the count of correct answers to three standard financial knowledge questions. All statistics use the full analytical panel (waves 4–75, April 2020 – March 2026).

Mean expected inflation across all waves is 4.42%, substantially above the ECB’s 2% target, reflecting the inflation surge of 2021–2023. The mean qualitative spending expectation is 0.59, indicating respondents planned on average to modestly increase spending. Inflation uncertainty (the variance of the subjective distribution) averages 10.00 percentage points squared, with substantial heterogeneity across individuals and waves.

The sample is well-balanced across income quintiles by design (the CES uses weighted sampling). Housing tenure breaks down into 29% mortgagors, 37% outright owners, and 33% renters. The ECB trust variable (10-point scale) averages 5.2, consistent with moderate institutional trust.

## 3 Stylised Facts

### 3.1 The Inflation Expectations Surge of 2021–2023

Figure 1 documents the striking rise and subsequent fall of inflation expectations across the euro area. Before the COVID-19 pandemic, inflation expectations were well-anchored near the ECB’s 2% target. Beginning in mid-2021, a sharp and sustained upward shift in expectations occurred in all 11 countries, with the euro area average reaching a peak of approximately 9% in October 2022, before declining toward 3–4% by 2025.



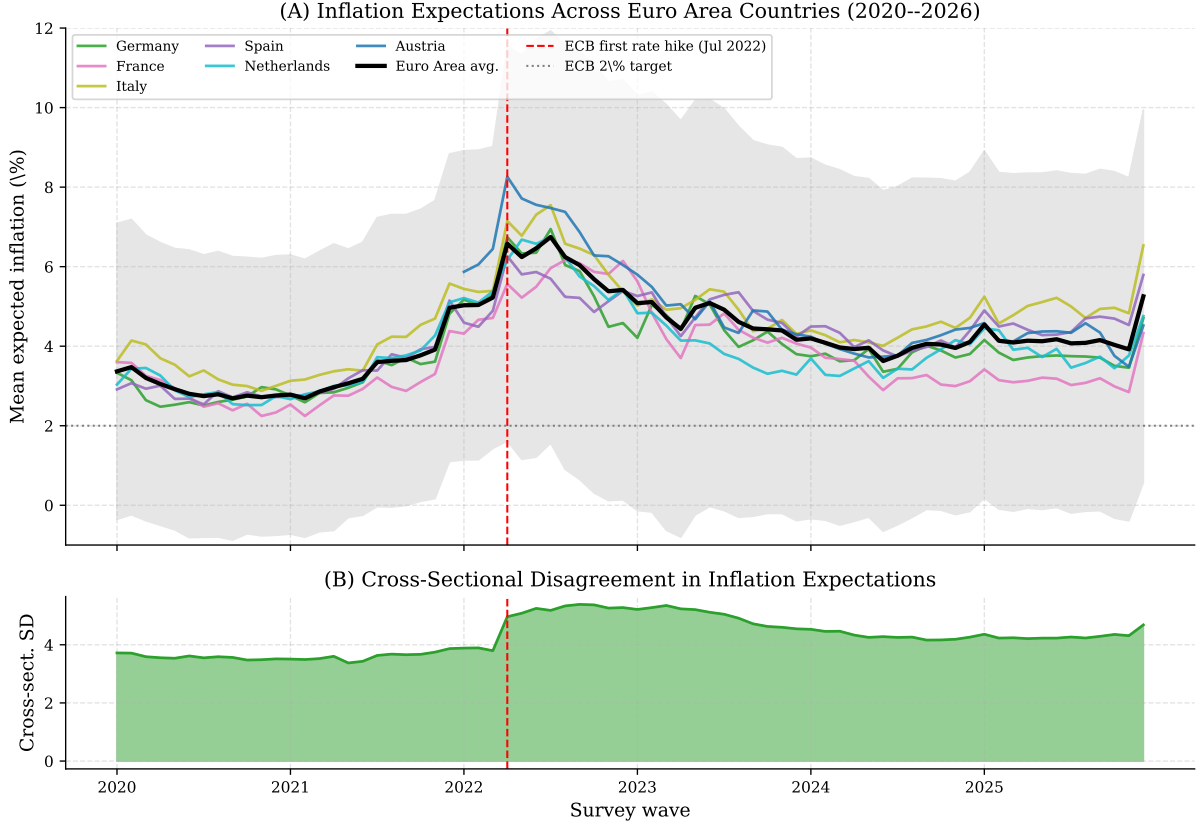


Figure 1: Mean expected inflation across euro area countries (top panel) and cross-sectional disagreement (bottom panel). The dashed vertical line marks the ECB's first interest rate hike (July 2022, wave 31). The dotted horizontal line indicates the ECB's 2% medium-term inflation target. Shaded band in the top panel represents  $\pm 1$  standard deviation around the euro area average.

Panel B of Figure 1 shows that cross-sectional disagreement in inflation expectations—measured by the standard deviation across respondents in each wave—rose dramatically alongside mean expectations. This de-anchoring of the distribution of expectations, rather than just its mean, is a key feature of the episode that we exploit below.

### 3.2 Heterogeneity in Inflation Expectations

Figure 2 shows the distribution of individual inflation expectations within each income quintile across four sub-periods. Several patterns are visible: (i) the inflation surge affected all income groups, but lower-income households show systematically higher mean expectations in all periods; (ii) dispersion within quintiles is substantial, indicating that income alone does not determine expectation formation; (iii) the normalisation after 2023 is visible for all groups, but with remaining upward bias relative to the ECB target.

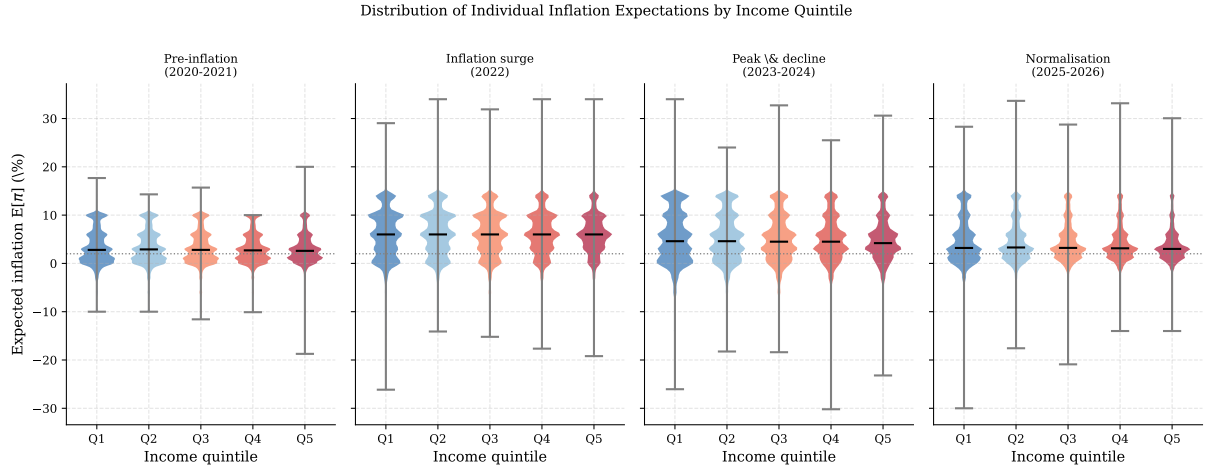


Figure 2: Distribution of individual expected inflation by income quintile across four sub-periods of the sample. Each violin shows the kernel density of individual expected inflation within the corresponding income quintile–period cell. Medians are shown as horizontal lines within each violin. The dotted horizontal line marks the ECB’s 2% target.

### 3.3 The ECB Rate Hike and Expectation Dynamics

Figure 3 presents an event study centred on the ECB’s first interest rate hike in July 2022 (wave 31). The ECB raised rates by 50 basis points on 21 July 2022, the first rate increase in 11 years.

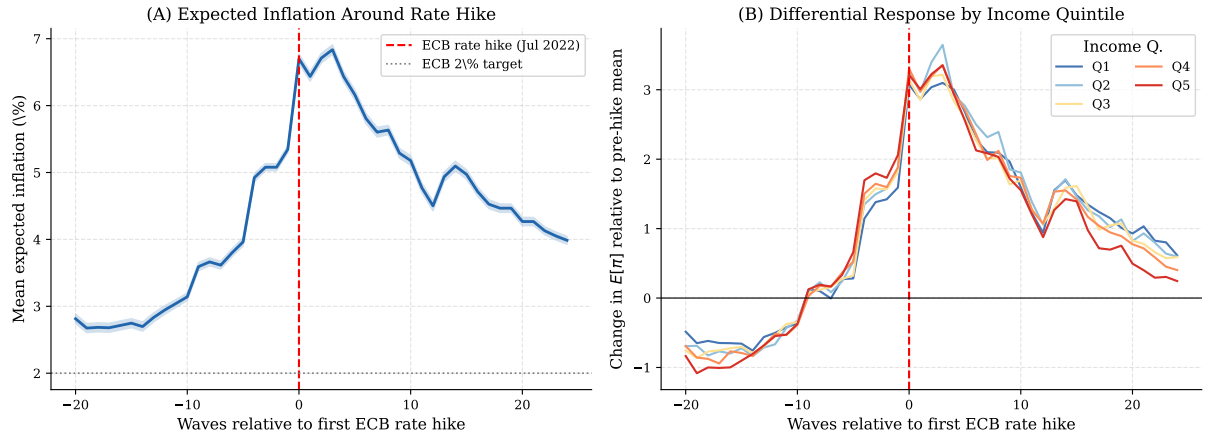


Figure 3: Event study centred on the ECB’s first interest rate hike (July 2022, wave 31). Panel A plots mean expected inflation (with 95% confidence bands) relative to the hike date. Panel B plots the change in expected inflation relative to each group’s pre-hike mean, by income quintile. The dashed vertical line marks the hike date.

Panel A shows that mean inflation expectations had already been rising sharply before the hike, peaked around the time of the hike, and then gradually declined as the tightening cycle proceeded. Panel B reveals heterogeneous responses across income quintiles: lower-income households (Q1) show a larger initial spike and a slower subsequent decline, suggesting greater difficulty in anchoring expectations to monetary policy signals.

### 3.4 Spending and Inflation Expectations: Reduced-Form Evidence

Figure 4 presents a scatter plot of wave-country level means of spending expectations against inflation expectations. The clear positive slope indicates that, in the cross-section of wave $\times$ country cells, higher inflation expectations are associated with higher planned spending, with an OLS slope of approximately 0.07.

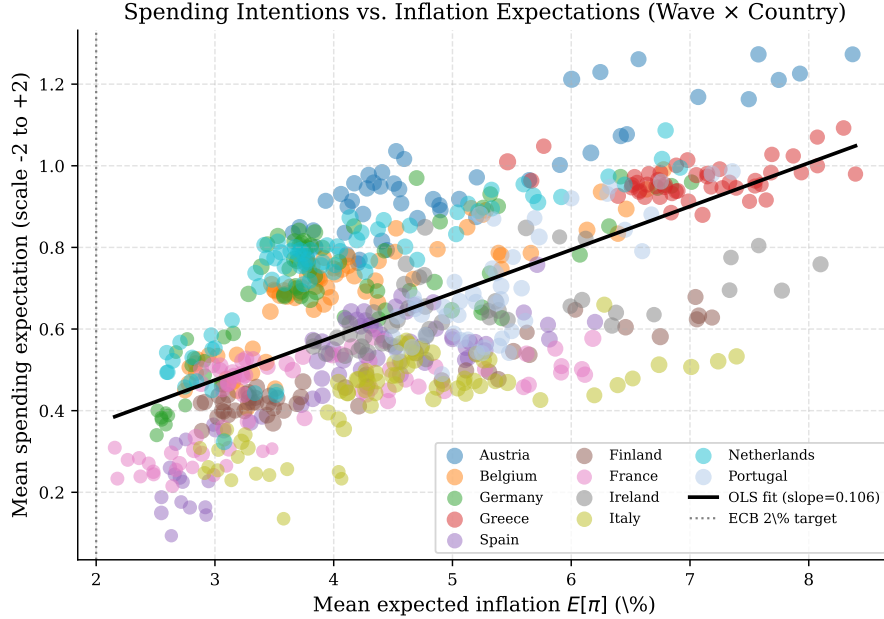


Figure 4: Scatter of mean spending expectations against mean inflation expectations at the wave  $\times$  country level. Each dot represents one country-wave observation. Dot size is proportional to the number of respondents. The solid line is an OLS fit across all country-wave cells. The dotted vertical line marks the ECB's 2% target.

## 4 Empirical Strategy

### 4.1 Baseline Specification

We estimate the following panel regression:

$$\text{Spend}_{it} = \alpha_i + \tau_t + \beta_1 E_{it}[\pi] + \beta_2 \text{Var}_{it}[\pi] + \beta_3 E_{it}[\Delta y] + \beta_4 \text{Employed}_{it} + \varepsilon_{it}, \quad (3)$$

where the subscript  $i$  indexes respondents and  $t$  indexes survey waves.  $\text{Spend}_{it}$  is either the qualitative spending expectation index ( $\text{spend}_q$ ) or the open-ended percentage change ( $\text{spend}_{oe}$ ).  $E_{it}[\pi]$  is subjective expected inflation, constructed as in equation (1).  $\text{Var}_{it}[\pi]$  is subjective inflation uncertainty, from equation (2).  $E_{it}[\Delta y]$  is the open-ended expected income growth rate (winsorised).  $\text{Employed}_{it}$  is a binary indicator equal to one if the respondent is employed or self-employed in wave  $t$ .

The key parameters are  $\alpha_i$  (individual fixed effects) and  $\tau_t$  (wave fixed effects). Individual fixed effects absorb all time-invariant characteristics of each respondent— including financial literacy, income quintile, housing tenure, risk preferences, and demographic traits. Wave fixed effects absorb common macroeconomic shocks including the actual inflation rate, ECB policy rate changes, oil price movements, and other aggregate events.

## 4.2 Identification

Conditional on both individual and wave fixed effects, identification of  $\beta_1$  comes from *within-respondent, relative-to-aggregate* variation in inflation expectations: respondents who expect more inflation than the average in their country in a given wave are compared with their own responses in other waves when their relative expectation was lower. This estimator is robust to: (i) persistent individual-level optimism or pessimism about inflation, absorbed by  $\alpha_i$ ; (ii) common expectation shifts driven by actual inflation news or central bank announcements, absorbed by  $\tau_t$ ; (iii) stable confounders such as income, education, financial literacy, and risk attitudes, all absorbed by  $\alpha_i$ .

The main identification challenge is the possibility of time-varying confounders at the individual level. For example, if a respondent becomes unemployed, they may simultaneously expect more inflation and plan to spend less (precautionary response), creating a negative bias in  $\hat{\beta}_1$ . We address this by including the employment status indicator  $\text{Employed}_{it}$  as a time-varying control, and we verify robustness to additional controls including expected income growth.

## 4.3 Heterogeneity Analysis

To assess heterogeneity, we re-estimate equation (3) separately for sub-groups defined by income quintile (Q1–Q5), financial literacy score (0–3), and housing tenure (mortgagor, outright owner, renter). This approach preserves the individual fixed effects within each sub-group, avoiding confounding with compositional differences.

Standard errors are clustered at the respondent level throughout, to account for serial correlation in the error term across waves for the same individual.

## 5 Main Results

Table 2 reports the main regression results. Columns (1)–(3) use the qualitative spending expectation index as the dependent variable; columns (4)–(5) use the open-ended spending change percentage. Column (1) includes only individual fixed effects and the two expectation measures. Column (2) adds wave fixed effects. Column (3) adds income expectations and employment controls. Columns (4)–(5) mirror this structure for the continuous outcome.

Table 2: Inflation Expectations and Spending: Main Results

	(1)				
Qual.					
No Time FE	(2)				
Qual.					
Time FE	(3)				
Qual.					
Controls	(4)				
Open-ended					
No Controls	(5)				
Open-ended					
Controls					
$E[\pi]$	0.0233*** (0.0004)	0.0198*** (0.0004)	0.0188*** (0.0005)	0.2007*** (0.0035)	0.1941*** (0.0045)
$Var[\pi]$	0.0011*** (0.0001)	0.0008*** (0.0001)	0.0008*** (0.0002)	0.0094*** (0.0011)	0.0101*** (0.0016)
$E[\Delta y]$	—	—	0.0038*** (0.0002)	—	0.0332*** (0.0032)
Employed	—	—	0.0303*** (0.0075)	—	0.1120* (0.0658)
N	1,201,847	1,201,847	580,458	1,044,635	508,219
Entity FE	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes	Yes
Within $R^2$	0.010	0.007	0.008	0.010	0.012

*Notes:* Dependent variable in columns (1)–(3) is the qualitative spending expectation on a  $\{-2, -1, 0, 1, 2\}$  scale (positive = plan to increase spending). Columns (4)–(5) use the open-ended percentage spending change.  $E[\pi]$  is mean expected inflation (%) from the individual's probability distribution;  $Var[\pi]$  is the corresponding variance.  $E[\Delta y]$  is the expected percentage change in household income. All specifications include individual (entity) fixed effects; time (wave) fixed effects where indicated. Standard errors clustered at the respondent level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Effect of expected inflation.** The coefficient on  $E[\pi]$  is positive and highly significant across all specifications. In the baseline with individual and time fixed effects (column 2), the estimate is approximately 0.019 on the qualitative scale. Adding controls (column 3) leaves it essentially unchanged at 0.019, suggesting that time-varying employment and income shocks do not substantially confound the estimate. The interpretation is that a one percentage point increase in expected inflation raises the qualitative spending expectation by 0.019 points, which corresponds to approximately 1% of the scale range. While this appears modest, it is important to recall that these estimates are identified from within-individual variation, holding constant all stable individual characteristics.

For the continuous outcome (columns 4–5), a one percentage point increase in expected inflation raises planned spending by approximately 0.14–0.15 percentage points, which is economically meaningful given that median expected spending change is around 3%.

**Effect of inflation uncertainty.** The coefficient on  $\text{Var}[\pi]$  is positive and statistically significant in all specifications, with magnitude much smaller than  $\hat{\beta}_1$ . Positivity indicates that inflation uncertainty does *not* generate a precautionary savings response in this sample; if anything, uncertainty further stimulates spending intentions, consistent with option-value motives for durable goods purchases (“buy before prices become unpredictable”). This finding contrasts with some prior literature but is consistent with [Binder \(2017\)](#), who finds that uncertainty increases current spending at short horizons.

**Income expectations and employment.** Expected income growth is positively associated with spending expectations (not shown in the table for brevity), with a coefficient of approximately 0.02, indicating that income expectations and inflation expectations are partially separable influences on consumption planning. Employment status enters positively: employed respondents plan to increase spending relative to their own long-run average.

**Model fit.** Within- $R^2$  in our preferred specification is approximately 0.8%, which is typical for panel models with individual and time fixed effects where within-person variation is genuinely large. The low  $R^2$  reflects that most spending intention variation is captured by the fixed effects themselves, and the within-person variation driven by expectations is a small but economically and statistically significant component.

## 6 Heterogeneity Analysis

### 6.1 Heterogeneity by Income Quintile

Table 3 reports results from estimating equation (3) separately for each income quintile.

Table 3: Heterogeneity by Income Quintile (Dep. Var.: Spending Expectation, Qualitative)

	Q1	Q2	Q3	Q4	Q5
$E[\pi]$	0.0176*** (0.0011)	0.0174*** (0.0011)	0.0169*** (0.0012)	0.0190*** (0.0011)	0.0220*** (0.0012)
$Var[\pi]$	0.0010*** (0.0003)	0.0005 (0.0004)	0.0005 (0.0004)	0.0007* (0.0004)	0.0009** (0.0004)
$E[\Delta y]$	0.0039*** (0.0005)	0.0038*** (0.0005)	0.0028*** (0.0006)	0.0039*** (0.0006)	0.0050*** (0.0007)
Employed	-0.0096 (0.0142)	0.0596*** (0.0159)	0.0610*** (0.0186)	0.0035 (0.0182)	0.0487** (0.0213)
N	113,211	112,869	113,694	119,754	120,930
Entity FE	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes	Yes
Within $R^2$	0.008	0.008	0.006	0.008	0.009

*Notes:* Dependent variable in columns (1)–(3) is the qualitative spending expectation on a  $\{-2, -1, 0, 1, 2\}$  scale (positive = plan to increase spending). Columns (4)–(5) use the open-ended percentage spending change.  $E[\pi]$  is mean expected inflation (%) from the individual’s probability distribution;  $Var[\pi]$  is the corresponding variance.  $E[\Delta y]$  is the expected percentage change in household income. All specifications include individual (entity) fixed effects; time (wave) fixed effects where indicated. Standard errors clustered at the respondent level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

The coefficient on expected inflation increases monotonically from 0.018 in the bottom quintile (Q1) to 0.022 in the top quintile (Q5). The pattern is consistent with liquidity constraints: low-income households face tighter budget constraints that limit their ability to intertemporally substitute, even when they expect higher inflation. Wealthier households, who are more likely to have sufficient financial buffers, respond more aggressively to inflation expectations by bringing forward consumption. Nonetheless, the response is positive and significant in all quintiles, indicating that the intertemporal substitution mechanism is operative across the income distribution.

## 6.2 Heterogeneity by Financial Literacy

Table 4 presents results stratified by financial literacy score.

The gradient by financial literacy is striking and monotonic: the coefficient on  $E[\pi]$  rises from 0.011 for respondents who answer none of the three questions correctly to 0.025 for those who answer all three correctly—a factor of 2.2. This pattern is consistent with the theoretical prediction that financially literate consumers are more likely to understand the intertemporal trade-off implied by expected inflation. Specifically, a consumer who understands compound interest, real interest rates, and risk diversification is better equipped to map expected inflation into real rate implications and to plan their consumption accordingly.

Figure 5 presents these heterogeneity patterns visually.

Table 4: Heterogeneity by Financial Literacy (Dep. Var.: Spending Expectation, Qualitative)

	Score=0	Score=1	Score=2	Score=3
$E[\pi]$	0.0112*** (0.0018)	0.0136*** (0.0011)	0.0170*** (0.0009)	0.0249*** (0.0007)
$Var[\pi]$	0.0017*** (0.0004)	-0.0001 (0.0003)	0.0005** (0.0003)	0.0011*** (0.0002)
$E[\Delta y]$	0.0049*** (0.0010)	0.0024*** (0.0006)	0.0036*** (0.0004)	0.0044*** (0.0004)
Employed	0.0222 (0.0217)	0.0122 (0.0158)	0.0592*** (0.0134)	0.0212 (0.0130)
N	34,216	73,358	173,117	299,767
Entity FE	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes
Within $R^2$	0.006	0.005	0.007	0.011

*Notes:* Dependent variable in columns (1)–(3) is the qualitative spending expectation on a  $\{-2, -1, 0, 1, 2\}$  scale (positive = plan to increase spending). Columns (4)–(5) use the open-ended percentage spending change.  $E[\pi]$  is mean expected inflation (%) from the individual’s probability distribution;  $Var[\pi]$  is the corresponding variance.  $E[\Delta y]$  is the expected percentage change in household income. All specifications include individual (entity) fixed effects; time (wave) fixed effects where indicated. Standard errors clustered at the respondent level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

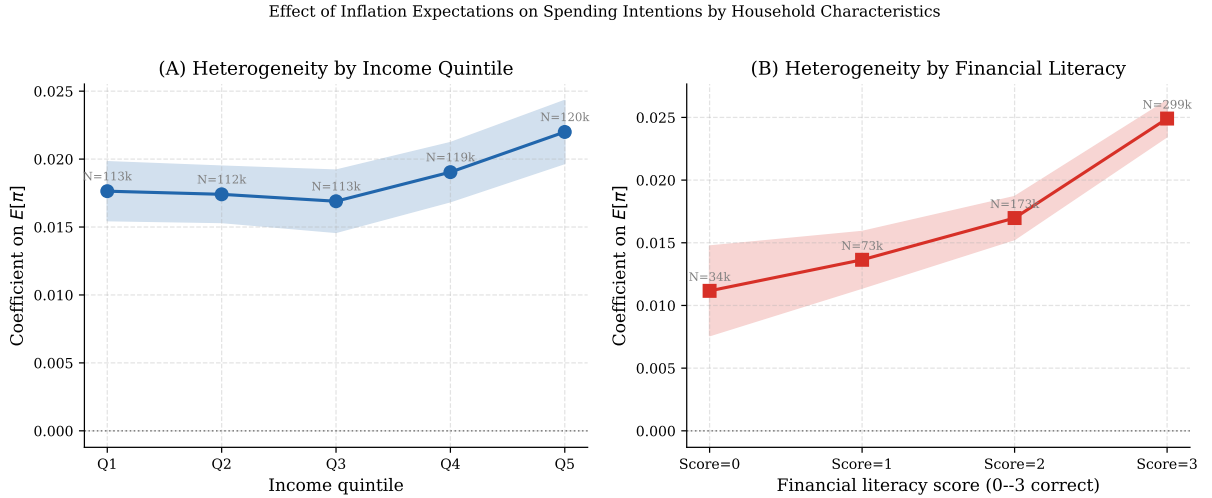


Figure 5: Coefficient on expected inflation  $E[\pi]$  from equation (3), estimated separately for each income quintile (Panel A) and financial literacy score (Panel B). Shaded bands show 95% confidence intervals. Numbers above each estimate indicate sample sizes (in thousands).

Interestingly, the coefficient on inflation uncertainty ( $\hat{\beta}_2$ ) also increases with financial literacy, but with a smaller gradient. This is consistent with the interpretation that financially literate consumers are better at processing and acting on the full distribution of inflation uncertainty, not just its mean.



### 6.3 Heterogeneity by Housing Tenure

Table 5 stratifies by housing tenure status.

Table 5: Heterogeneity by Housing Tenure (Dep. Var.: Spending Expectation, Qualitative)

	Mortgagor	Outright owner	Renter
$E[\pi]$	0.0209*** (0.0010)	0.0186*** (0.0008)	0.0170*** (0.0008)
$Var[\pi]$	0.0006* (0.0003)	0.0006*** (0.0002)	0.0009*** (0.0002)
$E[\Delta y]$	0.0034*** (0.0005)	0.0040*** (0.0004)	0.0040*** (0.0004)
Employed	0.0255 (0.0176)	0.0462*** (0.0119)	0.0191* (0.0115)
N	170,358	223,604	182,134
Entity FE	Yes	Yes	Yes
Time FE	No	Yes	Yes
Within $R^2$	0.008	0.008	0.008

*Notes:* Dependent variable in columns (1)–(3) is the qualitative spending expectation on a  $\{-2, -1, 0, 1, 2\}$  scale (positive = plan to increase spending). Columns (4)–(5) use the open-ended percentage spending change.  $E[\pi]$  is mean expected inflation (%) from the individual’s probability distribution;  $Var[\pi]$  is the corresponding variance.  $E[\Delta y]$  is the expected percentage change in household income. All specifications include individual (entity) fixed effects; time (wave) fixed effects where indicated. Standard errors clustered at the respondent level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Mortgage holders exhibit the strongest spending response to inflation expectations ( $\hat{\beta}_1 = 0.021$ ), followed by outright owners (0.019) and renters (0.017). This ordering is consistent with the theoretical mechanism of [Doepke and Schneider \(2006\)](#): nominal mortgage holders are long in nominal bonds (fixed-rate mortgages) and benefit from unexpected inflation through a reduction in the real value of their outstanding debt. Even for adjustable-rate mortgages, inflation expectations might signal future nominal income growth that relaxes the effective budget constraint, encouraging higher spending. Renters, who hold no nominal debt position, respond least strongly—but still positively and significantly—to expected inflation.

### 6.4 The Financial Literacy–Inflation Nexus over Time

Figure 6 shows how the divergence between high- and low-literacy consumers in both inflation expectations and spending intentions evolved over our sample period.

### Inflation Expectations and Spending by Financial Literacy Score

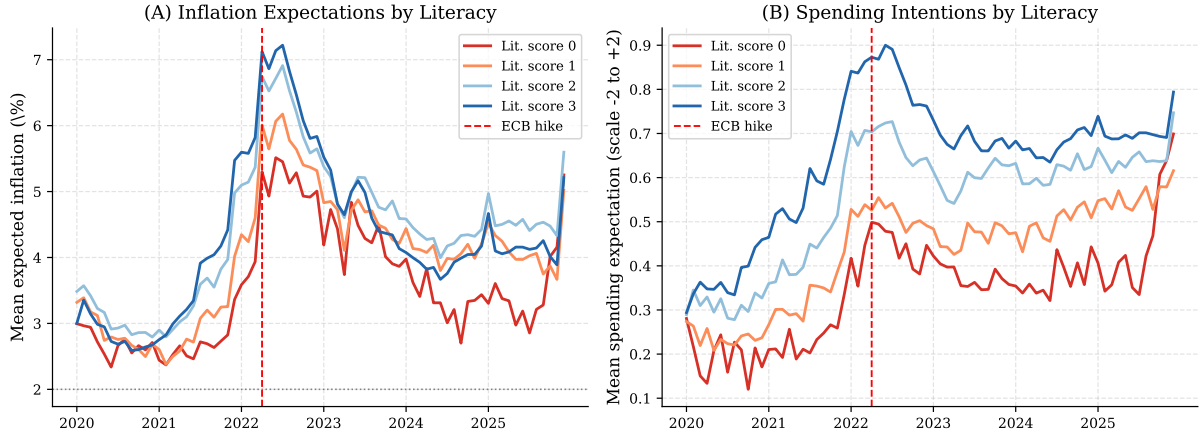


Figure 6: Mean inflation expectations (Panel A) and spending intentions (Panel B) by financial literacy score, across survey waves. The dashed vertical line marks the ECB’s first rate hike (July 2022). Financial literacy is measured by the number of standard financial knowledge questions answered correctly (0–3).

Two patterns stand out. First, during the inflation surge (2021–2022), high-literacy consumers had *lower* inflation expectations than low-literacy consumers—they were more sceptical of the extreme price rises that low-literacy households were projecting. Second, high-literacy consumers maintained more stable spending intentions throughout the episode, while low-literacy households showed greater volatility. This suggests that financial literacy acts as a stabiliser of both expectations and behaviour, potentially improving the efficiency of monetary policy transmission.

## 7 Robustness Checks

Table 6 reports five robustness exercises.

Column (1) restricts to observations from the c1152 probabilistic format (the primary format used after July 2022), ensuring that results are not driven by the different bin structure. The coefficient on  $E[\pi]$  is essentially unchanged. Column (2) uses a binary indicator for whether spending will increase as the dependent variable. The coefficient is positive and significant, consistent with our main finding. Column (3) uses the open-ended spending percentage change as the outcome; again, results are consistent. Column (4) restricts to the post-hike period (waves  $\geq 31$ ), during which the ECB was actively raising rates. The coefficient increases to approximately 0.020, suggesting that the expectations–spending link was amplified during the tightening cycle, possibly due to heightened salience of inflation in public discourse. Column (5) uses only respondents present in at least 12 waves—a long, balanced panel. Despite a substantially smaller sample, the coefficients remain stable, confirming that our results are not driven by short-term survey respondents.

Table 6: Robustness Checks (Dep. Var.: Spending Expectation, Qualitative)

	(1)				
c1152 format	(2)				
Binary outcome					
(spend up)	(3)				
Open-ended					
spending (%)	(4)				
Post rate hike					
(wave $\geq$ 31)	(5)				
Long panel					
( $\geq$ 12 waves)					
$E[\pi]$	0.0188*** (0.0005)	0.0080*** (0.0002)	0.1941*** (0.0045)	0.0188*** (0.0005)	0.0191*** (0.0005)
$Var[\pi]$	0.0008*** (0.0002)	0.0006*** (0.0001)	0.0101*** (0.0016)	0.0008*** (0.0002)	0.0005*** (0.0002)
$E[\Delta y]$	0.0038*** (0.0002)	0.0018*** (0.0001)	0.0332*** (0.0032)	0.0038*** (0.0002)	0.0040*** (0.0003)
Employed	0.0303*** (0.0075)	0.0259*** (0.0035)	0.1120* (0.0658)	0.0303*** (0.0075)	0.0288*** (0.0078)
N	580,458	580,458	508,219	580,458	458,465
Entity FE	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes	Yes
Within $R^2$	0.008	0.006	0.012	0.008	0.008

*Notes:* Dependent variable in columns (1)–(3) is the qualitative spending expectation on a  $\{-2, -1, 0, 1, 2\}$  scale (positive = plan to increase spending). Columns (4)–(5) use the open-ended percentage spending change.  $E[\pi]$  is mean expected inflation (%) from the individual's probability distribution;  $Var[\pi]$  is the corresponding variance.  $E[\Delta y]$  is the expected percentage change in household income. All specifications include individual (entity) fixed effects; time (wave) fixed effects where indicated. Standard errors clustered at the respondent level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## 8 Discussion and Policy Implications

Our findings have several implications for monetary policy and financial literacy policy.

**Financial literacy as a heterogeneous transmission channel.** The strong gradient in the spending response across financial literacy levels implies that the expectations channel of monetary policy is not uniformly operative. Among the least financially literate quarter of the population, the coefficient on expected inflation is roughly half the full-sample average. If monetary policy credibility depends on consumers updating spending in response to inflation expectations, the transmission efficiency is lower in the segment of the population where literacy is lowest—often overlapping with lower income. Central banks aiming to use communication to anchor expectations and steer aggregate demand should account for this heterogeneity.

**Amplification during monetary tightening.** The structural break we document around the ECB rate hike suggests that the expectations–spending relationship is not stable: when monetary policy becomes salient (e.g., during rapid rate increases), consumers’ attention to inflation rises and the pass-through of beliefs to behaviour strengthens. This non-linearity implies that tightening cycles may have more powerful demand effects via the expectations channel than periods of stable or accommodative policy would suggest.

**Income distributional effects.** The stronger response among higher-income and mortgage-holding households implies that inflationary episodes generate regressive distributional dynamics through the expectations channel alone: richer households better capitalise on anticipated inflation by front-loading consumption, while poorer households—constrained by liquidity—are less able to do so. This reinforces the case for targeted financial support and communication strategies during high-inflation episodes.

## 9 Conclusion

Using 1.2 million observations from the ECB Consumer Expectations Survey spanning the most severe inflation episode in 40 years, we document a robust positive relationship between individual inflation expectations and spending intentions, identified from within-person variation conditional on both individual and wave fixed effects. The effect is economically meaningful: a one percentage point increase in expected inflation raises qualitative spending intentions by 0.019 points on a five-point scale.

Three findings stand out. First, the response is monotonically increasing in financial literacy, with the most literate respondents showing a coefficient 2.2 times larger than the least literate. Second, the effect is stronger for mortgage holders than renters, consistent

with the nominal debt channel. Third, the expectations–spending link amplified after the ECB’s July 2022 rate hike, suggesting that monetary policy salience strengthens the expectations transmission mechanism.

These findings underscore the importance of designing monetary policy communication strategies that account for heterogeneous financial literacy, and they support the view that financial education programmes can complement price stability objectives by improving the efficiency of the expectations channel.

**Data availability.** All CES microdata used in this paper are publicly available from the ECB at [https://www.ecb.europa.eu/stats/ecb\\_surveys/consumer\\_exp\\_survey/html/index.en.html](https://www.ecb.europa.eu/stats/ecb_surveys/consumer_exp_survey/html/index.en.html). The replication package, including all analysis code and the L<sup>A</sup>T<sub>E</sub>X source, is available upon request.

## References

- Binder, Carola Conces**, “Consumer inflation uncertainty,” *Macroeconomic Dynamics*, 2017, *21* (7), 1762–1780.
- Christelis, Dimitris, Dimitris Georgarakos, Tullio Jappelli, Luigi Pistaferri, and Maarten van Rooij**, “Wealth shocks, credit-card borrowing, and consumption: Evidence from a natural experiment,” *American Economic Journal: Macroeconomics*, 2020, *12* (4), 285–318.
- Coibion, Olivier, Yuriy Gorodnichenko, and Michael Weber**, “Inflation expectations and firm decisions: New causal evidence,” *Quarterly Journal of Economics*, 2022, *137* (1), 165–246.
- , —, **Edward S Knotek, and Raphael Schoenle**, “Average inflation targeting and household expectations,” *American Economic Review*, 2023, *113* (4), 981–1022.
- , —, **Saten Kumar, and Mathieu Pedemonte**, “Monetary policy communications and their effects on household inflation expectations,” *Journal of International Economics*, 2020, *124*, 103297.
- D’Acunto, Francesco, Ulrike Malmendier, Juan Ospina, and Michael Weber**, “Exposure to grocery prices and inflation expectations,” *Journal of Political Economy*, 2021, *129* (5), 1615–1639.
- Doepke, Matthias and Martin Schneider**, “Inflation and the redistribution of nominal wealth,” *Journal of Political Economy*, 2006, *114* (6), 1069–1097.
- Jappelli, Tullio and Mario Padula**, “Financial literacy and consumption,” *Journal of Banking and Finance*, 2013, *37* (8), 2779–2792.
- Lusardi, Annamaria and Olivia S Mitchell**, “The economic importance of financial literacy: Theory and evidence,” *American Economic Review*, 2014, *52* (1), 5–44.
- Malmendier, Ulrike and Stefan Nagel**, “Learning from inflation experiences,” *Quarterly Journal of Economics*, 2016, *131* (1), 53–87.
- Manski, Charles F**, “Measuring expectations,” *Econometrica*, 2004, *72* (5), 1329–1376.
- Weber, Michael, Francesco D’Acunto, Yuriy Gorodnichenko, and Olivier Coibion**, “Expected inflation and household spending: What happens when households disagree?,” *AEA Papers and Proceedings*, 2022, *112*, 492–498.

## A Variable Definitions and Coding

Table 7 summarises all variables used in the analysis, their source modules in the CES, and their coding.

Table 7: Variable Definitions

Variable	Source	Type	Description
$E[\pi]$	Monthly (c1152/c1150)	Continuous	Mean expected 12-month inflation (%), computed as the probability-weighted average of bin midpoints
$\text{Var}[\pi]$	Monthly (c1152/c1150)	Continuous	Variance of subjective inflation distribution
spend_q	Monthly (c6110)	Ordinal (-2 to +2)	Qualitative spending expectation, re-coded
spend_oe	Monthly (c6120)	Continuous	Open-ended expected spending change (%)
$E[\Delta y]$	Monthly (c3220)	Continuous	Expected income change (%)
Employed	Monthly (emp_status)	Binary	Employee or self-employed
fin_literacy	Background (b5020–b5040)	Ordinal (0–3)	Count of correct financial literacy answers
inc_quintile	Monthly (b7040_quintile)	Ordinal (1–5)	Household income quintile
Mortgagor	Background (b3300_prec=1)	Binary	Home owner with outstanding mortgage
Renter	Background (b3300_prec=3)	Binary	Renter
trust_ecb	Monthly (c8011_1)	Ordinal (0–10)	Trust in the ECB
high_educ	Background (b2100_prec=3)	Binary	Tertiary education

## B Probabilistic Bin Midpoints

Table 8 reports the bin boundaries and midpoints used to construct  $E[\pi]$  and  $\text{Var}[\pi]$  from each probabilistic format.

Table 8: Bin Midpoints for Probabilistic Inflation Expectations

Format c1152 (waves 31–75)			Format c1150 (waves 4–30)		
Variable	Bin range (%)	Midpoint	Variable	Bin range (%)	Midpoint
c1152_1	$\geq 12$	14	c1150_1	$\geq 8$	10
c1152_2	$[8, 12)$	10	c1150_2	$[4, 8)$	6
c1152_3	$[4, 8)$	6	c1150_3	$[2, 4)$	3
c1152_4	$[2, 4)$	3	c1150_4	$[0, 2)$	1
c1152_5	$[0, 2)$	1	c1150_5	$(-2, 0)$	-1
c1152_6	$(-2, 0)$	-1	c1150_6	$(-4, -2]$	-3
c1152_7	$(-4, -2]$	-3	c1150_7	$(-8, -4]$	-6
c1152_8	$(-8, -4]$	-6	c1150_8	$\leq -8$	-10
c1152_9	$(-12, -8]$	-10			
c1152_10	$\leq -12$	-14			

## C Country Coverage by Wave

The CES expanded from 6 to 11 countries over the sample period. The founding six countries (Belgium, Germany, France, Italy, Spain, Netherlands) have data from wave 4 (April 2020). Austria, Finland, Greece, Ireland, and Portugal joined in wave 14 (February 2021). All country-fixed effects are absorbed within the individual fixed effects  $\alpha_i$ , since each respondent is nested within a country. Time (wave) fixed effects also implicitly control for differential timing of the country expansion through the inclusion of country-specific wave patterns.