Modeling How Individual Level Characteristics Impact Inflation Prediction Error

Erik Franke

Abstract

Consumer expectation surveys, while valuable, often overestimate future inflation compared to actual Personal Consumption Expenditure (PCE) growth. This discrepancy can influence economic policy and individual financial decisions. This study investigates the factors underlying these errors. The findings show that lower-income, less-educated, and minority individuals, particularly Black and Hispanic individuals, tend to exhibit larger inflation expectation errors. Additionally, women consistently overestimate inflation relative than men, even after accounting for other demographic factors. These results underscore the importance of considering demographic and socioeconomic disparities when interpreting inflation expectations survey data and calibrating monetary policy.

Introduction

Consumer inflation expectations are one of the key tools that the Federal Reserve uses to assess the health of the economy and guide monetary policy decisions. They influence how the Fed adjusts the Effective Federal Funds Rate, aiming to control inflation and maintain economic stability. Since establishing the 2% average inflation target in 2012, the Fed has placed particular emphasis on understanding and anchoring expectations. Research suggests that more informed consumers tend to have more anchored expectations (Binder, 2017). Household expectation surveys like the Federal Reserve Bank of New York's Survey of Consumer Expectations (SCE) provide valuable feedback on the effectiveness of the Fed's communication of macroeconomic conditions and monetary policy, including inflation.

According to economic theory, the New Keynesian Phillips Curve measures inflation by factoring in expected inflation alongside the output gap and supply shocks (Coibion, Gorodnichenko, and Kamdar 2017). This highlights the importance of managing consumer expectations carefully, as they influence inflation outcomes, labor market conditions, and overall economic activity. However, the accuracy of these expectations varies significantly. On average, households have a notable margin of error when predicting inflation a year in advance, raising important questions about the factors that shape these expectations and their reliability.

This paper examines how spatial, demographic, and socioeconomic factors influence individuals' ability to accurately predict future national inflation. Consumer expectations, which significantly impact economic behavior—such as spending and saving decisions—are shaped by both observable characteristics and the informational environment in which individuals operate. Differences in spatial, socioeconomic, and demographic contexts create information asymmetries, influencing whether U.S. consumers form inflation expectations in a backward-looking (based on past experiences) or forward-looking (based on anticipations of future trends) manner.

Review of the Literature

To understand how expectations mechanically fit into the economy it is important to first consider the theoretical assumption of utility maximization in consumer behavior. More specifically, where individuals form forward-looking inflation expectations to inform their financial decisions. To test this, Armantier et al. (2015) examined whether individuals act on their reported inflation expectations in a financially incentivized experiment and found that most respondents behaved consistently with their stated beliefs, aligning with economic theory. On the other hand, they note that individuals with lower numeracy, financial literacy, education levels, and who take longer to complete surveys, are less likely to act in accordance with their stated expectations. Bruine de Bruin et al. (2010) examined this phenomenon by conducting a study using data from RAND's American Life Panel to investigate how demographic variables and financial literacy impact inflation expectations. They found that respondents with lower education, income, and financial literacy, as well as nonwhite individuals and singles, tended to have higher inflation expectations. These differences were largely explained by variations in financial literacy and planning horizons. Dräger (2015) analyzed data from the Swedish Consumer Tendency Survey and media reports to uncover how consumers form inflation expectations. Their findings indicate that consumers' expectations are more influenced by their own perceptions and beliefs than by actual inflation rates. The study also highlights that media coverage, whether positive or negative, can introduce small biases in expectations, as even reports of falling inflation sometimes led to higher perceived and expected inflation.

While the previously detailed studies gauged differences in expectations among education and financial literacy, Bryan and Venkatu (2001) investigated gender differences in inflation perceptions and expectations using the Federal Reserve Bank of Cleveland (FRBC) and Ohio State University's (OSU) Inflation Psychology Survey as well as the University of Michigan's Survey of Consumers. Their analysis showed that women consistently report higher inflation expectations than men, even after controlling for demographic variables like income, education, age, and marital status. While factors such as shopping habits or specific expenditure patterns were initially considered potential explanations, these did not fully account for the observed differences. Later, Meyer and Venkatu (2011) used the same FRBC/OSU Inflation Psychology Survey to investigate demographic differences in inflation expectations and found that observed disparities—such as higher expectations among women compared to men—may be exaggerated by a small subset of respondents with extreme values. When inflation expectations are measured using the median instead of the mean, typical expectations across groups appear much closer, revealing minimal differences between men and women.

As much as it is necessary to consider demographic and socioeconomic factors when examining differences in inflation expectations, spatial factors are also bound to play a part. Bachmann et al. (2021) discovered partisan bias in U.S. inflation expectations, using data from the SCE between 2013 and 2018. Their results indicated that inflation expectations were higher in Republican-majority states during Barack Obama's presidency, likely due to expectations of expansionary policies under Democratic administrations. Conversely, expectations were higher in Democratic-majority states during Donald Trump's presidency. Using Blinder–Oaxaca decomposition, the authors found that personal characteristics, age, education, and political ideology explained some of the differences in expectations under Obama, though only personal characteristics were significant under Trump. The study suggests that political control influences inflation expectations, pointing to broader implications for partisan perceptions of economic policy.

The literature on consumer inflation expectations demonstrates a clear consensus that financial literacy, education, and income levels are critical factors in shaping accurate and anchored expectations. Those with higher levels in these areas tend to have more reliable expectations, while individuals with lower levels generally anticipate higher inflation. Gender differences are pervasive despite accounting for these factors, which could be overstated due to women reporting more extreme predictions. Media coverage, personal biases, and political ideology also impact expectations, with state partisan biases often aligning expectations in opposition to the current administration. However, this collection of literature did not account for state-level differences further than political effects.

This study accounts for significant factors identified in previous research on household inflation expectations, including income, gender, race and ethnicity, marital status, and education, as well as state-level differences in overall inflation. Unlike prior studies, this research specifically evaluates inflation expectation error by comparing respondents' year-ahead expectations to the actual reported PCE. Consequently, incorporating state-level PCE data is necessary to provide an accurate picture of expectations, as inflation pressures vary across states. Although age is controlled for in the aforementioned studies, a more granular measurement of inflation error might reveal age-related differences that prior studies did not detect.

Conceptual Framework

The goal of this study is to utilize the Federal Reserve of New York's SCE and the Bureau of Labor Statistic's PCE to answer how spatial and socioeconomic factors such as household income, employment status, education level, and state-level inflation impact individuals' ability to accurately predict future national inflation. Furthermore, how demographic factors such as age, gender, race, ethnicity, and marital status play a role. Understanding these dynamics is crucial, as consumer expectations play a significant role in shaping economic behavior, including spending and saving decisions, which in turn affect overall economic activity. Controlling for these factors then allows for analysis of whether U.S. consumers form their predictions in a backward- or forward-looking manor depending on information asymmetries.

By exploring these dimensions, this research aims to uncover the underlying reasons behind the persistent overestimation of inflation by consumers and identify key demographic and regional factors influencing these expectations. This analysis not only contributes to a deeper understanding of consumer behavior but also offers valuable insights for policymakers seeking to refine communication strategies and improve the efficacy of monetary policy.

Furthermore, the framework investigates the persistent tendency of consumers to overestimate inflation and identifies the demographic and regional variables that contribute to this phenomenon. By integrating these dimensions, the analysis aims to provide a nuanced understanding of how diverse consumer segments process and utilize information when forming inflation expectations. This understanding is crucial for policymakers, as it highlights the importance of targeted communication strategies to bridge informational gaps and enhance the effectiveness of monetary policy.

It can be hypothesized that higher levels of education and household income would equate to more well calibrated expectations, or in other words, lower prediction errors. Based on previous research it can also be predicted that women have larger prediction errors relative to men, even after controlling for income, education, age, and marital status. The story is likely the same for

Black and Hispanic individuals relative to Whites, a phenomenon that is more likely tied to structural and other factors not included in this model, such as financial literacy It is also possible that the effect of age on expectation error is negative, with older individuals having experienced past high inflationary periods and owning more investments. However, inflationary periods can also lead to greater distortion and de-anchoring of expectations in the long run. The body of literature has mixed with findings regarding age, with some studies finding younger individuals having higher inflation expectations and other studies finding the same for older individuals (Bruine de Bruin et al. 2010). For this reason, the relationship between age and expectation error will be modeled as quadratic, which should be convex, with younger and older adults having larger errors. As for the effect of COVID, it can be inferred that the distortion caused by the supply and demand side shocks of the pandemic increased inflation expectation error.

Although PCE is built into the independent variable, it does not account for backward looking prediction making. To address this, lagged national and state-level covariates are included in the model, accounting for the inflation rate in the month prior to the given response month. Note that state-level inflation is measured in yearly rates and are staggered bi-annually, which provides an adequate proxy for monthly changes. It is expected that increases in the previous month's national or state inflation would increase expectations, however the effect on error may be ambiguous.

Besides examining overall error, it is also intriguing to see if specific factors lead to significant overestimation or underestimation relative to those who are accurate. Overestimation is more often related to backward looking predictions, while more informed individuals may undershoot their year forward expectations if they think the economy will slow down in the next years based on economic indicators such as unemployment. On the other hand, less educated and lower income individuals could also dramatically overshoot or undershoot actual PCE, with no anchoring of their expectations.

Data and Variables

This study utilizes three primary datasets to empirically support the conceptual framework. First is the SCE, a pooled cross-sectional dataset with a panel component, collected monthly from 2013 to 2023. It provides individual-level data on one-year inflation expectations, alongside socioeconomic and demographic characteristics such as pre-tax household income, education level, and state of residence, age, and gender for 159,737 individuals. Second is the Bureau of Economic Analysis' (BEA) year-over-year national-level nominal percentage change in PCE or inflation rate, spanning 2012 to 2024, which offers monthly time-series data on inflation rates based on consumer spending across the U.S. Finally, the BEA's state-level annual PCE dataset (SAPCE) provides raw state-level PCE from 1997 to 2021. The datasets were integrated by merging the individual-level data from the Labor Market SCE and both the monthly national-level PCE and annual state-level PCE into the large SCE. The resulting dataset combines cross-sectional, time-series, and panel data structures.

The primary dependent variable of interest in this study is inflation expectation error (EXPE), which is calculated by taking the absolute value of the difference in individuals' median year forward inflation expectations from the response month and actual year forward national year over year percent change in PCE for the corresponding month. EXPE is used in the proceeding linear regression model, while a categorical expectation error variable (oERROR) accounts for

three groups, accurate predictions within +/- 1% point of actual inflation, overpredictions above 1% point, and underpredictions below -1% point. Median inflation expectations are found in the SCE Survey using a probability density function calculated from the respondent's probability predictions over ten bins ranging from greater than 12% inflation to greater than 12% deflation in the next 12 months. This information came from question 9 in the survey and Q9_cent50 in the dataset. Generally, the computed variable represents the degree to which an individual over or underestimates inflation a year in the future. Year over year state-level yearly percentage change in PCE (SPCE) was calculated by taking the log difference in current and previous year PCE for each state and multiplying it by 100. SPCE is staggered by half years, with January to June SPCE being from the previous year, and July through December for next year. The subset used for the project models is from June 2013 to June 2022, with the lagged SPCE variable limiting the sample due to the raw variable only spanning until 2021.

There are a wide range of independent variables of interest in this study due to the granular nature of individual level demographic information. The age, female, Hispanic, race, education, and married variables originally had only around 21,000 observations. This is because demographic information in the SCE is only collected in the initial survey, with repeat respondents having empty demographic information for any further responses up to maximum of 12 response months. This was carefully addressed by back and forward filling in the demographic information by response ID and date, resulting in a total of around 159,000 observations for each variable.

For reference, the variables age, female, Hispanic, race, education, married, and employment status were duplicated or recoded from the survey variables Q32, Q33, Q34, Q35, Q36, Q38, and Q10 respectively. The binary variables for female, Hispanic, and married were recoded to be yes=1 and no=0 opposed to yes=1 and no=2. The race variable was coded where the six binary variables Q35_1 through Q35_6 equaled 1. In a similar manner, the employment variable was coded using Q10_1 through Q10_9, leaving out other. The education variable was recoded into three groups opposed to 9, dropping other and consolidating less than high school to some college as one group, associate degree as another, and any higher degrees as the final group. Finally, the variable income is the combined responses from Q47, which was for first respondents only, and D6 which was answered by repeat respondents. Income was binned into six categories opposed to eleven. The breakdowns of each categorical variable can be found in the data dictionary below. The variable COVID was created to equal 1 where the date is greater than or equal to March 2020 and 0 otherwise.

Data Dictionary

Variable	Data Type	Description
EXPE	Continuous	Absolute value of difference in individual median year forward inflation expectations and actual year forward national year over year percent change in PCE (monthly)
oERROR	Categorical	Accurate, Overprediction, and Underprediction of Future Inflation: (If raw difference in expectations and PCE is between -1 and 1=1; If difference >1=2; If difference <-1=3)
PCE	Continuous	Year over year percent change in monthly national Personal Consumption Expenditure
SPCE	Continuous	Year over year percent change in state-level yearly Personal Consumption Expenditure
Age	Continuous	Respondent's age
Female	Binary	If respondent is female (female=1; male/other=0)
Hispanic	Binary	If respondent is Hispanic (yes=1; no=0)
Race	Categorical	Respondent's race: (White=1; Black or African American=2; American Indian/Alaska Native=3; Asian=4; Pacific Islander=5; Other=6)
Education	Categorical	Highest level of school completed: (Less than High school, High school, Some college=1; Associate degree=2; BA/BS, Masters, Doctorate, Professional (MD, JD, DDS)=3)
Income	Categorical	Pre-tax household income in the past year: (<$10,000–$19,999=1; $20,000–$39,999=2; $40,000–$59,999=3; $60,000–$99,999=4; $100,000–$199,999=5; ≥$200,000=6)
Married	Binary	If and individual is married (yes=1; no=0)
Employment Status	Categorical	Employed, Unemployed, Out of the Labor Force, or Retired: (Working full-time or part-time=1; Not working, but would like to work, temporarily laid off, or on sick or other leave=2; Permanently disabled or unable to work, student, or homemaker=3; Retiree or early retiree=4)
COVID	Binary	If the response date was during March 2020 or later (yes=1; no=0)

Empirical Methodology

The relationship between expectation error and individual-level factors will be modeled in two ways. First is linear OLS regression, with *EXPE* as the dependent variable. The lagged PCE_{t-c} and $SPCE_{t-c}$ predictors represent the previous response month for a given respondent, where *t* is the response date and *c*=1 representing the 1-month lag. *Age* is included in the model as a linear and quadratic as Age^2. *Female*, *Hispanic*, *Married*, and *COVID* are all included in the model as dummy variables. The categorical variables *Race, Education, Income,* and *Employment* are also included as dummy variables with White, less than high school to some college, $40,000 to $59,999, and employed being the respective reference groups. Where *J=6* race categories, *K*=3 education categories, *L*=6 income categories, and *M*=4 employment categories. The subscript *i* denotes individual responses. It is expected that the coefficients for *Female*, *Hispanic*, *COVID, Race* (2) or Blacks relative to Whites, *Income* below $40,000 (1,2) relative to between $40,000 and $59,999, and unemployed or out of the labor force relative to employed will be positive. In other words, these factors should lead to larger margins of prediction error. The opposite should be true for the dummies on *Income* above the reference (4-6) and *Education* above some college (2,3) relative to less than high school to some college. The likely scenario is that the coefficients are negative, meaning reduced prediction error. Age could have an ambiguous effect, but the quadratic should have a positive coefficient if young and old individuals overestimate inflation.

$$EXPE_{it} = \beta_0 + \beta_1 PCE_{t-1} + \beta_2 SPCE_{t-1} + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Female_i + \beta_6 Hispanic_i + \beta_7 Married_i + \beta_8 COVID_i + \sum_{j=1}^{J-1} \gamma_j \, Race_{ij} + \sum_{k=1}^{K-1} \delta_k \, Education_{ik} + \sum_{l=1}^{L-1} \emptyset_l \, Income_{il} + \sum_{m=1}^{M-1} \theta_m \, Employment_{im} + \epsilon_{it}$$

Another way to model this relationship is with a multinomial logit model, which allows for capturing why there may be individual-level differences in the probability of accurately estimating, overestimating, or underestimating inflation (oERROR). There are *J*=3 categories with *j*=1 representing accurate estimation and the reference group. The notation for *Race* was simply adjusted by replacing *J* from the previous model with *P*. Age^2 was also removed from the model. Similar coefficient behavior is likely to unfold regarding asymmetries in income, education, and gender. However, the direction of the relationships will become clearer. One possibility is that the most inaccurate predictions overestimate inflation, but there is also potential for some groups to have the same probability of over or underestimating.

$$\ln\left(\frac{P(\mathrm{o}=j|\mathrm{X})}{P(\mathrm{o}=J|\mathrm{X})}\right) = \beta_{0j} + \beta_{1j} PCE_{t-1} + \beta_{2j} SPCE_{t-1} + \beta_{3j} Age_{ij} + \beta_{4j} Female_i + \beta_{5j} Hispanic_i + \beta_{6j} Married_i + \beta_{7j} COVID_i + \sum_{p=1}^{P-1} \gamma_{pj} \, Race_{ij} + \sum_{k=1}^{K-1} \delta_{kj} \, Education_{ik} + \sum_{l=1}^{L-1} \emptyset_{lj} \, Income_{il} + \sum_{m=1}^{M-1} \theta_{mj} \, Employment_{im}$$

Results

To adjust for multicollinearity, variance inflation factors were used, addressing which groups of categorical variables needed to be consolidated. The overall test was below 10 and only yielded values greater for age and its transformed variable. Robust standard errors were used to address potential heteroskedasticity, despite traditional standard errors yielding similar significant results. Future models would need to better account for serial correlation, as the panel nature of the data likely made this unavoidable.

The OLS model reveals several notable findings. Both lagged PCE and lagged state PCE have statistically significant and positive coefficients, indicating that individuals' inflation expectation errors increase with higher recent inflation rates at both national and state levels. Specifically, a one-percentage-point increase in the previous response month's PCE is associated with a 0.04%-point increase in expectation error, holding other factors constant. This effect is smaller than expected, but still indicates the presence of backward-looking inferences.

Age does in fact exhibit a nonlinear relationship with inflation expectation error, as shown by the significant and positive coefficient for age and the negative coefficient for age squared. This suggests the opposite of the hypothesis, where expectation error is concave with respect to age, having the largest margin of error in the middle of life, and smaller error later.

However, as hypothesized, female respondents had significantly higher errors relative to men equating to a 0.9%-point greater error, holding other factors constant. Similarly, Black individuals exhibit higher errors relative to Whites with a 0.9%-point higher error and Hispanic individuals relative to other ethnicities have 0.36%-point greater error, other factors equal.

Looking at income tells the expected story, with the individuals from the lowest income households relative to those making $40,000 and $59,999 erroring by 1.15%-points and wealthy individuals from households making more than $200,000 having about 1%-point less error, controlling for other factors. Unemployed respondents also made larger errors, with a 0.3%-point increased error relative to employed respondents, holding other factors constant. Surprisingly, married people also had increased error relative to single people with 0.21%-point, with other factors held constant. Contrary to hypothesis, retired individuals relative to employed individuals have a 0.18%-point higher prediction error, holding other factors constant.

The multinomial logit model tells the story of the economic distortion caused by the COVID-19 pandemic, with respondents during the pandemic having 9.8% less chance of making accurate predictions relative to the pre-pandemic period, other factors held constant. The high inflationary and uncertain environment of the pandemic is also made obvious with respondents being 34% more likely to over predict inflation and 28% less likely to undershoot inflation relative to pre-pandemic, ceteris paribus.

It was also hypothesized that most respondents would overestimate opposed to underestimate. This proved to be the case for most groups, with the magnitude of probabilities for underpredicting being lower and more often insignificant. However, the probabilities for overprediction were consistent with the OLS model, with lower earning and less educated individuals more likely to error.

Conclusion

Overall, the findings in this paper are consistent with those in previous studies regarding demographic implications of inflation prediction error but also provide a more nuanced perspective about over and undershooting actual year forward inflation. This provides important context for monetary policy makers such as the Fed who rely on expectations surveys to guide their actions on whether to hold, cut, or raise the Effective Federal Funds Rate. As previously detailed, consumers' expectations are built into economic measures of future inflation, so it is incredibly important to understand how they are formed.

It appears that the Fed is not currently communicating its 2% average inflation target effectively, leaving a significant portion of the population's expectations de-anchored, especially those most damaged by actual or perceived high inflation. Is there a better way for them to message poor, lower-educated, and minority individuals? Much of this issue goes back to structural factors but is also tied to the proven disparities caused by lack of financial literacy. Another challenge that the Fed has faced is the distortion of the pandemic that was measured in this study. While improved communication can produce more reliable consumer expectations, there will inevitably be uncontrollable factors that disrupt future outlook.

For example, the incoming administration under former President Donald Trump will likely shift expectations more dramatically for higher educated individuals who worry about the effects of potential tariff plan on imported goods. Not to mention higher income individuals are more likely to have ties to foreign countries and trade. A follow up question is that if prices do increase measurably due to tariffs, how will individuals responding to surveys like the SCE react? More than likely, those with already misguided expectations will continue to be entrenched due to continued distortion.

This is all to say, that consumers are not all privy to the same information regarding price changes or policy, which impacts their ability to plan ahead. This contradicts the assumptions of macroeconomic models which assume that individuals make decisions based on their present fiscal information. There is work to be done to bring everyone to the same level of economic consciousness and forward-looking planning.

References

Armantier, Olivier, Wandi Bruine de Bruin, Giorgio Topa, Wilbert van der Klaauw, and Basit Zafar. 2015. "Inflation Expectations and Behavior: Do Survey Respondents Act on Their Beliefs?" *International Economic Review*, 56(2): 505-536. https://onlinelibrary.wiley.com/doi/pdf/10.1111/iere.12113

Bachmann, Oliver, Rüdiger Bachmann, Martin Gasteiger, and Mathias Hoffmann. 2021. "Partisan Bias in Inflation Expectations." *Public Choice*, 186 (3-4): 513-536. https://www.proquest.com/docview/2504631297?accountid=8576&sourcetype=Scholarly%20Journals

Binder, Carola. 2017. "Fed Speak on Main Street: Central Bank Communication and Household Expectations." *Journal of Macroeconomics* 52: 238–251. https://doi.org/10.1016/j.jmacro.2017.05.003.

Bruine de Bruin, Wandi, Wilbert van der Klaauw, Julie S. Downs, Baruch Fischhoff, Giorgio Topa, and Olivier Armantier. 2010. "Expectations of Inflation: The Role of Demographic Variables, Expectation Formation, and Financial Literacy." *Journal of Consumer Affairs*,

44(2): 381-402. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=78bbad79d77abe21304e8a5c8ca3b757356aa004

Bryan, Michael F., and Guhan Venkatu. 2001. "The Curiously Different Inflation Perspectives of Men and Women." *Federal Reserve Bank of Cleveland, Economic Commentary*. https://www.clevelandfed.org/publications/economic-commentary/2001/ec-20011101-the-curiously-different-inflation-perspectives-of-men-and-women

Card, David, and Alan B. Krueger. 1992. "School Quality and Black-White Relative Earnings: A Direct Assessment." The Quarterly Journal of Economics 107 (1): 151–200. https://davidcard.berkeley.edu/papers/school-quality-bw.pdf.

Coibion, Olivier, Yuriy Gorodnichenko, and Rupal Kamdar. 2017. "The Formation of Expectations, Inflation and the Phillips Curve." *NBER Working Paper No. 23304*. https://www.nber.org/system/files/working_papers/w23304/w23304.pdf

Dräger, Lena. 2015. "Inflation Perceptions and Expectations in Sweden – Are Media Reports the Missing Link?" *Oxford Bulletin of Economics and Statistics*, 77(5): 0305-9049. https://onlinelibrary.wiley.com/doi/pdf/10.1111/obes.12078

Meyer, Brent, and Guhan Venkatu. 2011. "Demographic Differences in Inflation Expectations: What Do They Really Mean?" *Federal Reserve Bank of Cleveland, Economic Commentary*. https://www.clevelandfed.org/publications/economic-commentary/ec-201107-demographic-differences-in-inflation-expectations-what-do-they-really-mean

Figure 1: Histogram of Raw Inflation Expectations Error

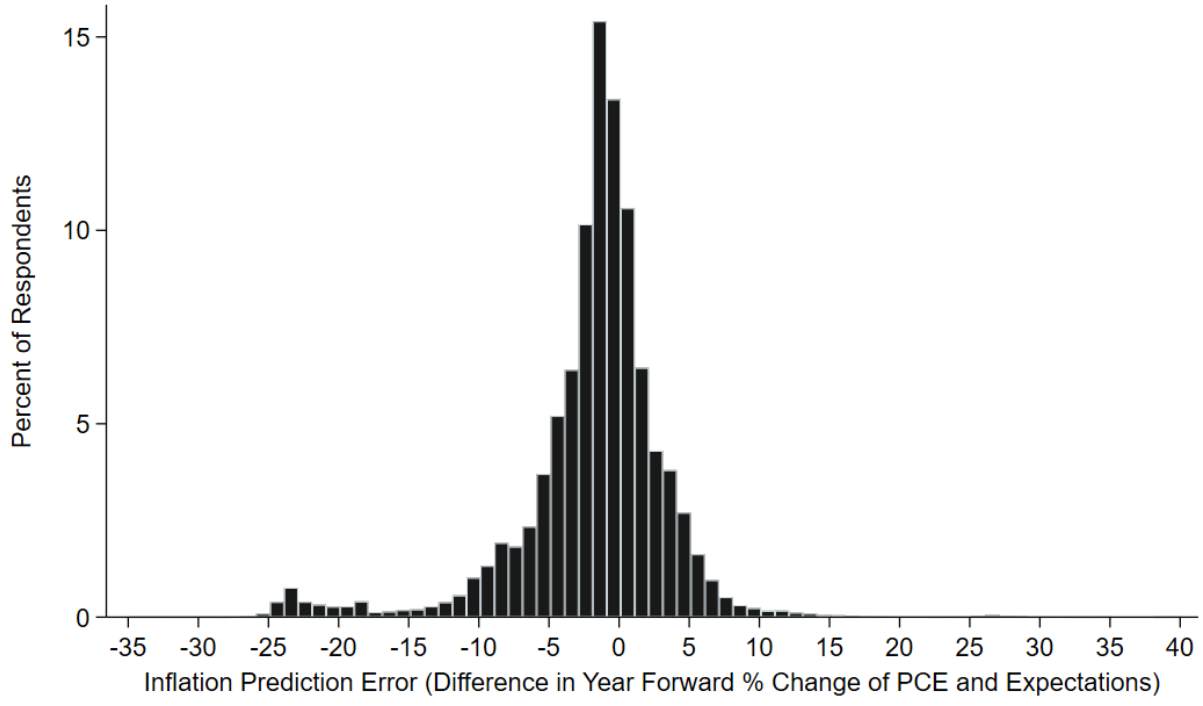

Table 1: Descriptive Statistics

Variable	Weighted Mean (SD)	Min	Max	N
EXPE (%pts)	4.08 (4.91)	0.00	39.67	155,971
oERROR	2.29 (0.81)	1	3	159,171
PCE (%pts)	2.23 (1.87)	0.04	7.25	159,171
SPCE (%pts)	4.02 (3.39)	-5.20	15.06	141,228
Age	51.10 (0.50)	18	99	159,171
Female	0.50 (0.50)	0	1	159,123
Hispanic	0.09 (0.28)	0	1	159,048
Race	1.46 (1.19)	1	6	158,903
Education	1.80 (0.92)	1	3	158,567
Income	3.29 (1.47)	1	6	158,691
Married	0.63 (0.48)	0	1	159,171
Employment	1.91 (1.17)	1	6	157,682
COVID	0.33 (0.47)	0	1	159,171

Table 2: Regression Models

	OLS Regression	Multinomial Logit Regressions (Marginal Effects)		
Dependent Variable	Continuous Expectation Error	Accurate Prediction Probability	Overestimate Prediction Probability	Underestimate Prediction Probability
Specification	1a	1b	2b	3b
Lagged PCE	0.041*** (0.011)	-0.001 (0.001)	-0.032*** (0.0008)	0.034*** (0.001)
Lagged State PCE	0.041*** (0.004)	-0.007*** (0.0005)	0.001*** (0.0003)	0.006*** (0.005)
Age	0.071*** (0.006)	-0.002*** (0.0001)	-0.002*** (0.0001)	0.003*** (0.0001)
Age^2	-0.0005*** (0.00006)	-	-	-
Female	0.876*** (0.028)	-0.029*** (0.003)	0.014*** (0.002)	0.015*** (0.003)
Hispanic	0.355*** (0.058)	-0.010* (0.006)	0.017*** (0.005)	-0.007 (0.006)
Black	0.882*** (0.061)	-0.057*** (0.005)	0.059*** (0.005)	-0.001 (0.006)
Married	0.209*** (0.033)	-0.009*** (0.003)	-0.002 (0.003)	0.011*** (0.004)
Bachelors or Higher	-0.887*** (0.034)	0.035*** (0.003)	-0.026*** (0.003)	-0.009** (0.004)
Unemployed	0.304*** (0.089)	-0.0007 (0.008)	-0.010* (0.006)	0.011 (0.008)
Retired	0.179*** (0.053)	0.0002 (0.005)	0.002 (0.004)	-0.002 (0.005)

Income <$10k - $19,999	1.154*** (0.072)	-0.052*** (0.005)	0.062*** (0.005)	-0.010 (0.006)
Income $200k<	-0.985*** (0.058)	0.066*** (0.007)	0.004 (0.006)	-0.070*** (0.011)
COVID	1.147*** (0.036)	-0.098*** (0.004)	0.337*** (0.002)	-0.279*** (0.005)
R-Squared	0.082	0.107	0.107	0.107
Observations	100,941	100,941	100,941	100,941

Notes: Robust standard errors are reported in parentheses for model 1a. Non-heteroskedasticity adjusted traditional standard errors for models 1b, 2, and 3 in parentheses. Pseudo R-squared reported for models 1b, 2b, and 3b. *** significant at 1 percent ** significant at 5 percent * significant at 10 percent.