Effects of monetary policy on household expectations: The role of investing households*

Taewon Hwang†

November 28, 2025

Abstract

Holding stock investments can incentivize households to monitor monetary announcements due to their impact on stock prices. This study examines how stock-investing households adjust their inflation expectations in response to monetary shocks. Using individual-level survey data from the U.S., I find that investors raise their short-term inflation expectations following a monetary expansion, in contrast to non-investing households. Additionally, investor households increase their non-durable consumption after an expansionary shock, unlike non-investors. These findings indicate that holding stock investments motivate households to adjust their expectations and consumption in response to monetary policy shocks, aligned with its intended effects.

Keywords: inflation expectations, financial market access, monetary policy

JEL Classification: D83, D84, E31, E52

*First draft: December 7, 2024. I am grateful to Vladislav Abramov, Hie Joo Ahn, Pedro Bento, Carlos Delgado, Li Gan, Jorge Hirs Garzon, Dennis Jansen, Yoon Jo, Nawon Kang, Yeon Jik Lee, Joonseok Oh, Geumbi Park, Andres Pinchao Rosero, Tatevik Sekhposyan, Yuzhe Zhang, and Sarah Zubairy, as well as seminar participants at the Midwest Econometrics Group 2024, SNDE Symposium in 2025, and Texas A&M Macro Mini-Conference 2025 for helpful suggestions and comments.

†Department of Economics, Texas A&M University, 2935 Research Parkway Suite 200, College Station, TX 77843, United States. E-mail: twhwang@tamu.edu.

1 Introduction

Household expectations are a crucial factor in determining the relevance of monetary policy. Changes in inflation expectations can alter the perceived real interest rate, thereby influencing households' consumption and saving decisions (Weber, Gorodnichenko, Coibion, & D'Acunto, 2022). Consequently, there is an extensive literature examining how inflation expectations, or expectations in general, are affected by policy changes. However, findings are inconclusive. In the context of monetary policy and household expectations, there is no consensus on whether household expectations are directly influenced by monetary policy. Several empirical studies find that the Federal Reserve monetary policy announcements do not significantly affect household inflation expectations (Binder, 2017; Coibion, Gorodnichenko, et al., 2023; Coibion et al., 2020; Lamla & Vinogradov, 2019; Lewis et al., 2019). In contrast, recent studies have uncovered heterogeneity in expectation formation across households with different demographic characteristics in response to monetary shocks (Ahn & Xie, 2024; Ahn et al., 2024; D'Acunto et al., 2023; Das et al., 2020). These studies raise an important question in the literature: are some households more attentive to monetary policy? Addressing this question is crucial for validating the expectation-driven propagation of monetary policy shocks, which stands at the foundation of modern macroeconomic models.

In this study, I propose that households actively participating in the stock market are more attentive to monetary policy. I hypothesize that stock-holding endogenously incentivizes households to actively seek information about monetary policy due to its potential impact on their stock asset values. I utilize individual-level data from the University of Michigan Survey of Consumers (henceforth MSC) to identify households that hold stock market investments (referred to as investor households) and those that do not (referred to as non-investor households). I track how investor households' inflation expectations adjust in comparison to their non-investing counterparts. Specifically, I investigate whether investor households are more likely to revise their inflation and economic expectations in response to monetary policy shocks. Conversely, non-investor households, which do not hold stock assets, are expected to show smaller or insignificant adjustments in expectations following monetary shocks.

The MSC data support this hypothesis: in response to an unexpected monetary easing, investor households tend to revise their short-term inflation expectations upward, while non-investor households are less likely to do so. These effects are particularly stronger during recessionary periods, and in response to monetary easings as opposed to tightenings, which allows the argument that economic uncertainty prompts market participants to closely monitor Fed announcements to hedge against risk. In line with these results, I find that investor households also raise their expectations for one-year-ahead business conditions in response to a monetary easing. In sum, the microdata suggest that stock market investors are attentive to monetary policy shocks that may affect their financial wealth and adjust their expectations on inflation and the economy accordingly, in line with the intended effects of monetary policy.

The hypothesis that investors households are driven to respond to monetary announcements due to their effects on their financial wealth is supported by the growing body of literature exploring the characteristics of households that participate in the financial market.[1] Several studies link stock market participation with financial literacy (Almenberg & Dreber, 2015; Kadoya et al., 2017; M. C. van Rooij et al., 2012). Notably, through a survey of Dutch households, M. van Rooij et al. (2011) find that stock ownership is significantly determined by financial literacy, even after controlling for demographic characteristics, income, and wealth. Thus, it is plausible that financially literate investors are particularly attentive to monetary policy, given its well-documented effect on stock prices (Swanson, 2021).

Can revisions in household expectations be linked to household decisions on consumption and saving? In theory, inflation expectations can influence household consumption through various channels. On one hand, higher subjective inflation expectations reduce perceived real interest rates (via the Fisher equation), thereby depressing the incentive to save and increasing current consumption (as predicted by the consumer Euler equation). On the other hand, higher inflation acts as a tax on nominal assets, leading to negative wealth and income effects that could offset the positive impact of inflation expectations on current consumption. Recent empirical studies have sought to establish a relationship between inflation expectations and household consump-

[1] See Alan (2006), Brown et al. (2008), Bucher-Koenen et al. (2021), Grinblatt et al. (2011), Guiso and Jappelli (2005), and Hong et al. (2004), for instance.

tion, but the evidence remains inconclusive. For instance, Burke and Ozdagli (2023) find that the increase in spending associated with changes in expectations is limited using panel survey data that includes both household expectations and actual consumption. Conversely, Coibion et al. (2022) track household expenditures and find that household exposure to monetary policy changes, which lead to revisions in their inflation expectations, also influences their spending behavior. Similarly, D'Acunto et al. (2023) find that consumers with high cognitive ability display lower forecast errors for inflation, have more consistent expectations, and increase their consumption propensity when inflation expectations rise, thus behaving in line with the consumer Euler equation.[2]

In this study, I extend my findings on household inflation expectations by investigating whether the heterogeneity in expectations is similarly observed in household expenditure responses. Using survey data from the Consumer Expenditure Surveys (henceforth CEX), I find that investor households exhibit a significant and consistent increase in non-durable consumption following an unanticipated expansionary monetary shock, even after controlling for income to account for potential general equilibrium effects. This effect is notably absent among non-investors, reinforcing the notion that non-investors are less attentive to changes in monetary policy. The responses for durable spending, however, are weak and statistically insignificant. I interpret these results as supporting evidence that investor households adjust their expectations and, consequently, adjust their consumption behavior in accordance with the Euler equation. Nevertheless, these findings are suggestive, given that the CEX does not include questions on household expectations, and no direct link can be made between the investor households identified in the MSC and those in the CEX.

This paper contributes to several streams of literature. First, it adds to the literature on how economic agents form expectations. Several studies within this area focus on the sources of information households use when forming their expectations (Armantier et al., 2016; Cavallo et al., 2017; Coibion & Gorodnichenko, 2015; Coibion et al., 2022; D'Acunto et al., 2021; Dräger, 2015) or whether specific events or experiences can influence expectations (D'Acunto et al., 2022; Weber, Gorodnichenko, & Coibion, 2022). Other studies examine the relevance of demographic charac-

[2]See D'Acunto et al. (2023) for further references.

teristics to expectation formation (Ahn et al., 2024; Bruine de Bruin et al., 2010; D'Acunto et al., 2023). In particular, this study is intimately connected to Ahn and Xie (2024), who suggest that stock-holding households have smaller inflation forecast errors and less within-group disagreement, supporting the idea that stock-market participation increases attentiveness to economic news. This study contributes to this body of work by proposing that stock-investing households actively *revise* their inflation expectations in response to monetary policy shocks. While previous research has often inferred the expectations of financial market participants based on market reactions to macroeconomic shocks (e.g. inflation swaps), this paper identifies the attentiveness of participants as individual-level *revisions* to expectations, allowing for a more nuanced and direct examination of their economic outlook.

Second, this research contributes to the literature on the relationship between economic agents' expectations and monetary policy.[3] Several studies examining the impact of Federal Reserve communication during the zero lower bound period find little evidence that such communication affected household expectations (D'Acunto et al., 2022). Consistent with these findings, I also find that unconventional monetary tools, such as forward guidance, do not prompt households to revise their inflation expectations. However, a novel feature of this study is its focus on how conventional monetary policy, specifically shocks to the federal funds rate, can influence the inflation expectations of different households. This suggests that conventional monetary policy may also affect household behavior through adjustments in expectations.

In terms of policy implications, the role of investing households in the transmission of monetary policy may be substantial, especially given their recent surge in representation (see Figure 1 for an illustration). According to the Survey of Consumer Finances, the proportion of U.S. households reporting stock investments reached 58 percent in 2022, the highest since the survey's inception in 1989. Notably, the share of households directly holding stocks increased by 6 percentage points during the three years that include COVID (2019-2022). In the context of this study, the growing proportion of investing households suggests a rising population that is more attentive to monetary announcements. An increasing share of households adjusting their expectations and consumption in line with the monetary authority's intentions could support policy efforts to stabilize macroe-

[3]See Coibion et al. (2020) and D'Acunto et al. (2023) for an extensive review.

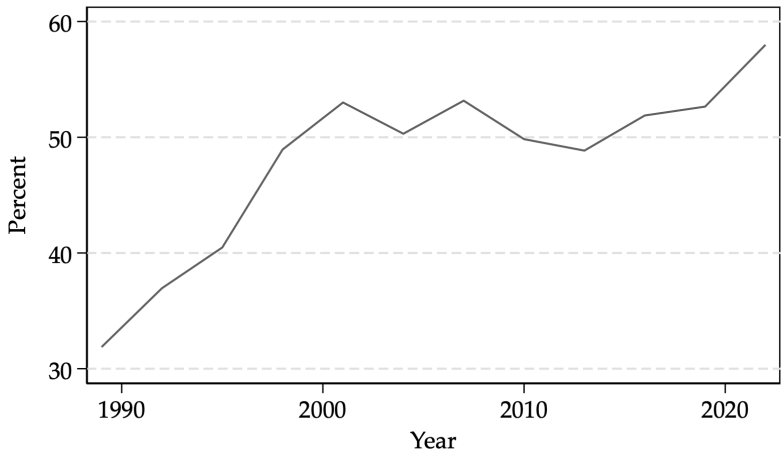

Figure 1: Share of families that have stock holdings. Stock holdings refer to the sum of directly-held stocks and indirect holdings, such as retirement accounts, pooled investment funds, and other managed assets. *Source*: Survey of Consumer Finances

conomic volatility.

The remainder of the paper is structured as follows: section 2 introduces the data, and sections 3 and 4 present the empirical analyses. Section 5 discusses the mechanisms supporting the empirical findings and provides supplemental analysis to identify the unique characteristics of investing households. Section 6 concludes.

2 Data

This section describes the survey data and monetary policy shocks used in this paper. The main analysis utilizes household expectations data from the Michigan Survey of Consumers (MSC). To investigate the link between household expectations and consumption behavior, I incorporate expenditure data from the Consumer Expenditure Surveys (CEX). For monetary policy shocks, I adopt measures from Swanson (2021).

2.1 Household expectations

The MSC is one of the oldest household surveys in the world, designed to track consumer attitudes and expectations. Since 1978, the survey has been conducted monthly by telephone, collecting responses from over 500 households representative of the U.S. population. The survey includes demographic information such as respondents' education level, age, and household income, allowing researchers to explore differences in economic outlook based on respondent characteristics. In 1990, the MSC began collecting data on respondents' stock market investments, though this was intermittently discontinued until it was fully integrated into the survey in 1998.[4] A key feature utilized in this study is the re-interview of about 40% of households six months after their initial interview. Given the limitations of the available investment-status information, the sample spans January 1998 to May 2019. About 70% of respondents report holding stock. On average, stock-holding households report lower inflation expectations and exhibit less dispersion (i.e., less disagreement) than non–stock-holding households. Stock holders are also distinctively more educated, more likely to be married and own a home, and are disproportionately represented in higher income quartiles. Additional summary statistics, including detailed demographic comparisons between investing and non-investing households, are provided in Appendix A.

Within the MSC questionnaire, I focus on a set of questions that assess respondents' expectations of future inflation. The first question asks whether the respondent believes prices will go up, go down, or remain the same over the next 12 months, followed by a request for a numerical estimate of expected future inflation. A subsequent question inquires about the outlook for prices over a longer period (5 to 10 years).[5] Since some households are contacted twice, with a six-month interval, I can calculate six-month revisions in inflation expectations. Additionally, I use questionnaire entries regarding households' outlook on future business conditions to verify whether changes in inflation expectations are associated with their broader economic outlook.

[4]Specific questionnaire entries regarding stock market investments in the MSC are given as follows: *Do you (or any member of your family living there) have any investments in the stock market, including any publicly traded stock that is directly owned, stocks in mutual funds, stocks in any of your retirement accounts, including 401(K)s, IRAs, or Keogh accounts? Considering all of your (family's) investments in the stock market, overall about how much would your investments be worth today?*

[5]Specific questionnaire entries regarding inflation expectations are given as follows: *During the next 12 months, do you think that prices in general will go up, go down, or stay where they are now? What about the outlook for prices over the next 5 to 10 years? Do you think that prices in general will go up, go down, or stay where they are now?*

2.2 Household expenditures

The CEX is one of the most comprehensive data sources on household consumption in the U.S. and is used to construct the weights of the Consumer Price Index (CPI). The CEX consists of two separate surveys: the Interview Survey and the Diary Survey. In this study, I use data exclusively from the Interview Survey, as the Diary Survey primarily covers expenditures on small, regularly purchased items. In contrast, the Interview Survey provides information on up to 95% of typical household consumption expenditures. Since 1980, the CEX has operated as a monthly rotating panel, collecting responses from 1,500 to 2,500 households representative of the U.S. population. Each household is interviewed once per quarter for a maximum of five consecutive quarters. Expenditure information is reported quarterly, while income information is recorded only in the first and last quarters. During each interview, households report expenditures for the three months preceding the interview month. I utilize data provided by Coibion et al. (2017) which spans the period from October 1979 to November 2010; however, the final sample used in this analysis covers the period from July 1991 to November 2010 due to the limited availability of monetary policy shock data.

To explore heterogeneous expenditure responses based on stock investment status, I categorize households as investors or non-investors according to their reported financial income.[6] Hence, households are classified as investors if they report non-zero financial income. Importantly, because changes in household expenditures in response to monetary policy shocks are a collective effect of multiple channels, I construct a measure which attempts to filter out key general equilibrium effects by obtaining the residuals of a regression of expenditures on multiple demographic characteristics, including household income, which are readily available in the CEX. I discuss this process in detail in Section 4.

[6] Financial income is defined as the sum of income from dividends, royalties, estates, or trusts.

2.3 Monetary policy shocks

I adopt the measure of monetary policy shocks from Swanson (2021). Extending the methods of Gürkaynak et al. (2004), Swanson (2021) identifies unanticipated changes in the federal funds rate, forward guidance, and large-scale asset purchases in response to FOMC announcements from July 1991 to June 2019. Among these three identified factors, the federal funds rate has the most significant impact on stock prices across the sample. Therefore, I primarily focus on how stock-holding investor households respond to unanticipated changes in the federal funds rate. The results will thus focus on the effects of conventional monetary policy on household expectations and expenditures, which has yet been extensively investigated in the literature. In an additional analysis, I examine whether unconventional monetary policy announcements, e.g. forward guidance and large scale asset purchases affect household expectations and find that the former factor appears to have an insignificant effect, whereas the latter shows periodically significant results. Since both the MSC and the CEX data are in monthly time, I aggregate the federal funds rate shocks to a monthly frequency.

3 Effects of monetary policy shocks on household expectations

To estimate how households revise their inflation expectations in response to monetary policy shocks, I employ the following model specification:

$$\begin{aligned}\mathbb{E}\pi_{i,t}^{h-yr} - \mathbb{E}\pi_{i,t-6}^{h-yr} = \alpha + \beta_0\, invest_{i,t} + \beta_1\, invest_{i,t} \times \left(-\sum_{j=t-6}^{t-1} mps_j\right) \\ + \beta_2\,(1 - invest_{i,t}) \times \left(-\sum_{j=t-6}^{t-1} mps_j\right) + \delta X_{i,t} + \gamma Z_t + \epsilon_{i,t},\end{aligned} \tag{1}$$

where $\mathbb{E}\pi_{i,t}^{h-yr}$ is respondent i's h-year-ahead inflation expectation for $h = 1, 5$ at time t from the Michigan Survey of Consumers; $invest_{i,t}$ is a dummy variable that indicates whether the respondent reported as holding stock investments; $\sum_{j=t-6}^{t-1} mps_j$ is the sum of monetary policy shocks occurring between the initial and subsequent surveys; $X_{i,t}$ are controls for the respondent's demo-

Table 1: Sensitivity of revisions in investors and non-investors' inflation expectations to monetary policy shocks

	1-year-ahead inflation expectations	5-year-ahead inflation expectations
Investor	0.0587	-0.0304
	(0.0959)	(0.0695)
Investor×(-FFR)	0.125**	0.0402
	(0.0556)	(0.0336)
Non-investor×(-FFR)	-0.142	-0.0429
	(0.0888)	(0.0656)
Constant	-0.732***	-0.248
	(0.225)	(0.164)
Controls	Yes	Yes
Observations	24,793	24,506
Adjusted R^2	0.018	0.005
F-test ($\beta_1 = \beta_2$)	7.32**	1.41

Notes: This table reports the regression results from Equation (1). Dependent variables are the six-month change in the MSC's 12-month-ahead inflation expectations and 5-year-ahead inflation expectations. "Investors" and "Non-investors" are dummies for MSC respondents that indicated that they had/did not have investments in the stock market at time t, interacted with the negative of the sum of the federal funds rate shocks of the past six months. The gender, education, birth cohort, home ownership, marriage status, income, investment status, and revisions in short-run gas price expectations of the respondent, as well as changes in the unemployment rate during the past six months are included as control variables. Survey weights are applied. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

graphic characteristics which include gender, education, birth cohort, home ownership, marriage status, and income, as well as the respondent's revisions in gas price expectations; Z_t controls for macroeconomic conditions by including the changes in the unemployment rate during the past six months. Survey weights are applied to ensure national representativeness.

I change the sign of $\sum_{j=t-6}^{t-1} mps_j$ to interpret β_1, β_2 as revisions in inflation expectations associated with *expansionary* monetary policy shocks. Because my primary interest lies in the difference in *slopes* between household types, I omit the level effect of the monetary policy shock in this specification. Nevertheless, the results are robust to including the main effects of both investment status and the monetary policy shock, as well as their interaction.

This empirical model is based on Coibion and Gorodnichenko (2015) and Ahn et al. (2024), but differs in several key aspects. Coibion and Gorodnichenko (2015) estimate the effect of oil price changes on inflation expectations and find a significant impact. To account for this, I include households' revisions in gas price expectations as a control variable to capture the confound-

ing effects of oil price changes on household expectations.[7] However, their study does not focus on heterogeneous responses between households. Ahn et al. (2024) examine the effects of mortgage-rate changes on households' inflation expectations, specifically comparing homeowners and renters. They find heterogeneous responses, proposing a mortgage refinancing channel that incentivizes homeowners to respond more sensitively to interest rate changes. The empirical model that I impose is similar to Ahn et al. (2024) in that it aims to identify household characteristics that lead to different behaviors in forming inflation expectations in response to monetary policy. However, my focus is on whether households are investors or non-investors, rather than on home ownership. Nonetheless, I control for home ownership, along with other common demographic characteristics, to isolate the effect of investment status on inflation expectation revisions. Finally, unlike Coibion and Gorodnichenko (2015), who consider current-period oil price changes, or Ahn et al. (2024), who consider interest rate changes induced by monetary policy shocks, I use the cumulative sum of past federal funds rate shocks in my analysis.

The first column of Table 1 presents the estimation results for revisions in inflation expectations over the next 12 months. I first confirm that there are no average differences in revisions between investor and non-investor households. The coefficient for investors interacted with the sum of the federal funds rate shocks is, however, positive and statistically significant at the 5% significance level, whereas the coefficient for non-investors is not significantly different from zero. F-test results on the equivalence of the two coefficients rejects the hypothesis at a 5% significance level. This indicates that investors incorporate signals from past federal funds rate shocks when forecasting inflation a year ahead, whereas households without stock holdings are less likely to do so. In conjunction with the empirical findings of Swanson (2021) that federal funds rate shocks have significant and consistent effects on stock prices, it is plausible that investors are incentivized to adjust their economic outlook in response to monetary shocks that impact their financial wealth. The positive coefficient suggests that investor households anticipate an increase (decrease) in inflation following an unanticipated decrease (increase) in the federal funds rate, which aligns with

[7] Revisions in 1-year ahead gas price expectations are available from April 2006; revisions in 5-year ahead gas price expectations are intermittently available from the beginning of the study period, but reliably available from December 2004. In Appendix B, I experiment with several specifications and find that results are robust to the choice of gas price expectations (see Table B.1). Following Coibion and Gorodnichenko (2025), as a proxy of gas price expectations, I also experiment with including six-month changes in gasoline prices. Results are robust to estimations on equivalent sample periods, and qualitatively hold when using the full period (see Table B.2).

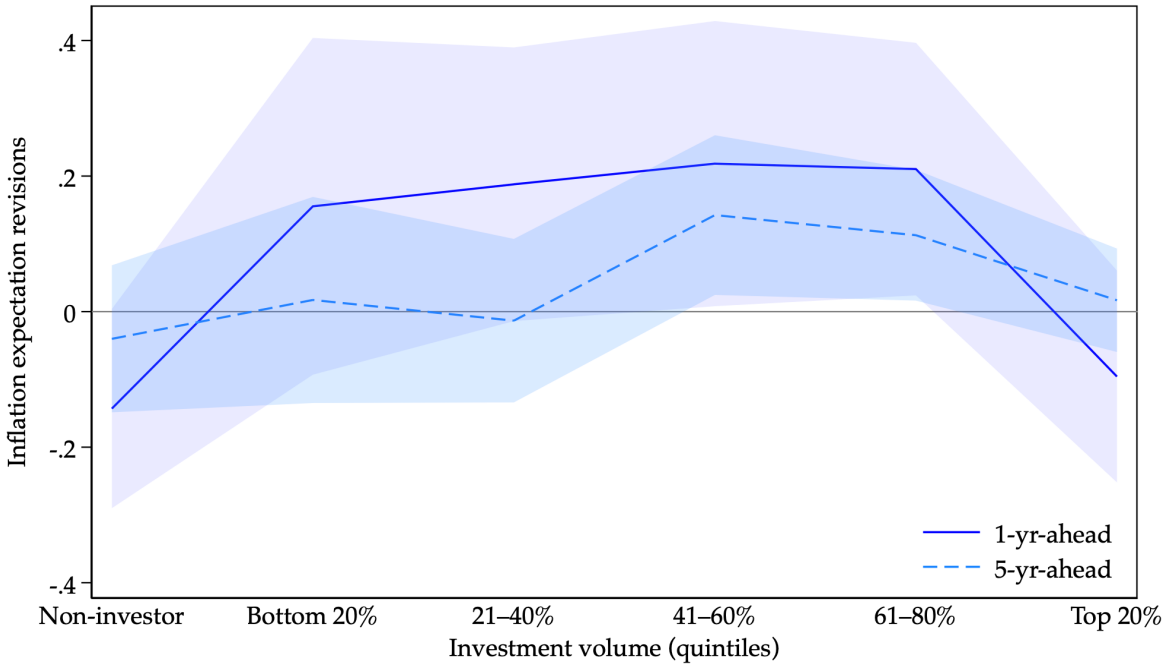

Figure 2: Revisions in inflation expectations, by investment volume quintile. The solid line plots the regressions results from Equation (1) for the six-month change in the MSC's 12-month-ahead inflation expectation and investor households grouped by stock investment value. The dotted line plots regression results for 5-year-ahead inflation expectation revisions. Shaded areas indicate 90% confidence intervals.

the intended effects of monetary policy.

In contrast to the revisions in one-year-ahead inflation expectations, neither investors' nor non-investors' revisions in five-year-ahead inflation expectations appear to be significantly influenced by previous federal funds rate shocks. As shown in the second column of Table 1, the coefficients of both investors and non-investors are not statistically significant. This suggests that households are unlikely to revise their long-run inflation expectations in response to federal funds rate shocks. These results are in line with previous empirical findings indicating that U.S. households' long-run inflation expectations are well-anchored after the late 1990s (Carvalho et al., 2023; Dräger & Lamla, 2013; Nautz et al., 2019).

Table 2: Sensitivity of revisions in investors and non-investors' inflation expectations to monetary policy shocks, by investment quintiles

	1-year-ahead inflation expectations	5-year-ahead inflation expectations
Non-investor×(-FFR)	-0.143	-0.0401
	(0.0893)	(0.0659)
Bottom 20%×(-FFR)	0.155	0.0172
	(0.151)	(0.0924)
21-40%×(-FFR)	0.188	-0.0133
	(0.123)	(0.0733)
41-60%×(-FFR)	0.218*	0.142**
	(0.128)	(0.0716)
61-80%×(-FFR)	0.210*	0.113*
	(0.113)	(0.0587)
Top 20%×(-FFR)	-0.0958	0.0167
	(0.0950)	(0.0464)
Controls	Yes	Yes
Observations	22,751	22,507
Adjusted R^2	0.017	0.005

Notes: This table reports the regression results from Equation (1), where investor households are grouped by stock investment value. Dependent variables are the six-month change in the MSC's 12-month-ahead inflation expectations and 5-year-ahead inflation expectations. "Non-investors" are dummies for MSC respondents that indicated that they did not have investments in the stock market at time t, interacted with the negative of the sum of the federal funds rate shocks of the past six months. "Bottom 20%", "21-40%", "41-60%", "61-80%"and "Top 20%" are dummies that group investor households by their overall investment value. The gender, education, birth cohort, home ownership, marriage status, income, investment volume quintile, and revisions in gas price expectations of the respondent, as well as changes in the unemployment rate during the past six months are included as control variables. Survey weights are applied. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

3.1 Which investors are sensitive to monetary policy shocks?

Next, I examine whether the size of households' stock market holdings introduces heterogeneity in the revision of inflation expectations. I classify investor households into five groups based on the total value of their stock investments.[8] Table 2 presents the estimates for revisions in one-year-ahead and five-year-ahead inflation expectations. Sorting households by investment value reveals a distinct pattern. Households with investment volumes around the median exhibit positive and statistically significant revisions in expectations, while those with smaller or much larger portfolios do not. Figure 2 illustrates these estimates by investment-value quintile. The response

[8]In 2018, the median investment volume for households in the bottom 20%, 21–40%, 41–60%, 61–80%, and top 20% of the MSC data was approximately $10,000, $40,000, $110,000, $300,000, and $1,000,000, respectively.

to monetary policy surprises follows an inverse U-shape across investment size. Notably, households with substantial assets adjust not only their short-term but also their long-term expectations, a result that contrasts with the conventional view that long-run inflation expectations are relatively insensitive to monetary policy shocks.

One possible explanation for insignificant revisions of households with small investment volume is that these households are unwilling to acquire information from monetary announcements because their effect on their aggregate investment valuation is minimal. On the other hand, households with substantial investment wealth could be less sensitive to monetary shocks because they possess sufficient liquid wealth and diversified assets (e.g., property wealth) to hedge against fluctuations in stock prices (the median investment value of respondents in the top 20% group is 1 million USD in 2018). This suggests that their incentive to respond attentively to monetary policy shocks may not be as strong as that of less wealthier households. The second column of Table 2 provides evidence that, unlike the previous results in Table 1, a more granular stratification of households by investment amount will uncover that some households will update their longer-run expectations as well.

3.2 Did the behavior of household expectations change before and after the zero lower bound period?

The sample period available for analysis includes the zero lower bound (henceforth ZLB) period, during which alternative measures beyond changes in the federal funds rate were utilized as policy tools. This raises the question of whether household inflation expectations were consistently updated via conventional monetary policy throughout this period, and whether alternative monetary policy measures initiated during the ZLB also influenced household expectations. In Table 4, I divide the sample period into three sections: 1) the "Pre-ZLB" period, from the start of the sample to June 2009; 2) the "ZLB" period, from July 2009 to November 2015; and 3) the "Post-ZLB" period, from December 2015 to the end of the sample.[9] Additionally, to examine the effect of alternative monetary tools (such as forward guidance or large scale asset purchases), I include

[9] While Swanson (2021), among others, define the ZLB period as beginning in January 2009 and ending in November 2015, I adjust the ZLB period used in analysis because I use the sum of previous policy shocks.

Table 3: Sensitivity of revisions in investors and non-investors' one-year-ahead inflation expectations to federal funds rate shocks, forward guidance shocks, and large scale asset purchases with respect to the ZLB period

	Full sample	Pre-ZLB		ZLB		Post-ZLB	
Non-investor×(-FFR)	-0.127	-0.117	-0.150	0.120	0.271	-0.357	-0.0699
	(0.0861)	(0.0986)	(0.100)	(0.396)	(0.401)	(0.277)	(0.297)
Investor×(-FFR)	0.112**	0.253***	0.163***	-0.165	-0.115	-0.0385	0.262**
	(0.0516)	(0.0593)	(0.0595)	(0.202)	(0.204)	(0.119)	(0.133)
Non-investor×(-FG)	-0.0867		-0.145		0.0130		-0.0674
	(0.0535)		(0.0934)		(0.0804)		(0.0998)
Investor×(-FG)	-0.0302		-0.0908*		0.0448		0.0401
	(0.0273)		(0.0500)		(0.0381)		(0.0445)
Non-investor×LSAP	-0.0341		0.252*		-0.190**		-0.690**
	(0.0716)		(0.139)		(0.0892)		(0.274)
Investor×LSAP	0.153***		0.422***		-0.0192		-0.678***
	(0.0382)		(0.0681)		(0.0468)		(0.127)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	24,793	6,014	6,014	11,662	11,662	7,082	7,082
Adjusted R^2	0.014	0.037	0.046	0.009	0.010	0.012	0.017

Notes: This table reports the regression results from Equation (1), where the sample period is divided with respect to the ZLB period. The dependent variable is the six-month change in the MSC's 12-month-ahead inflation expectations. "Investors" and "Non-investors" are dummies for MSC respondents that indicated that they had/did not have investments in the stock market at time t, interacted with the negative of the sum of the federal funds rate shocks and forward guidance shocks, and large scale asset purchases of the past six months. The gender, education, birth cohort, home ownership, marriage status, income, investment status, and revisions in gas price expectations of the respondent, as well as changes in the unemployment rate during the past six months are included as control variables. Survey weights are applied. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

interactions of investor status with the negative of the sum of past forward guidance shocks and large scale asset purchases (also provided by Swanson (2021)) in the same manner as federal funds rate shocks.

The results are twofold. First, I find that revisions in inflation expectations in response to federal funds rate shocks are statistically significant for investors during the pre-ZLB period. This contrasts with some previous literature that find that households' expectations do not significantly respond to monetary policy announcements in low-inflation environments.[10] However, after the

[10]Coibion et al. (2020), for instance, use MSC data and propose that household inflation expectations did not visibly move in response to large interest rate cuts (August 2007), or quantitative easing announcements (November 2008, November 2010), or the announcement of a 2% target rate (January 2012). Similarly, Binder (2017) reports that household inflation expectations did not appear to respond in a meaningful way to the Federal Reserve's announcement of an inflation target. Lamla and Vinogradov (2019) use high-frequency surveys of U.S. consumers to study how monetary policy announcements alter consumer expectations, and find that beliefs of consumers do not significantly change before and after an announcement.

onset of the ZLB period, this effect disappears for both investors and non-investors, likely because federal funds rate shocks were muted at the zero lower bound. In the post-ZLB period, attentiveness to the federal funds rate shocks return to pre-ZLB levels when incorporating all three types of monetary policy tools in the regression.

Second, I find that investor households did not revise their inflation expectations in response to forward guidance shocks during the ZLB period. This suggests that while investors are sensitive to monetary policy changes that directly impact their financial wealth, households in general are less influenced by the Fed's communication through alternative methods. These findings align with Lewis et al. (2019), who, using daily Gallup poll data, find that monetary policy news under the category of forward guidance does not significantly affect household expectations. Conversely, large-scale asset purchases appear to have influenced investors' expectations throughout the sample period. When dividing the sample into pre- and post-ZLB periods, I find that the effects of large-scale asset purchases on inflation expectations are present, but the heterogeneity based on investor status is less observed. This is in line with the lack of evidence on the effect of large scale asset purchases on stock prices, as reported in Swanson (2021). Overall, with the exception of the ZLB period, I find that conventional monetary policy shocks are associated with revisions in investor households' inflation expectations.

3.3 Effects of monetary policy shocks on outlooks of future business conditions

In this section, I investigate whether federal funds rate shocks influence households' outlook on the general economy beyond their inflation expectations. If households anticipate deteriorating business conditions in response to a series of monetary contractions, this outlook, along with their inflation expectations operating through the consumption Euler equation, could also impact their consumption and saving decisions, possibly through a precautionary saving motive. To further explore the effect of monetary policy shocks on households' outlook for future business conditions, I use the MSC's data on one-year-ahead business conditions.[11] One caveat to estimating changes in outlook on business conditions is that the MSC questionnaire records responses in cat-

[11] The questionnaire entry regarding business conditions in the MSC is given as follows: *About a year from now, do you expect that in the country as a whole, business conditions will be better or worse than they are at present, or just about the same?*

egorical terms (for instance, "better a year from now" or "worse a year from now"). To address this, I construct a binary variable that takes the value 1 if the household's outlook for economic conditions improved (e.g., if a household responded "worse" in the first survey and "better" in the second) and 0 otherwise.

I modify Equation (1) to incorporate revisions to business condition outlook as the dependent variable:

$$\begin{aligned}\mathcal{I}_{i,t} = \alpha + \beta_0\, invest_{i,t} + \beta_1\, invest_{i,t} \times \left(-\sum_{j=t-6}^{t-1} mps_j\right) \\ + \beta_2\,(1 - invest_{i,t}) \times \left(-\sum_{j=t-6}^{t-1} mps_j\right) + \delta X_{i,t} + \gamma Z_t + \epsilon_{i,t},\end{aligned} \tag{2}$$

where $\mathcal{I}_{i,t}$ is a binary variable that takes the value 1 if individual i's outlook on business conditions improved from time $t-6$ to t. I include the same set of investor dummies interacted with federal funds rate shocks and control variables as in the case of the baseline model.

Estimation results for changes in households' outlook on business conditions are reported in Table 4. The coefficient is positive and statistically significant for investor households, in contrast to non-investor households. This suggests that investor households adjust their outlook on business conditions in a postive direction in response to unanticipated monetary expansions, whereas non-investor households do not.

To summarize, households that report holding stock investments adjust their short-run inflation expectations and business condition outlook in response to federal funds rate shocks, whereas those without investments do not. I find that the magnitude of these revisions is particularly strong for households that change their investor status (i.e., households that decide to enter or exit the stock market), suggesting that monetary shocks can significantly impact households making decisions at the extensive margin, particularly those with relatively moderate investments. Additionally, I find that revisions were most sensitive to federal funds rate shocks before the ZLB period but disappeared afterwards. Forward guidance shocks, intended as a policy tool to adjust inflation expectations, did not appear to be particularly successful, even during the ZLB period.

Table 4: Sensitivity of revisions in investors and non-investors' macroeconomic expectations to monetary policy shocks

	$\mathcal{I}$(Better business conditions)
Non-investor×(-FFR)	0.00149
	(0.00548)
Investor×(-FFR)	0.00919**
	(0.00410)
Controls	Yes
Observations	27,864
Adjusted R^2	0.004

Notes: This table reports the regression results from Equation (2). The dependent variable is a binary variable that takes value 1 if an MSC respondent revised their expectation on one-year-ahead business conditions in a positive direction. "Investors" and "Non-investors" are dummies for MSC respondents that indicated that they had/did not have investments in the stock market at time t, interacted with the negative of the sum of federal funds rate shocks during the past six months. The gender, education, birth cohort, home ownership, marriage status, income, investment status, and revision in gas price expectations of the respondent, as well as changes in the unemployment rate during the past six months are included as control variables. Survey weights are applied. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Nevertheless, investor households actively revised their expectations during recessions and in response to expansionary, or optimistic, federal funds rate movements, which may have aided in stabilizing the business cycle. Overall, the MSC provides evidence that investor status is a key characteristic influencing the effectiveness of monetary policy on household expectations.

4 Effects of monetary policy shocks on household expenditures

In this section, I extend my analysis to examine whether households with different investment statuses exhibit heterogeneous expenditure responses to monetary policy shocks. Using the monthly CEX data from Coibion et al. (2017), I generate series of mean expenditures for investor and non-investor households, defined by whether they report nonzero financial income, which is composed of income from dividends, royalties, estates, or trusts. Expenditures are categorized into non-durable and durable expenditures, with each category following the classification provided by the national income and product accounts (NIPA) guidelines.[12]

[12]Details are provided in Appendix C.

To explore whether the expenditure responses of investor and non-investor households align with the expected results from the previous section on household expectations, I control for other relevant channels - for instance, by shutting down general wealth effects by controlling for income. Specifically, since household expenditures are likely influenced by various channels related to monetary policy shocks, and because investor and non-investor households may differ in demographic characteristics over the sample period, I use expenditure measures that control for observable household characteristics. Following Blundell et al. (2008) and Arellano et al. (2017), I construct the expenditure series as residuals from regressing log real per-capita expenditures on age, age-squared, sex, race, education level, log income, number of children (under 18) and seniors (over 64) within the household, as well as time fixed effects. By filtering out the effects of changes in income on consumption, I obtain estimates more closely associated to differences in expectations.

Nevertheless, since the MSC survey does not provide information on household expenditures, and the CEX survey used here lacks data on inflation expectations, I cannot directly assume that the investor households identified in the MSC will share the same outlooks and behavior as those in the CEX. Hence, interpretation of the empirical results presented in this section relies on the assumption that the investor and non-investor households of the two separate samples represent equivalent subsets of the population.

I apply the local projection technique from Jordà (2005) to estimate linear models, allowing me to calculate impulse responses to a monetary policy shock. The estimating equation is as follows:

$$y_{i,t+h} = \beta_{i,h} mps_t + \phi_{i,h}(L) Z_{i,t-1} + \varepsilon_{i,t+h}, \tag{3}$$

where the dependent variable y is a measure of household consumption (e.g. non-durable consumption, durable consumption) of households categorized by their investorship status. Investorship status, or whether the household is identified as participating in the financial market or not is proxied by their reported financial income, which is the of household income from dividends, royalties, estates, or trusts. Households are categorized as investors when this value is non-zero. As in the previous section, I use federal funds rate shocks from Swanson (2021) as monetary pol-

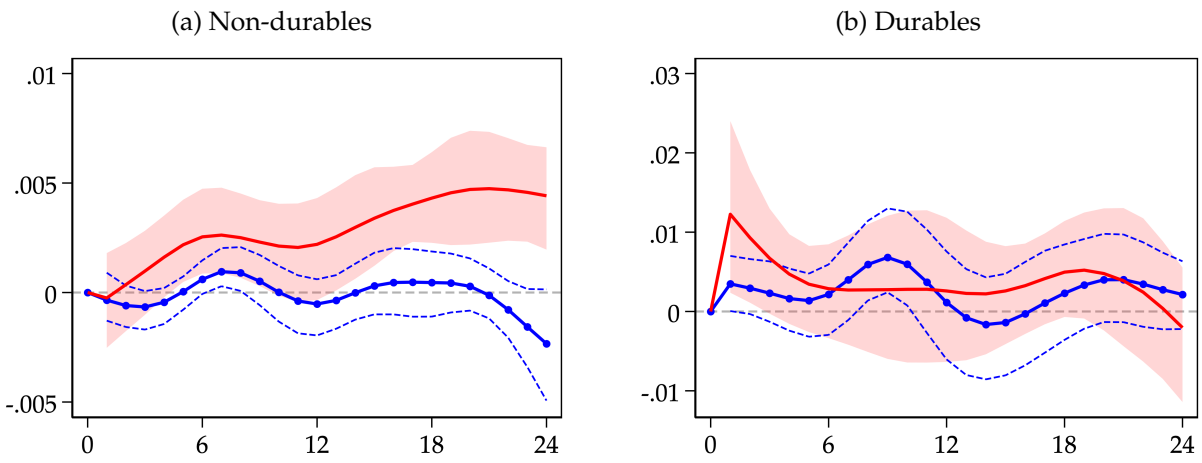

Figure 3: Impulse responses of household expenditures to a expansionary monetary policy shock for investors and non-investors. The measures of expenditure are the residuals from regressing log real per capita expenditure on a set of demographic characteristics, which include age, age squared, sex, race, education, income, and time fixed effects. Investors are those that report non-zero financial income. The red line is the impulse response for investors and the blue dotted line is the impulse response for non-investors. Impulse responses are derived using the smooth local projection approach by Barnichon and Brownlees (2019). Shaded areas are 90 percent confidence bands. The units for horizons are months.

icy shocks. h represents the horizon of interest, from which we obtain impulse responses β_h to monetary shocks up to horizon H. I simulate an expansionary monetary policy shock to retain consistency with the results from the previous section. Z_{t-1} is a vector of control variables comprised of lags of the dependent variable and lags of the federal funds rate shock. The term $\phi(L)$ is a a polynomial in the lag operator of order 4. The impulse responses are smoothed using the smooth local projection technique from Barnichon and Brownlees (2019).

Figure 3 displays impulse responses of expenditure residuals for investor and non-investor households, with the red line representing investor households and the blue line representing non-investors. Panel 3a shows the impulse response of non-durable consumption to an expansionary federal funds rate shock. Investor households significantly increase their non-durable consumption over a two-year period, whereas non-investors show no significant increase in expenditures in response to the expansionary shock. It is important to note that the dependent variable is the residual of regressing non-durable expenditures on household characteristics, including income, to remove any potential general equilibrium effects of monetary policy. Therefore, the hetero-

geneous responses between investors and non-investors may serve as supporting evidence that inflation expectations influence the consumption Euler equation. Specifically, in response to monetary easing, investor households likely revise their inflation expectations upward, perceiving real interest rates as lower (via the Fisher equation), which incentivizes increasing current consumption rather than saving.

Panel 3b plots the impulse response of durable consumption to an expansionary federal funds rate shock. In this case, the responses of investor and non-investor households are not significantly different from each other, and in general, the responses are not statistically different from zero. However, non-investor households do appear to significantly increase their durable expenditure shortly after a monetary expansion. This could be due to non-investor households perceiving less constraint in financing durable goods due to lower interest rates. Overall, these empirical results are moderately consistent with recent studies that examine the relationship between inflation expectations and household expenditures. For example, Coibion, Georgarakos, et al. (2023) find that households with exogenously higher inflation expectations tend to increase their spending on non-durable goods and services, based on randomized control trials conducted on Dutch households. Similarly, Coibion et al. (2022) study the effects of different mediums for communicating monetary policy on expectations and observe corresponding adjustments in consumption using U.S. scanner data. Building on these recent studies, I suggest that investor households, which are more attentive to monetary policy, represent a key subgroup in the transmission of monetary policy to household consumption.

5 Discussion

This section provides additional evidence and discusses relevant mechanisms previously explored in the literature that support my empirical findings. Section 5.1 presents empirical findings that suggest that investors are more sensitive to conventional monetary shocks during recessionary periods and links this to the "risk-hedging channel," proposed by Ahn and Xie (2024), as a potential mechanism for why stockholders may be more attentive to monetary announcements. In a similar

approach, the following section investigates sign-dependency in the effect of monetary policy on household expectations. Here, I find that investor households significantly respond to expansionary policy, whereas effects are insignificant for contractionary shocks. I tie this to a "confirmation bias" mechanism, explored largely in the behavioral finance literature.

5.1 Risk-hedging in recessionary periods

In this section, I examine whether households respond differently during recessions compared to normal times. I distinguish between these periods using the recession dates classified by the NBER. To obtain the heterogeneous responses of revisions in inflation expectations depending on the state of the economy, I estimate the following empirical specification:

$$\begin{aligned}\mathbb{E}\pi_{i,t}^{h-yr} - \mathbb{E}\pi_{i,t-6}^{h-yr} = \alpha + \beta_0\, invest_{i,t} \\ + \sum_{k=1}^{K}\sum_{l=1}^{L}\beta_{k,l}\left(invest_{i,t}^{k} \times rec_{i,t}^{l} \times \left(-\sum_{j=t-6}^{t-1} mps_j\right)\right) + \delta X_{i,t} + \gamma Z_t + \epsilon_{i,t},\end{aligned} \tag{4}$$

where $rec_{t,t-6}$ indicates whether both year-months t and $t-6$ are (not) within the period of the two recessions included in the study period. Hence, observations in which the first survey was recorded in a non-recessionary period but the second was recorded in a recessionary period (or *vice versa*) are discarded from this analysis. I interact these with dummy variables that indicate whether the household responded as "investing in the stock market" at time t, and the negative of the federal funds rate shocks, similar to the baseline empirical model. Therefore, β_1, for instance, can be interpreted as the effect of an expansionary monetary policy on revisions in inflation expectations during normal times for households that invest in the stock market. In Table 5, estimation results are presented for the two subsets of time periods. Comparing the results between these two periods, I find that revisions to inflation expectations are stronger during recessions than in normal times. This suggests that investors, during a recession, are more likely to be attentive to monetary policy expansions that are implemented to counteract the downturn.

One mechanism for the heightened attention of stock-holding households to monetary shocks during recessionary periods is the *risk-hedging channel*, as proposed by Ahn and Xie (2024). This

Table 5: Sensitivity of revisions in investors and non-investors' one-year-ahead inflation expectations to monetary policy shocks in good times and bad times

	1-year-ahead inflation expectations
Non-recession×Non-investor×(-FFR)	-0.0453
	(0.0533)
Non-recession×Investor×(-FFR)	0.0296
	(0.0316)
Recession×Non-investor×(-FFR)	0.0207
	(0.0375)
Recession×Investor×(-FFR)	0.0535*
	(0.0274)
Controls	Yes
Observations	37,437
Adjusted R^2	0.003

Notes: This table reports the regression results from Equation (4), where a dummy variable indicating whether the expectations were recorded in NBER recessions are interacted with the monetary policy shocks. The dependent variable is the six-month change in the MSC's 12-month-ahead inflation expectations. "Investors" and "Non-investors" are dummies for MSC respondents that indicated that they had/did not have investments in the stock market at time t, interacted with the sum of the federal funds rate shocks of the past six months. The gender, education, birth cohort, home ownership, marriage status, income, investment status, and revisions in gas price expectations of the respondent, as well as changes in the unemployment rate during the past six months are included as control variables. Survey weights are applied. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

channel suggests that households acquire economic information to hedge against the high risks associated with stock market investments. For investor households, information acquisition thus serves as a hedging instrument. During periods of increased volatility in the stock market, we would expect investors to pay more attention to economic information and update their future outlook accordingly. Hence, the increased responsiveness of expectations during economic downturns documented in this section provides suggestive evidence that the risk-hedging channel is a source of the heterogeneous responses of investing households as opposed to non-investing households.

5.2 Sign-dependent effects of monetary policy shocks

This section examines the asymmetric effects of federal funds rate shocks on households' inflation expectations. I consider the following estimating equation, which extends the baseline empirical model by separately analyzing the effects of unanticipated monetary policy contractions and

Table 6: Sign-dependence in the sensitivity of revisions in investors and non-investors' one-year-ahead inflation expectations to monetary policy shocks

	1-year-ahead inflation expectations
Non-investors$\times I_t^- \times$(-FFR)	-0.0625
	(0.125)
Non-investors$\times I_t^+ \times$(-FFR)	-0.319
	(0.204)
Investors$\times I_t^- \times$(-FFR)	0.229***
	(0.0860)
Investors$\times I_t^+ \times$(-FFR)	-0.155
	(0.123)
Controls	Yes
Observations	23895.000
Adjusted R^2	0.018

Notes: This table reports the regression results from Equation (5). Dependent variables are the six-month change in the MSC's 12-month-ahead inflation expectations and 5-year-ahead inflation expectations. "Investors" and "Non-investors" are dummies for MSC respondents that indicated that they had/did not have investments in the stock market at time t, interacted with positive and negative federal funds rate shocks of the past six months. I^- refer to six-month periods where the sum of monetary shocks are negative, and I^+ positive. The gender, education, birth cohort, home ownership, marriage status, income, investment status, and revisions in gas price expectations of the respondent, as well as changes in the unemployment rate during the past six months are included as control variables. Survey weights are applied. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

expansions:

$$\mathbb{E}\pi_{i,t}^{h-yr} - \mathbb{E}\pi_{i,t-6}^{h-yr} = \alpha + \beta_0\, invest_{i,t} + \sum_{k=1}^{K}\sum_{l=1}^{L}\beta_{k,l}\left(invest_{i,t}^{k} \times sign_{i,t}^{l} \times \left(-\sum_{j=t-6}^{t-1} mps_j\right)\right) + \delta X_{i,t} + \gamma Z_t + \epsilon_{i,t}, \tag{5}$$

where $sign_t$ is a dummy variable indicating whether the sum of the previous federal funds rate shocks are either negative or positive. Hence, there are a total of four estimated coefficients, each representing the response of revisions in inflation expectations for investors or non-investor households, and for positive or negative federal funds rate shocks. I include the same set of control variables as in the case of the baseline model.

Table 6 reports the estimation results. I find that expansionary federal funds rate shocks lead to revisions in one-year-ahead inflation expectations for investor households, whereas contractionary shocks do not. These results are in line those of Baqaee (2020), which, also using the MSC data,

find that household expectations are more sensitive to inflationary news. This divergence based on the sign of the shock could be attributed to investor households' tendency to be more attentive to optimistic events. In the behavioral finance literature, this is known as confirmation bias, where individuals are inclined to retain a currently favored hypothesis throughout their decision-making process (Barberis et al., 1998; Klayman, 1995; Madsen, 1994; Tversky & Kahneman, 1974). Lutz (2015) also finds that expansionary monetary policy shocks can have a substantial positive effect on investor sentiment. Consistent with my baseline results, non-investors show no significant response to federal funds rate shocks, regardless of their direction.

6 Conclusion

Recent measures that have lowered barriers to stock market entry—such as the elimination of commission fees and the introduction of fractional stock trading—have significantly driven the recent rise in stock market participation (Da et al., 2024; Tripathi & Rengifo, 2023). This study proposes that stock market participants play a key role in the propagation of monetary policy. Using MSC survey data, I demonstrate that investing households are attentive to unexpected changes in the federal funds rate, as indicated by their revisions in inflation expectations and economic outlook. Additionally, using expenditure data from the CEX, I show that investing households significantly respond to monetary shocks. I further verify that investors use monetary announcements as a tool to hedge against the risks of holding stock assets, evidenced by their heightened attention during periods of high uncertainty. The direction of revisions in both inflation expectations and expenditures aligns with the consumption Euler equation, linking the theoretical foundations of textbook macroeconomic models to household-level micro data. While alternative monetary policy tools, such as forward guidance and communication strategies, have been extensively studied post-ZLB, my findings suggest that conventional monetary policy can also influence the expectations and consumption behavior of a growing subset of the population. Therefore, measures that encourage stock market participation could potentially enhance the effectiveness of monetary policy in reducing economic volatility.

One aspect of household expectations not addressed in this study is the level of expectations. The literature documents that inflation expectations among professional forecasters and financial markets often diverge significantly from those of households (Coibion et al., 2020). Household expectations are typically more volatile, exhibit greater disagreement, and involve higher uncertainty. In contrast, professional forecasters have well-anchored expectations, suggesting that information from the Fed is effectively incorporated into their forecasts. Since my findings indicate that investor households adjust their inflation expectations in line with monetary policy, it would be interesting to explore whether their expectation formation starts to resemble that of professional forecasters. If this were the case, it could alleviate concerns in the literature regarding the Fed's reliance on professional forecasters when conducting policy. I leave this for future research.

References

Ahn, H. J., & Xie, S. (2024, July 22). Stock-driven household attention.

Ahn, H. J., Xie, S., & Yang, C. (2024). Effects of monetary policy on household expectations: The role of homeownership. *Journal of Monetary Economics*, 103599.

Alan, S. (2006). Entry costs and stock market participation over the life cycle. *Review of Economic Dynamics*, *9*(4), 588–611.

Almenberg, J., & Dreber, A. (2015). Gender, stock market participation and financial literacy. *Economics Letters*, *137*, 140–142.

Arellano, M., Blundell, R., & Bonhomme, S. (2017). Earnings and consumption dynamics: A nonlinear panel data framework. *Econometrica*, *85*(3), 693–734.

Armantier, O., Nelson, S., Topa, G., van der Klaauw, W., & Zafar, B. (2016). The price is right: Updating inflation expectations in a randomized price information experiment. *The Review of Economics and Statistics*, *98*(3), 503–523.

Baqaee, D. R. (2020). Asymmetric inflation expectations, downward rigidity of wages, and asymmetric business cycles. *Journal of Monetary Economics*, *114*, 174–193.

Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of Financial Economics*, *49*(3), 307–343.

Barnichon, R., & Brownlees, C. (2019). Impulse response estimation by smooth local projections. *The Review of Economics and Statistics*, *101*(3), 522–530.

Binder, C. (2017). Fed speak on main street: Central bank communication and household expectations. *Journal of Macroeconomics*, *52*, 238–251.

Blundell, R., Pistaferri, L., & Preston, I. (2008). Consumption inequality and partial insurance. *American Economic Review*, *98*(5), 1887–1921.

Brown, J. R., Ivković, Z., Smith, P. A., & Weisbenner, S. (2008). Neighbors matter: Causal community effects and stock market participation. *The Journal of Finance*, *63*(3), 1509–1531.

Bruine de Bruin, W., Vanderklaauw, W., Downs, J. S., Fischhoff, B., Topa, G., & Armantier, O. (2010). Expectations of inflation: The role of demographic variables, expectation formation, and financial literacy. *Journal of Consumer Affairs*, *44*(2), 381–402.

Bucher-Koenen, T., Alessie, R. J., Lusardi, A., & van Rooij, M. (2021, April). Fearless woman: Financial literacy and stock market participation.

Burke, M. A., & Ozdagli, A. (2023). Household inflation expectations and consumer spending: Evidence from panel data. *The Review of Economics and Statistics*, *105*(4), 948–961.

Carvalho, C., Eusepi, S., Moench, E., & Preston, B. (2023). Anchored inflation expectations. *American Economic Journal: Macroeconomics*, *15*(1), 1–47.

Cavallo, A., Cruces, G., & Perez-Truglia, R. (2017). Inflation expectations, learning, and supermarket prices: Evidence from survey experiments. *American Economic Journal: Macroeconomics*, *9*(3), 1–35.

Coibion, O., Georgarakos, D., Gorodnichenko, Y., & van Rooij, M. (2023). How does consumption respond to news about inflation? field evidence from a randomized control trial. *American Economic Journal: Macroeconomics*, *15*(3), 109–152.

Coibion, O., & Gorodnichenko, Y. (2015). Is the phillips curve alive and well after all? inflation expectations and the missing disinflation. *American Economic Journal: Macroeconomics*, *7*(1), 197–232.

Coibion, O., & Gorodnichenko, Y. (2025, May). Inflation, expectations and monetary policy: What have we learned and to what end?

Coibion, O., Gorodnichenko, Y., Knotek, E. S., & Schoenle, R. (2023). Average inflation targeting and household expectations [Publisher: The University of Chicago Press]. *Journal of Political Economy Macroeconomics*, *1*(2), 403–446.

Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Innocent bystanders? monetary policy and inequality. *Journal of Monetary Economics*, *88*, 70–89.

Coibion, O., Gorodnichenko, Y., Kumar, S., & Pedemonte, M. (2020). Inflation expectations as a policy tool? *Journal of International Economics*, *124*, 103297.

Coibion, O., Gorodnichenko, Y., & Weber, M. (2022). Monetary policy communications and their effects on household inflation expectations [Publisher: The University of Chicago Press]. *Journal of Political Economy*, *130*(6), 1537–1584.

Da, Z., Fang, V. W., & Lin, W. (2024). Fractional trading. *The Review of Financial Studies*, hhae012.

D'Acunto, F., Hoang, D., Paloviita, M., & Weber, M. (2023). IQ, expectations, and choice. *The Review of Economic Studies*, *90*(5), 2292–2325.

D'Acunto, F., Hoang, D., & Weber, M. (2022). Managing households' expectations with unconventional policies. *The Review of Financial Studies*, *35*(4), 1597–1642.

D'Acunto, F., Malmendier, U., Ospina, J., & Weber, M. (2021). Exposure to grocery prices and inflation expectations [Publisher: The University of Chicago Press]. *Journal of Political Economy*, *129*(5), 1615–1639.

D'Acunto, F., Malmendier, U., & Weber, M. (2023, January 1). What do the data tell us about inflation expectations? In R. Bachmann, G. Topa, & W. van der Klaauw (Eds.), *Handbook of economic expectations* (pp. 133–161). Academic Press.

Das, S., Kuhnen, C. M., & Nagel, S. (2020). Socioeconomic status and macroeconomic expectations. *The Review of Financial Studies*, *33*(1), 395–432.

Dräger, L. (2015). Inflation perceptions and expectations in sweden – are media reports the missing link? *Oxford Bulletin of Economics and Statistics*, *77*(5), 681–700.

Dräger, L., & Lamla, M. J. (2013, July 30). Anchoring of consumers' inflation expectations: Evidence from microdata.

Grinblatt, M., Keloharju, M., & Linnainmaa, J. (2011). IQ and stock market participation. *The Journal of Finance*, *66*(6), 2121–2164.

Guiso, L., & Jappelli, T. (2005). Awareness and stock market participation. *Review of Finance*, *9*(4), 537–567.

Gürkaynak, R. S., Sack, B. P., & Swanson, E. T. (2004, November 1). Do actions speak louder than words? the response of asset prices to monetary policy actions and statements.

Hong, H., Kubik, J. D., & Stein, J. C. (2004). Social interaction and stock-market participation. *The Journal of Finance*, *59*(1), 137–163.

Jordà, Ò. (2005). Estimation and inference of impulse responses by local projections. *American Economic Review*, *95*(1), 161–182.

Kadoya, Y., Khan, M. S. R., & Rabbani, N. (2017, October 20). Does financial literacy affect stock market participation?

Klayman, J. (1995, January 1). Varieties of confirmation bias. In J. Busemeyer, R. Hastie, & D. L. Medin (Eds.), *Psychology of learning and motivation* (pp. 385–418, Vol. 32). Academic Press.

Lamla, M. J., & Vinogradov, D. V. (2019). Central bank announcements: Big news for little people? *Journal of Monetary Economics*, *108*, 21–38.

Lewis, D. J., Makridis, C., & Mertens, K. (2019, September 1). Do monetary policy announcements shift household expectations?

Lutz, C. (2015). The impact of conventional and unconventional monetary policy on investor sentiment. *Journal of Banking & Finance*, *61*, 89–105.

Madsen, J. B. (1994). Tests of rationality versus an "over optimist" bias. *Journal of Economic Psychology*, *15*(4), 587–599.

Nautz, D., Strohsal, T., & Netšunajev, A. (2019). THE ANCHORING OF INFLATION EXPECTATIONS IN THE SHORT AND IN THE LONG RUN. *Macroeconomic Dynamics*, *23*(5), 1959–1977.

Swanson, E. T. (2021). Measuring the effects of federal reserve forward guidance and asset purchases on financial markets. *Journal of Monetary Economics*, *118*, 32–53.

Tripathi, J. S., & Rengifo, E. W. (2023). The impact of fractional trading on risk aversion for non-professional investors. *Finance Research Letters*, *52*, 103547.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases [Publisher: American Association for the Advancement of Science]. *Science*, *185*(4157), 1124–1131.

van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, *101*(2), 449–472.

van Rooij, M. C., Lusardi, A., & Alessie, R. J. (2012). Financial literacy, retirement planning and household wealth. *The Economic Journal*, *122*(560), 449–478.

Weber, M., Gorodnichenko, Y., & Coibion, O. (2022, January). The expected, perceived, and realized inflation of u.s. households before and during the COVID19 pandemic.

Weber, M., Gorodnichenko, Y., Coibion, O., & D'Acunto, F. (2022). Reality check: How people form inflation expectations and why you should care.

Appendices

A Summary statistics of MSC households

Table A.1: Summary statistics, by investing status

Variable (Category)	Investors		Non-investors	
Continuous (mean (sd))				
1-year ahead inflation expectations (%)	3.11	(3.37)	3.86	(4.25)
5-year ahead inflation expectations (%)	2.87	(2.27)	3.24	(3.29)
Revision in 1-year ahead inflation expectations (%p)	-0.27	(4.22)	-0.41	(5.39)
Revision in 5-year ahead inflation expectations (%p)	-0.14	(2.73)	-0.24	(4.01)
Revision in 1-year ahead gas price expectations (%p)	-1.62	(35.69)	-1.52	(39.19)
Categorical (count (%))				
Gender				
Male	9955	57.3%	3319	51.9%
Female	7421	42.7%	3079	48.1%
Age				
Under 40	3549	20.4%	1594	24.9%
40 to 60	7135	41.1%	1965	30.7%
Over 60	6692	38.5%	2839	44.4%
Education				
Less than college	2754	15.8%	2525	39.5%
Some college	4558	26.2%	2202	34.4%
College degree and above	10064	57.9%	1671	26.1%
Marital status				
Married/partner	12577	72.4%	3015	47.1%
Divorced	1809	10.4%	1322	20.7%
Widowed	1066	6.1%	813	12.7%
Never married	1924	11.1%	1248	19.5%
Children in household				
Without children	12285	70.7%	4792	74.9%
With children	5091	29.3%	1606	25.1%
Home ownership				
Owns or is buying	15261	87.8%	4181	65.3%
Rent	2115	12.2%	2217	34.7%
Region				
West	3735	21.5%	1379	21.6%
North Central	4898	28.2%	1681	26.3%

Northeast	3099	17.8%	976	15.3%
South	5644	32.5%	2362	36.9%
Income quartile				
Bottom 25%	1311	7.5%	2646	41.4%
26-50%	3636	20.9%	2037	31.8%
51-75%	5597	32.2%	1148	17.9%
Top 25%	6832	39.3%	567	8.9%
Investment volume				
Bottom 20%	2415	15.6%		
21-40%	2779	18.0%		
41-60%	3023	19.5%		
61-80%	3410	22.0%		
Top 20%	3845	24.9%		
No Investments			6398	100.0%
Total	15472	100.0%	6398	100.0%

B Robustness checks

This section reports regression results that incorporate alternative measures of household gasoline price expectations. In Table B.1, I present estimates from regression models that include short-run gas price expectations (columns (1) and (4)), long-run gas price expectations (columns (2) and (5)), or both (columns (3) and (6)). First, it is important to observe that changes in gasoline price expectations are strongly associated with changes in household inflation expectations – consistent with existing literature on the salience of gasoline prices in shaping household beliefs. Notably, the magnitude of short-run gas price expectations is larger in models of short-run inflation expectations, and *vice versa*, suggesting that households perceive overall price levels to co-move with gasoline prices over time. Second, the results from these alternative specifications are qualitatively consistent with the baseline findings. For short-run inflation expectations, F-tests indicate a statistically significant difference in expectation updating between households that hold stocks and those that do not. This difference is consistently absent in the case of long-run inflation expectations.

Next, I replace survey-based gas price expectations with weekly U.S. regular conventional retail

Table B.1: Sensitivity of revisions in investors and non-investors' inflation expectations to monetary policy shocks, controlling for gas price expectations

	1-year-ahead inflation expectations			5-year-ahead inflation expectations		
	(1)	(2)	(3)	(4)	(5)	(6)
1-yr gas revisions	0.0112***		0.0101***	0.00510***		0.00194**
	(0.00104)		(0.00118)	(0.000765)		(0.000871)
5-yr gas revisions		0.00328***	0.00129**		0.00365***	0.00333***
		(0.000427)	(0.000517)		(0.000306)	(0.000375)
Investors (β_1)	0.125**	0.133***	0.108*	0.0402	0.0206	0.0255
	(0.0556)	(0.0300)	(0.0561)	(0.0336)	(0.0187)	(0.0336)
Non-investors (β_2)	-0.142	0.0662*	-0.144	-0.0429	-0.0124	-0.0150
	(0.0888)	(0.0382)	(0.0888)	(0.0656)	(0.0302)	(0.0655)
Observations	24,793	33,655	23,895	24,506	33,286	23,729
Adjusted R^2	0.018	0.014	0.018	0.005	0.009	0.011
F-test ($\beta_1 = \beta_2$)	7.32***	2.77*	6.40**	1.41	1.14	0.34

Notes: This table reports the regression results from Equation (1). Dependent variables are the six-month change in the MSC's 12-month-ahead inflation expectations and 5-year-ahead inflation expectations. "Investors" and "Non-investors" are dummies for MSC respondents that indicated that they had/did not have investments in the stock market at time t, interacted with the negative of the sum of the federal funds rate shocks of the past six months. The gender, education, birth cohort, home ownership, marriage status, income, investment status, and revisions in gas price expectations of the respondent, as well as changes in the unemployment rate during the past six months are included as control variables. Survey weights are applied. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

gasoline prices (in dollars per gallon), as used in Figure 2, Panel A of Coibion and Gorodnichenko (2025). These data are publicly available from the Energy Information Agency. I aggregate the weekly series to monthly frequency to match the MSC data and compute six-month changes in gas prices to align with the structure of the inflation expectations variables.

Table B.2 presents the results. In columns (1) and (3), I confirm that the baseline results are robust to substituting gas price expectation revisions with actual changes in gasoline prices over the same sample period (April 2006 onward). For short-run inflation expectation revisions, the estimates remain qualitatively similar but are somewhat larger in magnitude for investor households. F-test results continue to show significant differences between investor and non-investor households. Interestingly, column (3) suggests that investor households' long-run inflation expectations may also respond to monetary policy shocks; however, the estimated effect is small, and the F-test does not detect a statistically significant difference between the two groups. Since gasoline price data are available from August 1990 onward, I extend the sample to the full MSC period in columns (2)

Table B.2: Sensitivity of revisions in investors and non-investors' inflation expectations to monetary policy shocks, controlling for gasoline prices

	1-year-ahead inflation expectations		5-year-ahead inflation expectations	
	(1)	(2)	(3)	(4)
ΔRegular gas prices	1.616***	1.616***	0.293***	0.276***
	(0.0771)	(0.0737)	(0.0504)	(0.0486)
Investors (β_1)	0.235***	0.126***	0.0745**	0.0344*
	(0.0552)	(0.0284)	(0.0335)	(0.0182)
Non-investors (β_2)	0.00491	0.0629*	-0.0187	-0.00848
	(0.0884)	(0.0364)	(0.0647)	(0.0282)
Sample period	Baseline	Full	Baseline	Full
Observations	25,356	38,135	25,019	37,437
Adjusted R^2	0.040	0.034	0.004	0.003
F-test ($\beta_1 = \beta_2$)	5.52**	2.71*	1.81	2.17

Notes: This table reports the regression results from Equation (1). Dependent variables are the six-month change in the MSC's 12-month-ahead inflation expectations and 5-year-ahead inflation expectations. "Investors" and "Non-investors" are dummies for MSC respondents that indicated that they had/did not have investments in the stock market at time t, interacted with the negative of the sum of the federal funds rate shocks of the past six months. The gender, education, birth cohort, home ownership, marriage status, income, investment status, and changes in regular gasoline prices, as well as changes in the unemployment rate during the past six months are included as control variables. Survey weights are applied. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

and (4). F-test results remain broadly consistent with earlier findings, though the estimated effects are somewhat attenuated.

C Definitions of expenditures

I adopt the definitions provided in Coibion et al. (2017). Classifications are based on the national income and product accounts (NIPA) handbook, chapter 5: 'Consumer Spending.'

Non-durable consumption Non-durable consumption is the sum of expenditures on non-durable goods and services. These include food and beverages, clothing and footwear, gasoline and other energy/fuel, personal care, magazines, newspapers, etc., tobacco, child-care, hospital, and nursery services (i.e. household operations), household utilities and energy, recreation services, financial services, accommodations, telecommunication services, transportation services (housing and rent

or imputed rental value; health care; (health) insurance; education services are excluded).

Durable consumption Durable consumption is the sum of expenditures on recreational goods, furniture and furnishing, jewelry and watches, mortgage payments, education, health care, pensions, cash contributions, household expenditures (including home insurance and maintenance), occupation expenses, property taxes, new motor vehicles, parts and accessories.