Portfolio-driven Household Attention

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Household Heterogeneity and Macroeconomic Outcomes

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How does households' portfolio affect their expectation formation?

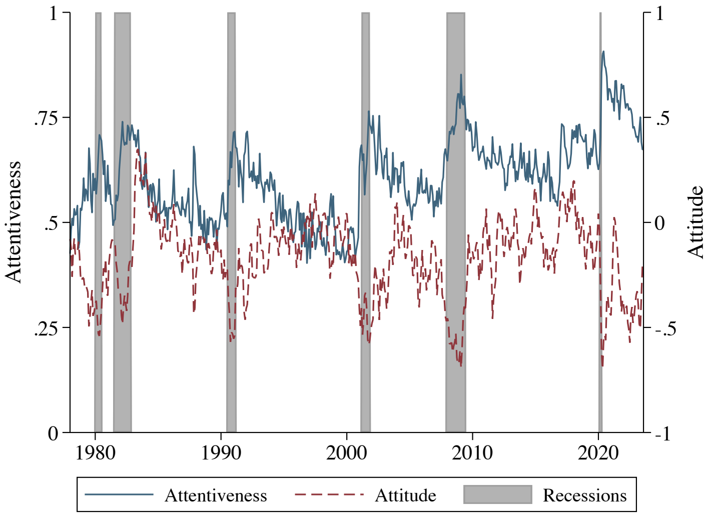
- Which asset in particular? **Stock** $\rightarrow$ more accurate information about current inflation and produce better inflation projections
- What explains this phenomenon? **Heterogeneous attention allocation** $\rightarrow$ Stockholding incentivizes information acquisition
- Why is this important? Heterogeneous effects of **monetary policy** $\rightarrow$ potentially exacerbating inequality

Stockholding as a determinant of household attention heterogeneity

- New indicators of **attentiveness** and **attitude** based on novel use of Michigan Survey of Consumers
- New empirical evidence that stockholders
  - form more accurate inflation expectations
  - more responsive to economic shocks
- Mechanisms:
  - Frequency channel: high-frequency information flows
  - Risk hedging channel: risk can be hedged with more attention
- Implications: monetary policy has favorable effects on stockholders via the feedback effects of attentiveness

Households' attentiveness is counter-cyclical

Details



Attentiveness: counter-cyclical Attitude: pro-cyclical

Stockholding improves forecast accuracy and attentiveness to economic news

Dependent variable	Inflation forecast error		Attentiveness	
	(1) OLS	(2) IV	(3) OLS	(4) IV
Stock (β)	-0.371***	-0.595***	0.08***	0.10***
	(0.024)	(0.061)	(0.00)	(0.01)
Time FE	Y	Y	Y	Y
Demographics FE	Y	Y	Y	Y
Number of obs.	109,001	42,404	120,147	45,987
R^2	0.1157	0.0011	0.1045	0.0038

- Instrument stock-holding using positions from six months ago
- Results are robust after controlling for attitudes or sentiments.

Response to demand news

IRFs

A positive change in Fed reaction to news by Bauer and Swanson (2022)

$\Longrightarrow$ inflation forecast $\uparrow$, future business conditions $\uparrow$, sentiment $\uparrow$

$$Y_{i,t} = \alpha + \beta_0\ \mathit{Stock}_{i,t} + \beta_1\ \mathit{Stock}_{i,t} \times \mathit{Shock}_t + \beta_2\ \textit{non-Stock}_{i,t} \times \mathit{Shock}_t + \delta X_{i,t} + \epsilon_{i,t}$$

Dependent variable	(1) Inflation	(2) Business conditions	(3) Sentiment
Stock $\times$ *Fed reaction*$_t$ (β_1)	**0.134***	**0.188*****	**3.127*****
	(0.020)	(0.008)	(0.163)
non-Stock $\times$ *Fed reaction*$_t$ (β_2)	0.071	0.144***	2.534***
	(0.035)	(0.011)	(0.216)
F-test: $\beta_1 = \beta_2$	2.79*	10.14***	4.83**
Number of obs.	108,755	110.523	120,147
R^2	0.0285	0.0294	0.0768

Response to a supply shock

IRFs

A positive TFP news shock by Barsky and Sims (2011)

$\implies$ inflation forecast $\downarrow$, future business conditions $\uparrow$, sentiment $\uparrow$

$$Y_{i,t} = \alpha + \beta_0\ \mathit{Stock}_{i,t} + \beta_1\ \mathit{Stock}_{i,t} \times \mathit{Shock}_t + \beta_2\ \mathit{non\text{-}Stock}_{i,t} \times \mathit{Shock}_t + \delta X_{i,t} + \epsilon_{i,t}$$

Dependent variable	(1) Inflation	(2) Business conditions	(3) Sentiment
Stock $\times$ *TFP News*$_t$ (β_1)	**-0.044***	**0.162*****	**3.167*****
	(0.024)	(0.013)	(0.242)
non-Stock $\times$ *TFP News*$_t$ (β_2)	-0.003	0.187***	2.559***
	(0.035)	(0.016)	(0.275)
F-test: $\beta_1 = \beta_2$	0.93	1.6	2.78*
Number of obs.	45,934	47,868	51,330
R^2	0.0259	0.0316	0.0878

Mechanisms: Frequency Channel

The high-frequency information flows make stockholders update their information on the macroeconomy more frequently. Gas price is an exception:

Dependent variable	**Gas price forecast errors**			
	(1) OLS	(2) IV	(3) Control attitude	(4) Control sentiment
Stock (β)	**0.181**	**0.181**	**0.077**	**0.216**
	(0.115)	(0.347)	(0.135)	(0.135)
Time FE	Y	Y	Y	Y
Demographics FE	Y	Y	Y	Y
Number of obs.	64,492	26,980	67,460	67,460
R^2	0.2866	-0.0001	0.5475	0.5511

Stock market participation does NOT improve gas price forecasts!

Mechanisms: Risk-hedging Channel

Attention to the macroeconomy and the consequent improvement in information precision helps to hedge against the risk associated with stock-holding. specification

Dependent variable	Attentiveness	
Uncertainty measure	(1) Monetary policy	(2) Financial
Stock $\times$ *Uncertainty*$_t$ (β_1)	**2.11*****	**2.65*****
	(0.17)	(0.14)
non-Stock $\times$ *Uncertainty*$_t$ (β_2)	1.25***	1.45***
	(0.27)	(0.21)
F-test: $\beta_1 = \beta_2$	7.61***	23.01***
Number of obs.	120,147	120,147
Adj. R^2	0.0777	0.0794

Implications to theory and policy

- Stockholding creates feedback effects on household expectation formation
  - Existing literature focuses on the determinants of portfolio allocation
  - Our study shows stockholding can be an important determinant of households' attention
- The attention heterogeneity driven by households' portfolio choices can create unintended consequences of monetary policy
  - Stock-market participation and the resulting increase in households' attention to macroeconomic news may enhance the effectiveness of monetary policy (e.g. forward guidance)
  - Monetary policy may exacerbate wealth inequality as stockholders more actively re-optimize their consumption and portfolio choices

Conclusions

This paper provides novel empirical evidence that stock market participation is an important determinant of attention allocation heterogeneity:

- Evidence:
  - Accuracy of inflation perceptions and expectations
  - Responsiveness to economic news
- Mechanisms:
  - Frequency channel: gas price expectations
  - Risk-hedging channel: responsiveness to uncertainty shocks
- Implications:
  - Important feedback effects on household expectation formation
  - Unintended consequences of monetary policy

Appendix

Measure of attentiveness and attitudes

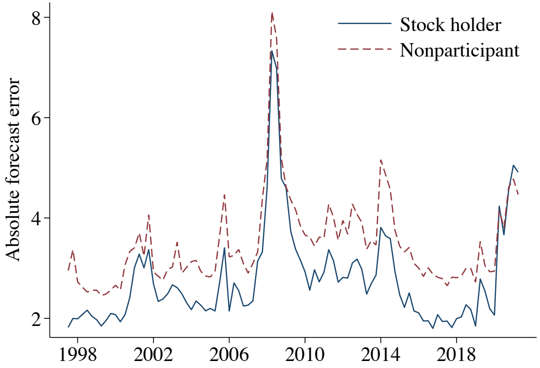
Back

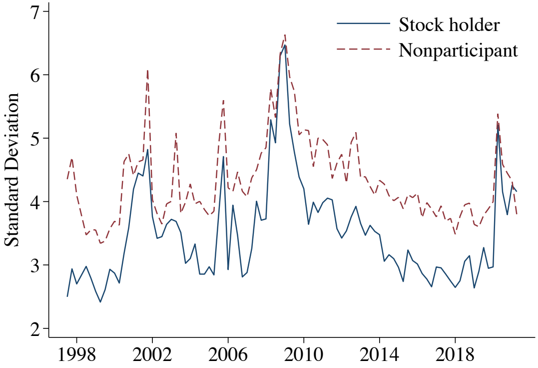
Construct two variables to measure households' attention and attitude towards the macroeconomy based on the following question in the Michigan Survey of Consumers:

"During the last few months, have you heard of any favorable or unfavorable changes in business conditions? What did you hear?"

- **Attention**: equals 1 if households recall at least one change and 0 if not. Overall about 60% households recall at least one change.
- **Attitude**: equals 1 if households recall only favorable changes, -1 if only unfavorable changes, and 0 otherwise. Overall about 18% recall only favorable changes, and 34% recall only unfavorable changes.

Stylized Facts: Forecast Accuracy and Disagreement



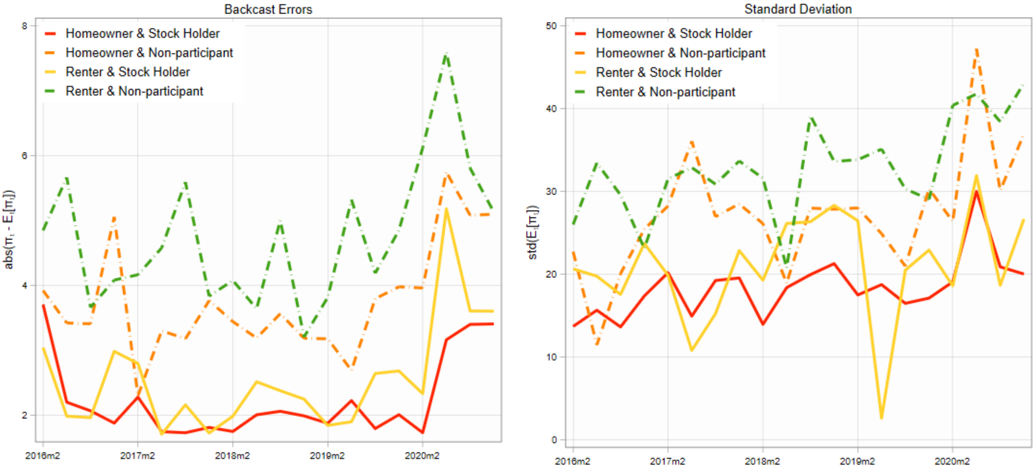


Stockholders' inflation expectations are more accurate than those of non-holders, and show less disagreement.

Backcast

Stylized facts: Backcast Accuracy and Disagreement

Back



Stockholders' inflation perceptions are more accurate than those of non-holders, and show less disagreement.

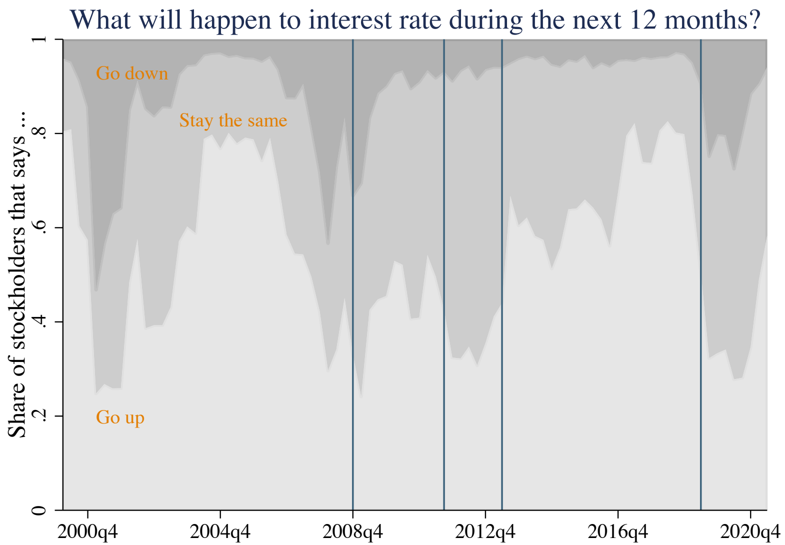
Forward guidance event studies

Back

We look closely at changes in households' interest-rate predictions after the following four events of forward guidance implemented between 2008 and 2019:

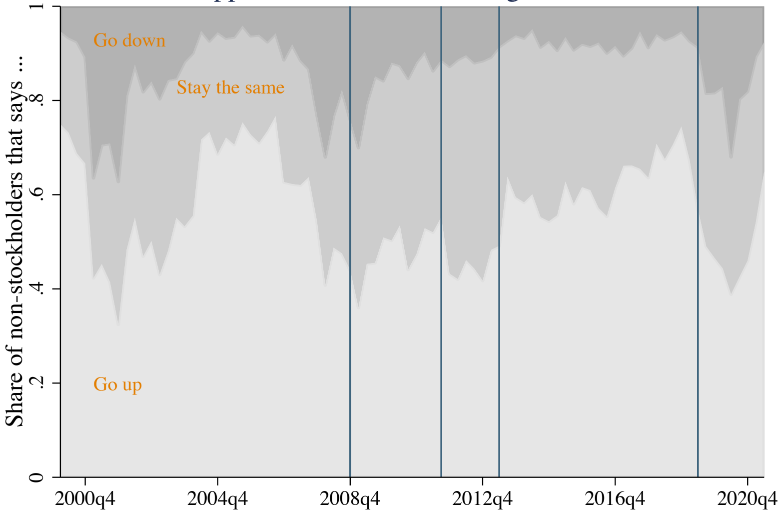
- **2008Q4**: The US economy reached the zero lower bound (ZLB) and the FOMC conducted "open-ended" forward guidance.
- **2011Q3**: The FOMC announced that it expected to keep the federal funds rate low at least through mid-2013.
- **2013Q2**: The end of the forward guidance period after the Great Recession.
- **2019Q2**: The FOMC announced that it would steady the policy rate.

Back

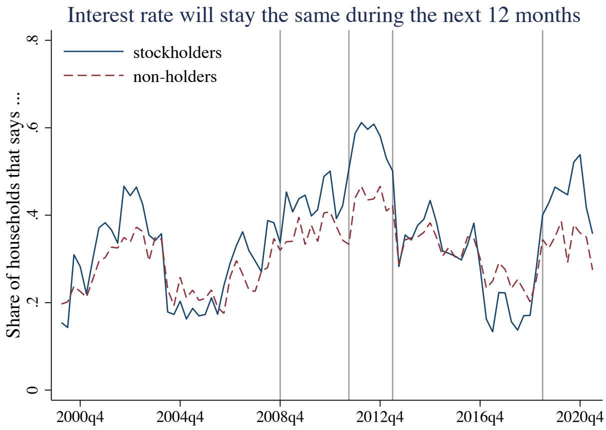

What will happen to interest rate during the next 12 months?
Share of stockholders that says ...
Go down
Stay the same
Go up
0
.2
.4
.6
.8
1
2000q4
2004q4
2008q4
2012q4
2016q4
2020q4

Back

What will happen to interest rate during the next 12 months?



Stylized Facts: Responses to Forward Guidance Announcements



A significantly larger portion of stockholders' interest rate expectations are consistent with the FOMCs' Forward Guidance announcements.

Details

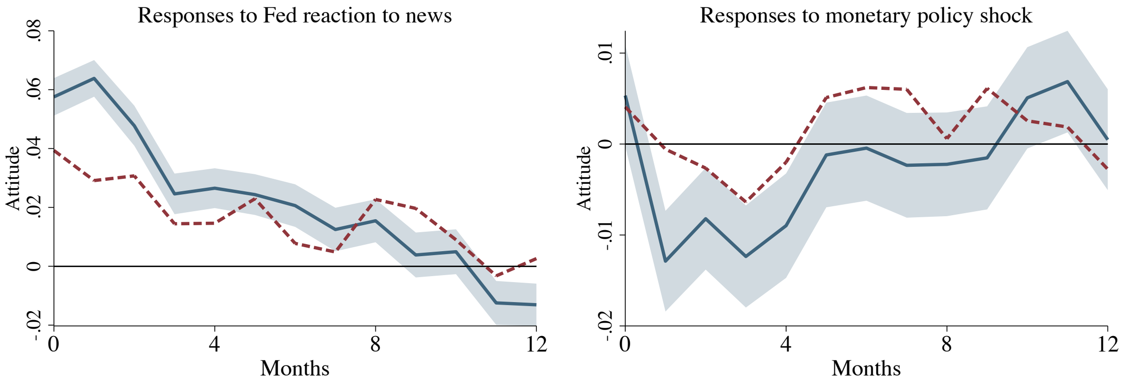
Stock market participation raises inflation forecast accuracy and attention to economic news

Back

Dependent variable	Inflation forecast error		Attentiveness	
Stock (β)	-0.345***	-0.309***	0.078***	0.079***
	(0.023)	(0.023)	(0.003)	(0.003)
Attitude	-0.344***		-0.119***	
	(0.012)		(0.002)	
Sentiment		-0.011***		-0.001***
		(0.000)		(0.000)
Time FE	Y	Y	Y	Y
Demographics FE	Y	Y	Y	Y
Number of obs.	108,026	108,026	120,147	120,147
R^2	0.1255	0.1373	0.1305	0.1046

IRFs of attitude to monetary policy news

Back



IRFs of sentiment to monetary policy news

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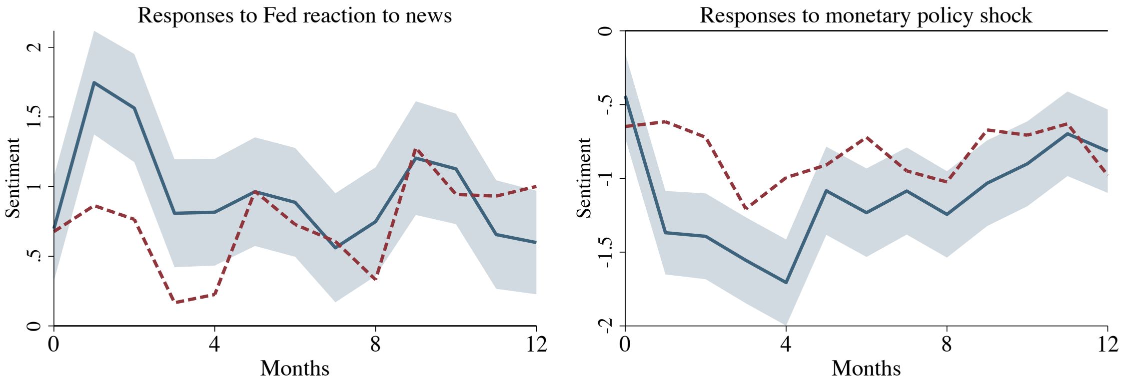

IRFs of business condition outlook to monetary policy news

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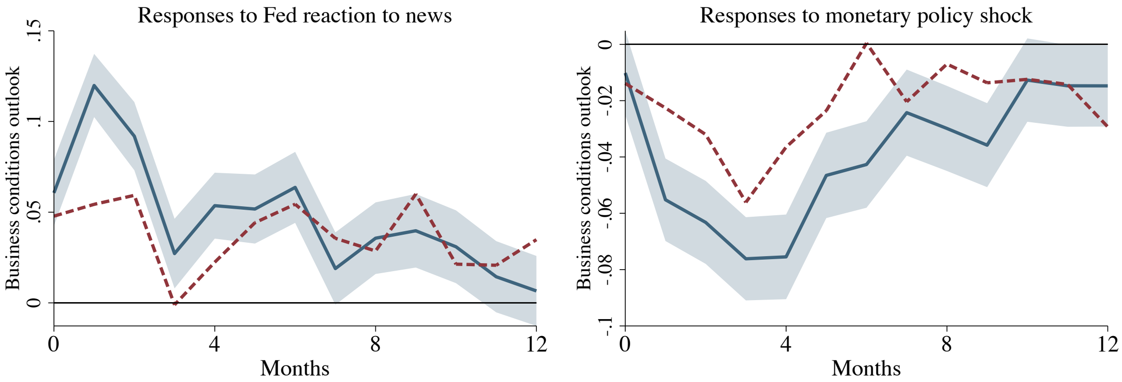
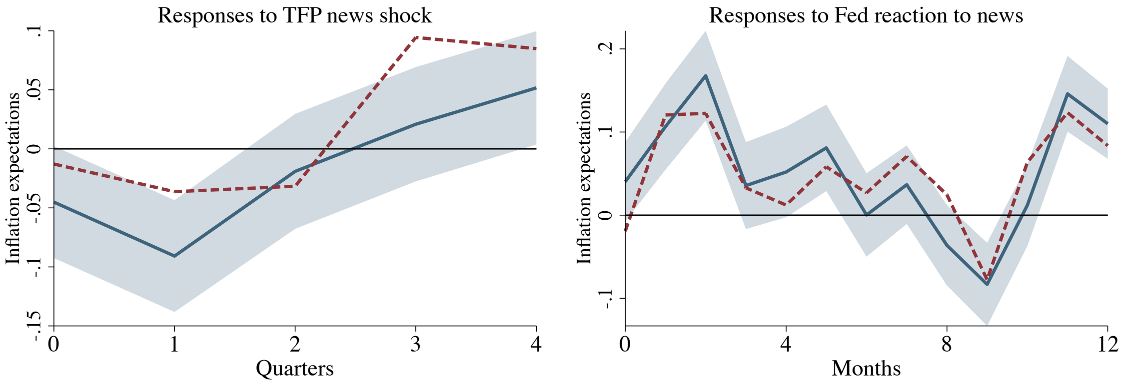


IRFs of inflation expectations to supply and demand news

Back



Responses to Economic Uncertainty

Back

$$\begin{aligned} \textit{Attentiveness}_{i,t} = &\beta_1\ \textit{Stock}_{i,t} \times \textit{Uncertainty}_t + \beta_2\ \textit{non-Stock}_{i,t} \times \textit{Uncertainty}_t \\ &+ \alpha + \beta_0\ \textit{Stock}_{i,t} + \delta X_{i,t} + \epsilon_{i,t} \end{aligned}$$

- $\textit{Stock}_{i,t}$/$\textit{non-Stock}_{i,t}$: dummy variable indicating (non)stock-holding
- $\textit{Uncertainty}_t$:
    - Market-based monetary policy uncertainty (Bauer, Lakdawala and Mueller, 2022)
    - Financial uncertainty (Ludvigson, Ma and Ng, 2021)
- $X_{i,t}$: demographic fixed effects including gender, education, birth cohort, marriage status, region, homeownership, and income quintiles