Selective Inattention to Interest Rates

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Motivation

- Households' macro expectations suggest they are very uninformed on **average**
  - Level of expectations is often systematically biased Weber et al. 22
  - Substantial dispersion in expectations across people Mankiw et al. 04
  - Errors in their expectations are predictable ex-ante Bordalo et al. 20

- Motivated adding information frictions to quantitative macro models Auclert et al. 20

  $\Rightarrow$ **Average** expectation is slow-moving and under-reacts Coibion-Gorodnichenko 12, 15

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- Motivated adding information frictions to quantitative macro models Auclert et al. 20
- Introspection: macro expectations much more important for "**big**" decisions
  - These **big** decisions also tend to occur less frequently
  - Example: interest rates important when **buying a house**, but less so for groceries

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- **Question**: Do HHs **select** into paying attention based on **types** of decisions?

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- Introspection: macro expectations much more important for "**big**" decisions
- **Question**: Do HHs **select** into paying attention based on **types** of decisions?
- **If yes**, how does this **selection** affect the transmission of shocks?
  - Belief heterogeneity $\Rightarrow$ **average** may not be the relevant object Miller 77, Afrouzi et al. 24

This Paper

Is there selective inattention to interest rates based on **durables purchases**?

"decision-making" (DM)

1. Use existing surveys to study how interest rate expectations differ based on DM
   - Benefit: high-quality data on expectations
   - Cost: imprecise identification of **DM status** + hard to isolate attention

This Paper

Is there selective inattention to interest rates based on **durables purchases**?

"decision-making" (DM)

1. Use existing surveys to study how interest rate expectations differ based on DM
2. Conduct a new survey to identify how macro attention changes based on DM
   - Benefit: better identify **DM status** + elicit information acquisition directly
   - Cost: hard to study accuracy in expectations given one cross-section

This Paper

~~Is there selective inattention to interest rates based on durables purchases?~~ ✓

How does selective inattention affect **aggregate responses** to interest rates?

1. Use existing surveys to study how interest rate expectations differ based on DM
2. Conduct a new survey to identify how macro attention changes based on DM
3. Develop incomplete markets model with $\overbrace{\text{durables}}^{\text{DM in model}}$ + rational inattention to rates
   - Use patterns in IA from survey to discipline information cost parameter(s)
   - Compare **model IRFs** to level and volatility of rates with $\underbrace{\text{exogenous inattention}}_{\text{DM} \perp \text{beliefs} \Rightarrow \text{no selection}}$

Outline

1. Existing Surveys: Expectations Accuracy around Decision-Making
2. New Survey: Information Acquisition around Decision-Making
3. Incomplete Markets Model with Selective Inattention
4. Interest Rate Passthrough with Selective Inattention
5. Conclusion

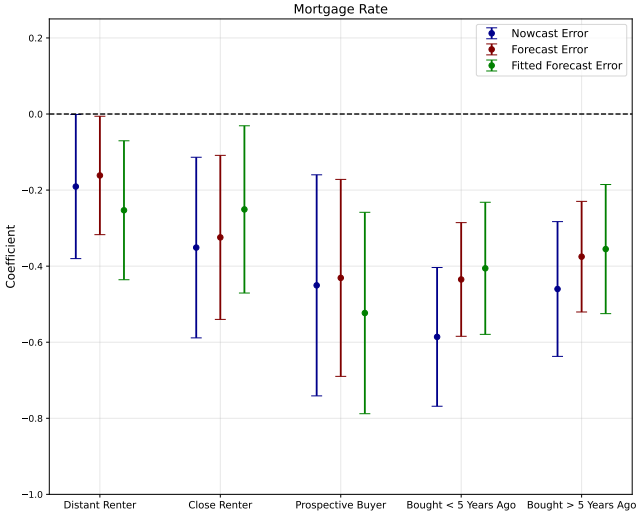
Outline

Survey 1/2: NY Fed Survey of Consumer Expectations

- **Sample**: repeated cross-section of $\sim$ 8K respondents in 2014-2023
- Variables of interest:
  1. **Nowcasts** of current average 30-year fixed mortgage rate
  2. **Forecasts** of one-year ahead mortgage rate and inflation
  3. **DM status** based on distance from past or (intended) future home purchase
- Construct errors using 30-year fixed rate in Freddie Mac PMMS and CPI
- Run the following regression:

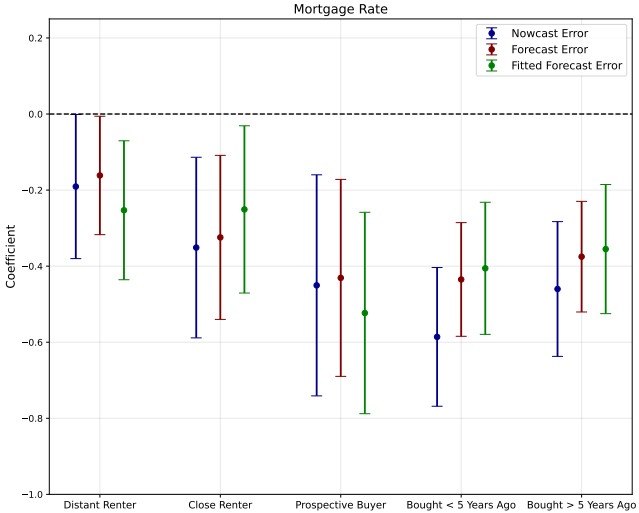
$$\log |\text{Error}_{it}| = \sum_s \beta_s \cdot \mathbf{1}\left(\text{DM Status}_{it} = s\right) + \text{Controls}_{it} + \delta_t + \epsilon_{it}$$

Decision-Makers Have More Accurate Beliefs



Errors of prospective buyers $\approx$ **40% lower** than those with no purchase plan

Decision-Makers Have More Accurate Beliefs



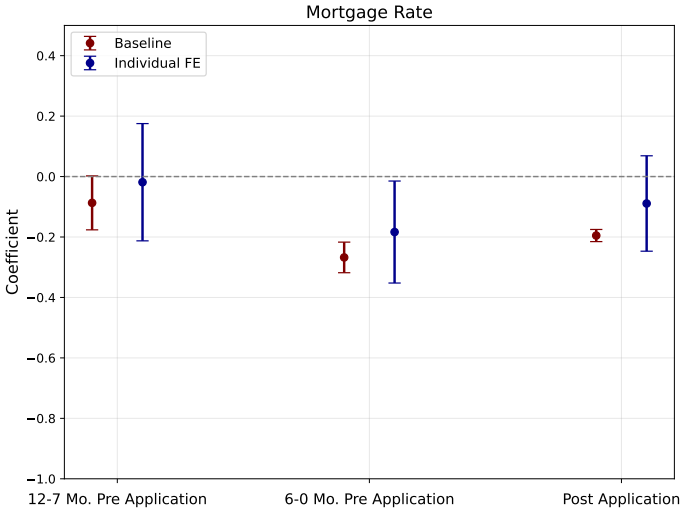
Almost all of forecasting gain comes from nowcasting improvement

Survey 2/2: ECB Survey of Consumer Expectations

- **Sample**: **panel** of $\sim$ 130K individuals in 2020-2024 from six largest countries
  - Restriction: only include individuals who rented at some point in survey
  - Note: quarterly frequency $\Rightarrow$ short panel
- Variables of interest:
  1. **Forecasts** of one-year ahead mortgage rates, inflation, GDP, and unemployment
  2. **DM status** based on distance from mortgage application
- Construct errors based on country-specific realizations
- Run the following regression:

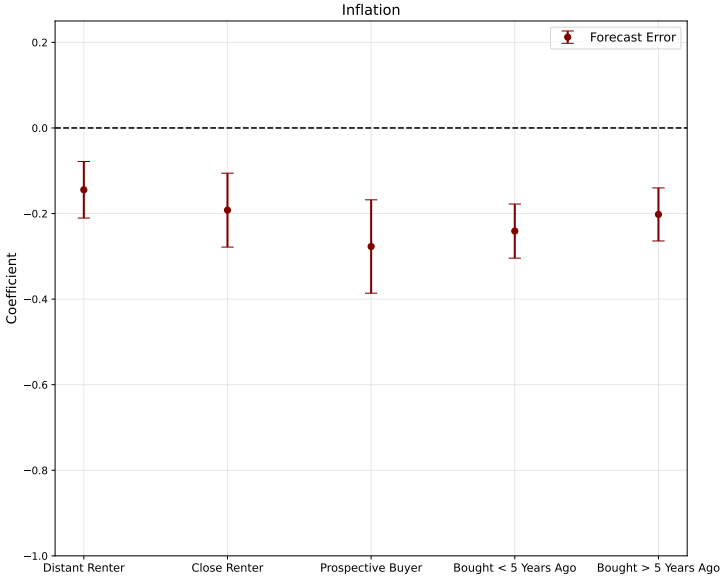
$$\log |\text{Error}_{it}| = \sum_s \beta_s \cdot \mathbf{1}\left(\text{DM Status}_{it} = s\right) + \text{Controls}_{it} + \textbf{Tenure}_{it} + \delta_t + \lambda_{\mathbf{i}} + \epsilon_{it}$$

Decision-Makers Have More Accurate Beliefs: ECB



Mortgage rate forecast errors fall by about **20%** pre-application

Smaller Differences for Other Variables: Inflation in NY Fed



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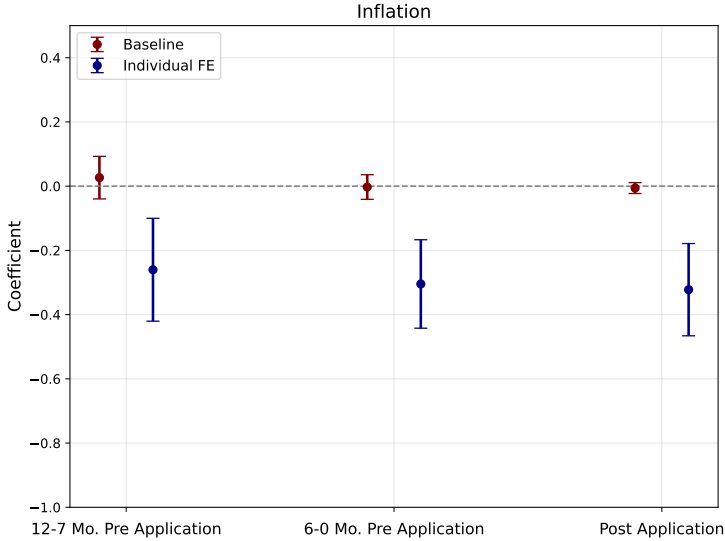
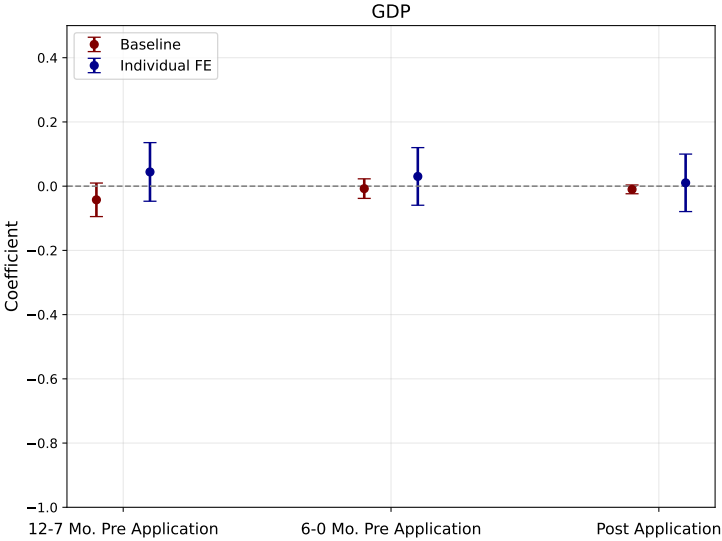
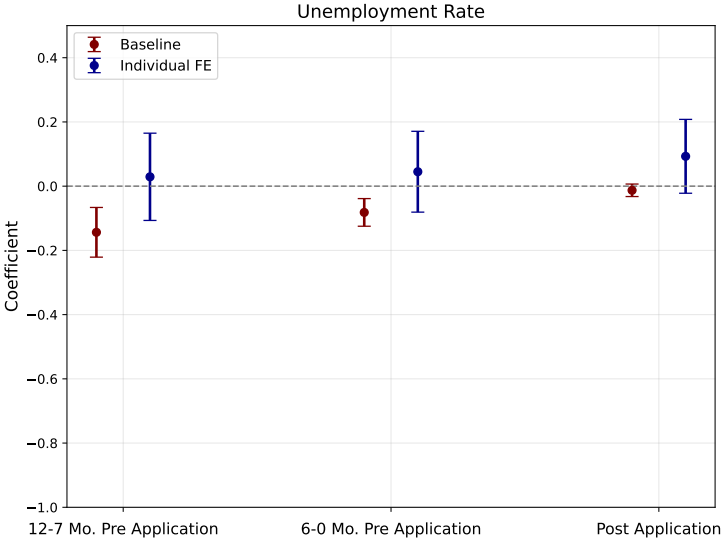


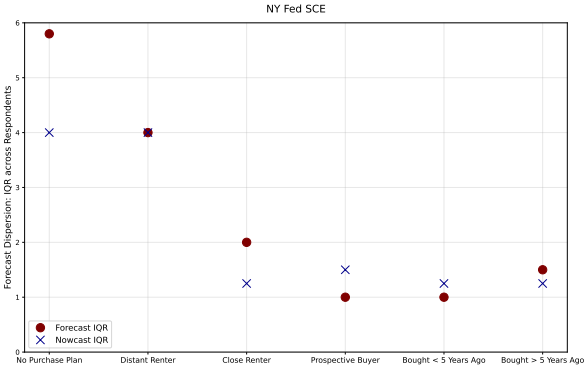
Smaller Differences for Other Variables: GDP in ECB

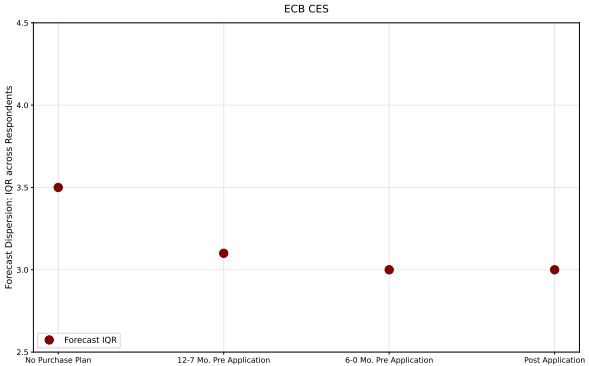


Smaller Differences for Other Variables: UR in ECB



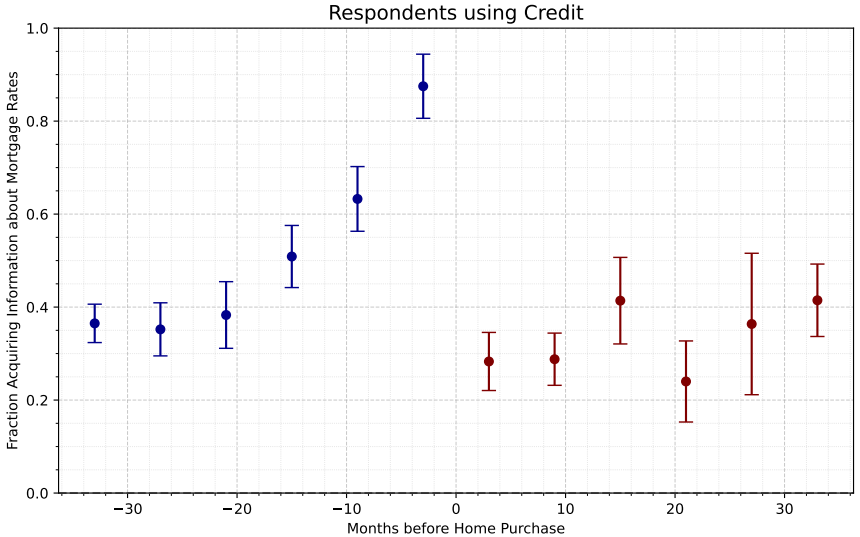
Less Dispersion among DMs' Beliefs: Both Surveys





Outline

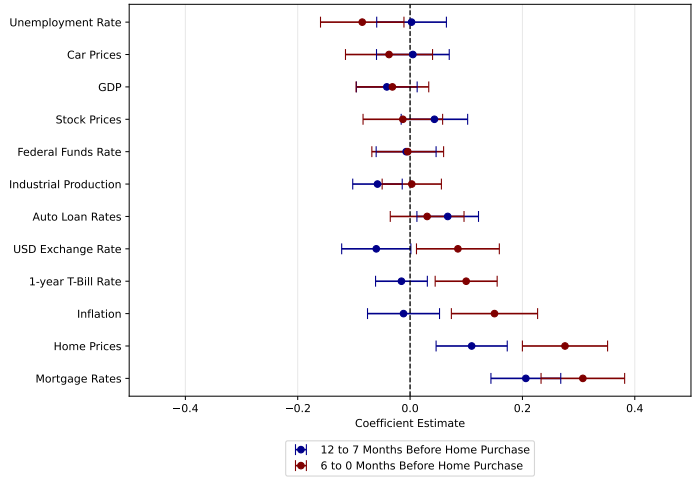
Information Acquisition is Concentrated Pre-Decision



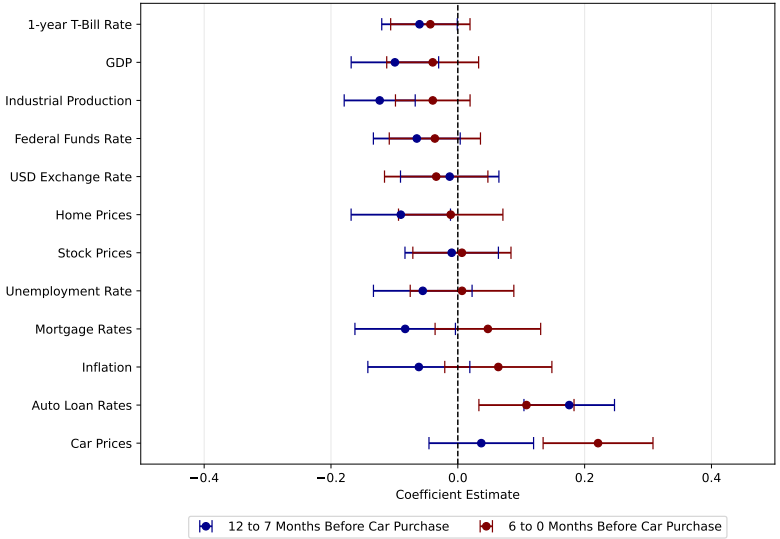
▸ Sources ▸ Heterogeneity ▸ Owners ▸ Values

IA IS CONCENTRATED ON DECISION-RELEVANT VARIABLES

$$\text{Info. Acquisition}_i = \sum_d \beta_d \cdot \mathbf{1}\left(\text{Home Distance}_i = d\right) + \text{Controls}_i + \text{Other Distances}_i + \epsilon_i$$



Patterns in Information Acquisition are Decision-Specific



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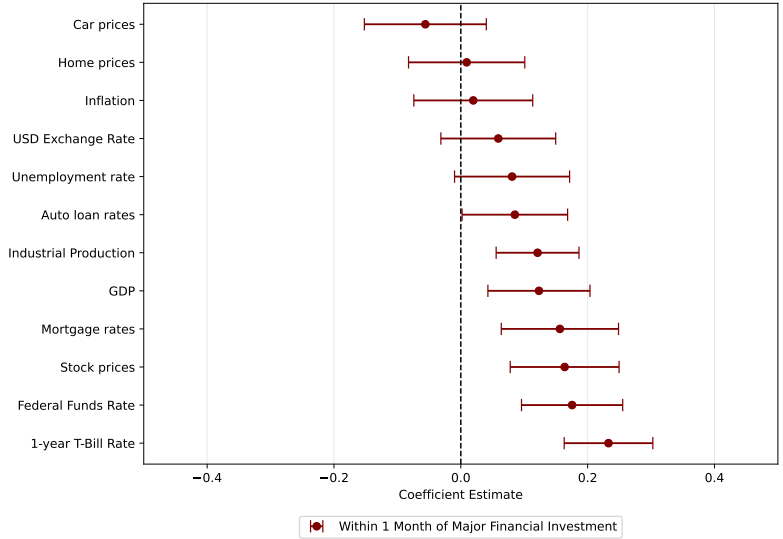

Taking Stock: 5 Facts

1. Households close to **durables** purchases have more **accurate** macro expectations
2. Improvement in expectation accuracy is largest for **interest rates**
3. Decision-makers' beliefs are less **dispersed** and **uncertain**
4. Households concentrate **information acquisition** around durables purchases
5. Households' information acquisition is about **decision-relevant variables**

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Next: what are the macroeconomic implications of this **selective inattention**?

Outline

Bewley-Huggett-Aiyagari

$$\overbrace{\text{Partial equilibrium incomplete markets model}}^{\text{household block of McKay-Wieland 2021}} + \text{durables} + \overbrace{\text{dynamic info. acquisition}}^{\text{rational inattention}}$$

Partial equilibrium incomplete markets model + durables + dynamic info. acquisition

Decision-Making

Given beliefs, HHs choose non-durables **c**
and durables $\mathbf{d}'$ subject to:

- Income risk + collaterized borrowing
- Stochastic interest rate r
- Depreciation of durables stock
- Durables adjustment costs
- Operating + maintenance costs
- Match-quality shocks (e.g. job change)

Partial equilibrium incomplete markets model + durables + dynamic info. acquisition

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$$\Downarrow$$

Rich model of how beliefs about $r \longrightarrow \mathbf{c}, \mathbf{d}'$

Partial equilibrium incomplete markets model + durables + dynamic info. acquisition

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Information Acquisition

HHs receive signals of endogenous precision about current r

- Cost of signals = $\omega \times$ mutual info.
- Benefit of signals = better choice of $\mathbf{c}, \mathbf{d}'$
- Interest rate is persistent $\Rightarrow$ prior beliefs are state variables

Partial equilibrium incomplete markets model + durables + dynamic info. acquisition

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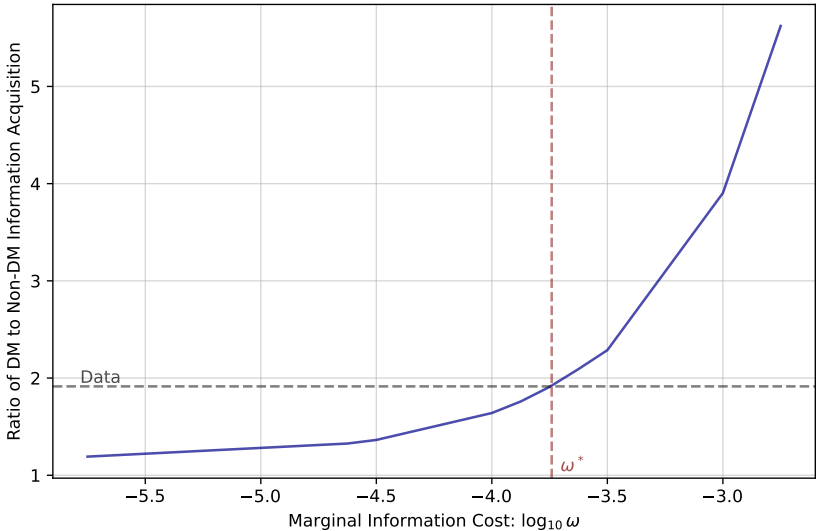
$\Downarrow$

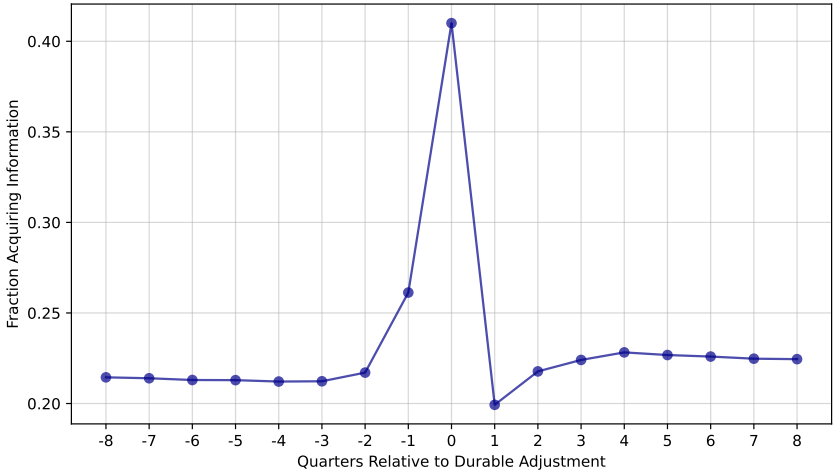
Endogenous beliefs about r that come from dynamic information acquisition

Effect of Information Cost on Information Acquisition



▸ Summary Stats ▸ Durables Adjustment Hazard

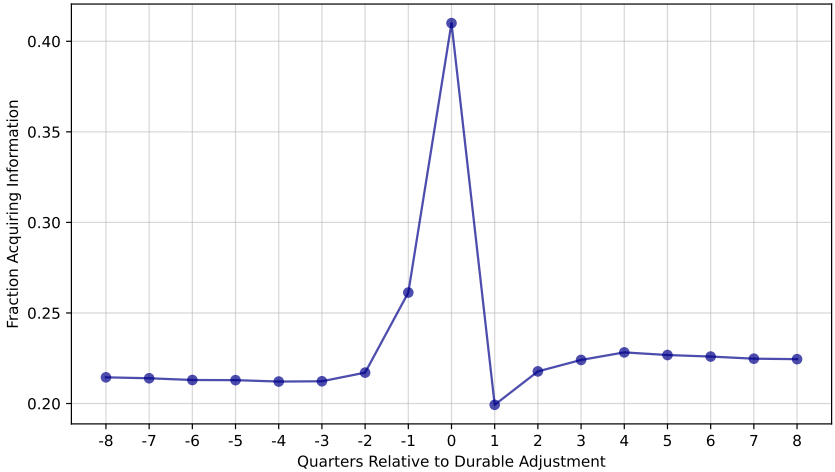
Extensive Margin of Info. Acquisition in Event-Time



Households acquire information in **all** periods...

▸ Durables Share ▸ Information Acquisition sS

Extensive Margin of Info. Acquisition in Event-Time



... but this information acquisition is **concentrated** around durables adjustments

Durables Share | Information Acquisition sS

Implications for Aggregate Beliefs

Aggregate Beliefs are Sluggish, Like in the Data...

- Direct evidence of information-rigidity = CG (2015) regression

$$\underbrace{r_{t+3} - \overline{F}_t r_{t+3}}_{\text{forecast error}} = \alpha + \beta_{CG} \underbrace{\left(\overline{F}_t r_{t+3} - \overline{F}_{t-1} r_{t+3}\right)}_{\text{forecast revision}} + \epsilon_t$$

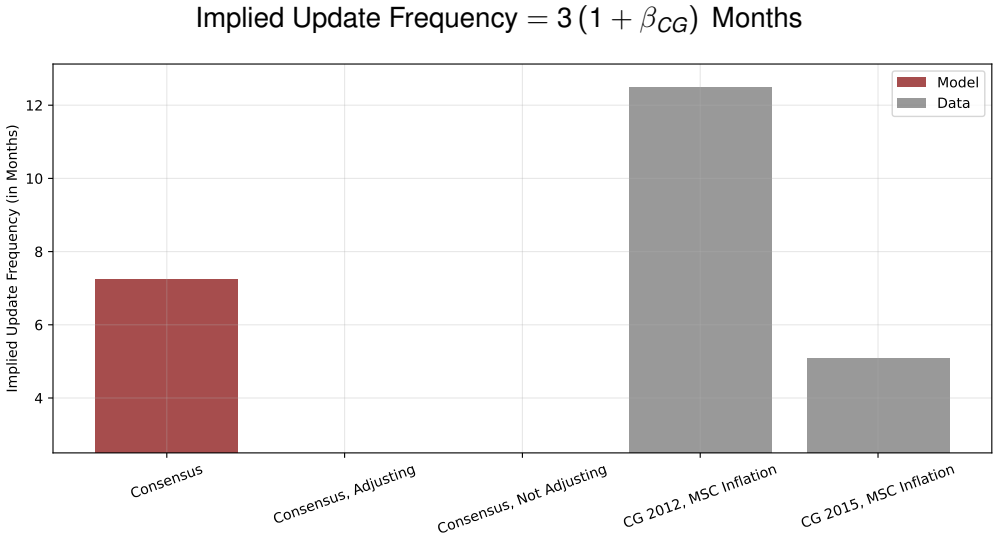
- Common finding: $\beta_{CG} > 0 \Rightarrow$ aggregate expectations are **sluggish**

- In a sticky-information model (constant probability of updating expectations),

$$\text{Implied Update Frequency} = 3\,(1 + \beta_{CG}) \text{ Months}$$

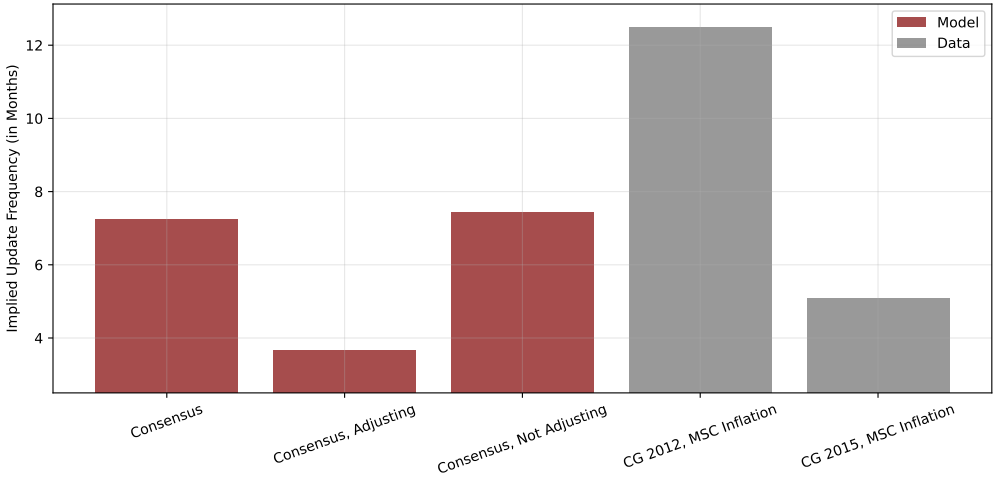
$\Rightarrow$ Common target for calibrating sticky information models (e.g. McKay-Wieland 2021)

Aggregate Beliefs are Sluggish, Like in the Data...



… But This Masks Substantial Selection into Attention!

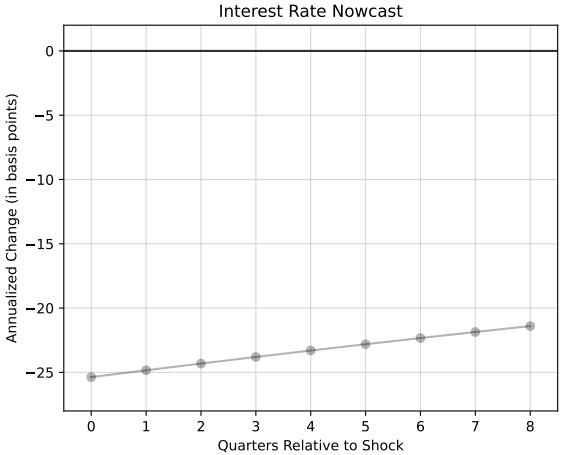
Implied Update Frequency $= 3\,(1 + \beta_{CG})$ Months

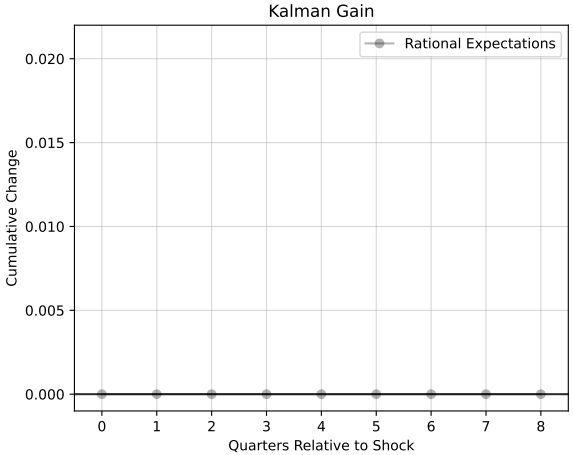


Outline

Responses to Interest Rate Cuts

Impulse Response of Beliefs to Rate Cut

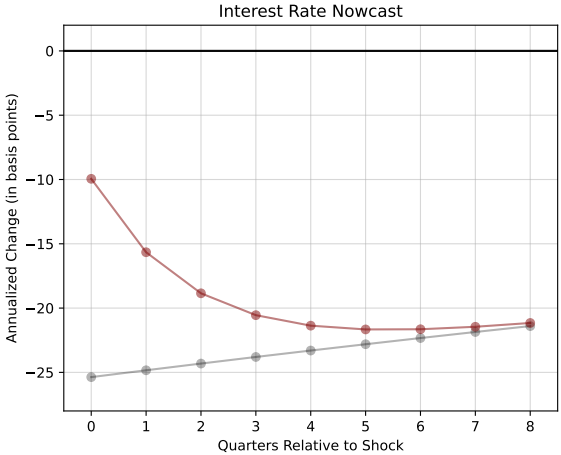


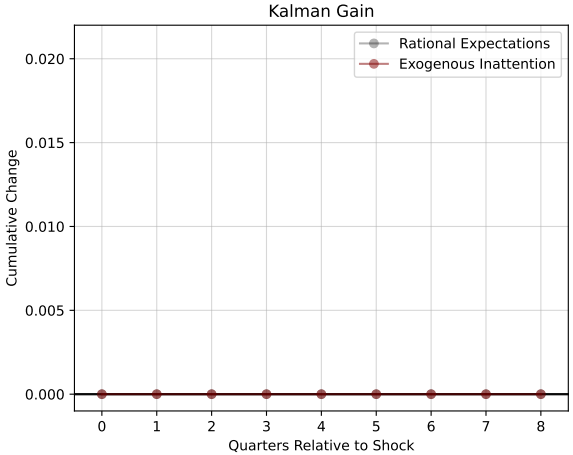


Rational Expectations: households observe current interest rate

▸ Decomposition

Impulse Response of Beliefs to Rate Cut

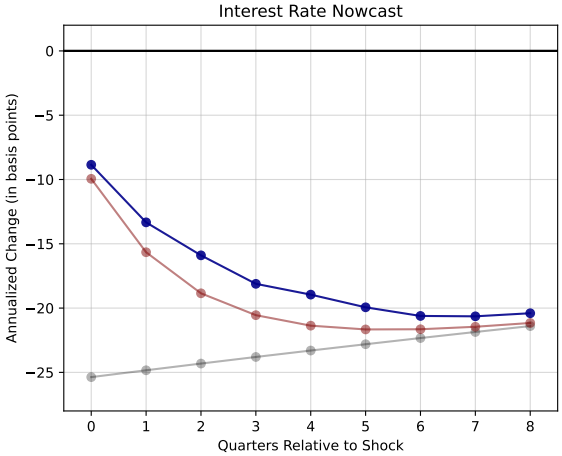


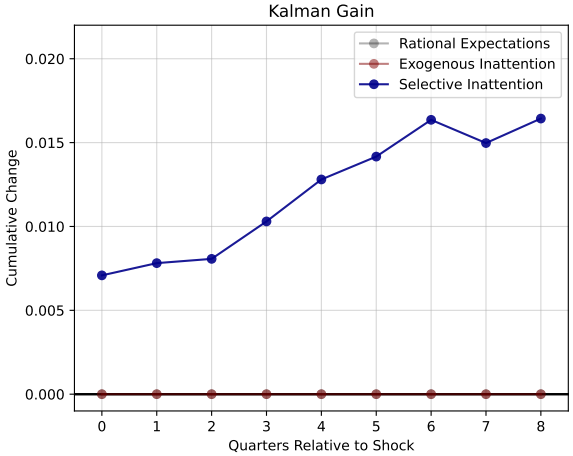


Exogenous Inattention: average inattention same as in baseline model

▸ Decomposition

Impulse Response of Beliefs to Rate Cut

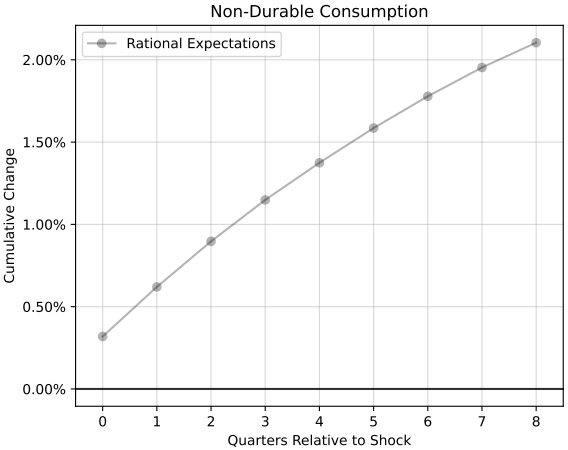


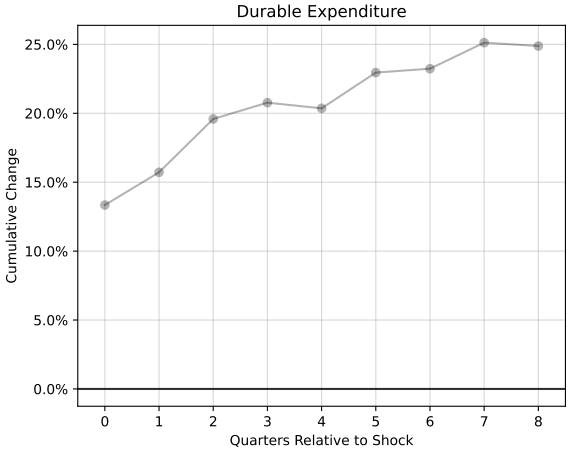


Selective Inattention: baseline model with endogenous information acquisition

▸ Decomposition

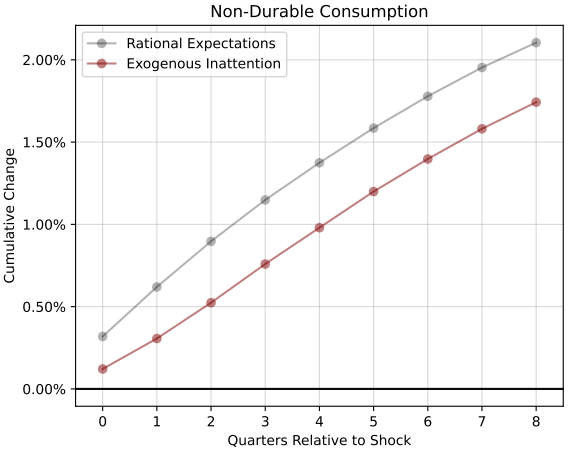
Impulse Response of Spending to Rate Cut

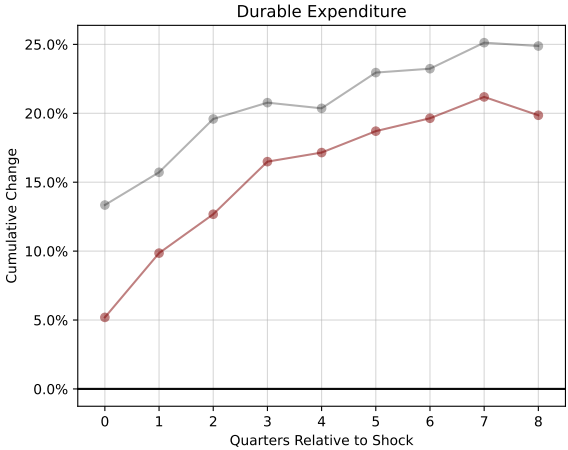




▸ Aggregate Expenditure ▸ Incorporating GE Effects ▸ Non-Linearity

Impulse Response of Spending to Rate Cut





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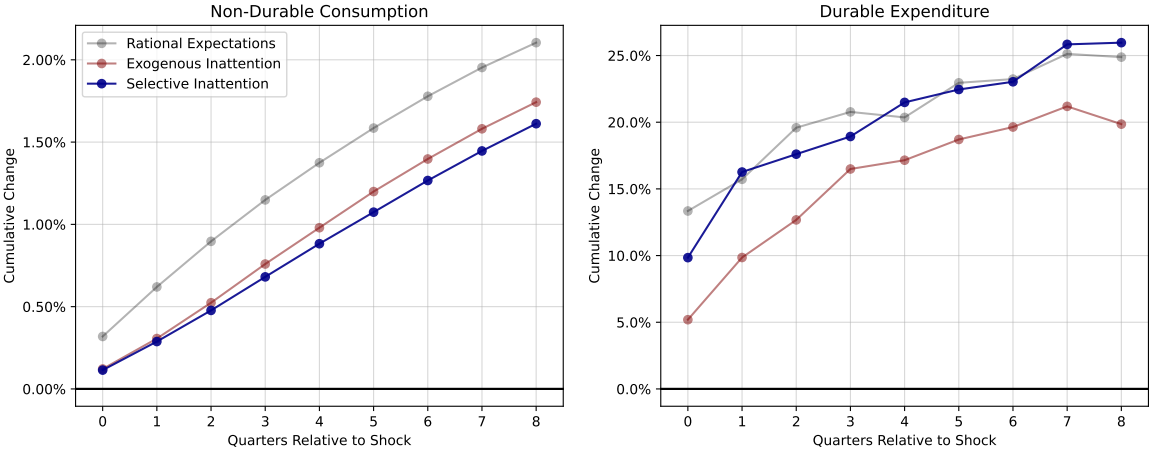
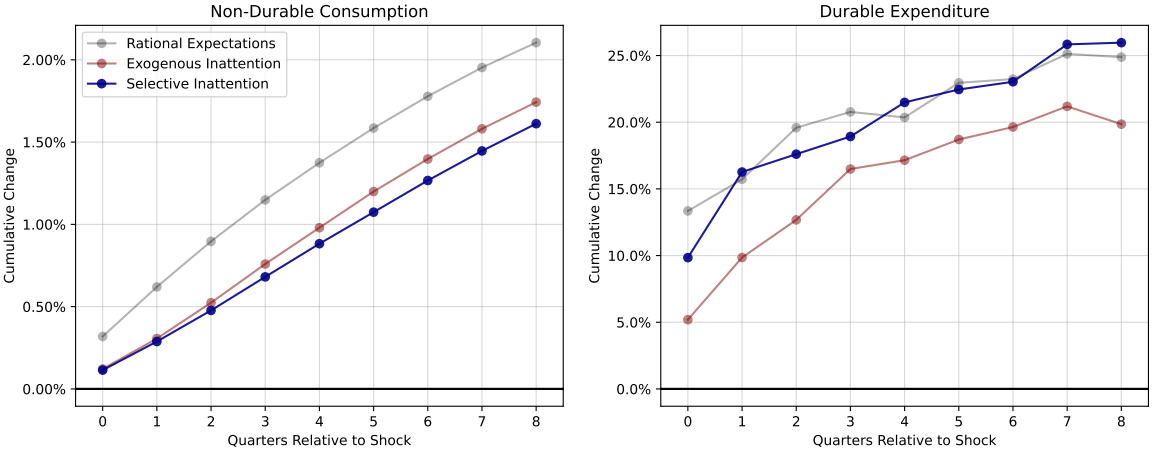


Non-durable response is dampened like with **exogenous inattention**...

▸ Aggregate Expenditure ▸ Incorporating GE Effects ▸ Non-Linearity

Impulse Response of Spending to Rate Cut

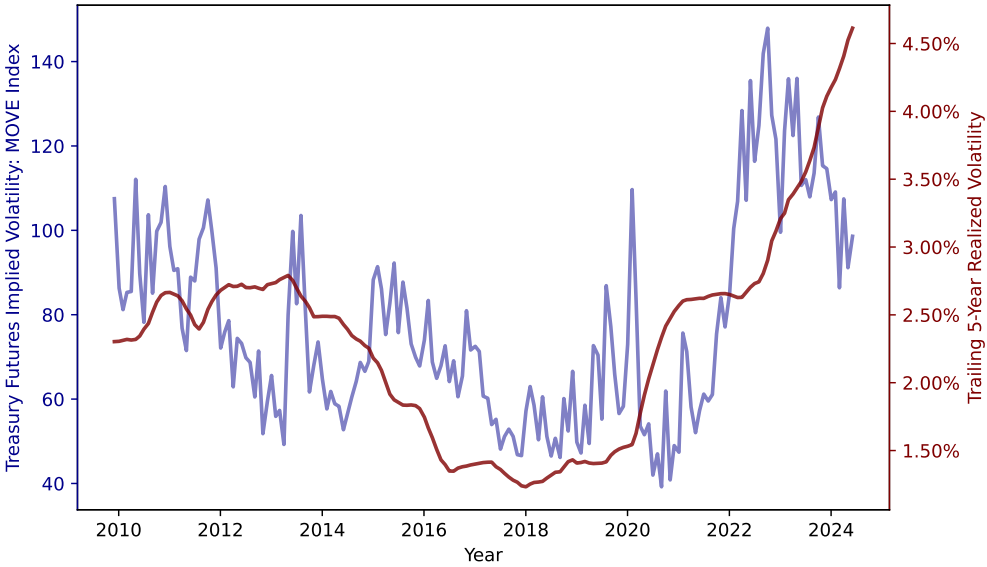


... but **durable** response is larger, closer to **rational expectations**!

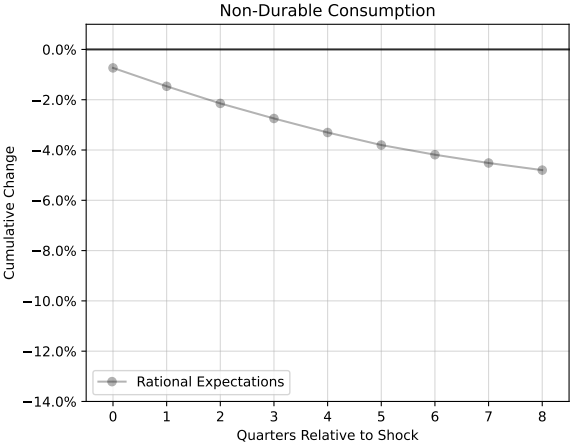
▸ Aggregate Expenditure ▸ Incorporating GE Effects ▸ Non-Linearity

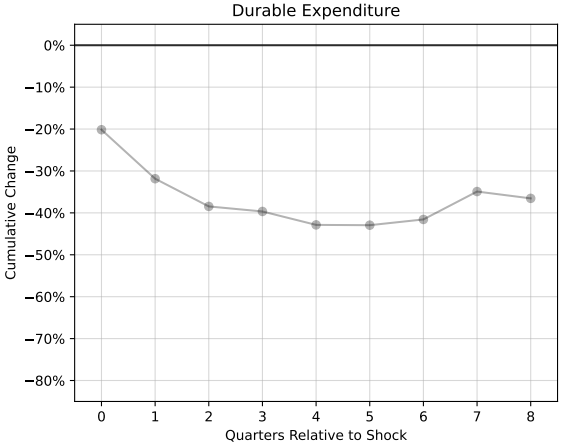
Effects of Changes in Interest Rate Volatility

Motivation: Recent Rise in Rate Volatility



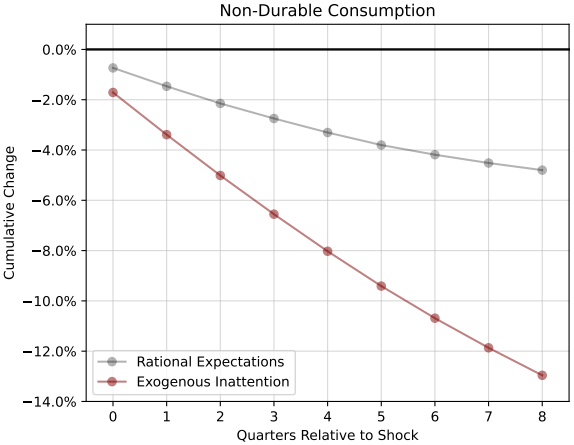
Impulse Response of Spending to Increase in Volatility

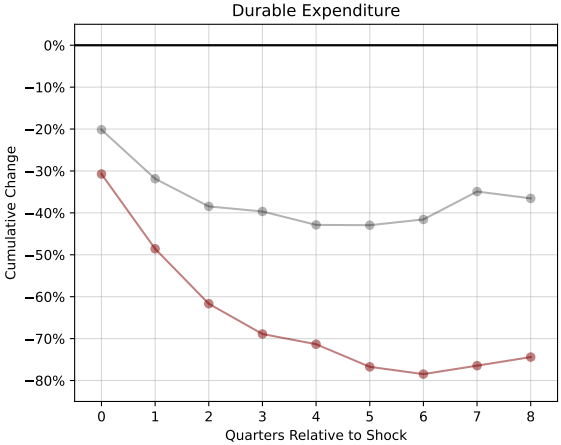




Increase in volatility $\Rightarrow$ spending falls due to precautionary motives...

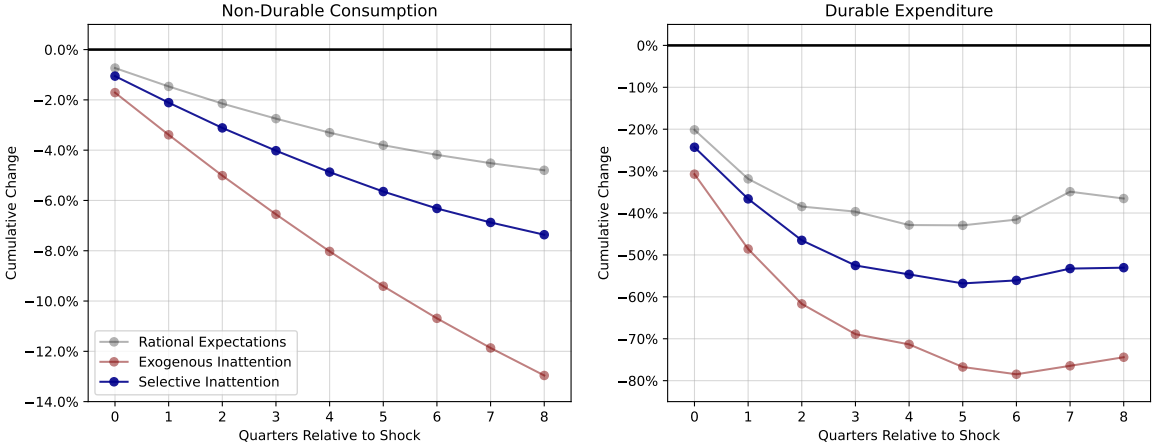
Impulse Response of Spending to Increase in Volatility





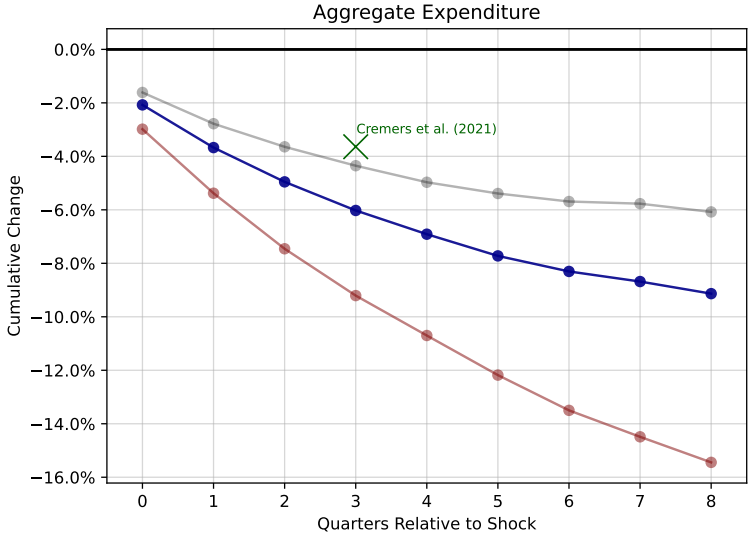
... which is stronger with **exogenous inattention** because of additional uncertainty

Impulse Response of Spending to Increase in Volatility



Selective inattention undoes over 50% of this fall due to ↑ info. acquisition!

Response of Aggregate Spending is Closer to the Data



▸ State-Dependence of Rate Cuts

Outline

Conclusion

- Households are selectively inattentive to interest rates
  - IA is concentrated around durables purchases, where beliefs are more accurate
- **Like** exogenous inattention, selective inattention generates:
  1. Slow-moving aggregate beliefs
  2. Dampened responses of non-durable consumption to interest rates

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Takeaway: Aggregate inattention hides substantial selection into attention that can be measured, modeled, and has different implications!

THANK YOU!

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Main Survey Questions

- Eliciting our main measure of information acquisition

  Step 1: *In the last 3 years, did you actively search for information about any of the following economic variables in the U.S.?*

  By "active search" we mean a deliberate effort to find information which could include searching online, reading news articles or reports, talking to a financial advisor or broker, or any other intentional effort to gather information.

  Step 2: *How many months ago did you last actively search for information about mortgage rates?*

- Eliciting households' distance from the primary home purchase

  Owners: *How many months ago did you finalize the purchase of your current primary residence?*

  Renters: *How many months from now do you expect the closing on your primary residence purchase?*

  By "closing", we mean signing the final documents to officialize the purchase.

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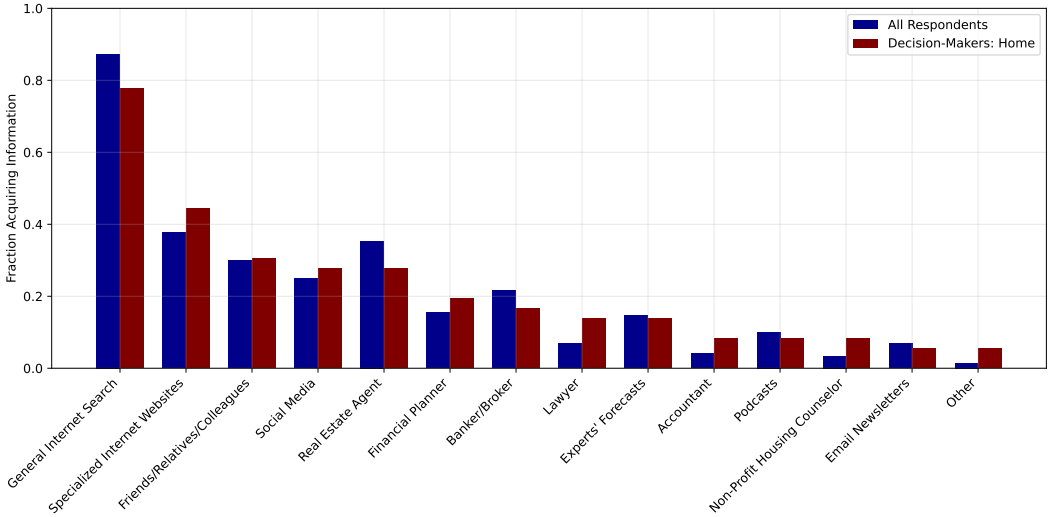
Sources of Information Acquisition



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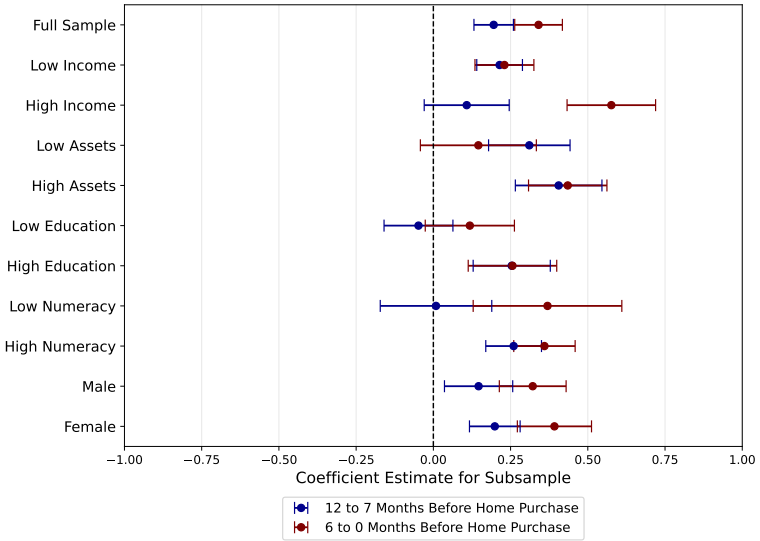
Heterogeneity in Information Acquisition



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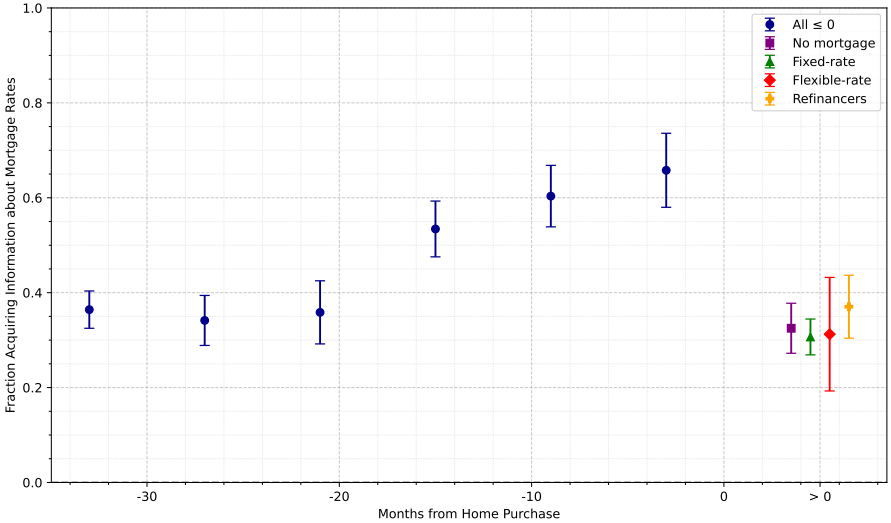
Heterogeneity in Information Acquisition of Owners



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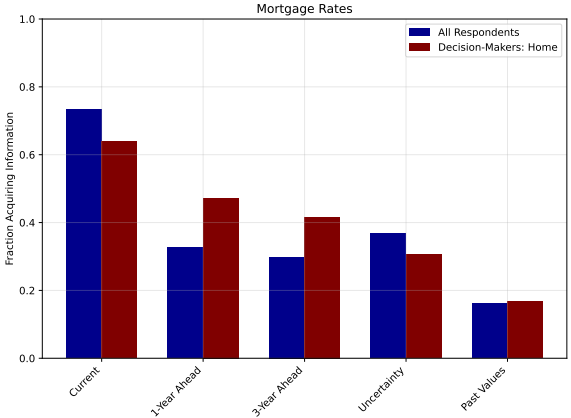
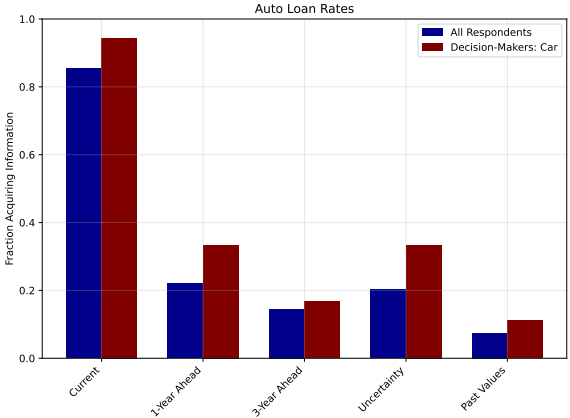
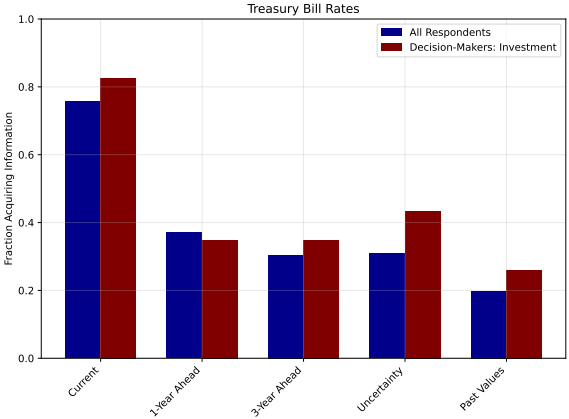
IA is Primarily about Current Values of Variables





Investment Decisions Back

IA is Primarily about Current Values of Variables



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Steady-State Summary Statistics

	Mean	SD	P10	P50	P90
Assets/Income: b/y	3.51	4.93	-0.91	1.91	10.27
Durable/Non-Durables: d'/c	2.55	0.40	1.99	2.58	3.01
Durables Gap	0.14	0.17	-0.05	0.11	0.38
Acquired Information	0.23	0.42	0.00	0.00	1.00
Kalman Gain: G	0.10	0.21	0.00	0.00	0.40
Kalman Gain Conditional on IA	0.46	0.21	0.30	0.40	0.80
Normalized Nowcast Error: $\lvert\hat{\mathbb{E}}(r) - r\rvert/\lvert r\rvert$	0.28	8.00	0.02	0.10	0.32
Normalized Prior Variance: Σ/σ_r^2	0.33	0.17	0.13	0.30	0.57

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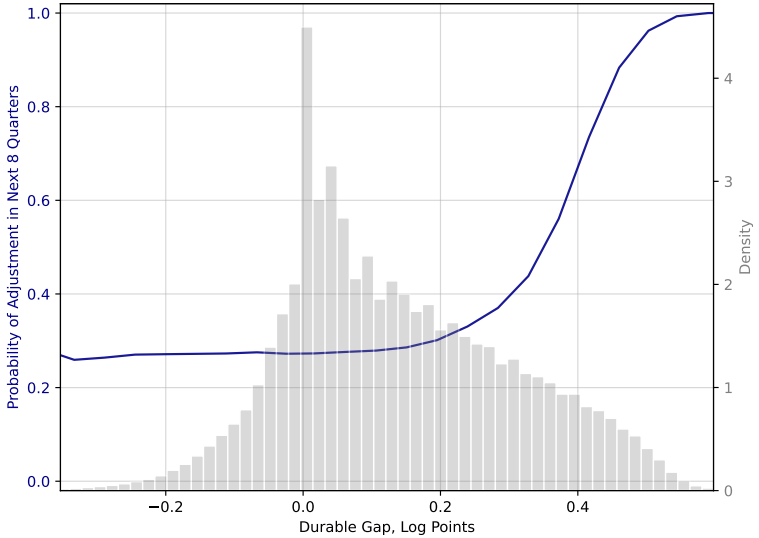
Adjustment Probability as a Function of Durables Gap



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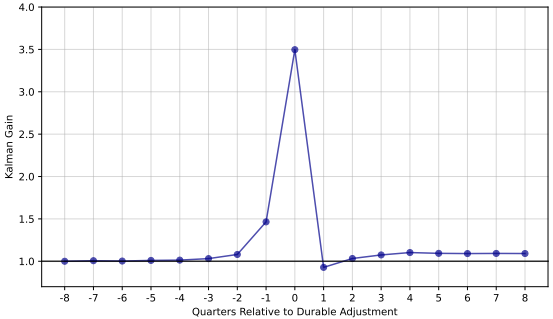
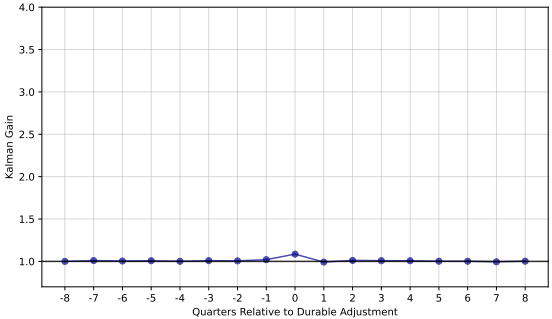
Baseline: $\psi = 0.63$



Low Durables Share: $\psi = 0.99$



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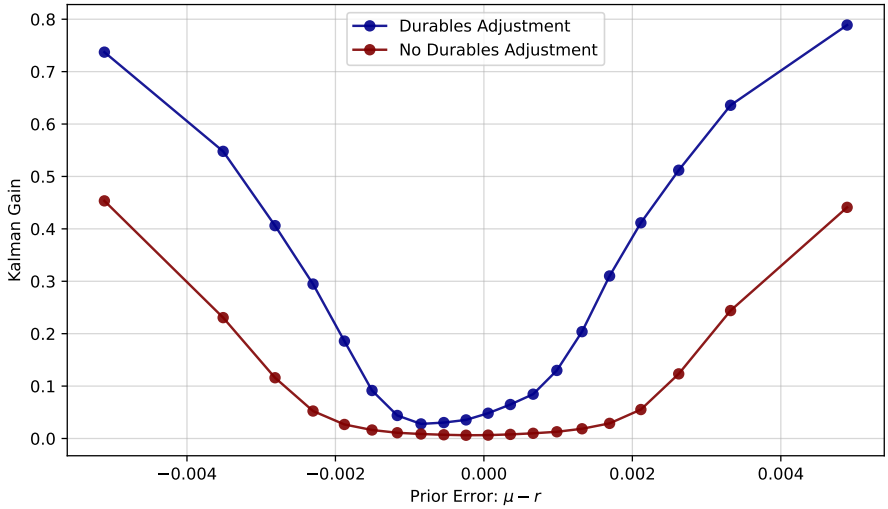
Durables Adjustment Shift sS Bands of Info. Acqusition



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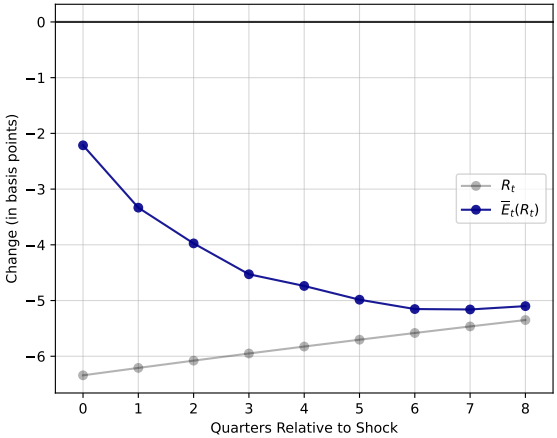
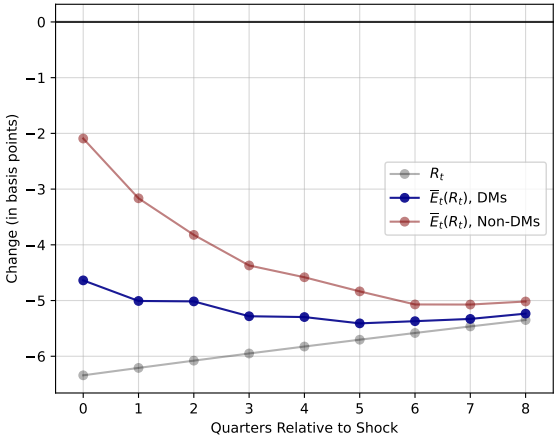
Decomposition of Aggregate Belief Response





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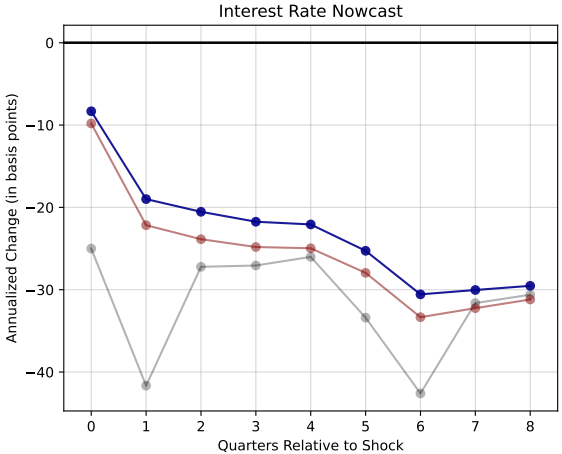
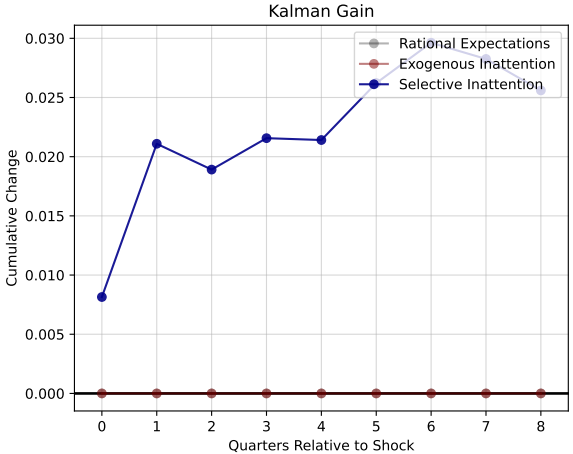
IRFs to Romer-Romer Shock with Agg. Y and P Response





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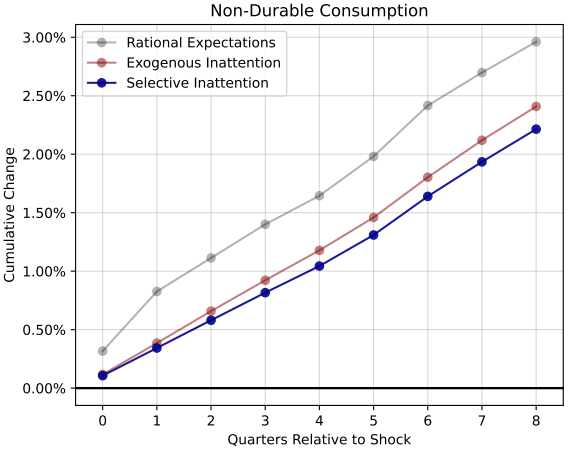
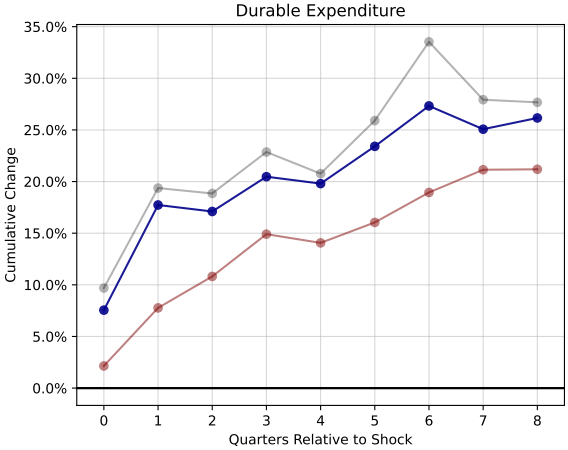
IRFs to Romer-Romer Shock with Agg. Y and P Response





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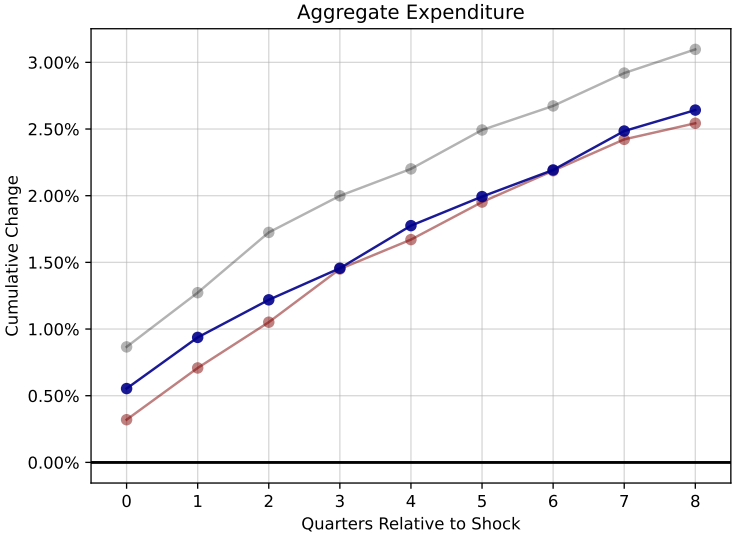
Impulse Response of Agg. Spending to Rate Cut



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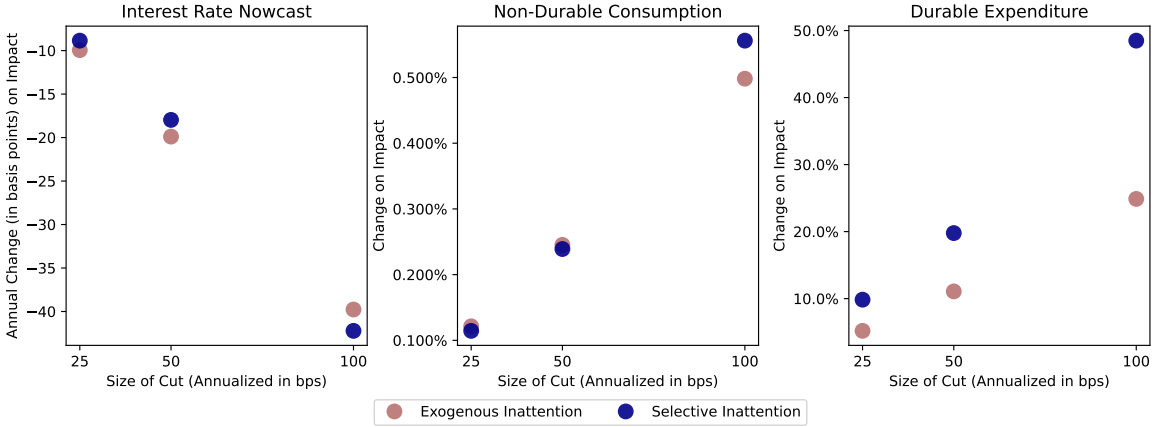
Non-Linear Impact of Rate Cuts: On Impact



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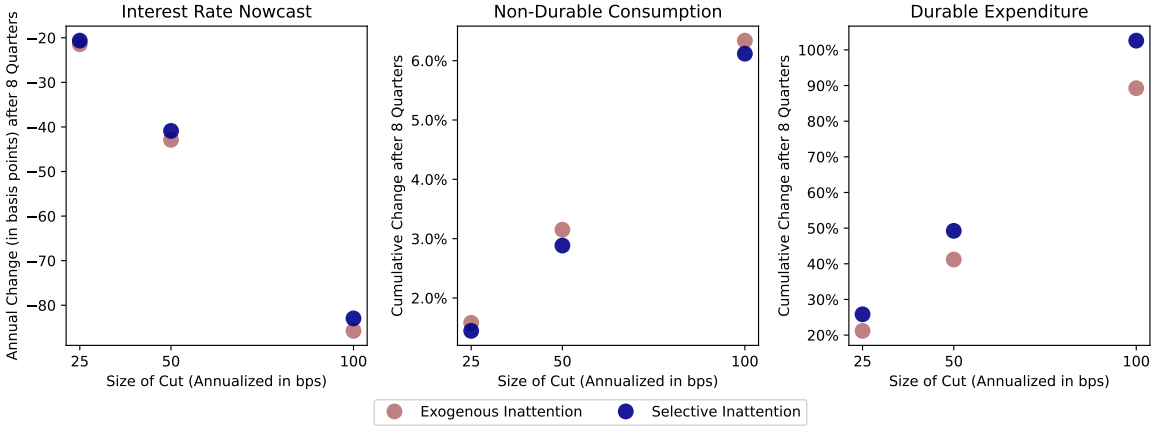
Non-Linear Impact of Rate Cuts: After 8 Quarters



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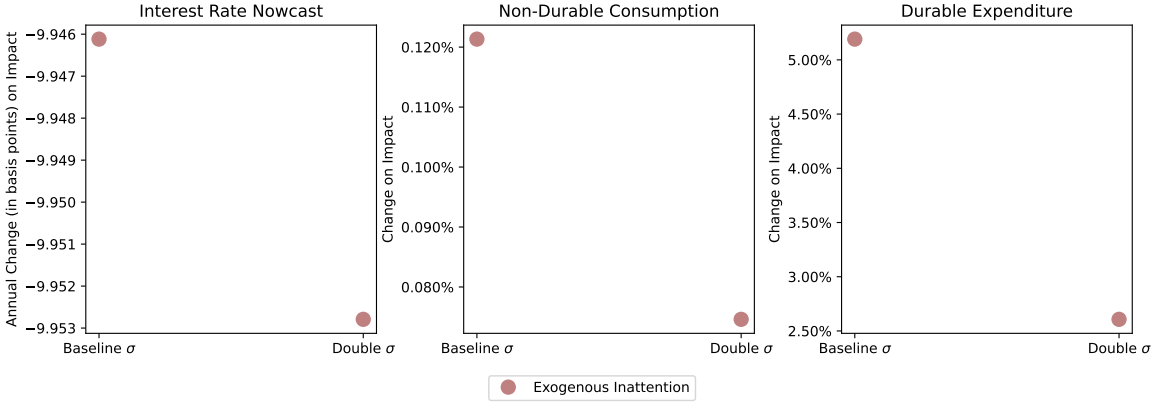
State-Dependence on Volatility: On Impact



Increase in volatility $\Rightarrow$ consumption is less responsive to interest rates

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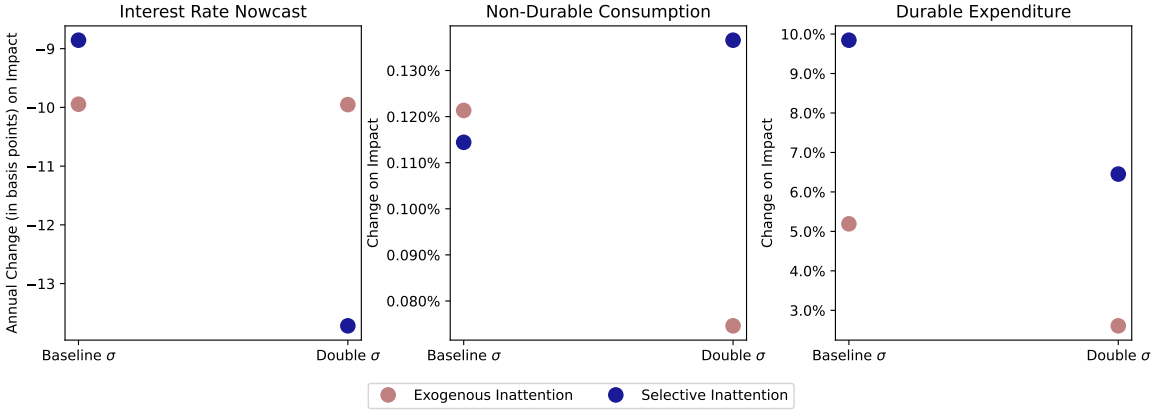
State-Dependence on Volatility: On Impact



... but not with **selective inattention** because of increased info. acquisition!

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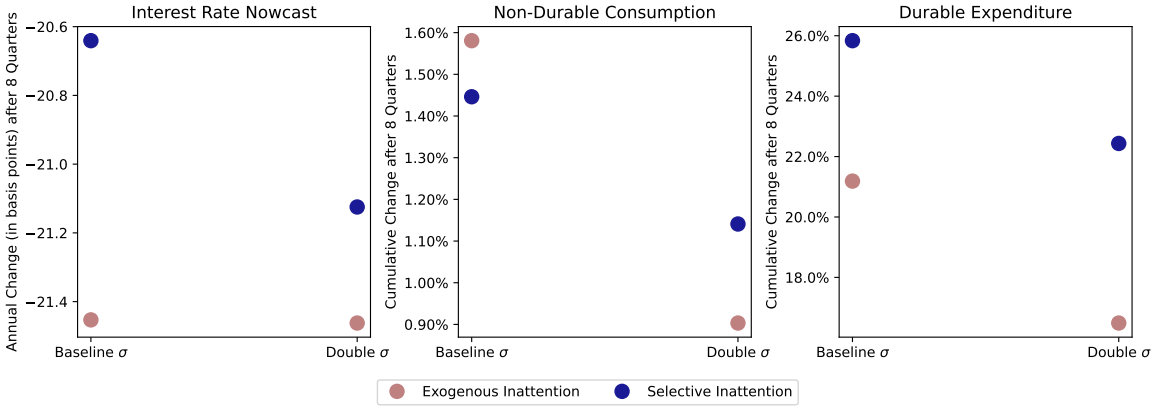
State-Dependence on Volatility: After 8 Quarters



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