

# 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
  - ⇒ **Average** expectation is slow-moving and under-reacts Coibion-Gorodnichenko 12, 15
  - ⇒ Aggregate responses to shocks are “hump-shaped”, like in data Christiano et al. 05

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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 do the macro implications of this **selection** differ?
  - Belief heterogeneity  $\Rightarrow$  **average** may not be the relevant object Miller 77, Afrouzi et al. 24

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

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  $\overbrace{\text{durables}}^{\text{DM in model}} + \text{rational inattention to rates}$ 
  - Use patterns in IA from survey to discipline information cost parameter
  - Compare **model IRFs** to level and volatility of rates with  $\overbrace{\text{exogenous inattention}}^{\text{DM} \perp \text{beliefs} \Rightarrow \text{no selection}}$

# 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

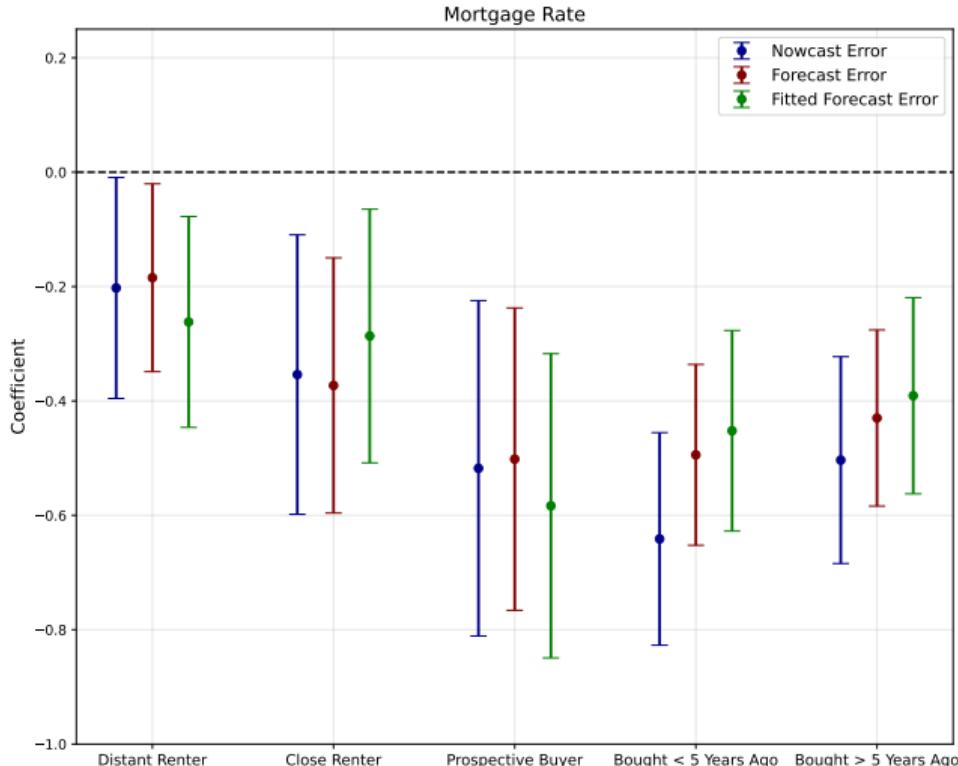
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## SURVEY 1/2: NY FED SURVEY OF CONSUMER EXPECTATIONS

- **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:

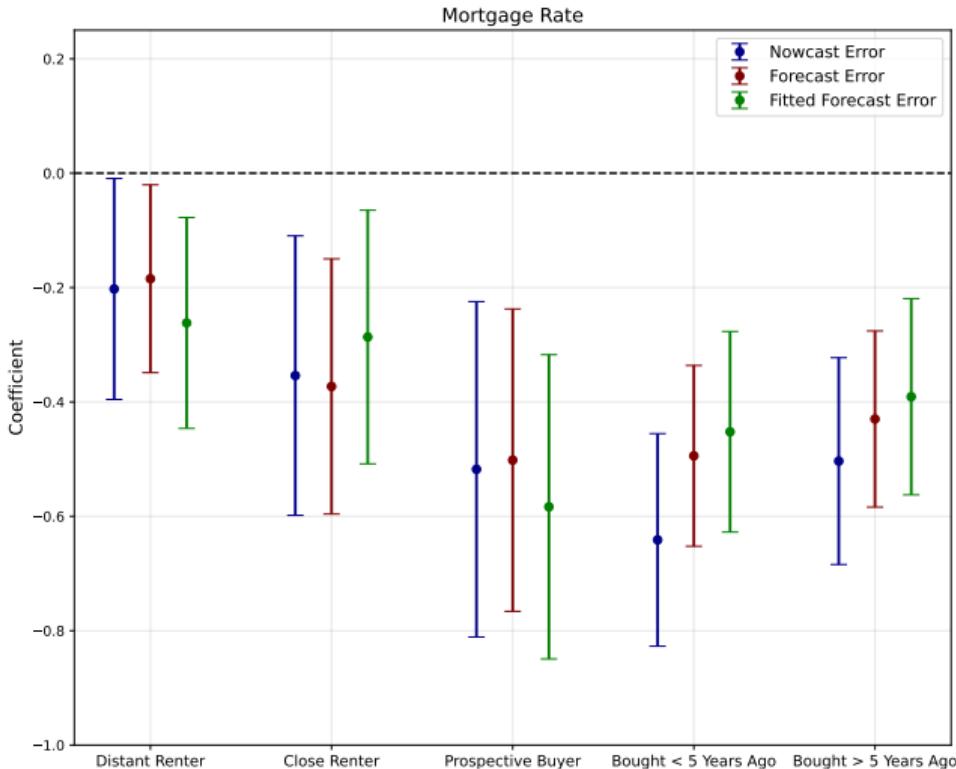
$$\log |\text{Error}_{it}| = \sum_s \beta_s \cdot \mathbf{1}(\text{DM Status}_{it} = s) + \text{Controls}_{it} + \delta_t + \epsilon_{it}$$

# DECISION-MAKERS HAVE MORE ACCURATE BELIEFS



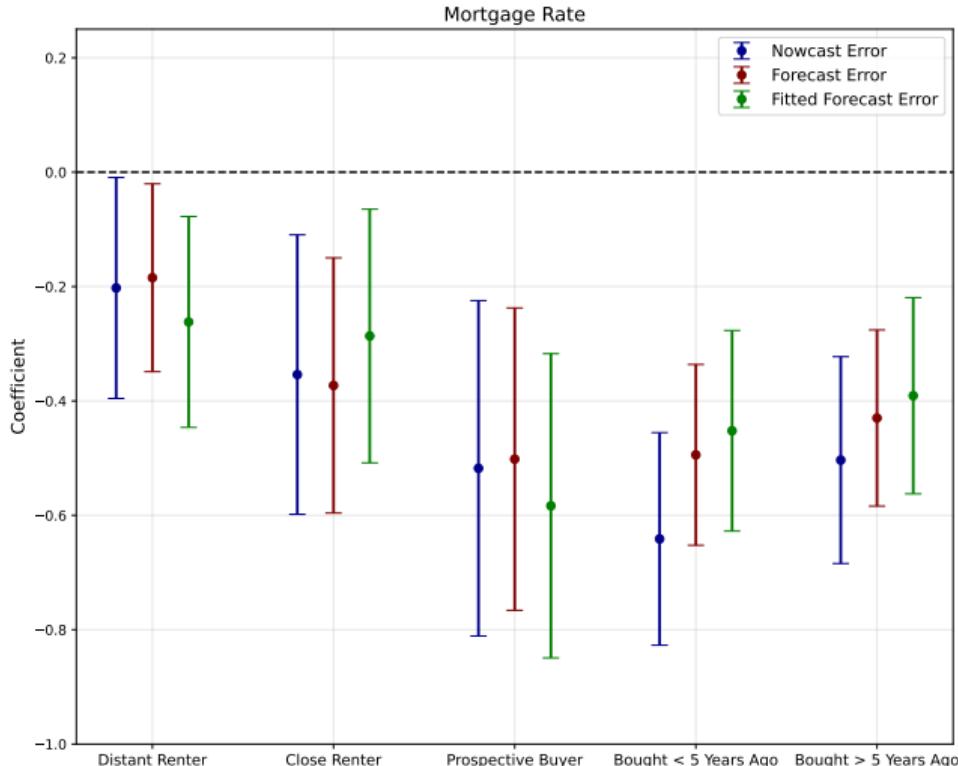
Errors of prospective buyers  $\approx$  **50% lower** than those with no purchase plan

# DECISION-MAKERS HAVE MORE ACCURATE BELIEFS



≈ 2x difference between individuals in top and bottom terciles of income or education

# DECISION-MAKERS HAVE MORE ACCURATE BELIEFS



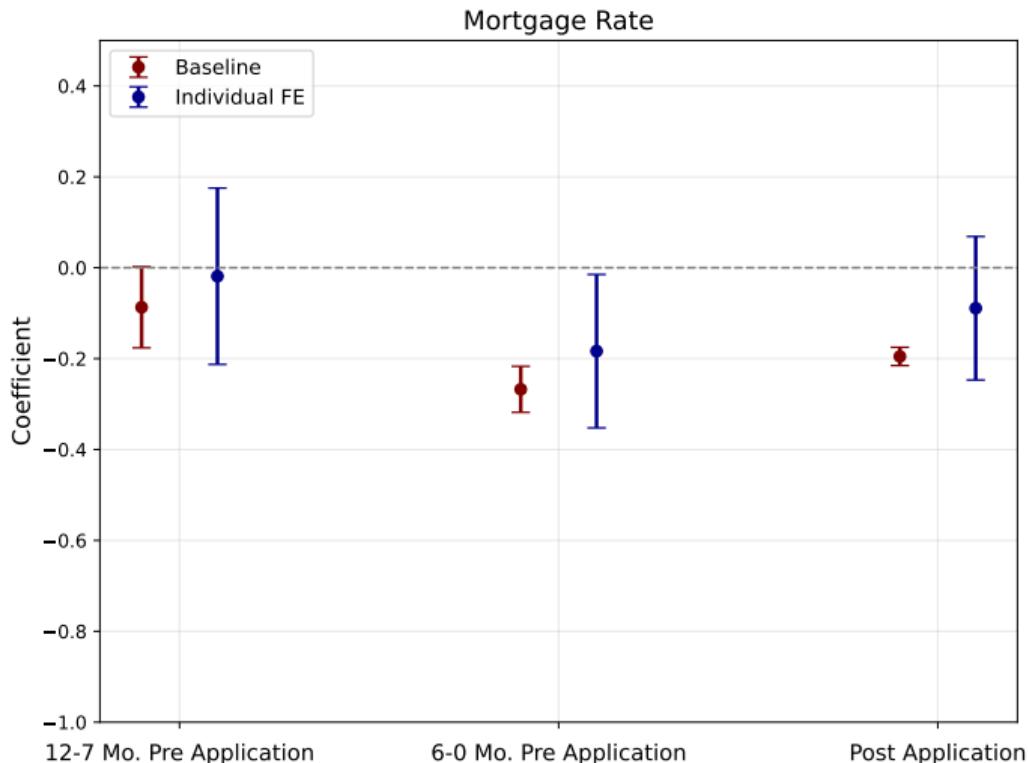
Almost all of forecasting gain comes from nowcasting improvement

## 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:

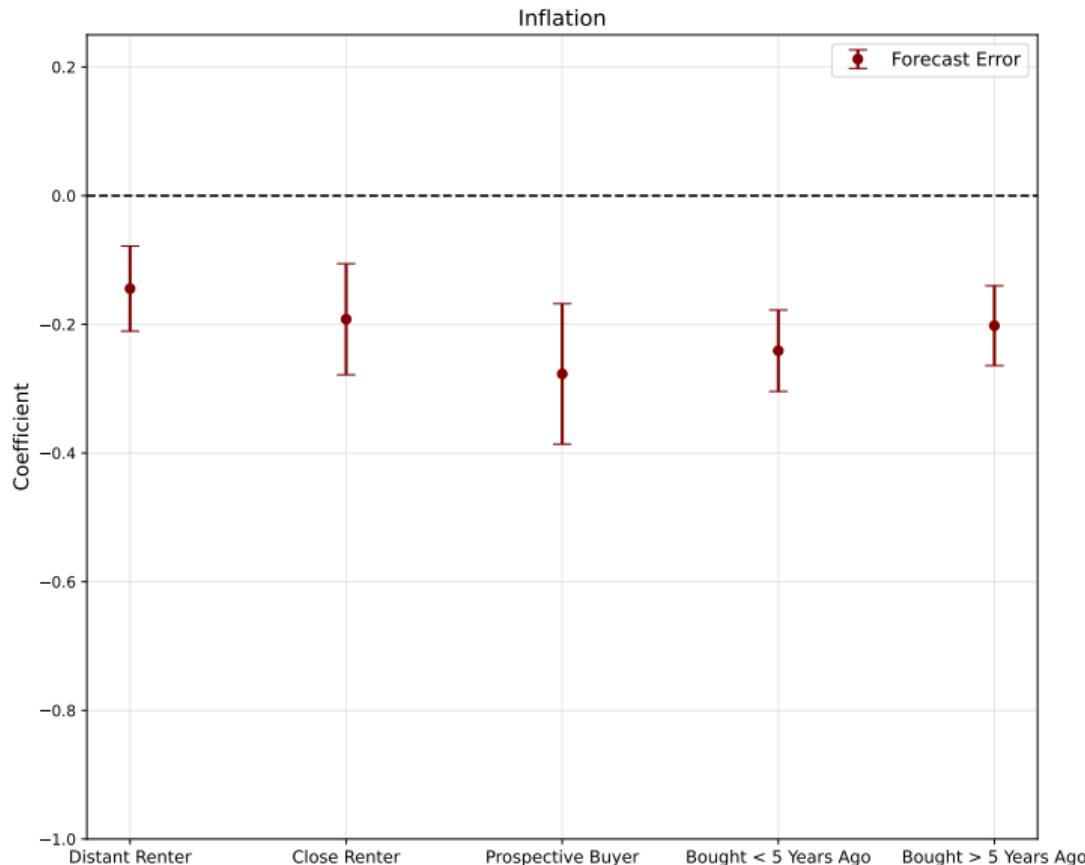
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# DECISION-MAKERS HAVE MORE ACCURATE BELIEFS: ECB

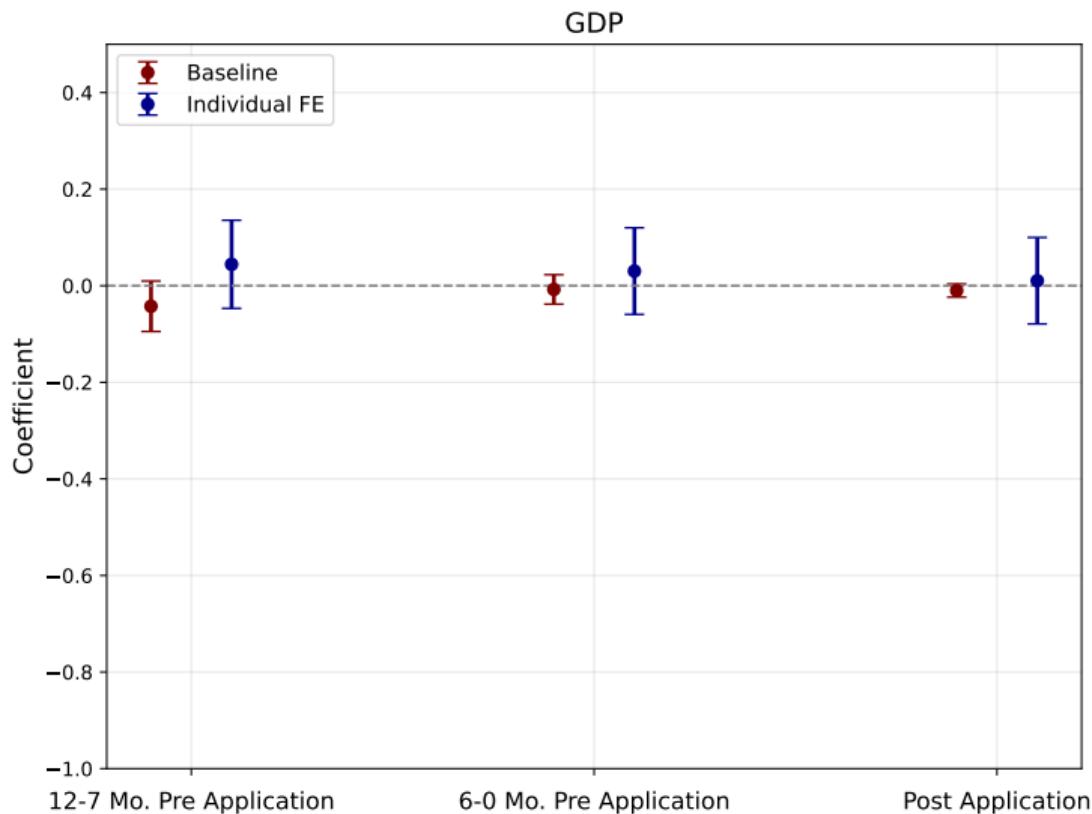


Mortgage rate forecast errors fall by about **20%** pre-application

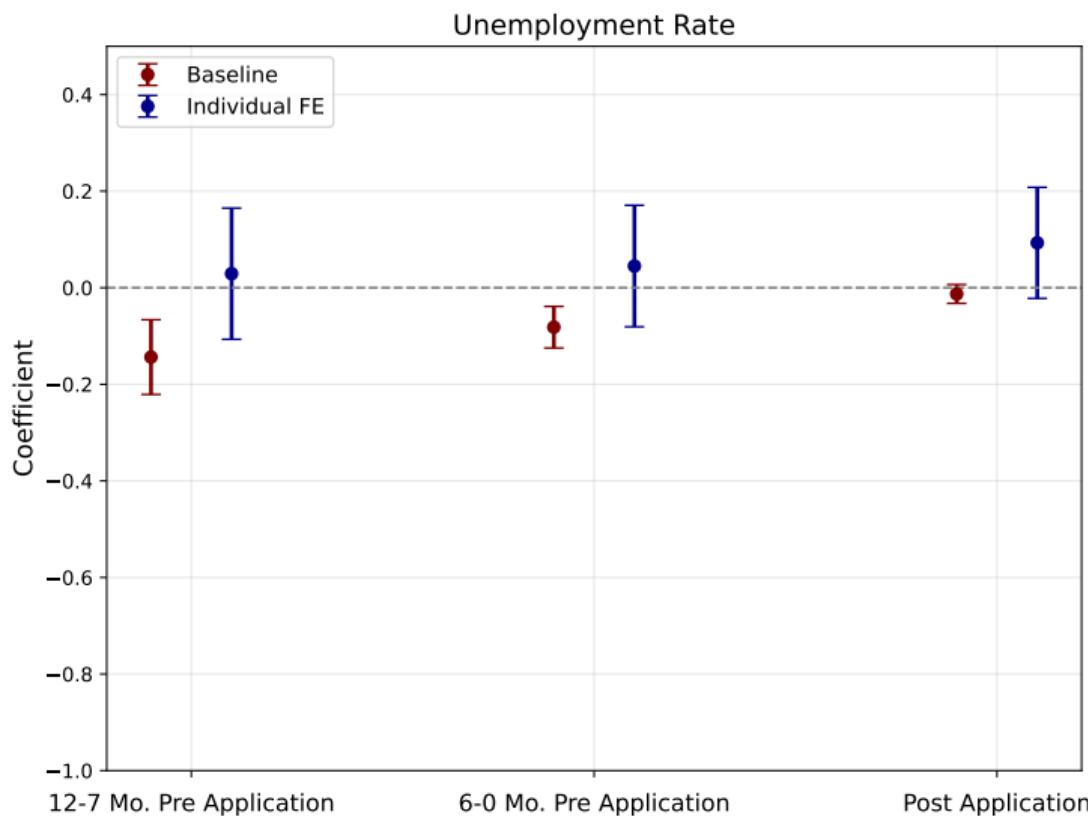
# SMALLER DIFFERENCES FOR OTHER VARIABLES: INFLATION IN NY FED



# SMALLER DIFFERENCES FOR OTHER VARIABLES: GDP IN ECB



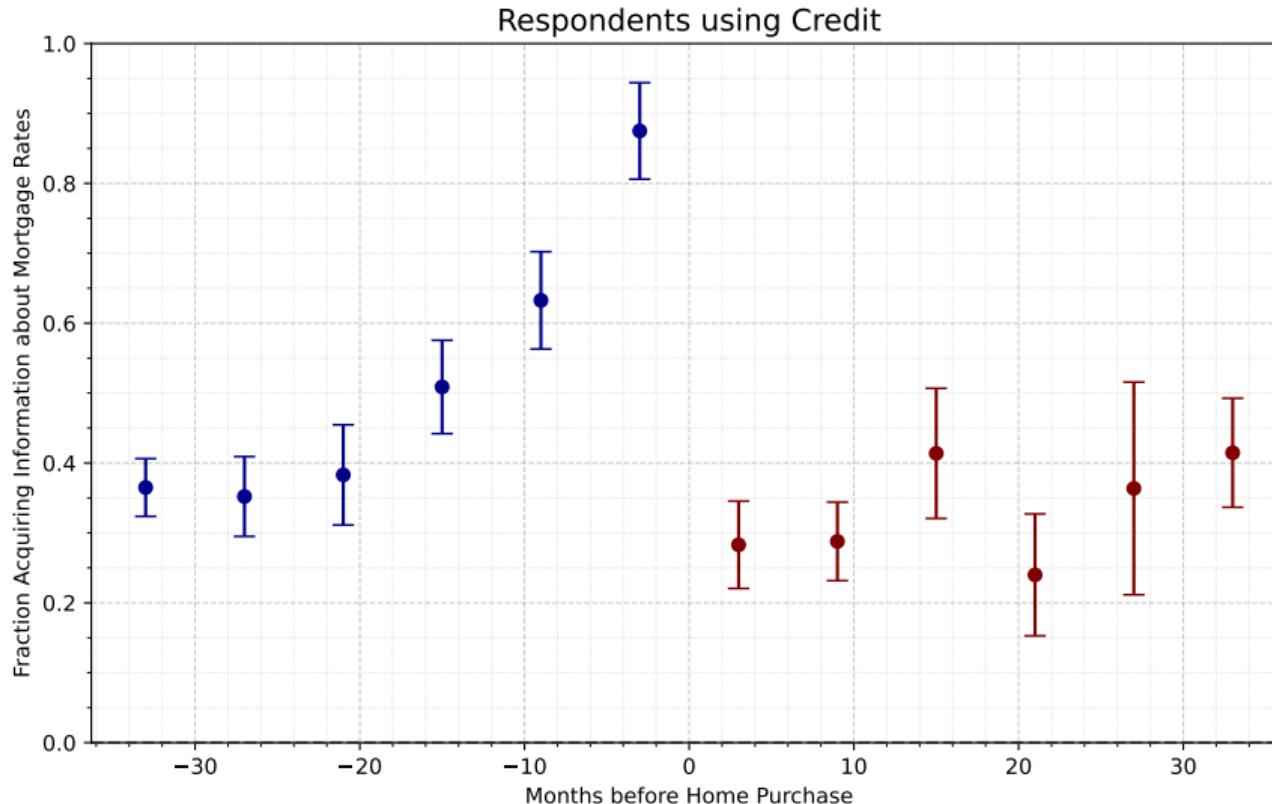
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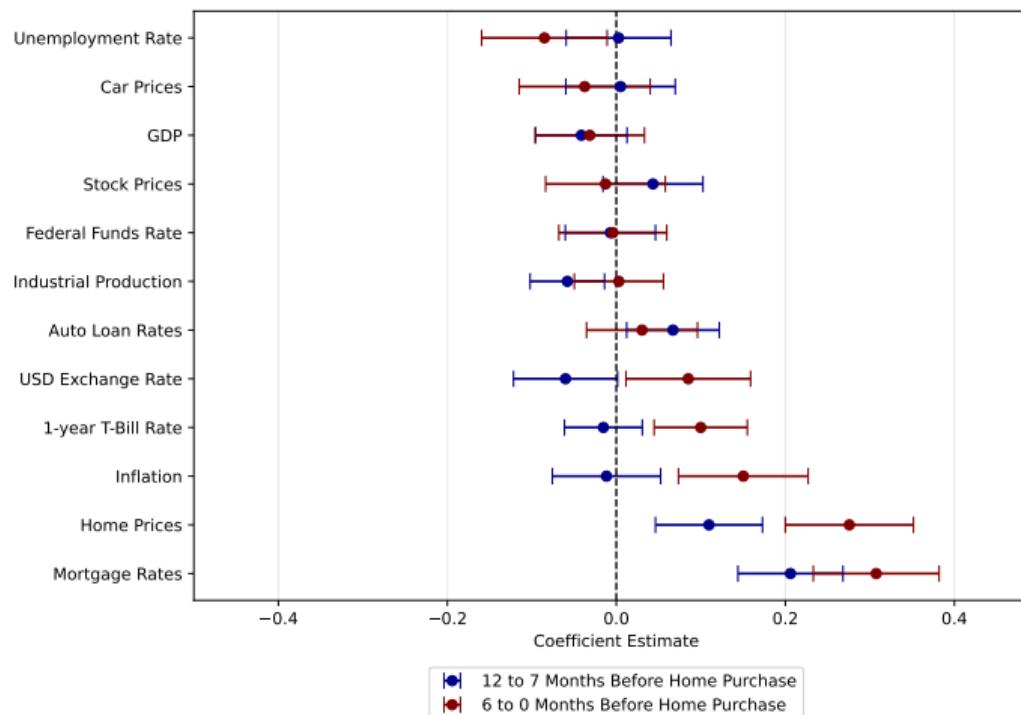
# INFORMATION ACQUISITION IS CONCENTRATED PRE-DECISION



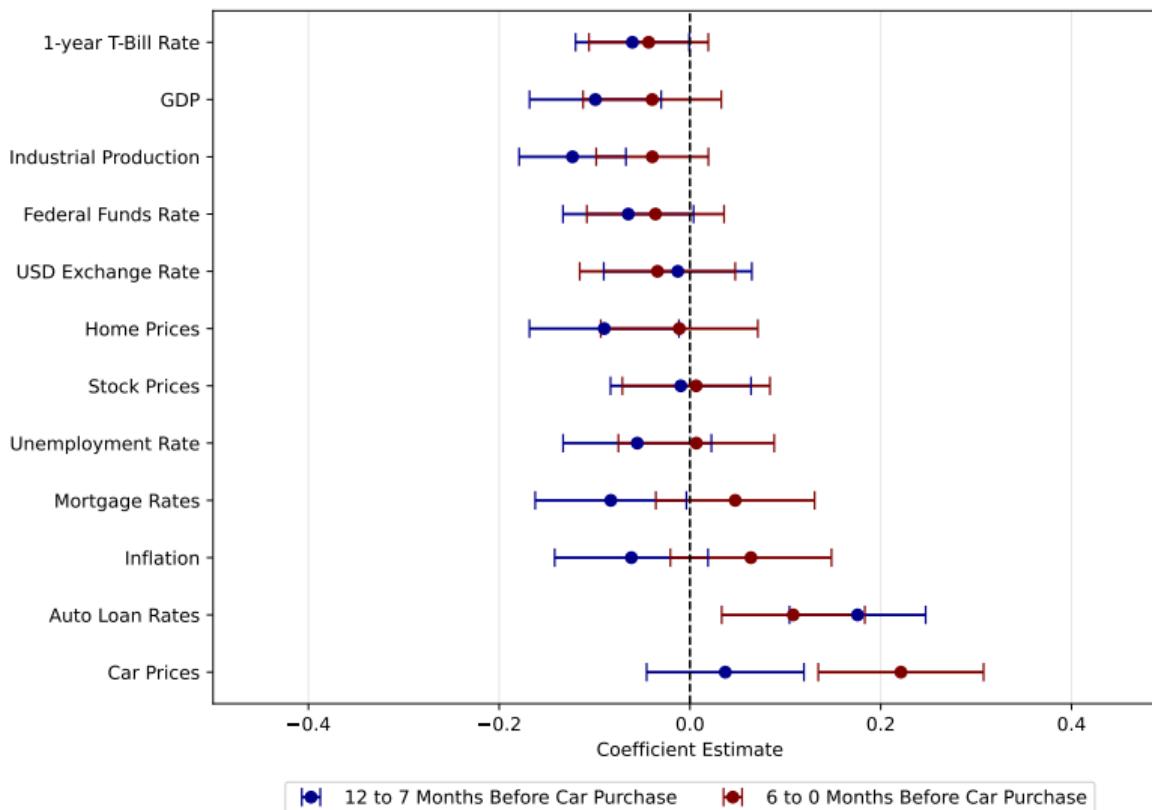
▶ Survey Description

# IA IS CONCENTRATED ON DECISION-RELEVANT VARIABLES

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



# PATTERNS IN INFORMATION ACQUISITION ARE DECISION-SPECIFIC



## 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** (see paper)
- 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**?

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# MODEL SKETCH

Bewley-Huggett-Aiyagari

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

household block of McKay-Wieland 2021

rational inattention

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

## Decision-Making

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

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

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

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## Information Acquisition

HHs know DGP + receive signals of endog. precision about  $r$  = rational inattention

- Cost of signals =  $\omega \times$  mutual info.
- Benefit of signals = better choice of  $\mathbf{c}, \mathbf{d}'$

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- Interest rate is persistent  $\Rightarrow$  prior beliefs are state variables
- Assumption: Gaussian signals about current  $r$

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

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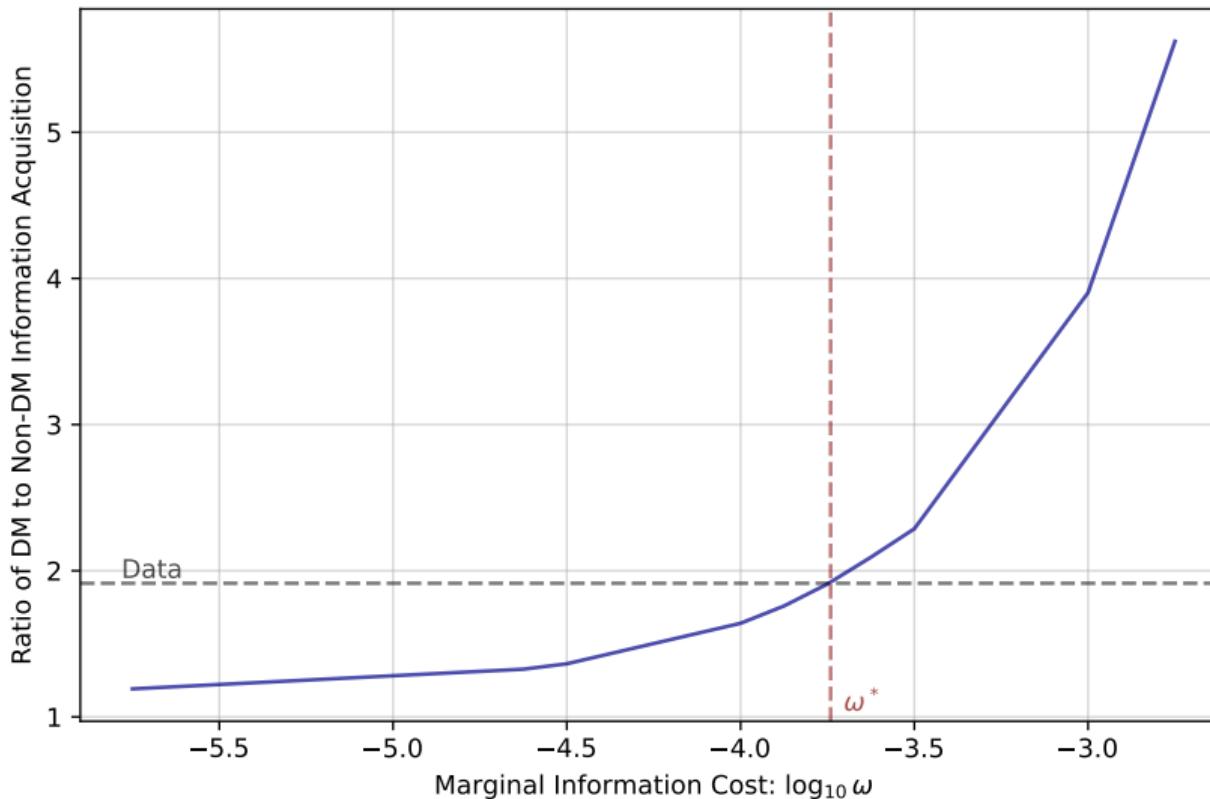
Endogenous beliefs about  $r$  that come from dynamic information acquisition

# CALIBRATION

Parameter	Description	Value	Source
<i>Internally-Calibrated</i>			
$\beta$	Discount factor	0.9829	Asset-to-GDP ratio
$\psi$	Non-durables exponent	0.627	Durable-to-nondurable consumption ratio
$f$	Fixed cost	0.11	Adjustment probability
$1 - \xi$	Match-quality shock probability	0.034	Share of adjustments from MQ shocks
$\omega$	Marginal information cost	$10^{-3.741}$	Concentration in information acquisition
<i>Externally-Calibrated</i>			
$\gamma$	RRA (and inverse EIS)	2	.
$\varepsilon$	Durables elasticity of substitution	0.5	McKay and Wieland (2021)
$1 - \lambda$	Required downpayment	0.2	McKay and Wieland (2021)
$\delta$	Depreciation rate	0.017	McKay and Wieland (2021)
$\chi$	Maintenance share	0.35	McKay and Wieland (2021)
$\nu$	Operating cost	0.012	McKay and Wieland (2021)
$\rho_y$	Income persistence	0.977	Flodén and Lindé (2001)
$\sigma_\epsilon$	Income shock std. dev.	0.058	Flodén and Lindé (2001)
$\bar{r}$	Real rate mean	0.0143	10-Year Treasury Rate: 1961-2024
$\rho$	Real rate persistence	0.979	10-Year Treasury Rate: 1961-2024
$\sigma$	Real rate shock std. dev.	0.0014	10-Year Treasury Rate: 1961-2024
$\tau_b$	Borrowing spread	0.4156%	30-Year Fixed Mortgage Rate: 1971-2024

▶ Welfare Loss

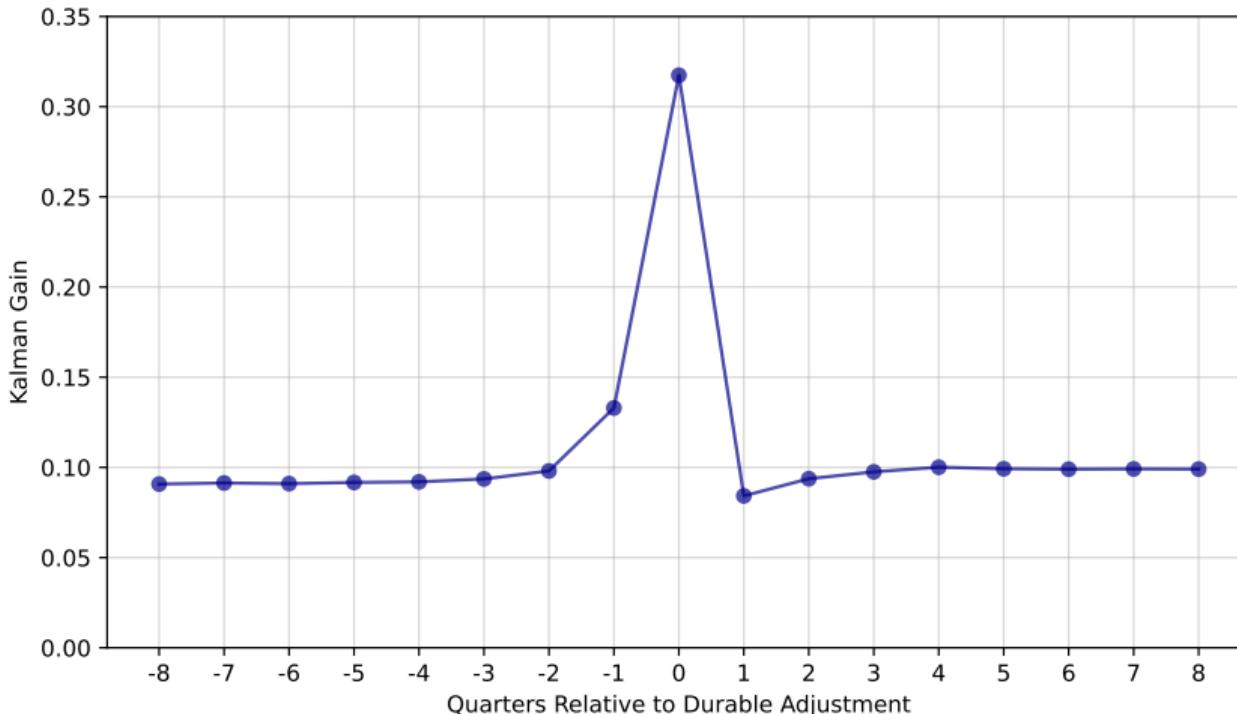
# EFFECT OF INFORMATION COST ON INFORMATION ACQUISITION



▶ Summary Stats

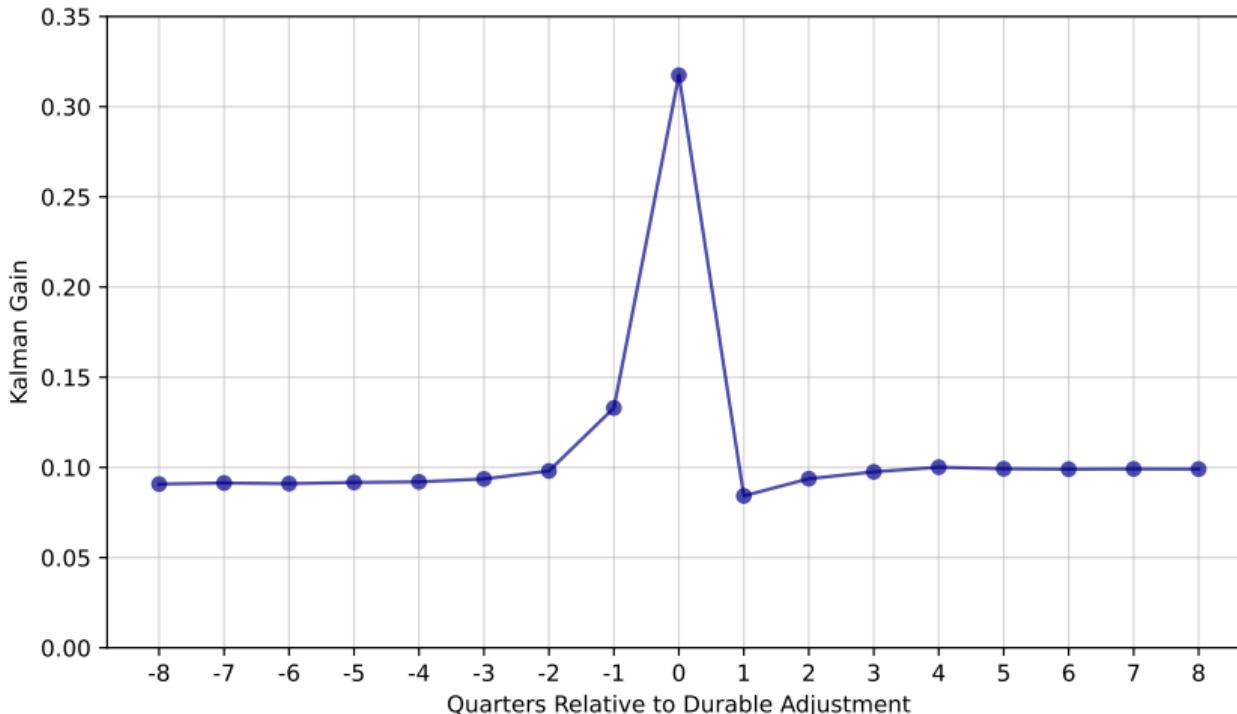
▶ Durables Adjustment Hazard

# INFORMATION ACQUISITION IN EVENT-TIME



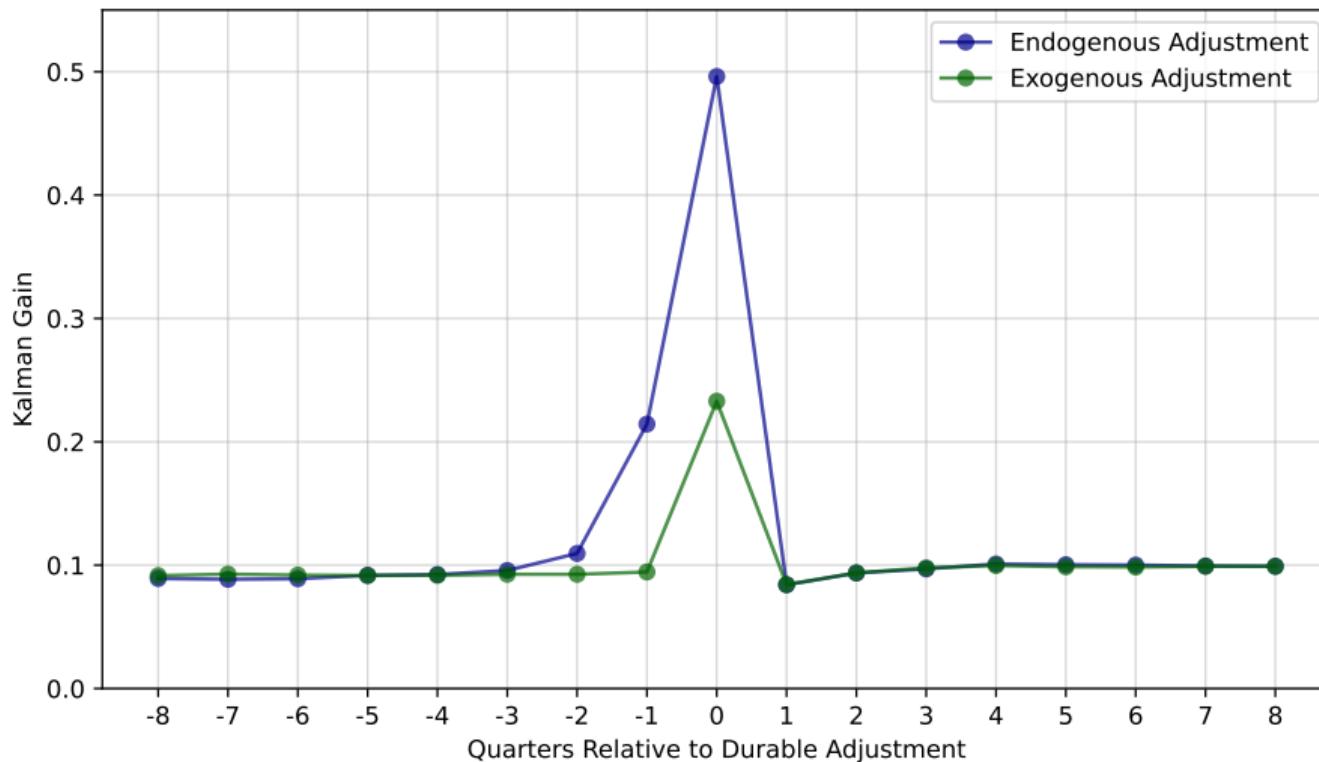
Households acquire information in **all** periods...

# INFORMATION ACQUISITION IN EVENT-TIME



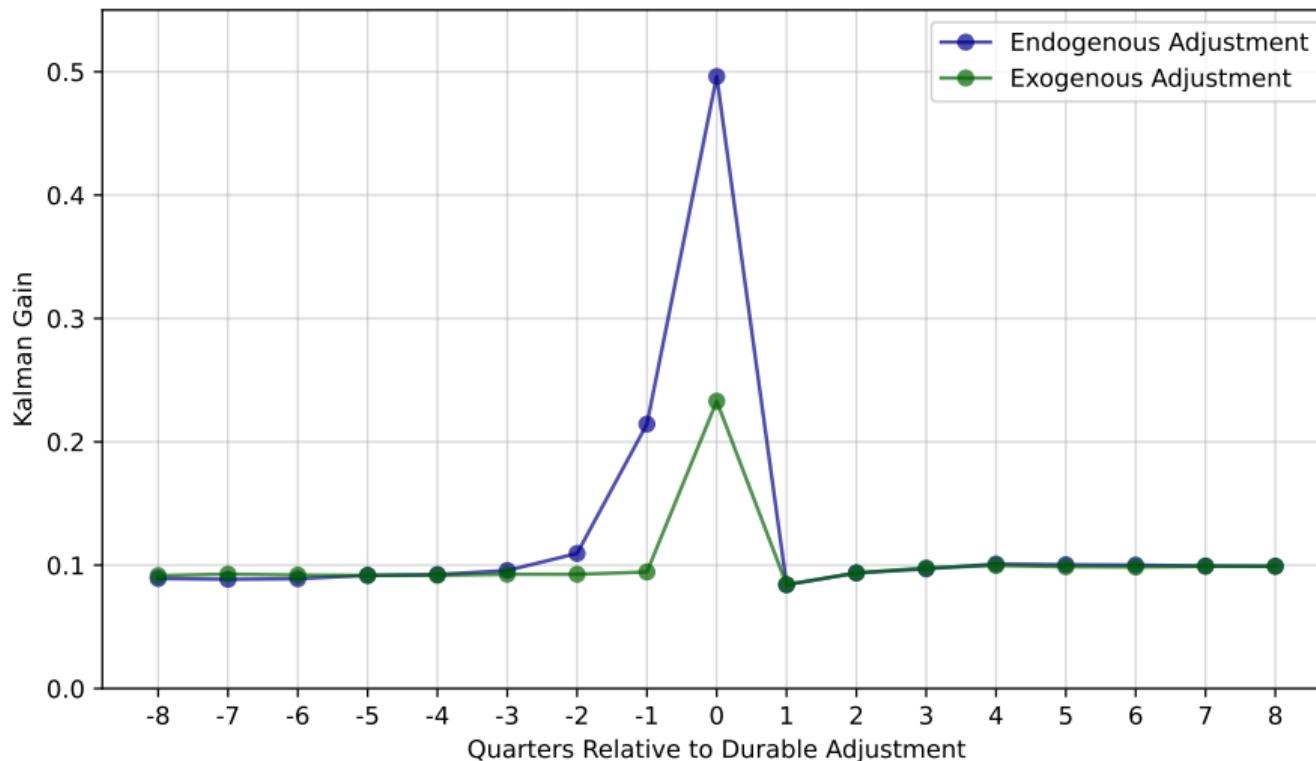
... but this information acquisition is **concentrated** around durables adjustments

# ENDOGENOUS ADJUSTMENTS $\Rightarrow$ INFO. ACQUISITION PRE-CHOICE



Information acquisition increases in anticipation of **state-dependent** adjustments...

# ENDOGENOUS ADJUSTMENTS $\Rightarrow$ INFO. ACQUISITION PRE-CHOICE



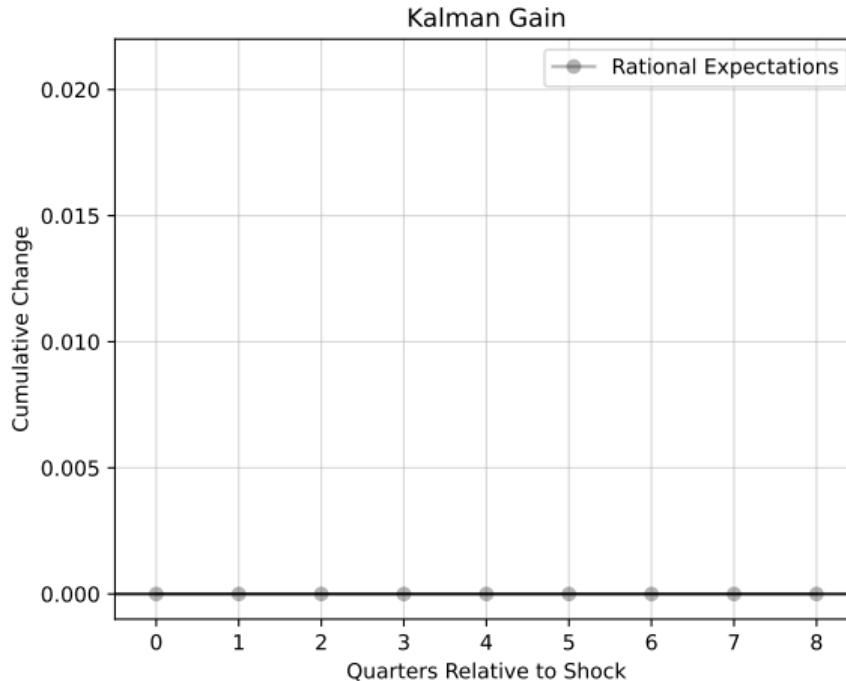
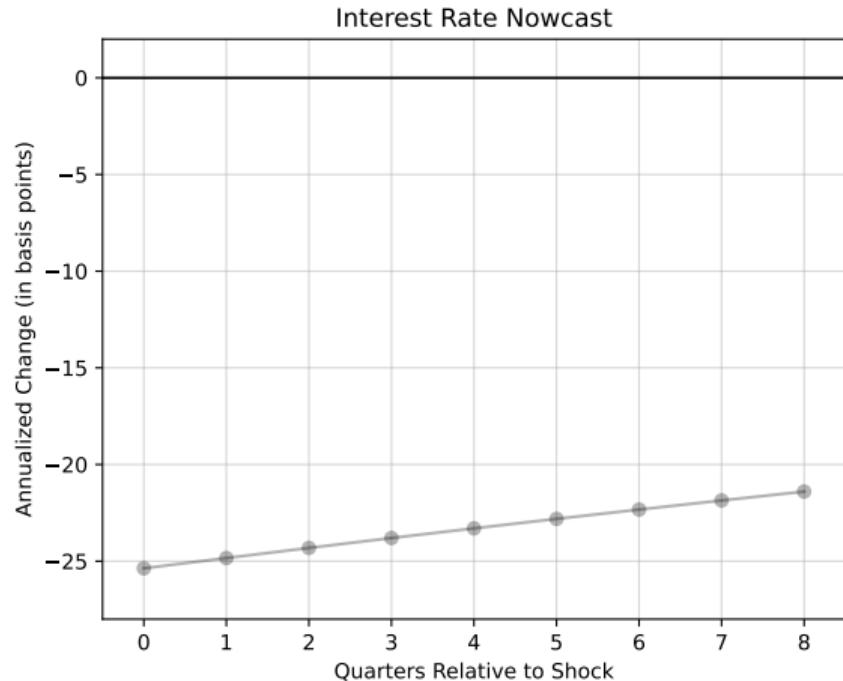
... but is concentrated around the choice for **time-dependent** adjustments Afrouzi et al. 24

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# RESPONSES TO INTEREST RATE CUTS

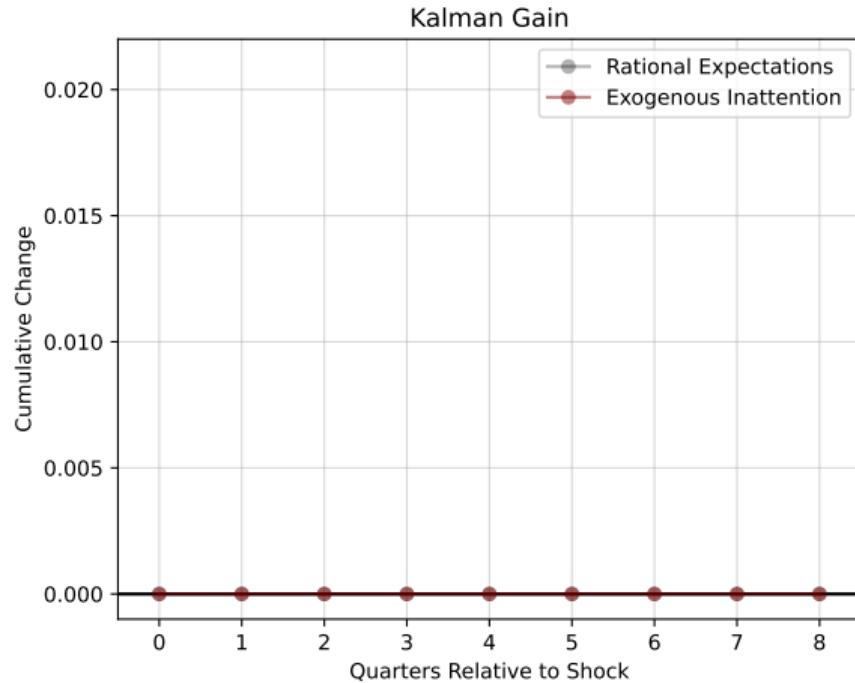
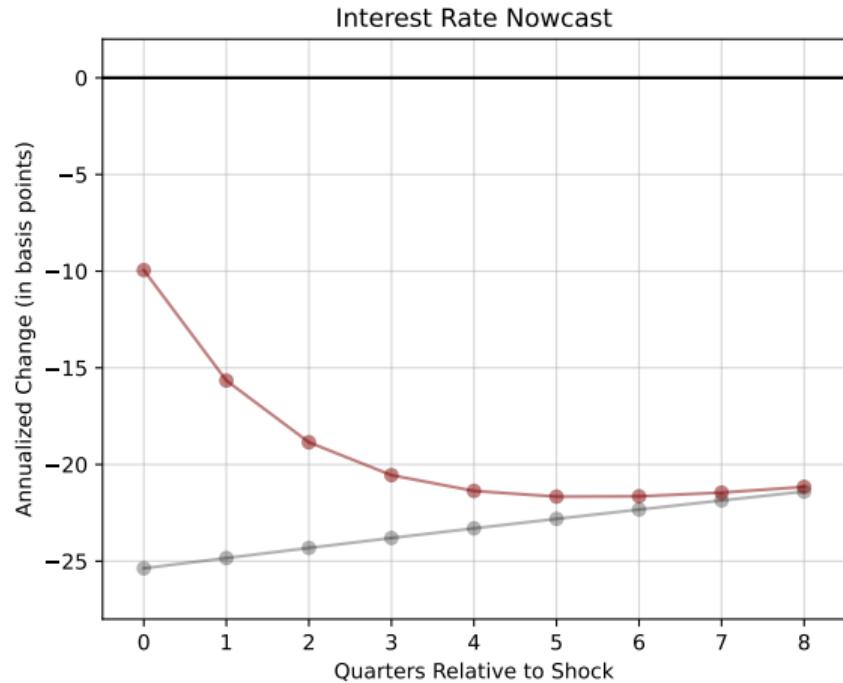
# IMPULSE RESPONSE OF BELIEFS TO RATE CUT



**Rational expectations:** households observe current interest rate

► Decomposition

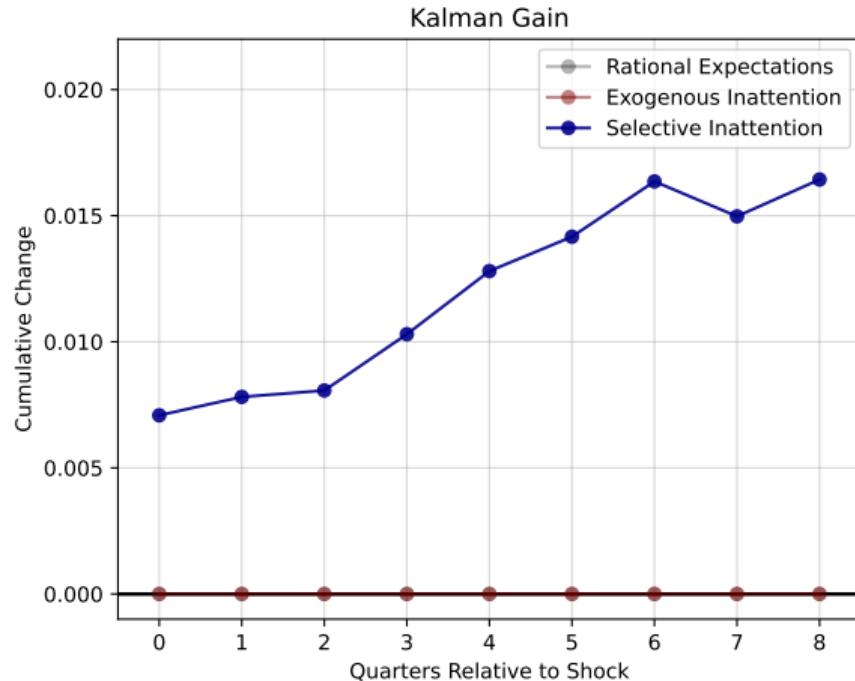
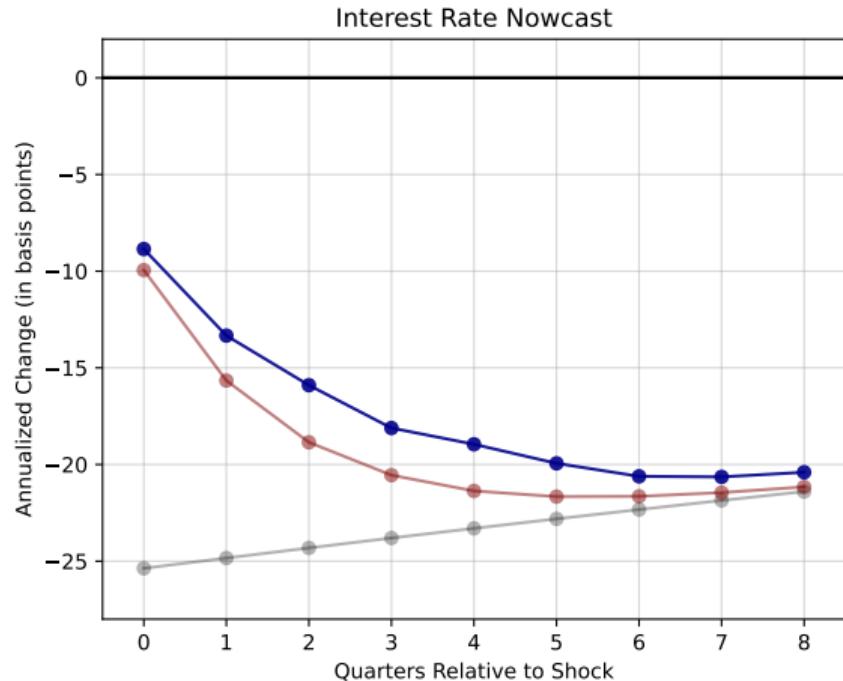
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**Exogenous inattention:** constant  $G$  set to match CG 15 coefficient in baseline model

► Decomposition

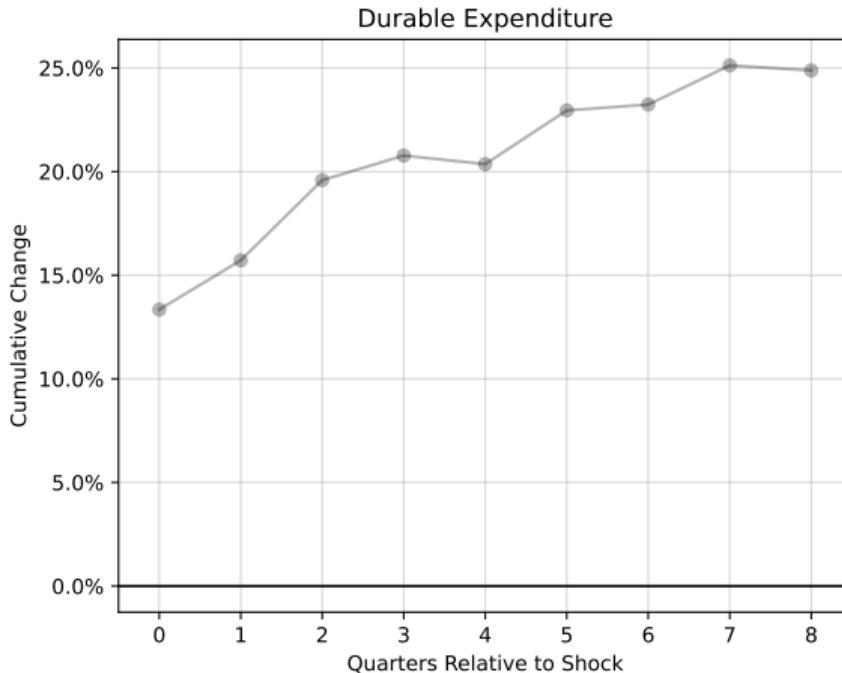
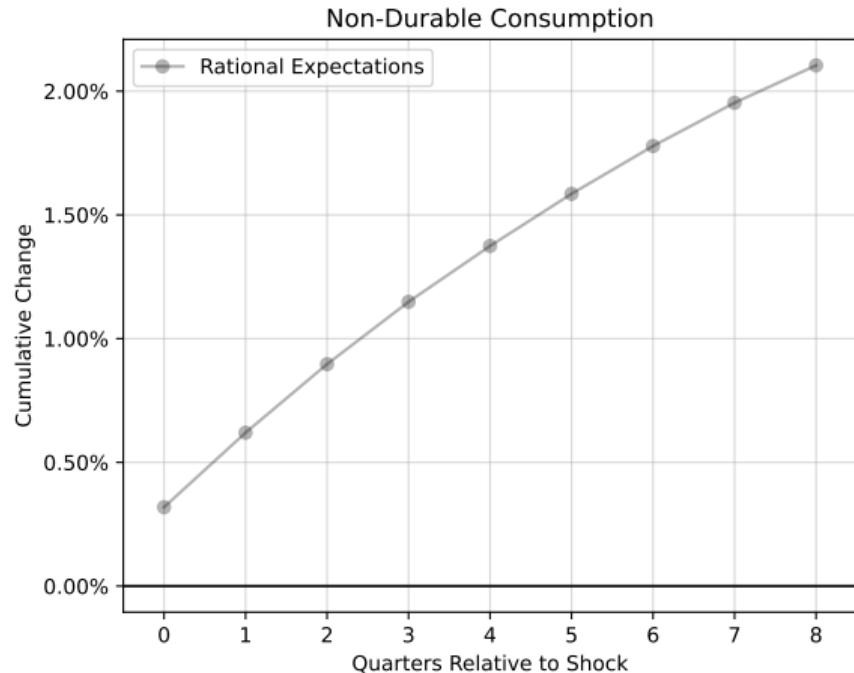
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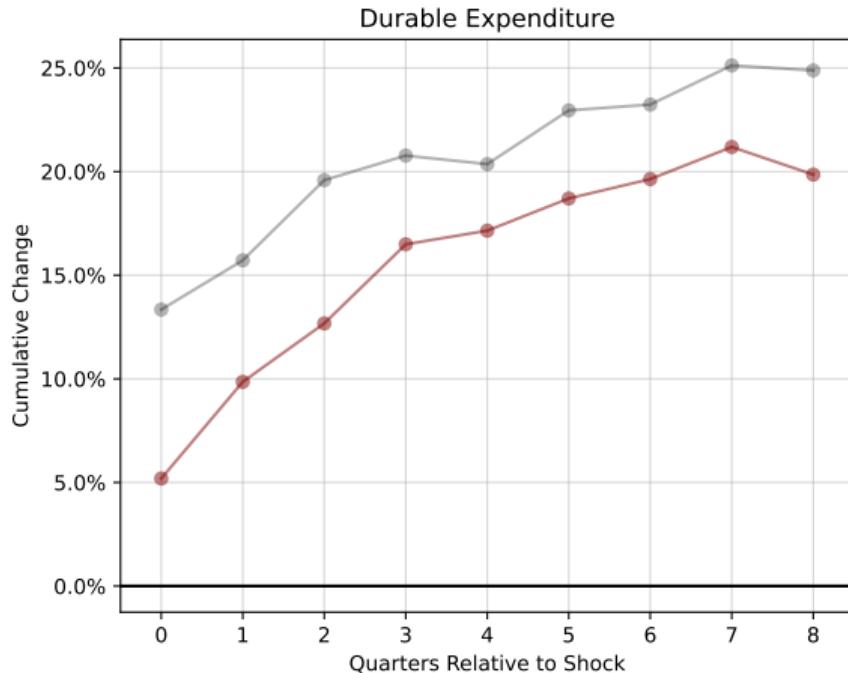
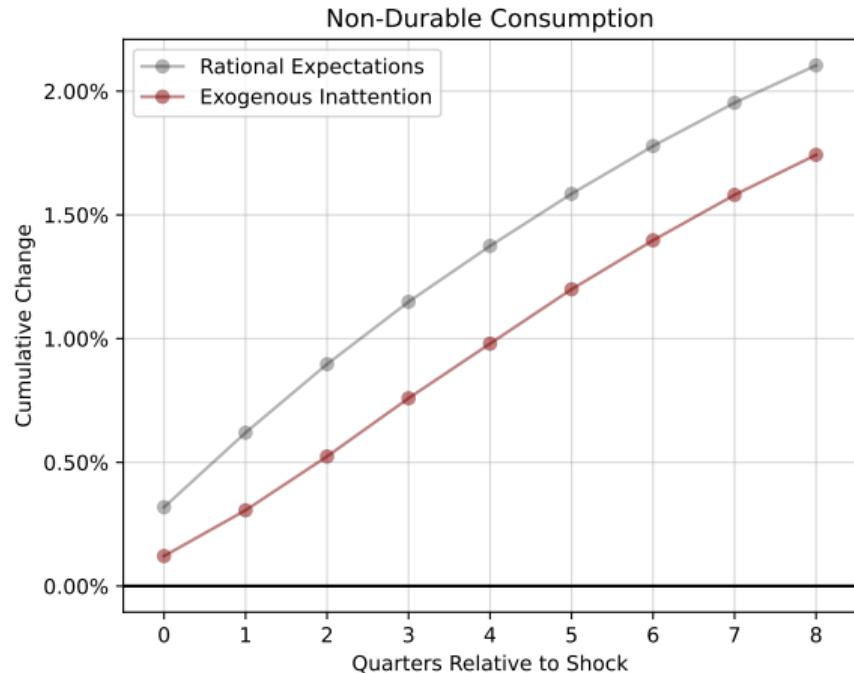
**Selective inattention:** baseline model with endogenous information acquisition

► Decomposition

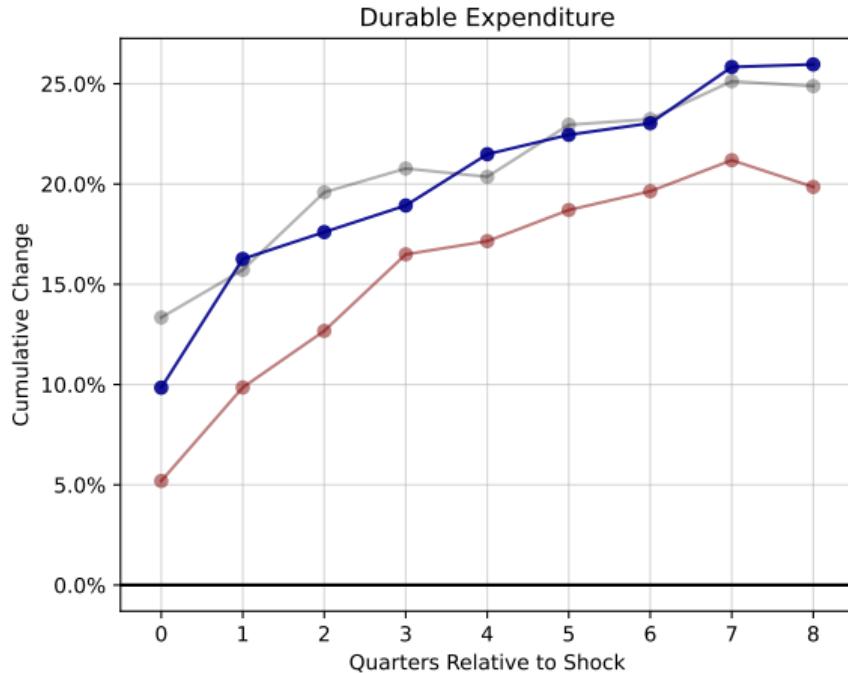
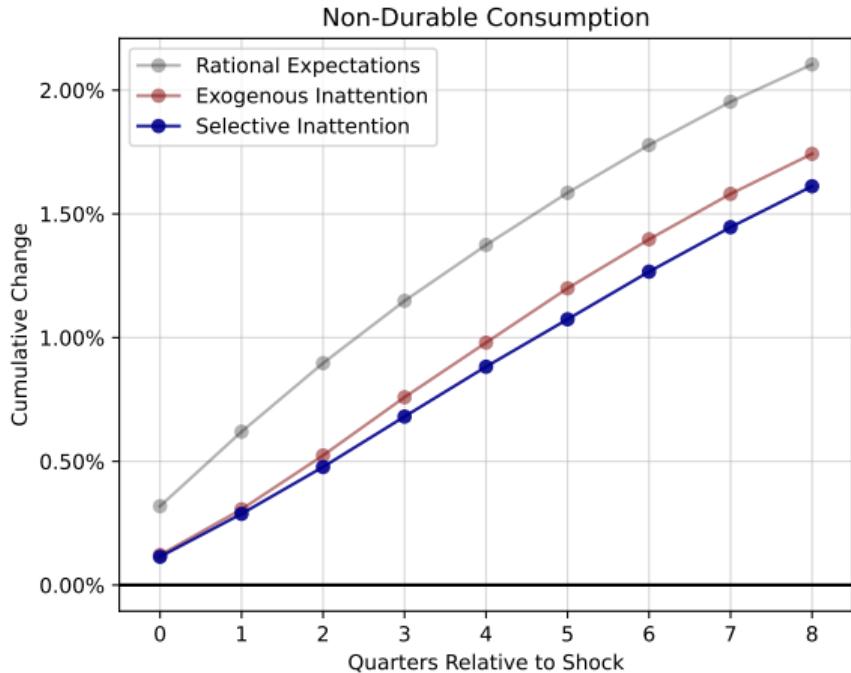
# IMPULSE RESPONSE OF SPENDING TO RATE CUT



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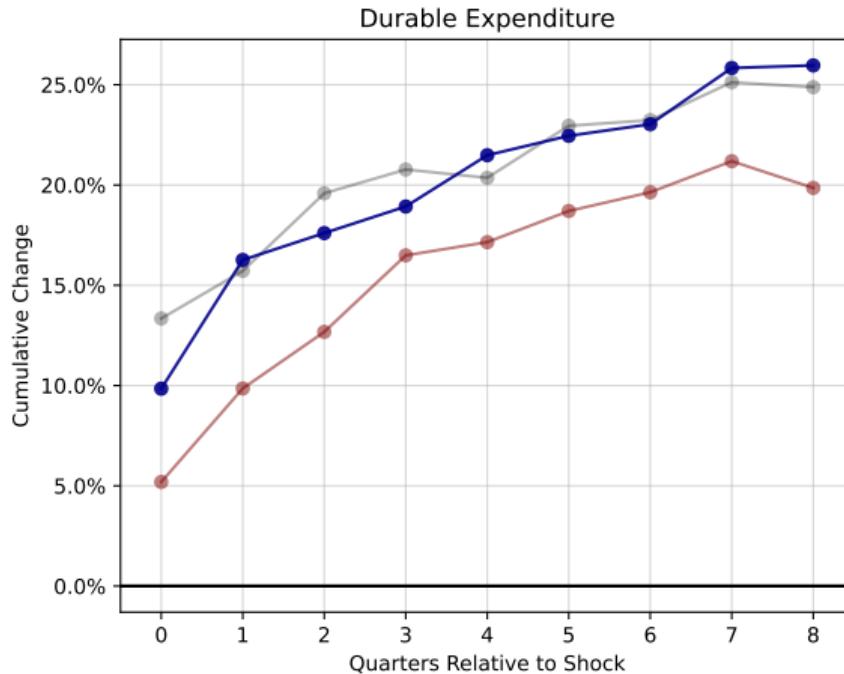
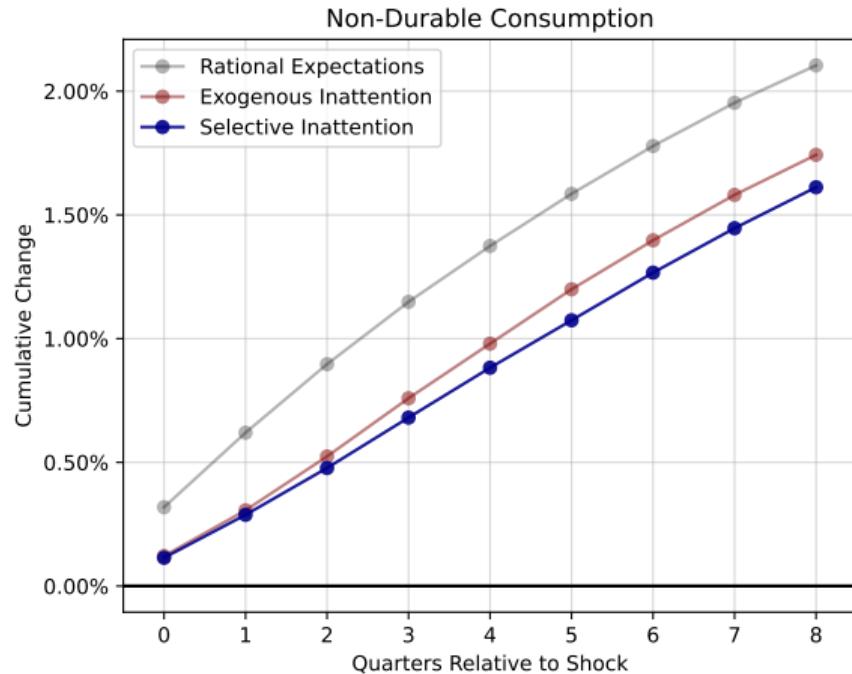


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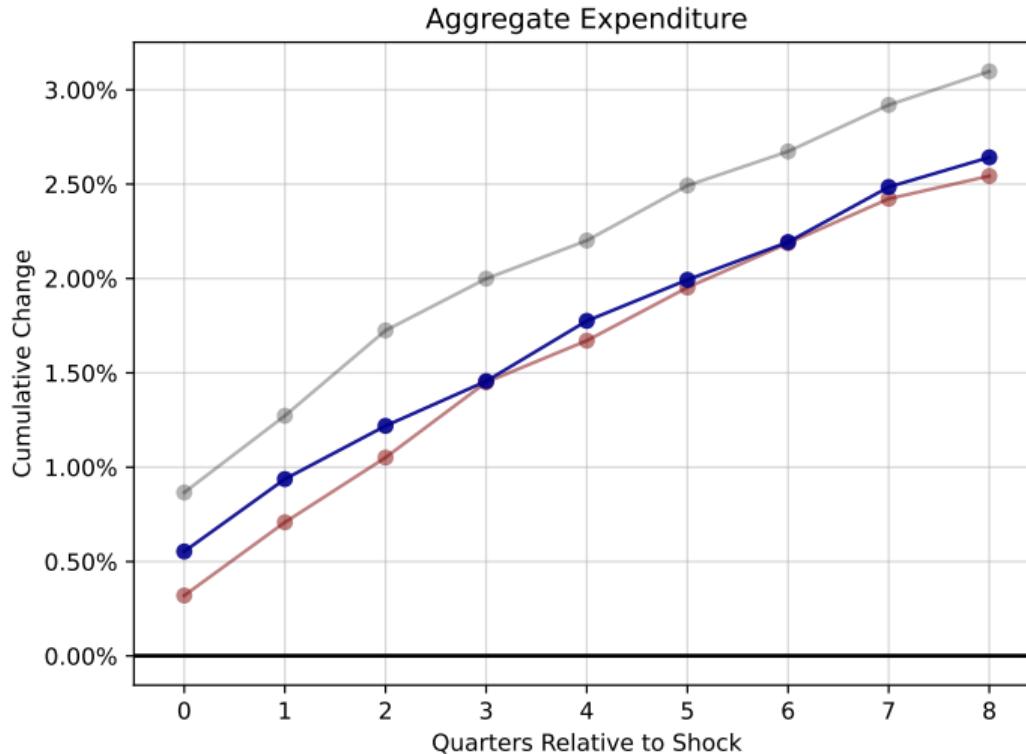
**Non-durable** response is damped like with **exogenous inattention**...

# IMPULSE RESPONSE OF SPENDING TO RATE CUT



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

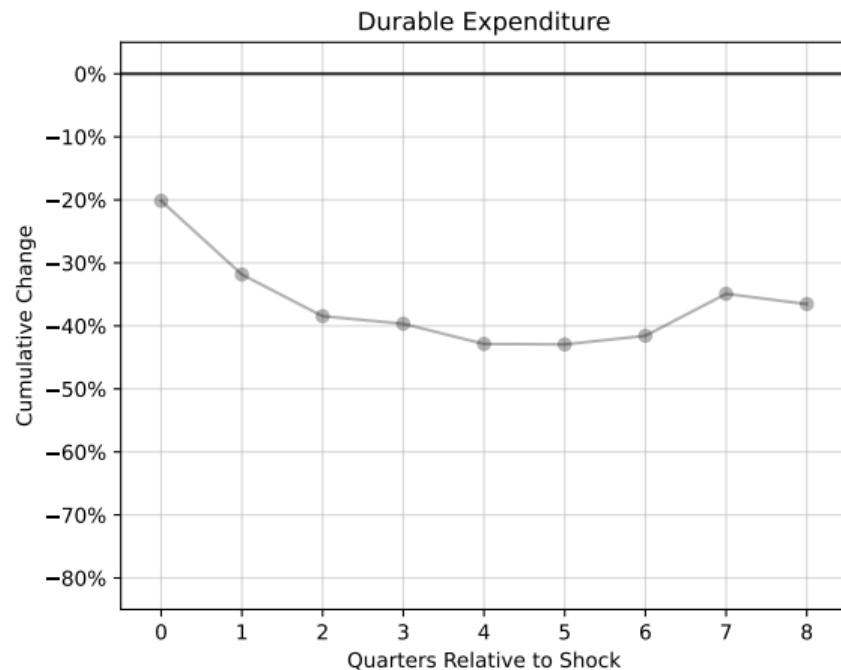
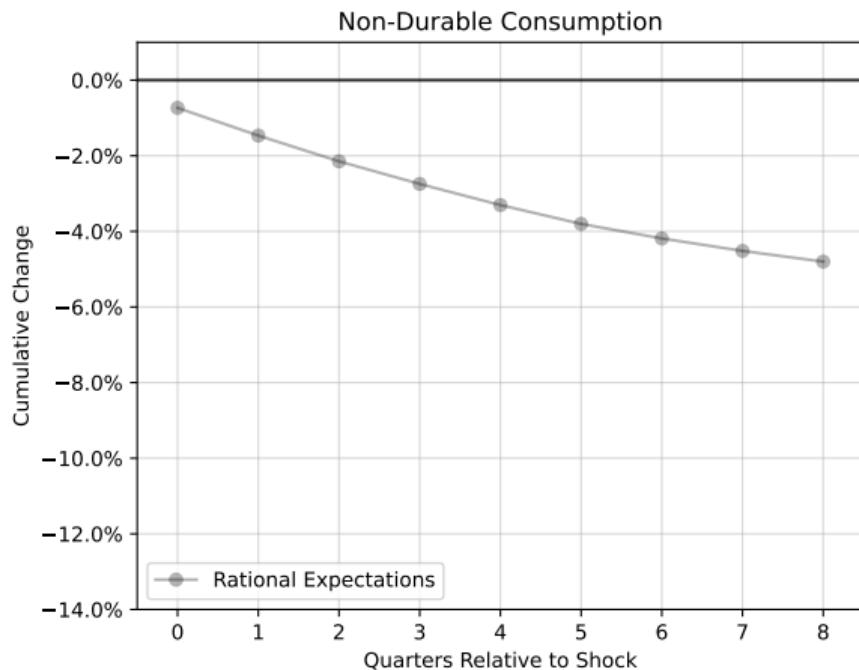
# SMALL DIFFERENCE IN AGGREGATE SPENDING RESPONSE TO RATE CUT



Shift in **composition** of spending to durables  $\Rightarrow$  GE effects through  $\frac{p_d}{p_c}$  Barsky et al. 07

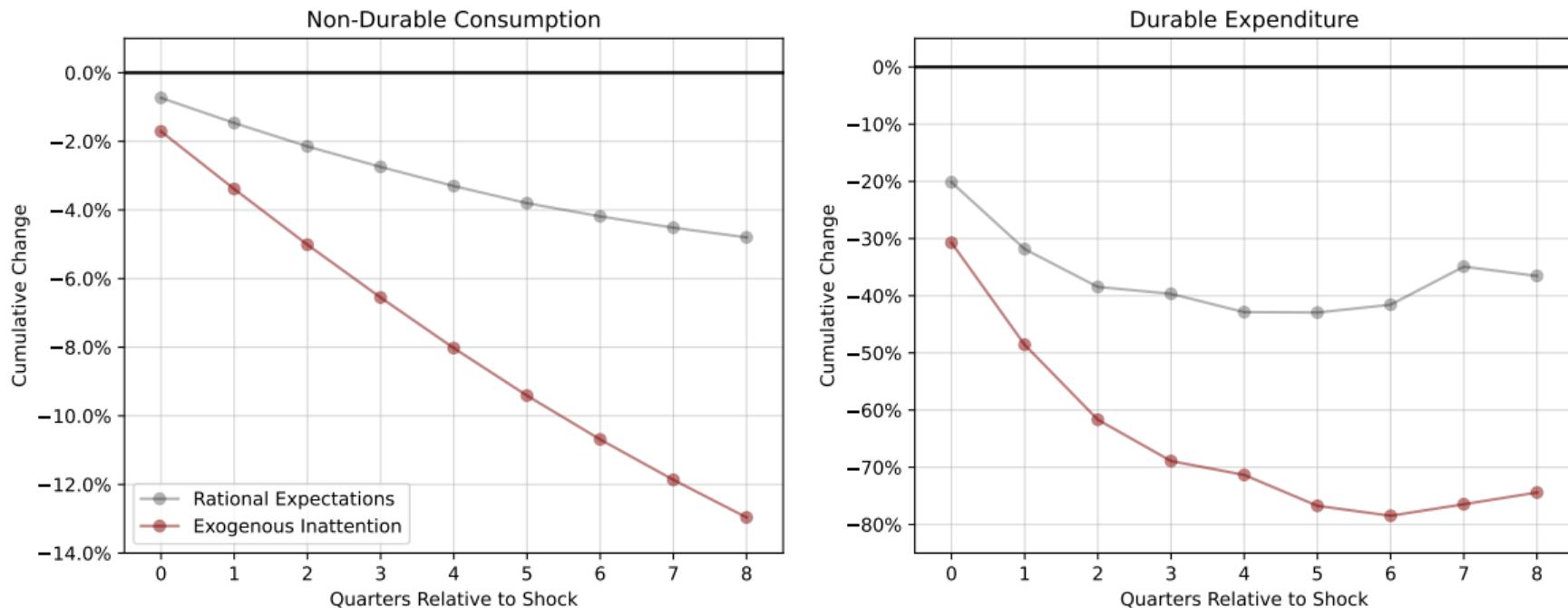
# EFFECTS OF CHANGES IN INTEREST RATE VOLATILITY

# IMPULSE RESPONSE OF SPENDING TO INCREASE IN VOLATILITY



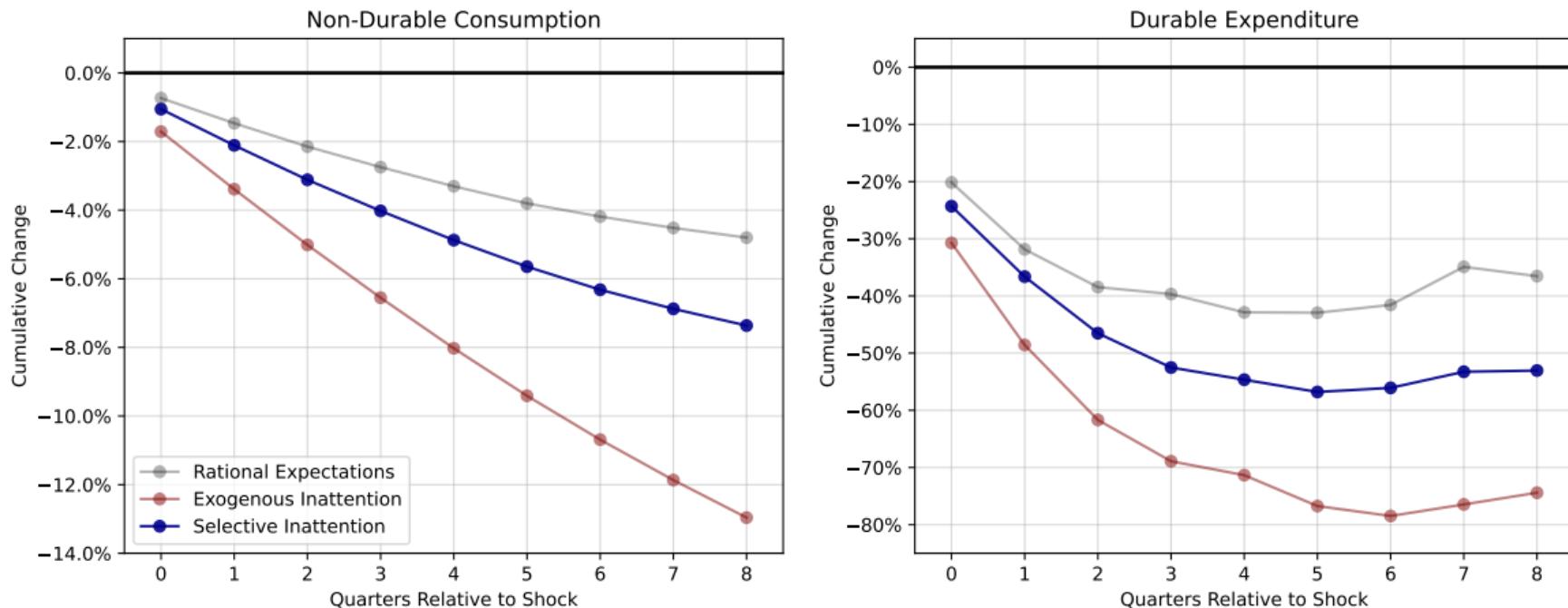
Increase in volatility  $\Rightarrow$  spending falls due to precautionary motives...

# IMPULSE RESPONSE OF SPENDING TO INCREASE IN VOLATILITY



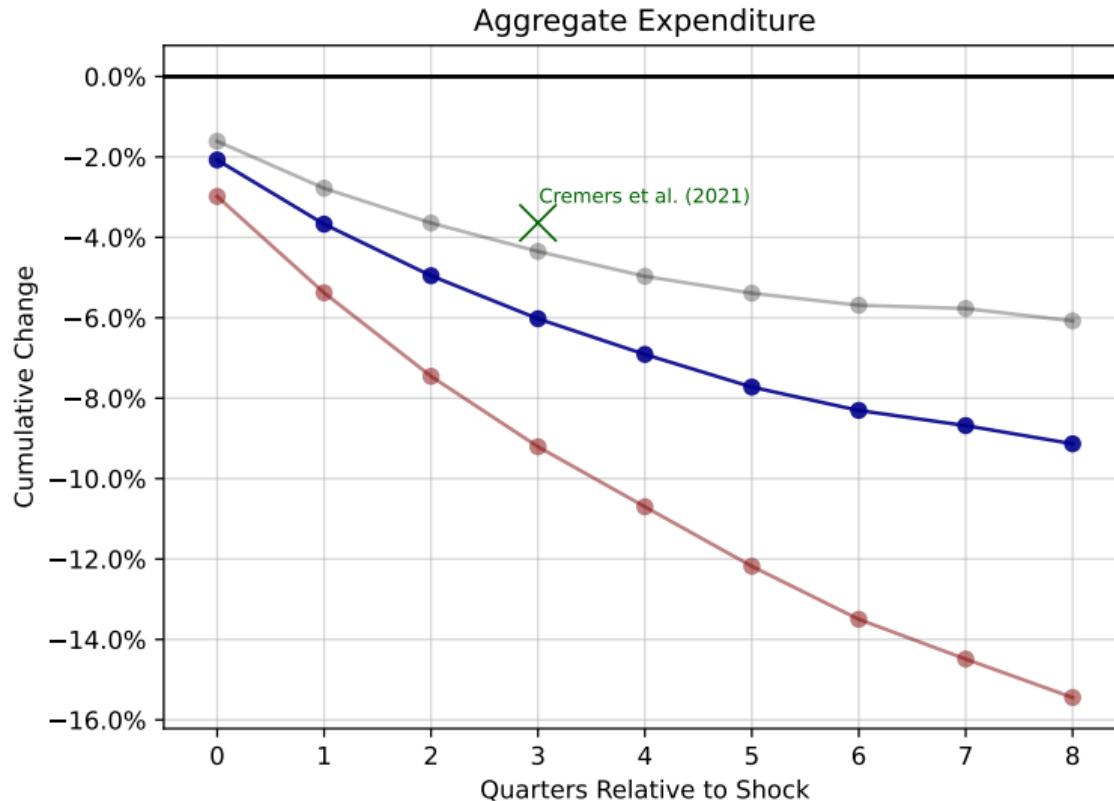
... which is stronger with **exogenous inattention** because of additional uncertainty

# 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



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- Data: Households are **selectively inattentive** to interest rates
  - IA is concentrated around durables purchases, where beliefs are more accurate
- Model: **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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  - ① Shifts the **composition** of spending responses to rate cuts towards durables
  - ② **Dampens** responses to changes in volatility closer to the data
  - ③ **Accelerates** the impact of larger rate cuts (see paper)
  - ④ Reduces state dependence of rate cuts on volatility (see paper)

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**Takeaway:** Right model of belief formation may be different for lumpy decisions, such as durables, price setting, investment, hiring and firing, ...

# THANK YOU!

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## ADDITIONAL RESULTS FROM NEW SURVEY

- Information acquisition (IA) is primarily about the current values of variables 
- Primary source of information is internet search 
- No difference in IA based on mortgage type or refinancing plans 
- Positive effect of decision-making due to job relocations on IA 
- IA is directly associated with belief accuracy and uncertainty 
- Similar improvement in belief accuracy for home purchases to SCE 
- Reductions in subjective uncertainty for home purchases 

## SURVEY DESCRIPTION

We design and conduct a cross-sectional survey of U.S. households via Prolific

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## **Survey Innovations**

- Direct measure of distance from durable adjustments
  - Primary home purchase
  - Car purchases
- Measures of information acquisition other than forecasting performance
  - Last active search for information about key variables

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## Main Blocks

- ① Home decision-making: distance from primary home purchase

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## Main Blocks

- ① Home decision-making
- ② Other decisions: distance from car purchase + other major financial decisions

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## Main Blocks

- ① Home decision-making
- ② Other decisions
- ③ Information acquisition: time since last search + type/source of info searched

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## Main Blocks

- ① Home decision-making
- ② Other decisions
- ③ Information acquisition
- ④ Macro expectations: beliefs about mortgage rates, T-Bill rates, and inflation

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## Main Blocks

- ① Home decision-making
- ② Other decisions
- ③ Information acquisition
- ④ Macro expectations
- ⑤ Background & financial situation: info on household's balance-sheet using SCF format, demographics, job relocations

▶ Questions

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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?*

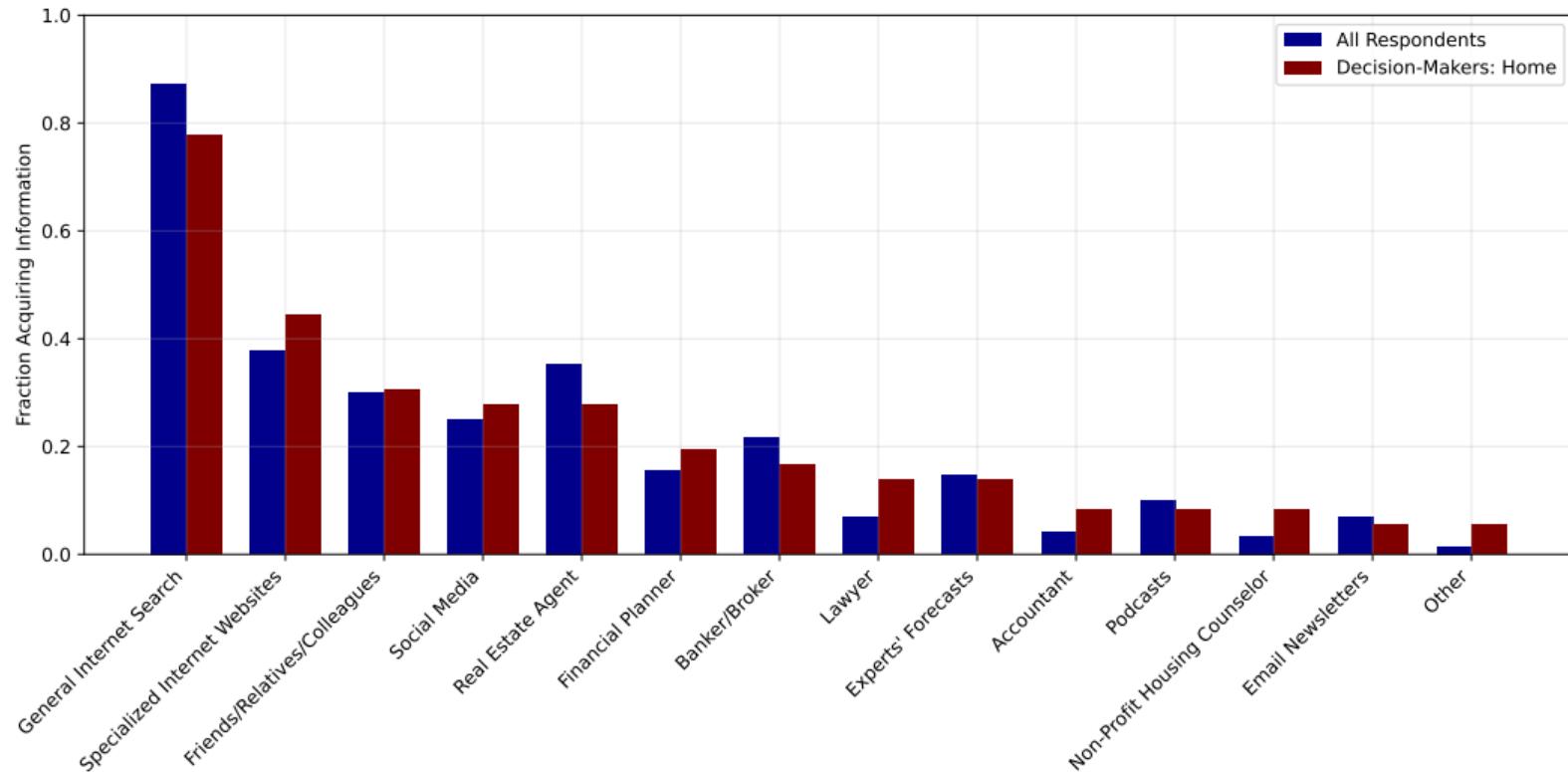
- Eliciting households' distance from the primary home purchase

**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.*

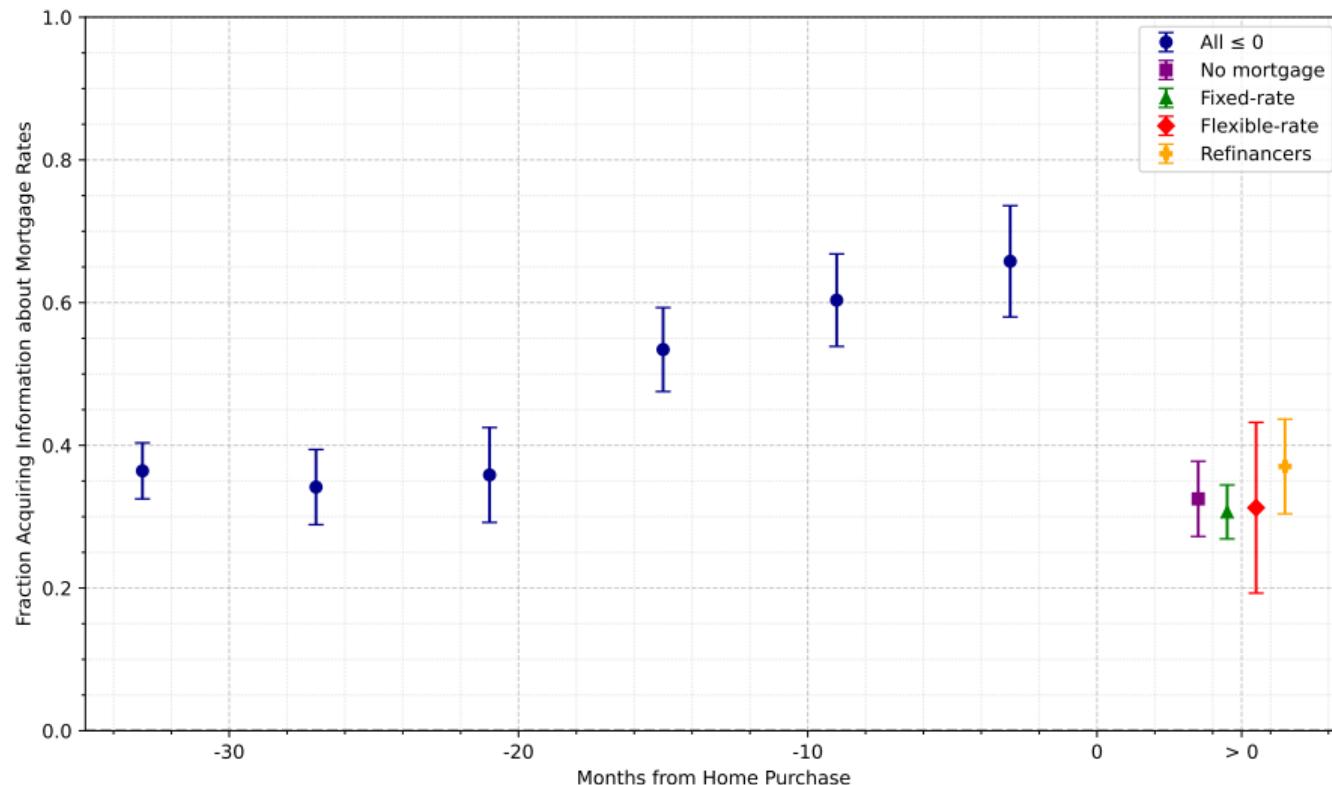
# SOURCES OF INFORMATION ACQUISITION



◀ Back: IA

◀ Back: Additional Results

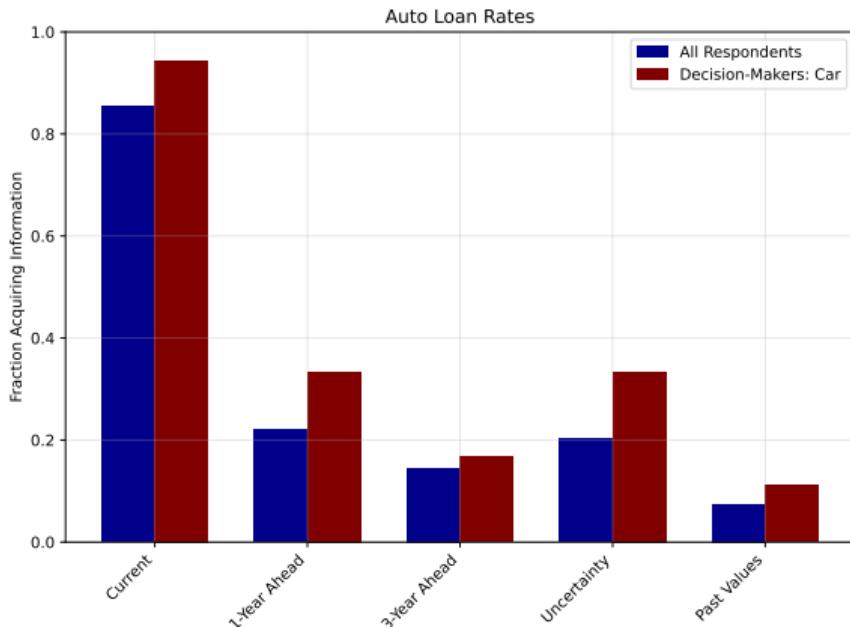
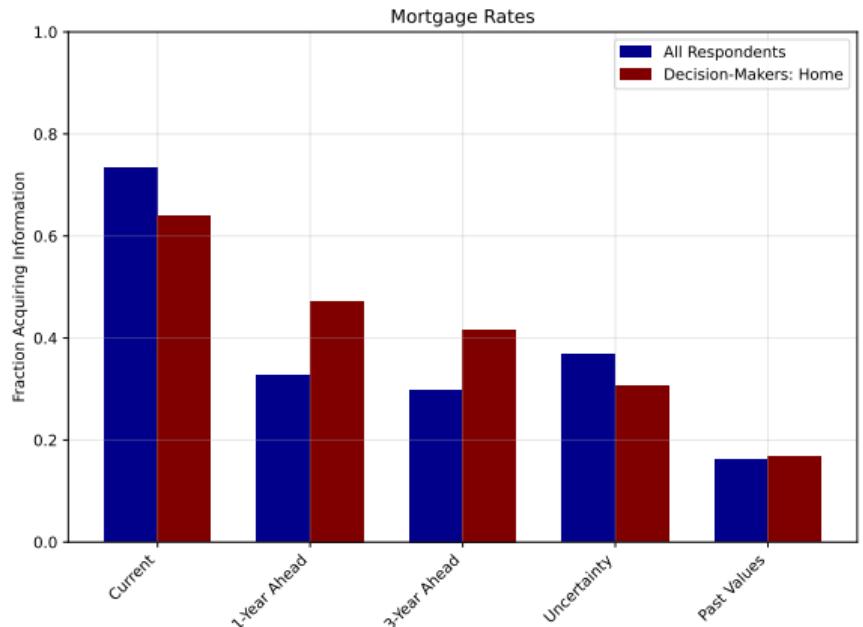
# HETEROGENEITY IN INFORMATION ACQUISITION OF OWNERS



◀ Back: IA

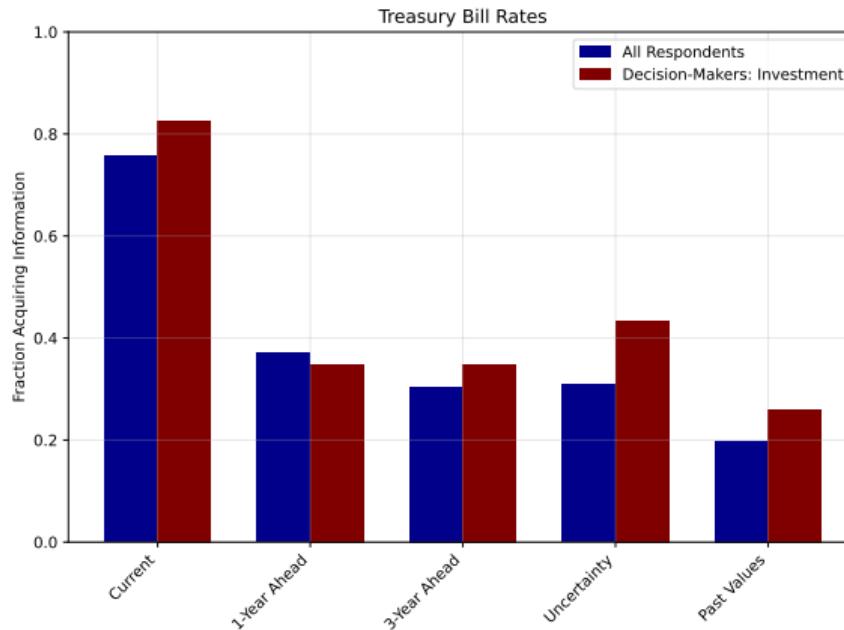
◀ Back: Additional Results

# IA IS PRIMARILY ABOUT CURRENT VALUES OF VARIABLES



▶ Investment Decisions ◀ Back: IA ◀ Back: Additional Results

# IA IS PRIMARILY ABOUT CURRENT VALUES OF VARIABLES



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# ENDOGENEITY OF DECISION-MAKING

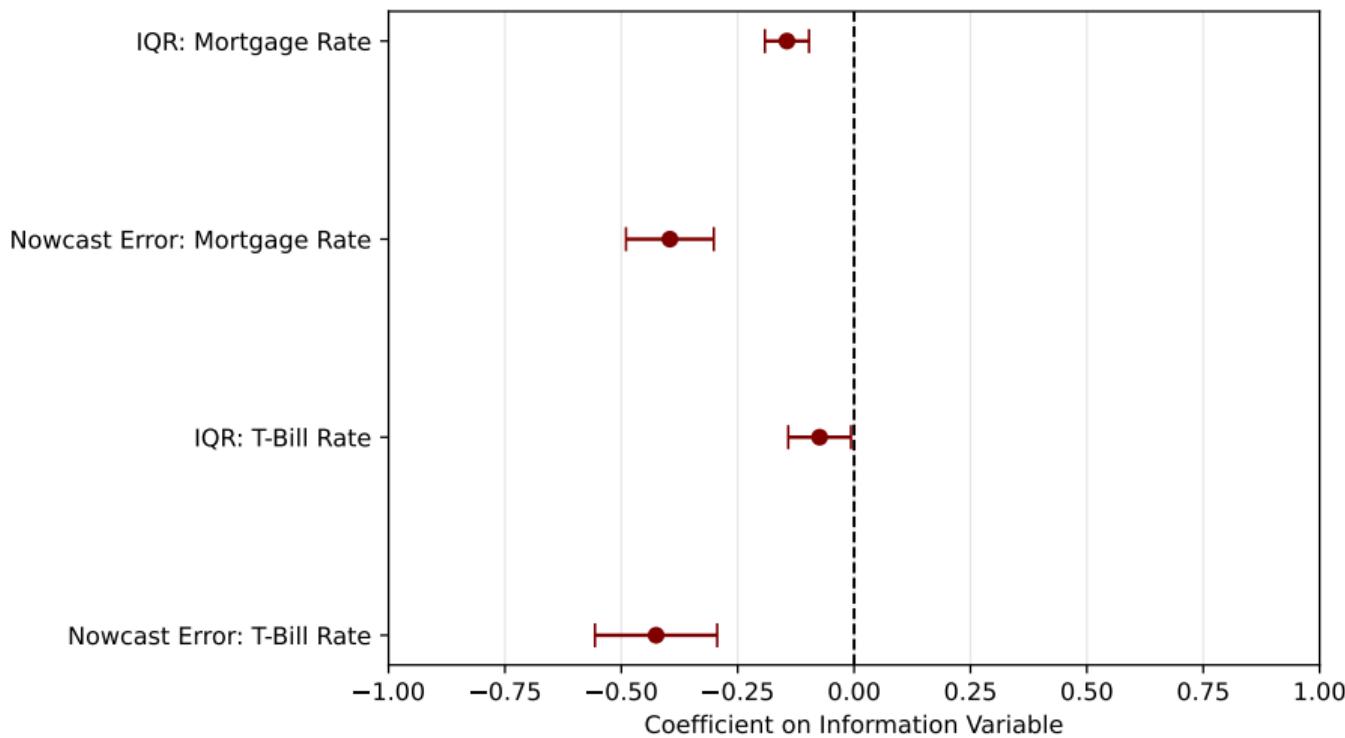
- Concern: decision-making is **endogenous** to information acquisition and beliefs
- Solution: **IV** = anticipated moves due to job relocations

**Dependent Variable:** Information Acquisition

Variable	OLS	First Stage	IV	OLS	First Stage	IV
Home Decision-Maker	0.30*** (0.07)		0.89*** (0.34)	0.30*** (0.06)		0.96*** (0.34)
Job Relocation		0.23*** (0.07)			0.23*** (0.07)	
N	787	787	787	787	787	787
Controls				✓	✓	✓
F-stat		10.51			3.57	

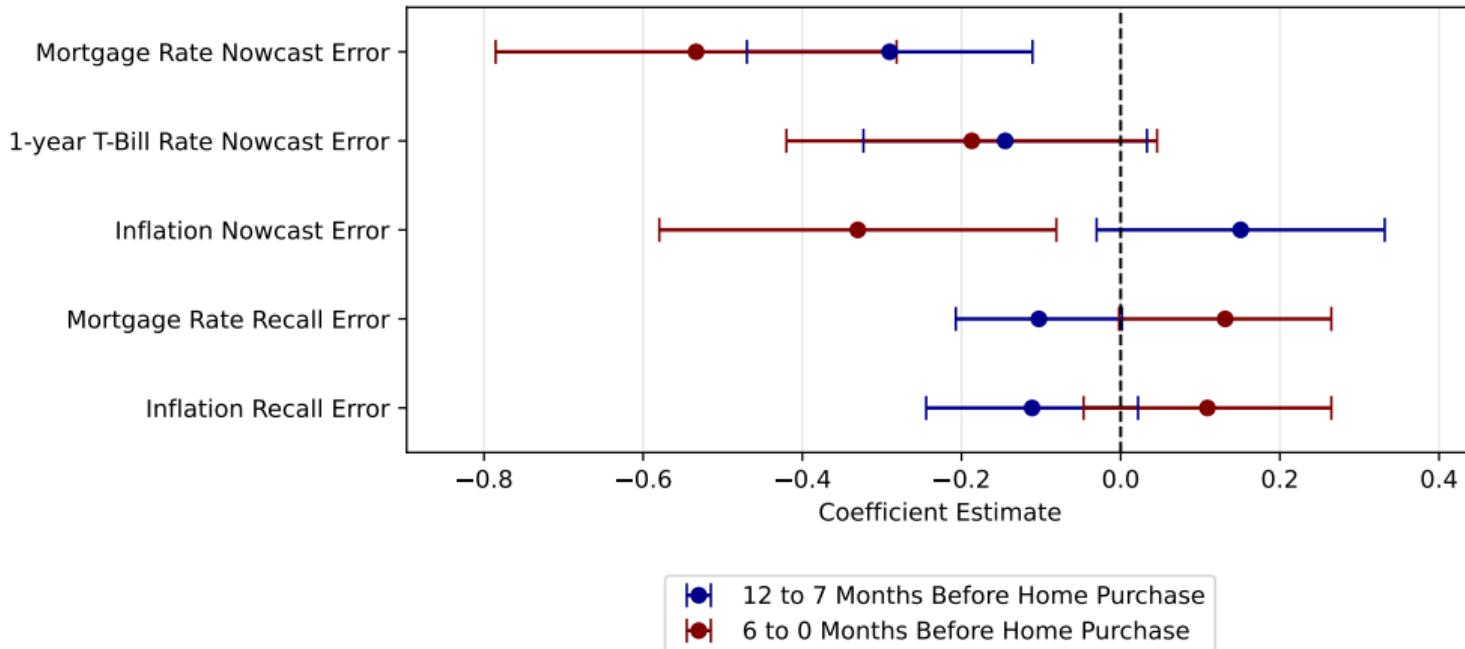
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# DIRECT ASSOCIATION BETWEEN IA AND BELIEFS



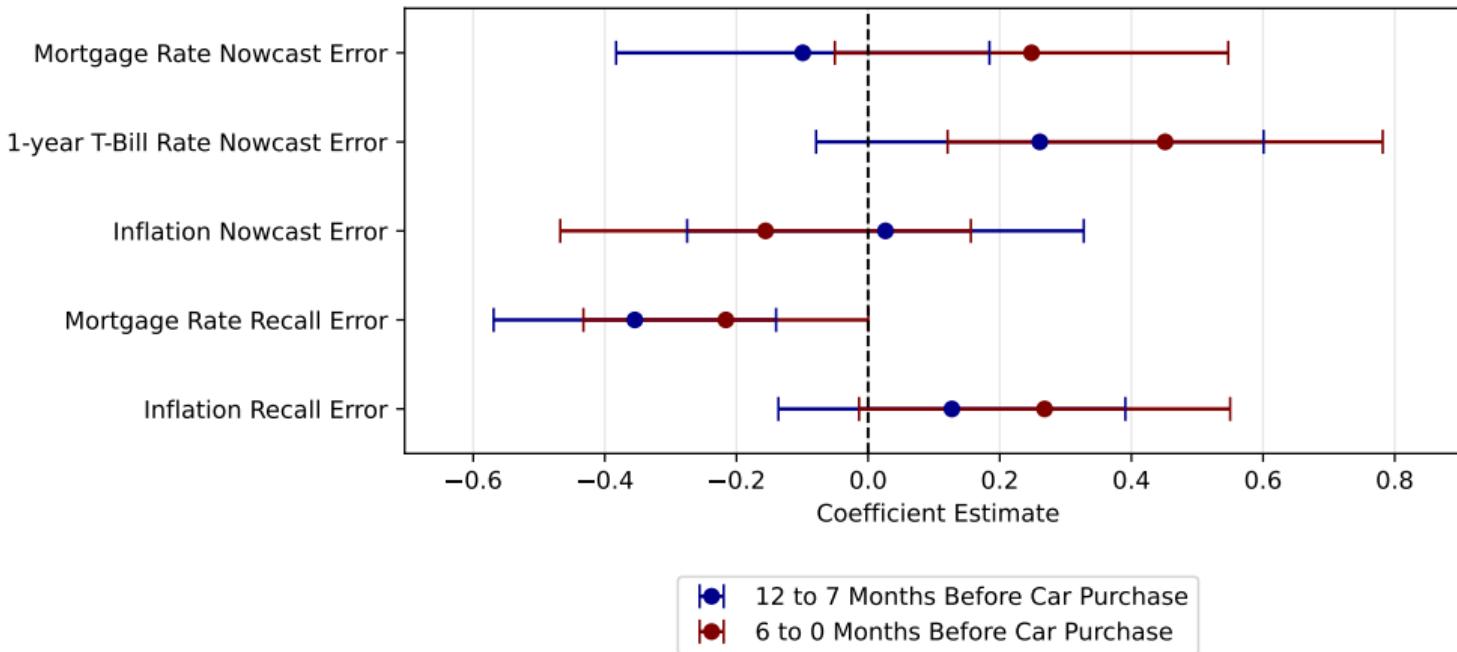
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# REDUCTION IN NOWCAST ERRORS: HOME PURCHASE



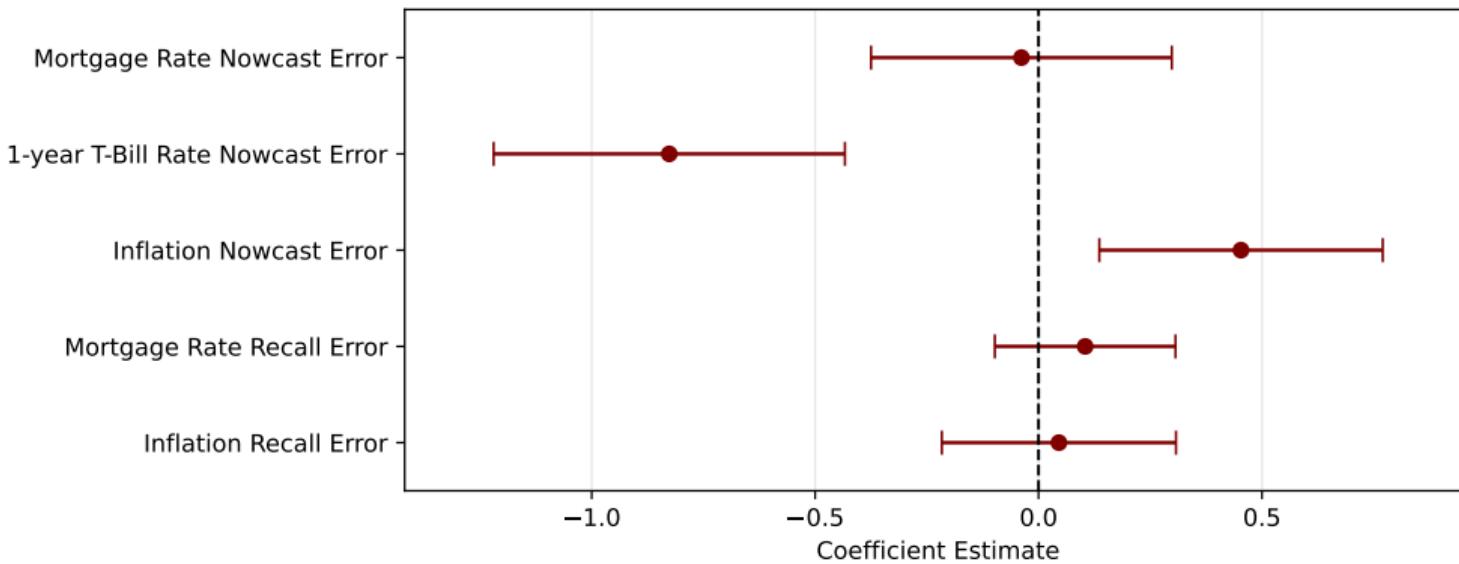
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# REDUCTION IN NOWCAST ERRORS: CAR PURCHASE



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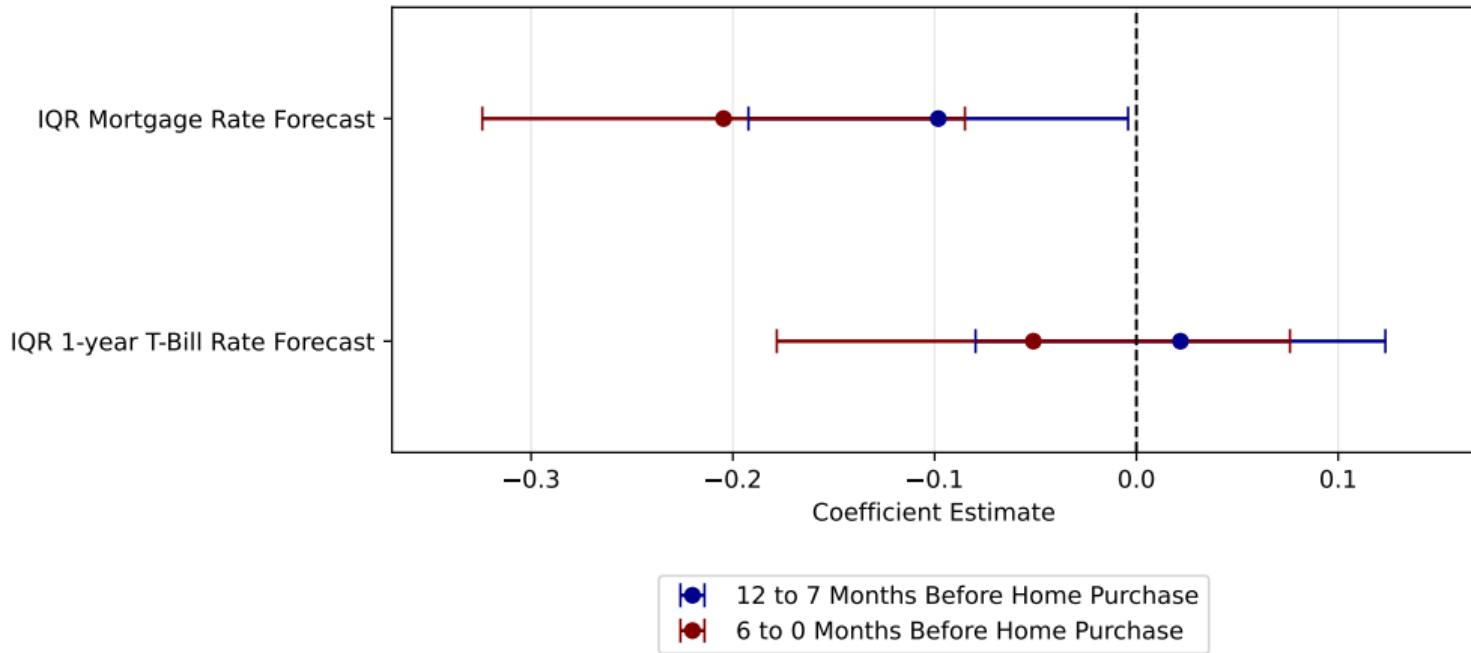
# REDUCTION IN NOWCAST ERRORS: FINANCIAL INVESTMENT



Within 1 Month of Major Financial Investment

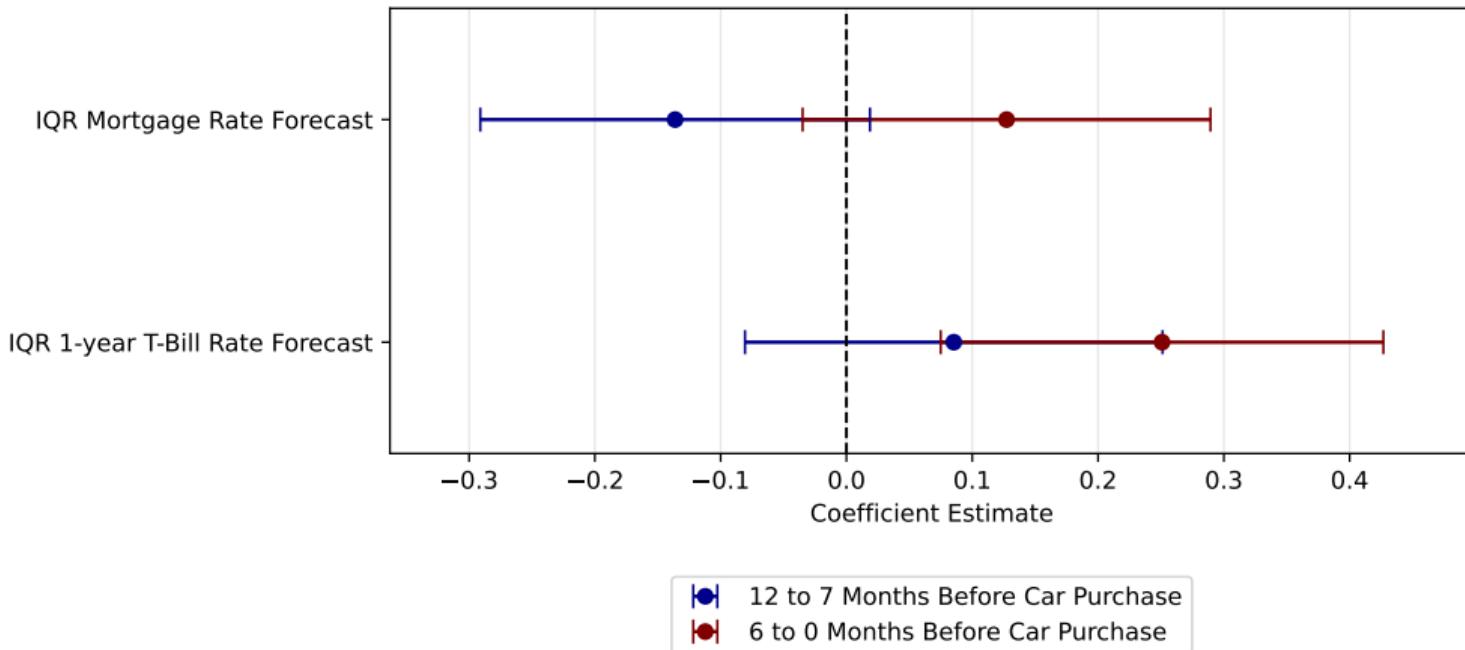
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# REDUCTION IN SUBJECTIVE UNCERTAINTY: HOME PURCHASE



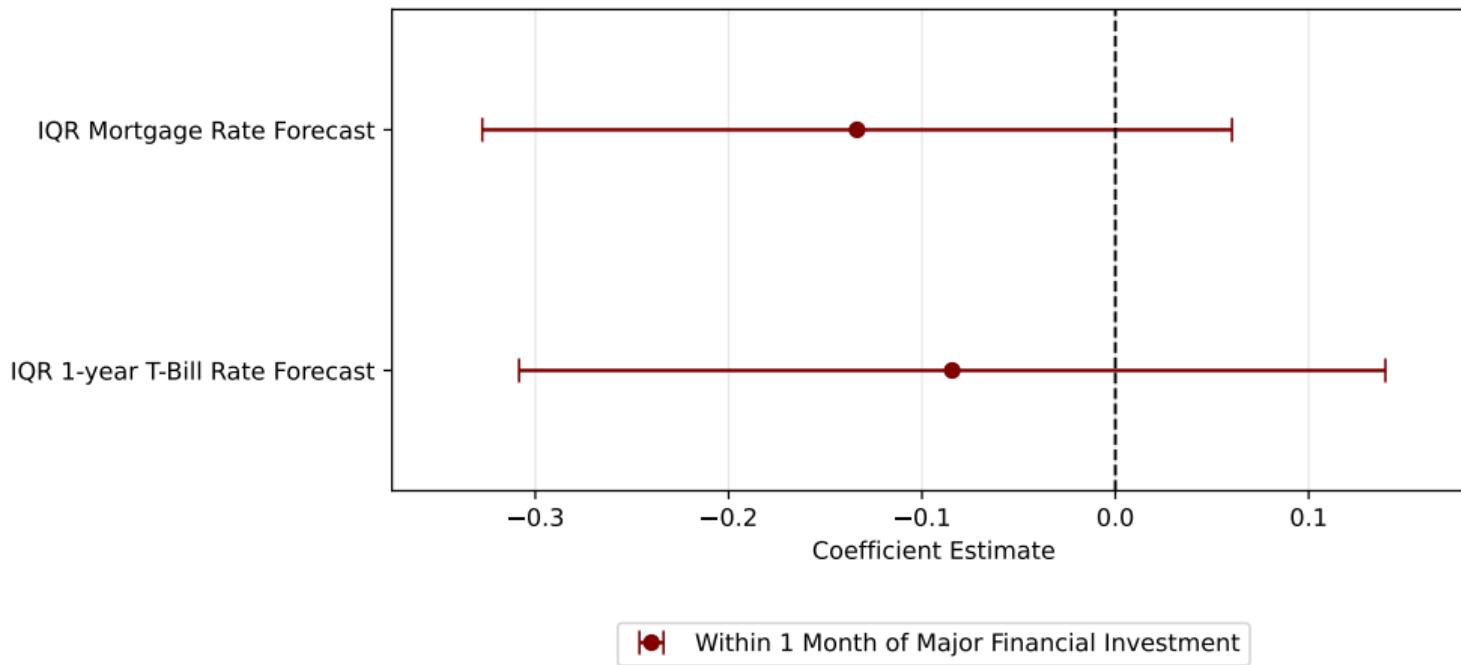
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# REDUCTION IN SUBJECTIVE UNCERTAINTY: CAR PURCHASE



◀ Back

# REDUCTION IN SUBJECTIVE UNCERTAINTY: FINANCIAL INVESTMENT



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# WELFARE LOSS FROM INATTENTION

- Natural question: how large are welfare losses from selective inattention?
- Compute two welfare metrics in **basis points** of lifetime consumption
  - ① **Static**: loss from not having full-information in **current** period, ignoring info. cost
  - ② **Dynamic**: loss from not having full-information in **all** periods, ignoring info. cost

[◀ Back: Calibration](#)

[◀ Back: CG](#)

# WELFARE LOSS FROM INATTENTION

- Natural question: how large are welfare losses from selective inattention?
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  - ② **Dynamic**: loss from not having full-information in **all** periods, ignoring info. cost
- Losses are **small**, but still have aggregate effects! Akerlof-Yellen 85 Maćkowiak-Wiederholt

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	Static	Dynamic
Mean	0.03	2.17
Median	0.02	1.9

◀ Back: Calibration

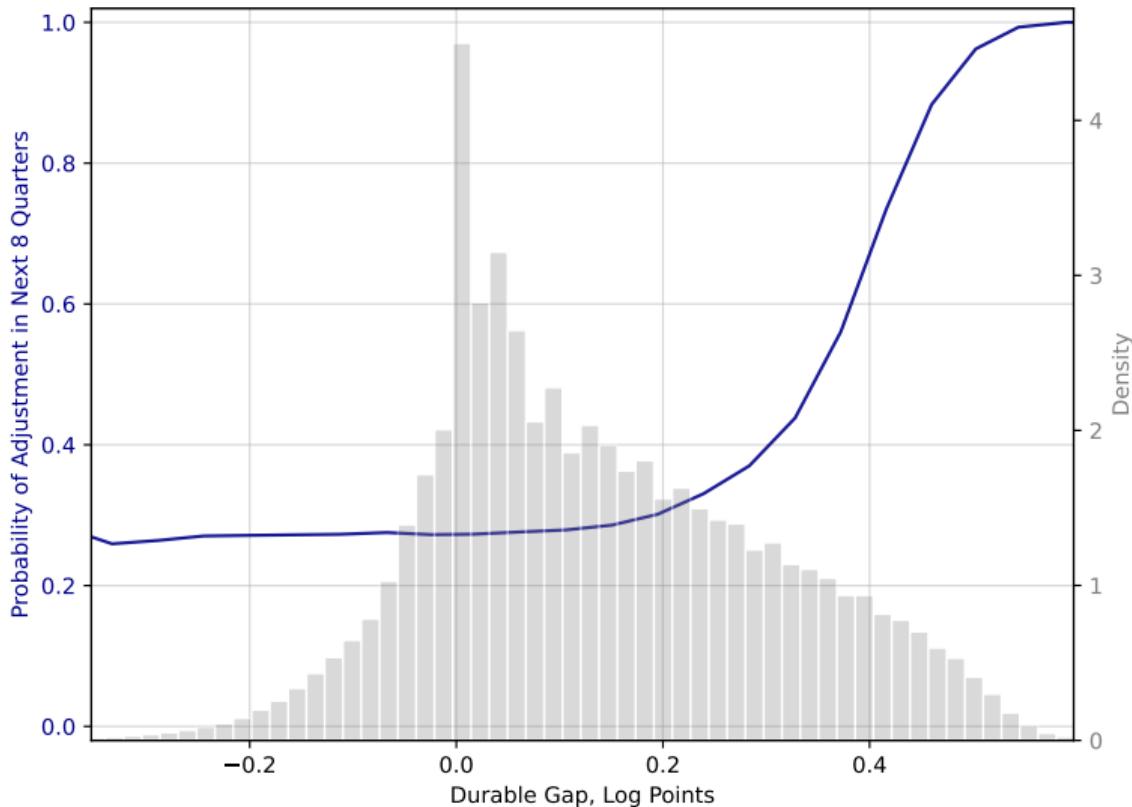
◀ Back: CG

## 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: $ \hat{\mathbb{E}}(r) - r / r $	0.28	8.00	0.02	0.10	0.32
Normalized Prior Variance: $\Sigma/\sigma_r^2$	0.33	0.17	0.13	0.30	0.57

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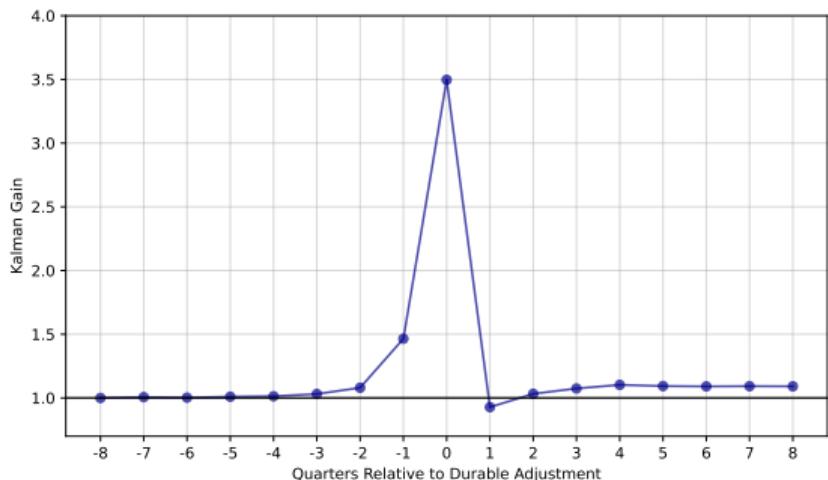
# ADJUSTMENT PROBABILITY AS A FUNCTION OF DURABLES GAP



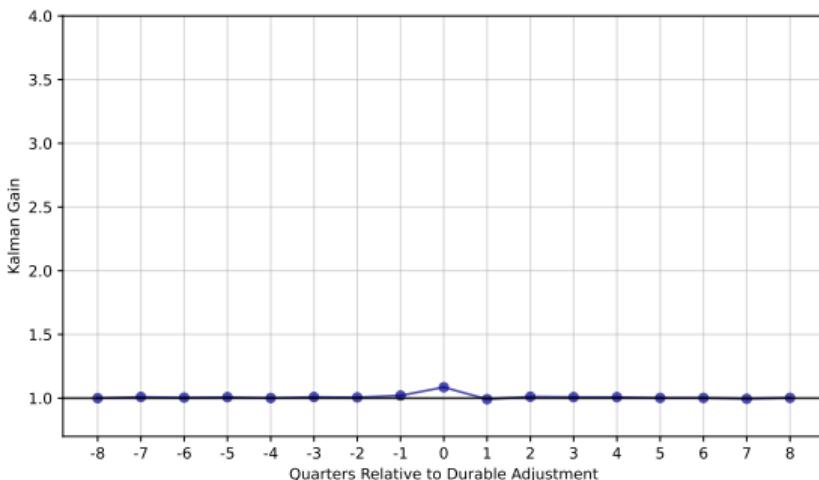
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# CONCENTRATION IN INFO. ACQUISITION ↴ DURABLES SHARE

**Baseline:**  $\psi = 0.63$

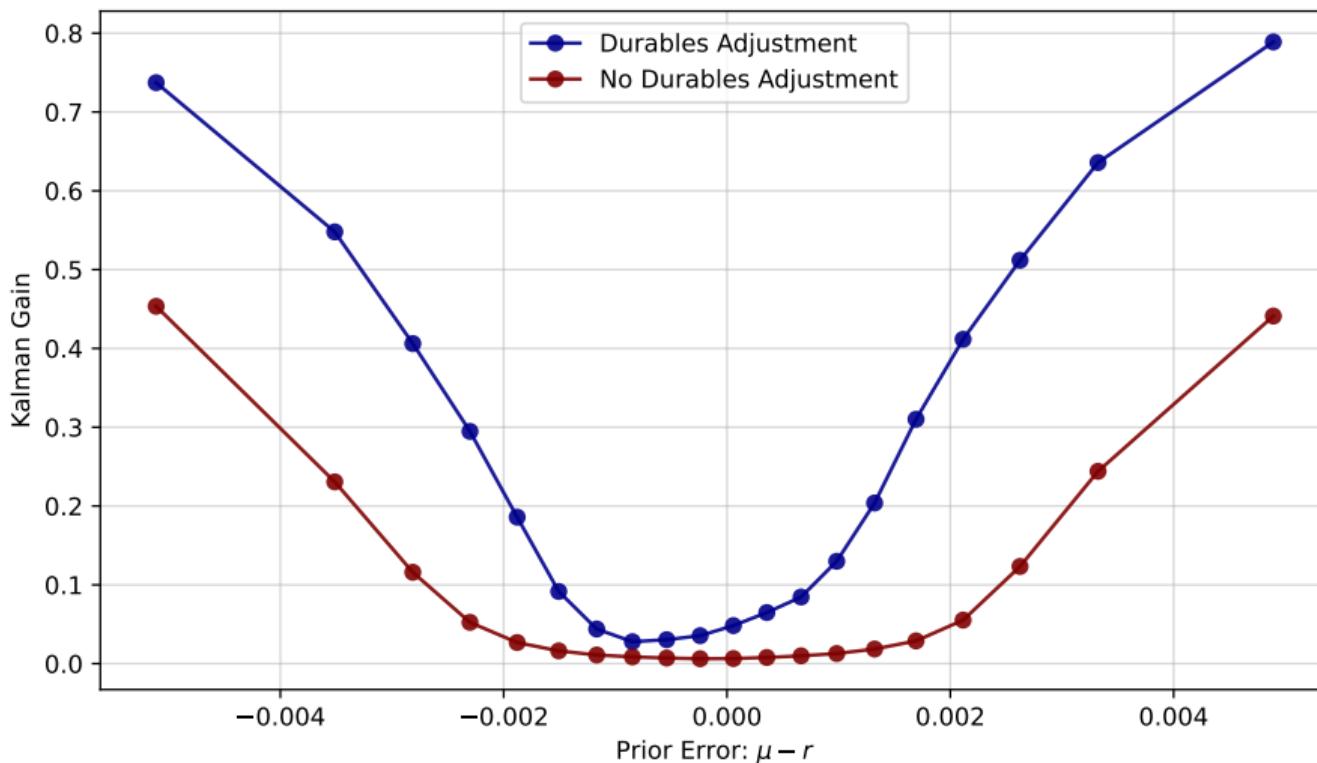


**Low Durables Share:**  $\psi = 0.99$



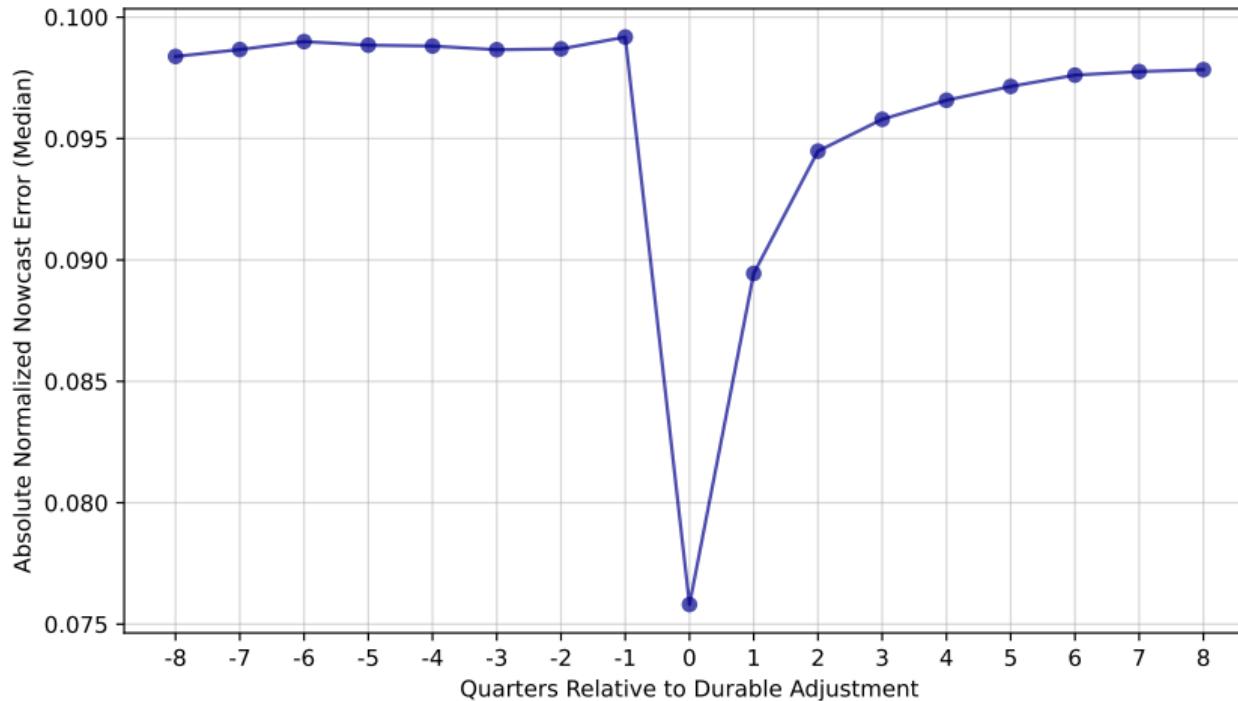
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# DURABLES ADJUSTMENT SHIFT sS BANDS OF INFO. ACQUISITION



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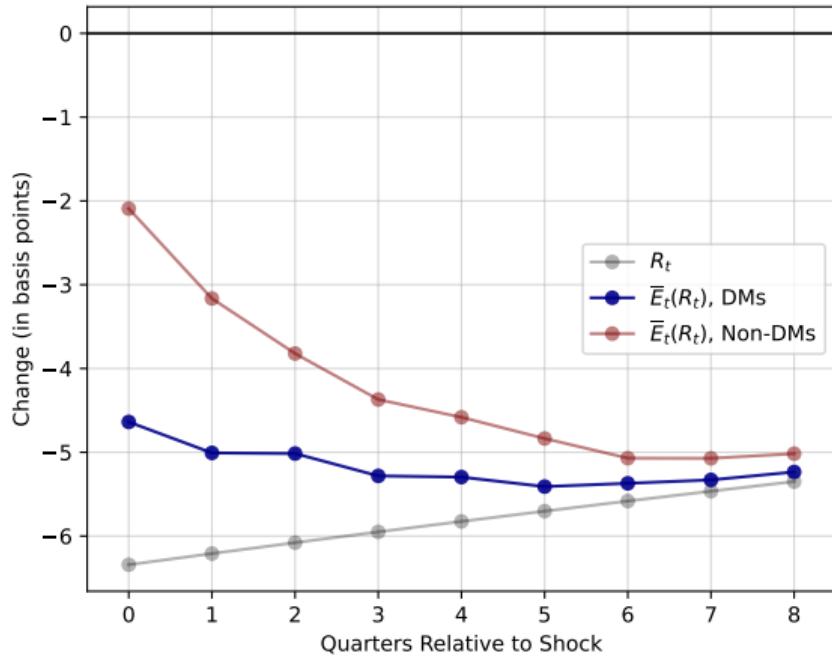
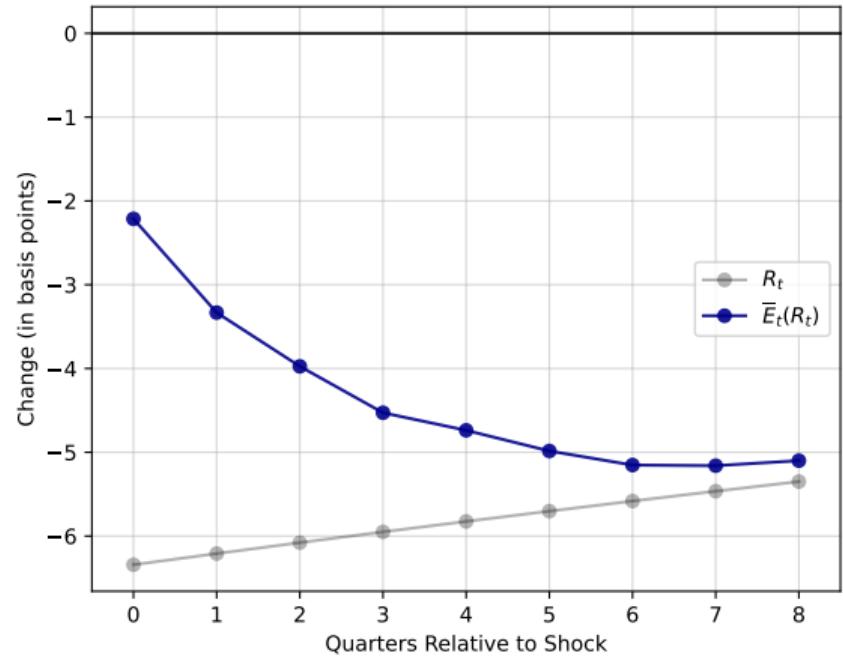
# NOWCAST ERRORS IN EVENT-TIME



Forecast errors remain lower **post-choice** because beliefs are a “stock” not “flow”

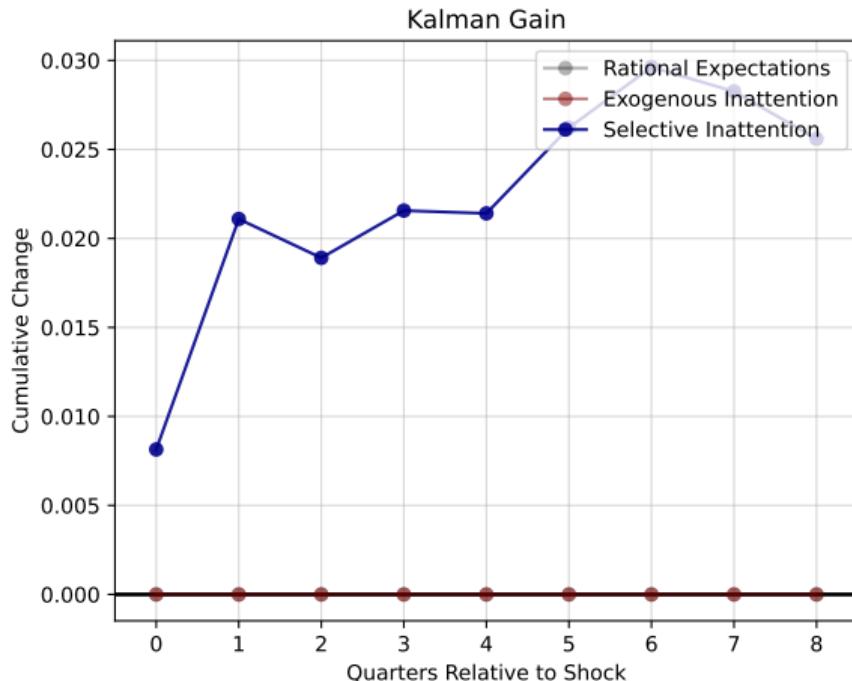
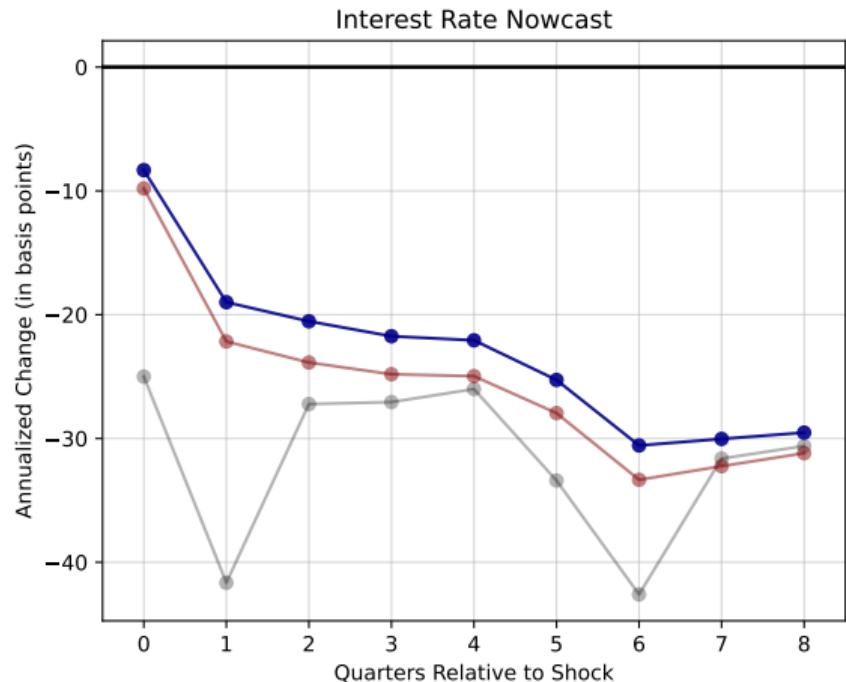
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# DECOMPOSITION OF AGGREGATE BELIEF RESPONSE



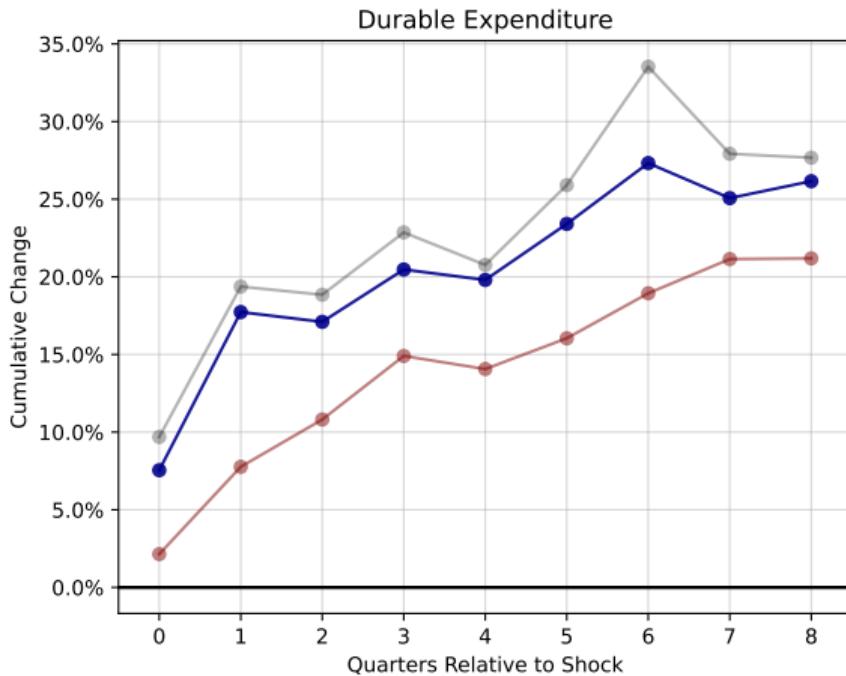
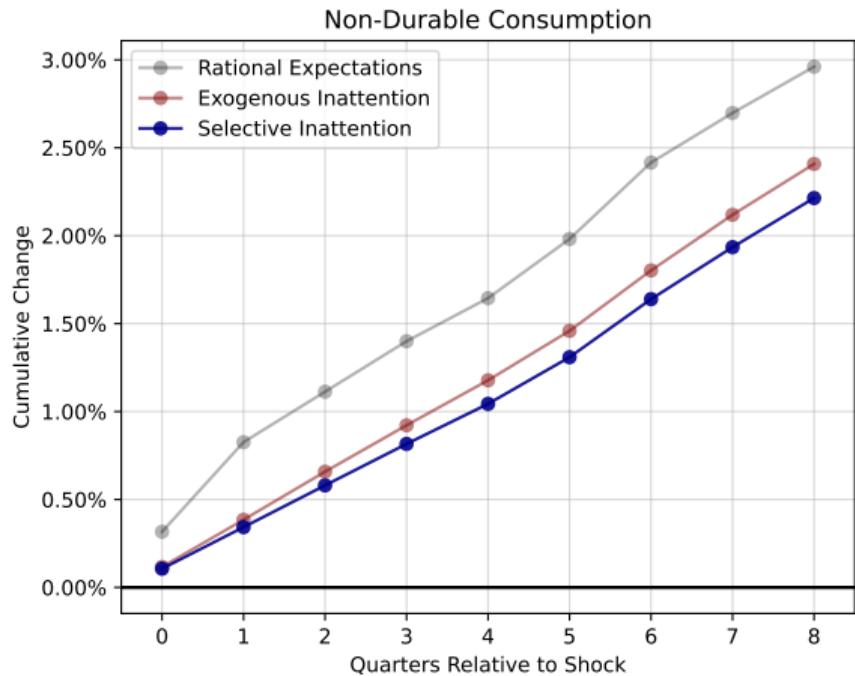
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# IRFs TO ROMER-ROMER SHOCK WITH AGG. Y AND P RESPONSE



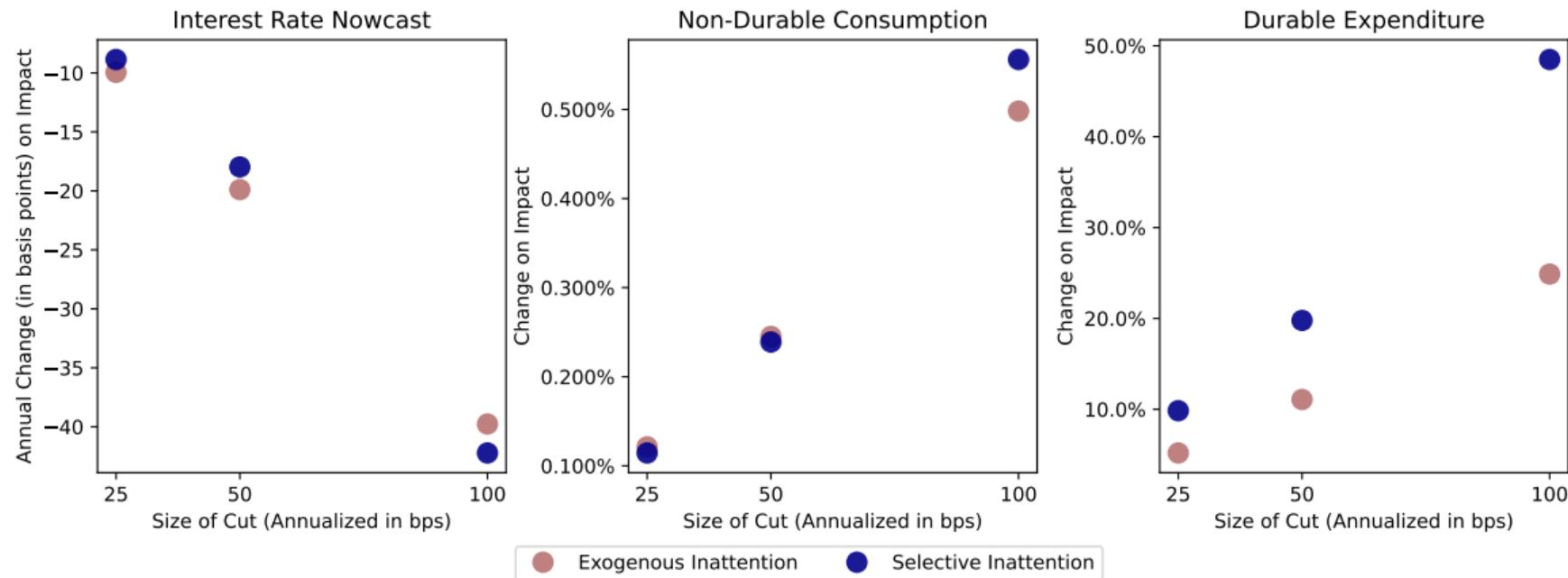
◀ Back

# IRFs TO ROMER-ROMER SHOCK WITH AGG. Y AND P RESPONSE



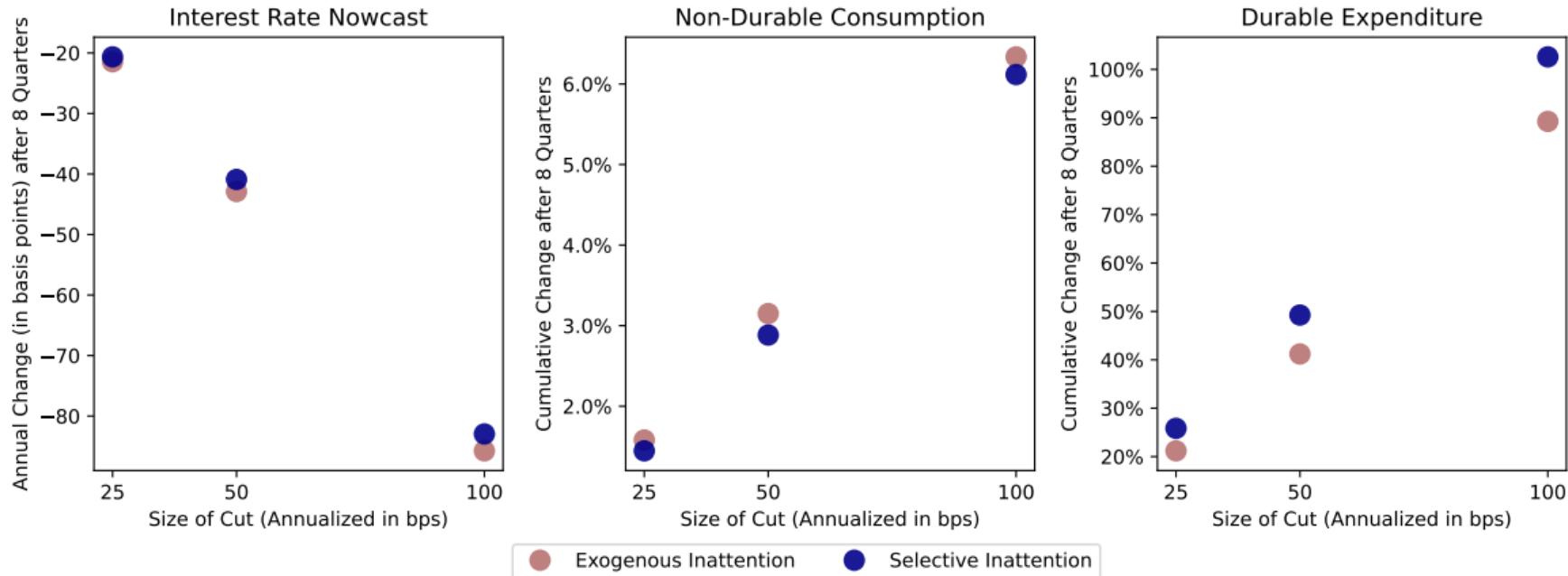
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# NON-LINEAR IMPACT OF RATE CUTS: ON IMPACT



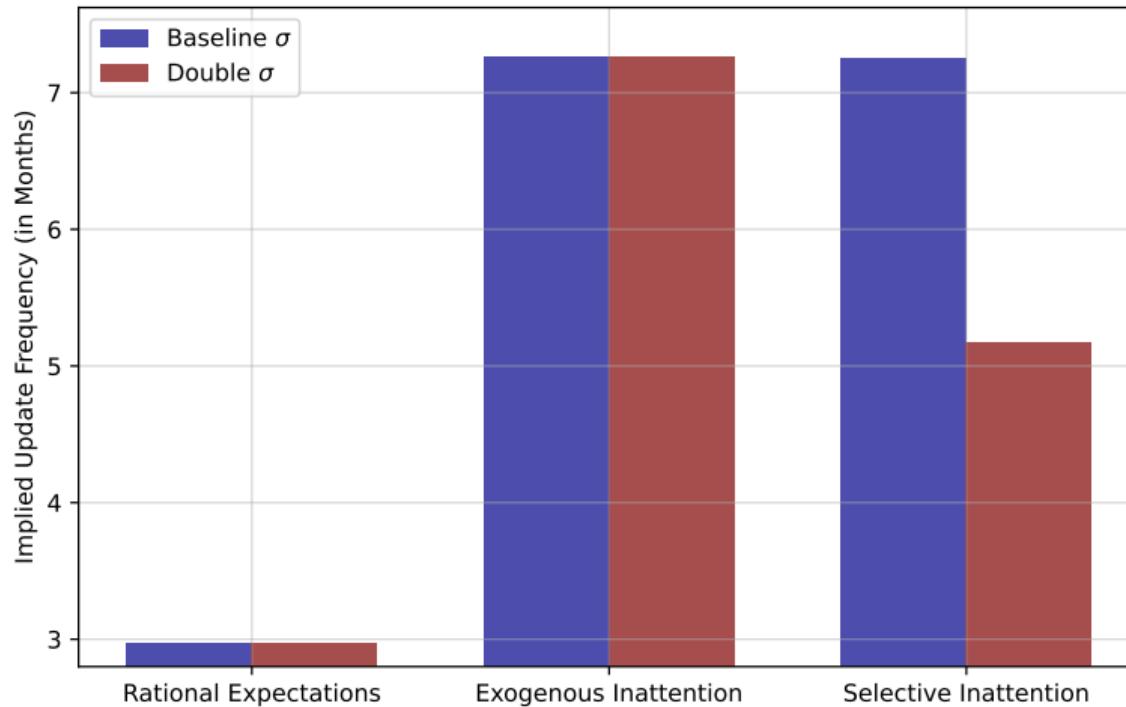
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# NON-LINEAR IMPACT OF RATE CUTS: AFTER 8 QUARTERS



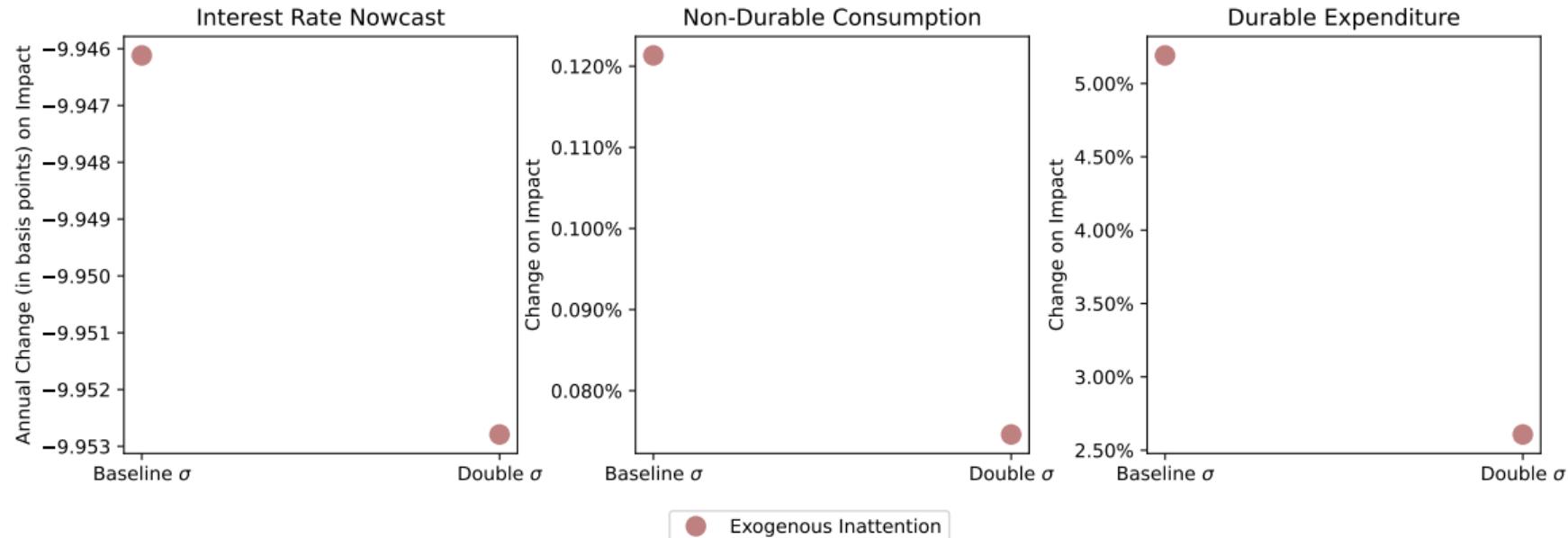
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# EFFECTS OF INCREASE IN VOLATILITY ON BELIEFS



**Increase** in volatility  $\Rightarrow$  more information acquisition  $\Rightarrow$  **less** belief rigidity

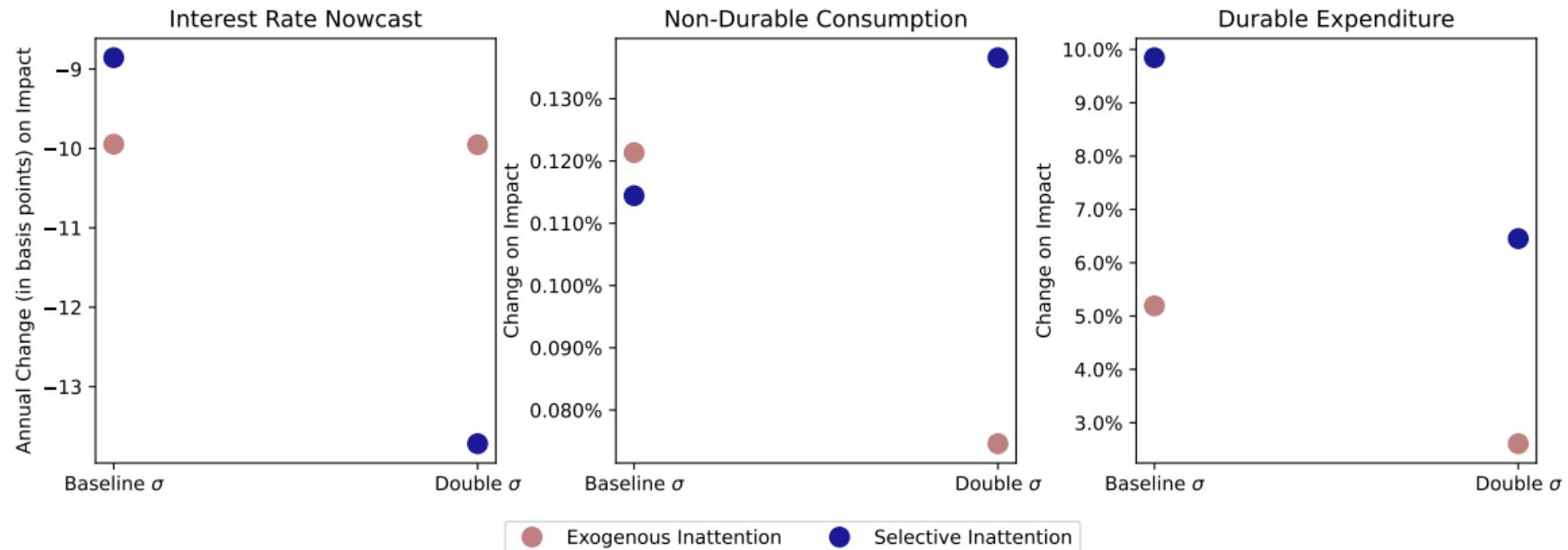
# STATE-DEPENDENCE ON VOLATILITY: ON IMPACT



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

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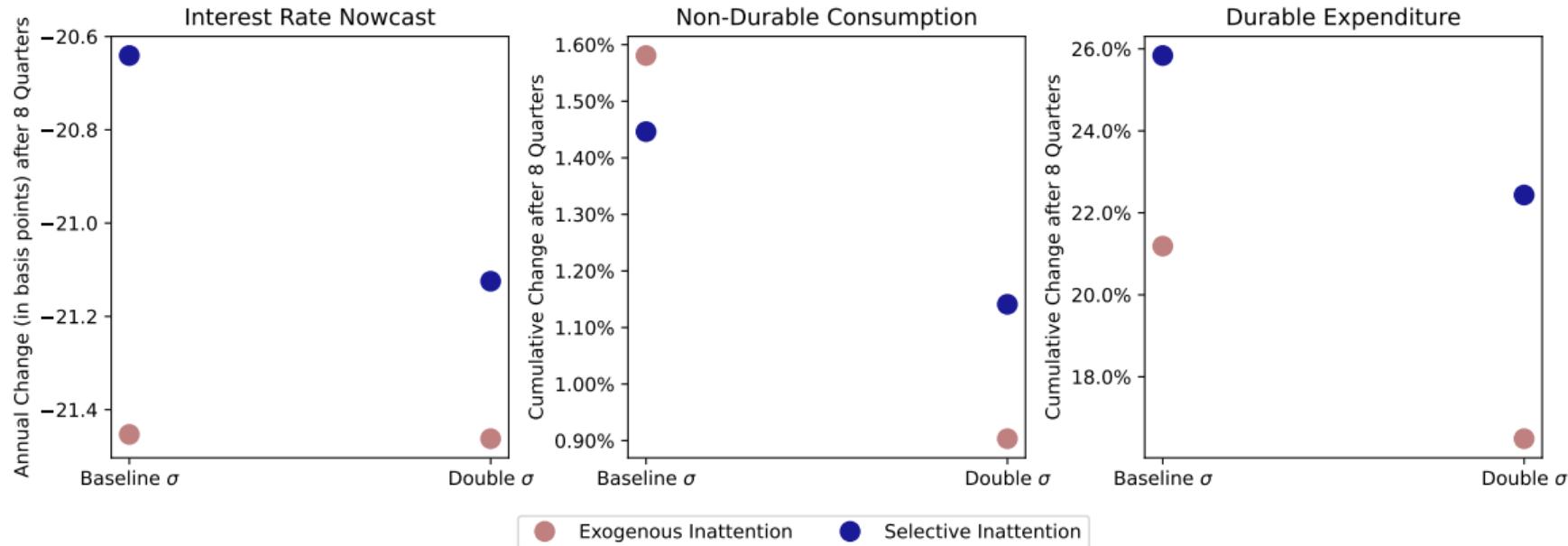
# STATE-DEPENDENCE ON VOLATILITY: ON IMPACT



... 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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