

Limited Consideration Sets and Financial Decision-Making

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The Conventional Wisdom: Retail Investors Make Bad Decisions

▶ Decades of evidence:

- Barber & Odean (2000): “Trading is hazardous to your wealth”.
- Odean (1999): Investors trade too much.

▶ The Standard Approach:

Compare investor choices to **all available assets**, i.e., the market portfolio.

- ▶ **Implicit assumption:** Investors evaluate the *entire universe* of thousands of assets.

What Problems do People Solve?

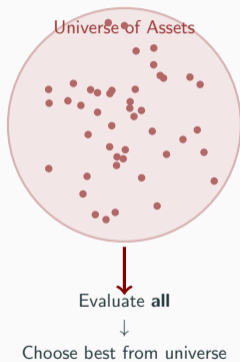
- ▶ Typical assumption in economics is that the information people are given is what they use to make decisions and form beliefs.
- ▶ This assumption underpins the revealed preference approach and evaluations of decision quality.

Mental Representation and Identification

- ▶ What if attention is limited or information is costly to process (Sims, 2003, Manzini & Mariotti, 2014; Gabaix, 2014; Caplin et al., 2019)?
- ▶ People use a (potentially distorted) mental representation of problem they face for judgment & decisions (Kahneman, 1973; Shenhav, et al., 2017; Heiss, 2021; Bohren et al., 2026).
- ▶ To recover preferences and underlying processing model, first need to understand what problem people think they are are solving.

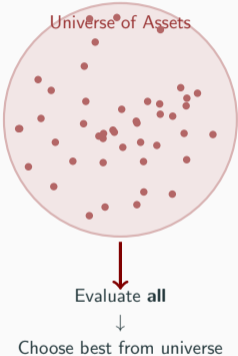
Attention is Limited

What Standard Models Assume



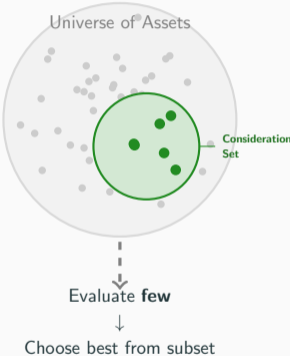
Attention is Limited

What Standard Models Assume



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How Investors Decide



Mismeasured opportunity sets
↓
Overstated investor “biases”

This Paper: Directly Observe Consideration Sets

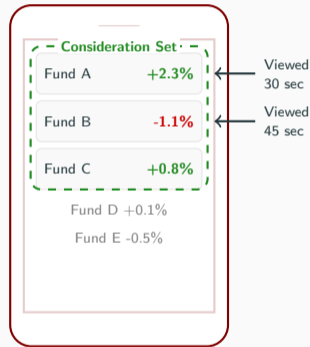
Unique dataset from a major mutual fund trading App in China.

- ▶ 13,000 retail investors, Dec 2021 – Oct 2022.
- ▶ Trading records, holdings and demographics.
- ▶ Every **asset page** viewed prior to trading: timestamps.
- ▶ Age, 46, 45% female, 200k RMB holdings, 62 times per month.

Constructing Consideration Sets

We can construct the **actual** consider. set:

- ▶ All funds viewed in 7 days before trade (results robust to different windows).
- ▶ Examine perf. of traded assets to market.
- ▶ Perf. of traded asset to consideration set.



Average: 25 funds viewed

Trading Performance

Comparing Assets Traded to Market Benchmark

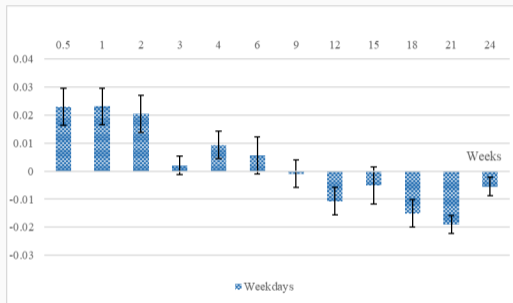
- ▶ Market benchmark (counterfactual strategy): A **randomly** selected fund from all available funds of the same type (e.g., conservative, moderate, aggressive growth funds).
 - Expected payoff from the counterfactual strategy: **equal-weighted** average of realized returns across all available funds of the same type.
- ▶ Compare the returns of the traded asset to its market benchmark (set):

$$\text{Ret}_{ijmt} = \beta \text{ Asset bought}_{ijmt} + \text{Investor by Set FE} + \text{Product FE} + \text{Month FE} + \varepsilon_{imjt}$$

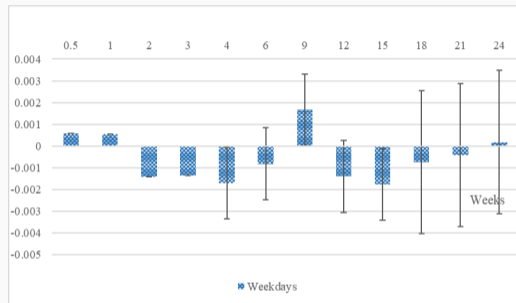
- Where i denotes an investor, j denotes a mutual fund product, m denotes a market benchmark, and t denotes the trading date.
- *Ret*: cumulative returns over multiple horizons, with and without risk adjusted for stock and bond market factors.
- *Asset bought*: a dummy that equals one if a product is purchased and zero for the counterfactual.

NOT Out-performing Market Benchmark

Raw returns



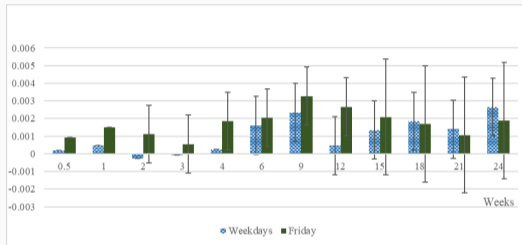
Risk-adjusted returns



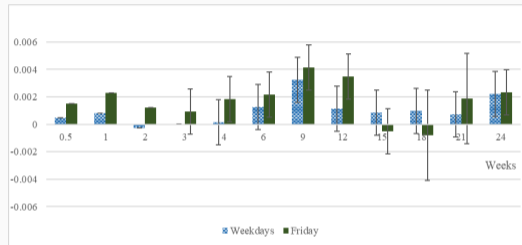
- ▶ Raw returns: While the traded asset outperforms the market benchmark within the first four weeks, it performs significantly worse in the longer horizon, negative 100 bps.
- ▶ Risk-adjusted returns: Individual investors, on average, do not outperform the market, negative 10-20 bps.

Out-performing Own Consideration Set

Raw returns



Risk-adjusted returns



- ▶ Raw returns: The relative performance is largely positive across various horizons, statistically significant in 1, 6, 9, 15, 18, and 24 weeks after the trade by 5 to 27 basis points.
- ▶ Risk-adjusted returns: Purchased assets significantly outperform own consideration set in 1, 6, 9, and 24 weeks.

Friday Effect: Quasi-experiment

Decision Quality and Deliberation

▶ China's T+1 Trading Rule:

- Orders confirmed next *trading* day.
- Friday orders → confirmed Monday.

▶ Prediction: More uncertainty ⇒ More deliberation.

▶ Validation 1: Confirmed extra weekend uncertainty:

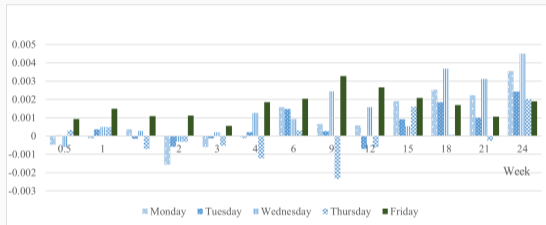
- The risk of a fund over two consecutive trading days is highest on Friday.

▶ Validation 2: Investors deliberate more on Friday trades.

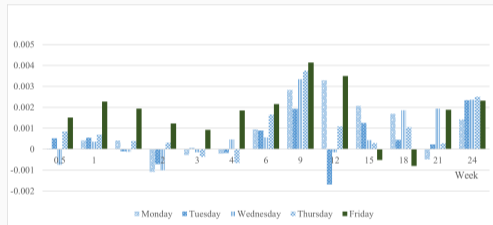
- Friday: +0.6% browsing frequency.
- Friday: +1.4% browsing duration.

More Deliberation \Rightarrow Better Choices

Ret. Across Weekdays



Risk-adjusted Ret. Across Weekdays



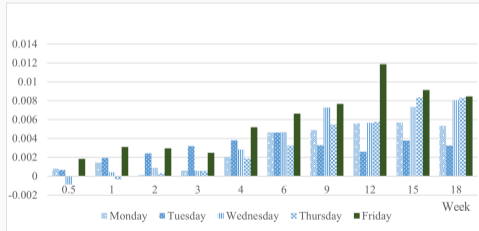
- ▶ Returns of traded assets relative to consideration sets are highest for Friday trades.
- ▶ Effect declines after 3 months.

Implications for Real Returns: Round-Trip Trades

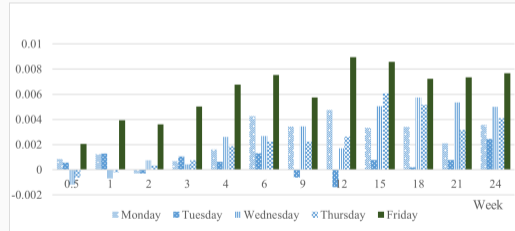
► Buy trades followed by observed sell:

- Out-performance persists beyond 3 months, across all weekdays.
- Friday effect is stronger (No more round-trip trades on Fridays).
- Suggests greater incentives to deliberate and real return implications.

Round trip in 18 wks



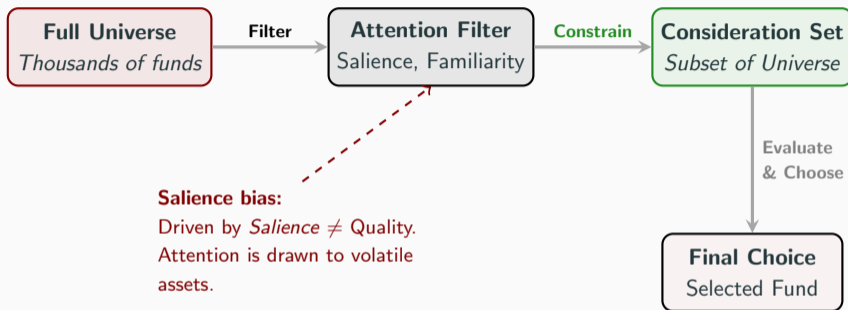
Round trip in 48 wks



Note: Coefficients from interaction of Asset bought \times Friday \times Round-trip.

Mechanism

Why Do People Underperform? Attention Constraint



Key Implication: Systematic Correlation with Attention

"Investor biases" \approx **Attention Constraints**, not necessarily biased preferences.
Underperformance comes from how consideration set is formed, not decision quality from set.

First Stage: What Enters the Consideration Set?

Panel A: Set Structure			
Dep. var.:	(1) # Fund Companies	(2) HHI	(3) Top Fund Company%
Actual Set	-3.249*** (0.554)	0.067*** (0.005)	0.083*** (0.007)
Observations	270,810	270,810	270,810

Panel B: Saliency			
Dep. var.:	Volatility	Skewness	Rank Top 10
Actual Set	0.015*** (0.001)	0.465*** (0.016)	0.026*** (0.002)
Observations	359,016	358,410	360,042
Investor by set FE	Y	Y	Y

Compared to a **randomly sampled same-size counterfactual set**, assets in consideration sets are more likely to be:

- ▶ **From fewer fund companies**
- ▶ **From the largest fund company**
- ▶ **Top-ranked** on platform displays
- ▶ **Higher volatility**
- ▶ **More skewed returns**

⇒ **Familiarity and saliency** distort the formation of consideration sets.

Second Stage: Asset Choices and Deliberation

Dep. var.:	(1) Rank Top 10	(2) Risk	(3) Skewness
Asset bought	0.002162** (0.001)	0.001578*** (0.000)	-0.009840** (0.004)
Asset bought × Friday	-0.004480*** (0.001)	-0.000226* (0.000)	0.009494** (0.004)
Investor by set FE	Y	Y	Y
Product FE	Y	Y	Y
Month FE	Y	Y	Y
Observations	7,477,626	7,566,714	7,563,832
R-squared	0.544	0.910	0.861

Friday trades compared to other weekdays:

- ▶ **Lower-ranked** on platform displays
- ▶ **Lower volatility** (more salient)
- ▶ **More skewed** returns

⇒ **Asset choices less subject to salience**
after deliberation.

Experimental Validation

Do People Do Better With Directed Attention?

Platform: Prolific (pre-registered)

100 subjects receive a task:

- ▶ Trade 20 assets over 15 periods.
- ▶ *Hidden* prob. of price increase: $\Theta = \{0.25, 0.30, 0.45, 0.55, 0.65, 0.70, 0.75\}$
- ▶ **Price updates:** \uparrow 6% or \downarrow 5% per period.

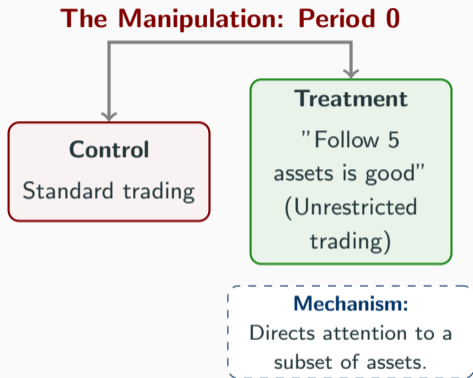
Timeline: Periods -4 to -1: Learning phase;

Period 0: Prices reset.

Allocate endowment among assets;

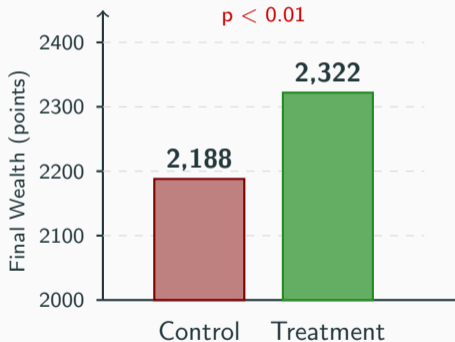
Periods 1–10: Active trading.

Hypothesis: If attention causes better decisions \Rightarrow Treatment group should respond more to price signals and earn higher wealth.



Results

Narrow consider. sets improve perf.

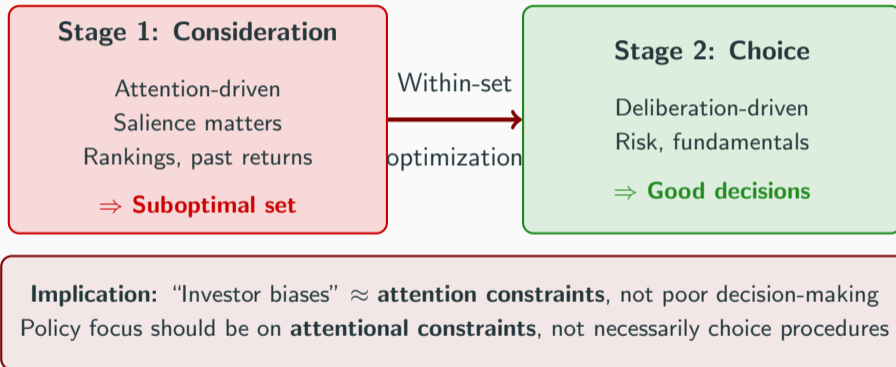


Sensitivity to Bayesian posterior mean

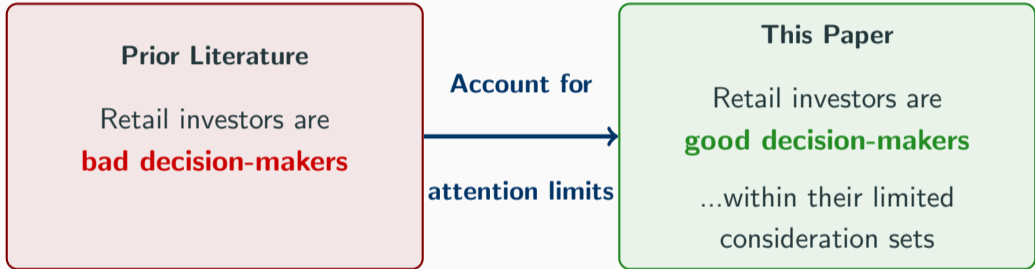
Dep. var.: Held Share	Coefficient
Bayesian Posterior	0.033***
Followed Good	-0.040***
Followed × Posterior	0.151***

Interpretation: Directed attention improves inference from signals.

Putting It Together: The Two-Stage Model



Reinterpreting the Behavioral Finance Literature



Mismeasured consideration sets \Rightarrow understates decision quality

Broader Implications

1 For Measuring Decision Quality

- Cannot assess choices without knowing what was considered
- Standard benchmarks (full universe) systematically overstate errors

2 For Understanding “Biases”

- Many apparent biases may reflect attention constraints
- Preferences and beliefs unidentified without consideration data

3 For Policy and Platform Design

- Help investors **see better options** (expand consideration sets)
- Rather than help them **choose better** (they already do this well)

4 Beyond Finance

- Insurance choices, consumer products, online search
- High-dimensional choice environments with attention constraints

Thank You

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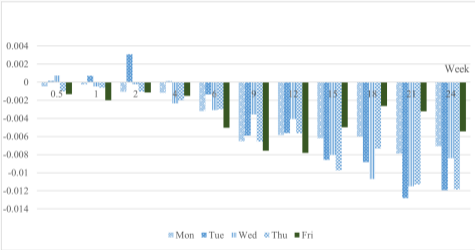
`yiqing.lu@nyu.edu`

Summary Statistics

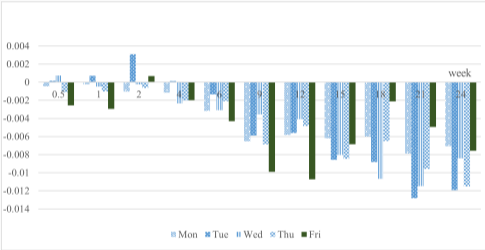
Variable	Mean	Median	SD
<i>Investor Characteristics</i>			
Age	46.0	40.0	12.6
Female (%)	46.9	–	–
Holdings (RMB)	205,385	64,364	384,234
Products in portfolio	9.5	6.0	10.6
<i>Consideration Sets</i>			
Set size	25.1	2.0	81.4
Browsing frequency	61.8	2.0	205.7
Browsing duration (sec)	583.7	45.0	1,865.1
<i>Sample</i>			
Investors		13,112	
Buy trades		310,288	

Under-performing Own Consideration Set: Sell Decisions

Raw returns



Risk-adjusted returns



► Assets sold significantly under-perform own consideration set across weekdays and various horizons.