SCALING CHALLENGES ON PORTFOLIO MANAGEMENT

Does **Perceptions** Dynamics Affect Managerial **Decisions** ?

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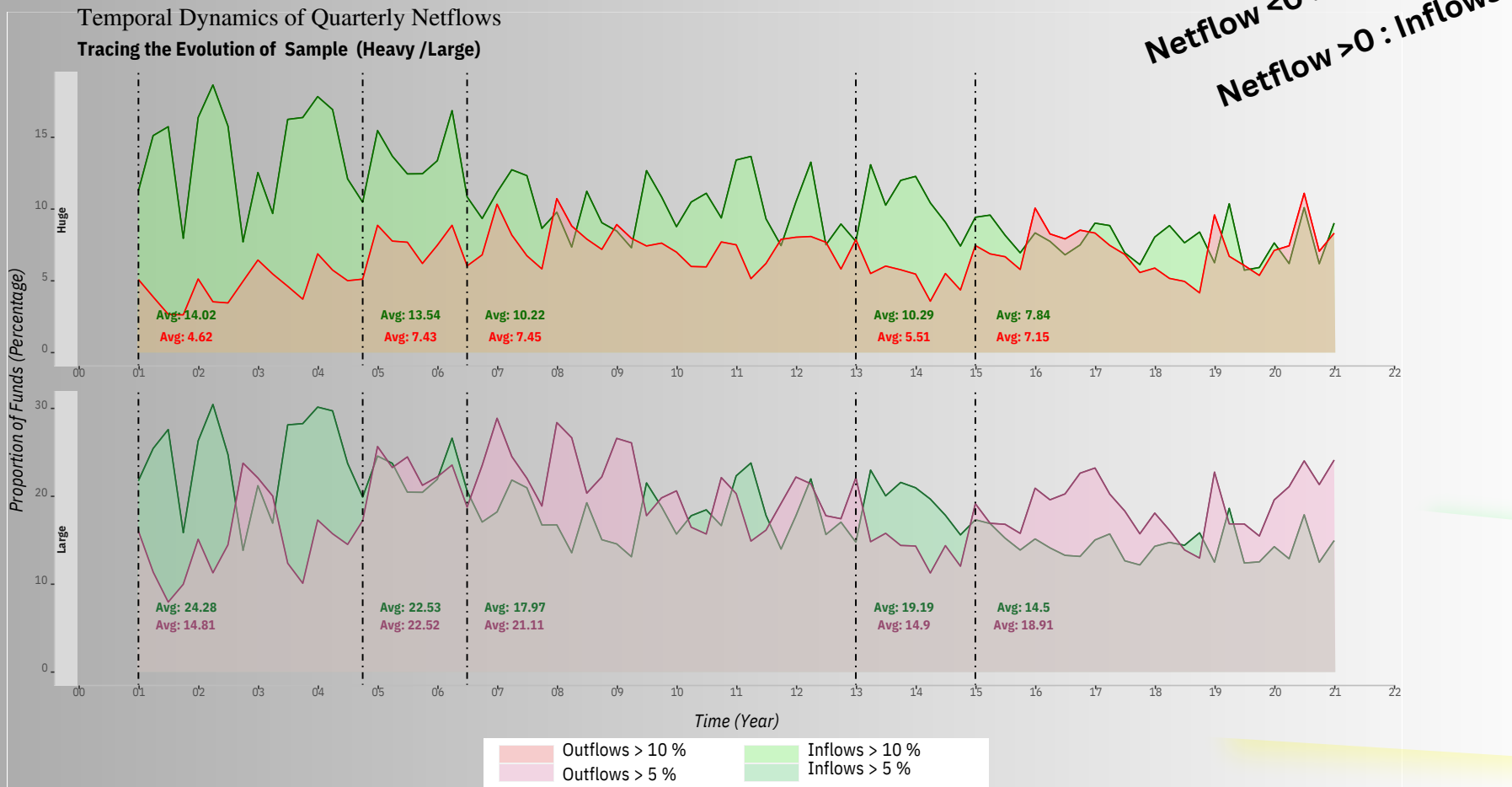
Heavy Flows and Scalling Challenges

Capital inflows and outflows exert significant pressure on fund **managers**, forcing them to adapt their **behavior** to safeguard portfolio stability.

- **Understanding** how managers navigate large-scale flow dynamics is crucial for predicting **market** behavior and **ensuring clients' interests**.
- Theres is a big pie on the game: During the last quarter of 2018 active equity mutual funds industry experienced withdrawals around $75.5 billion. At the end of 2022, the industry was valuated at $22.1 trillion.

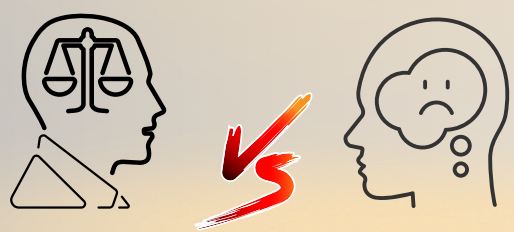
Netflow=Subscriptions+Redemptions



Managerial Behavior

WHAT DO MANAGERS PERCEIVE?

HEAVY REWARD AND PUNISHMENT



- Cen et al. (2024 WP). NBER: *Managers' compensation* is heavily influenced by assets under management (AUM). Fund flows, exert a strong impact on the *career outcomes*, especially concerning their downside career risk.
    - Large inflows (outflows) associated with superior likelihood of turnover and income promotion (deplotion).

Managerial Behavior

THEORY

FULLY RATIONAL BEHAVIOR

Berk and Green (2004) Within active equity portfolio management, **price pressures** and **portfolio size** are key constraints on a manager's ability to maintain competitive excess returns.

- Chen et al. (2004), Pastor and Stambaugh (2015), Zhu (2018): Demonstrated the negative association between portfolio size and fund performance due to forced diversification and bounded investment opportunity sets.
- Coval and Stafford (2007), Lou (2012): Showed that forced trades lead to short-term price deviations, affecting subsequent risk-adjusted performance.

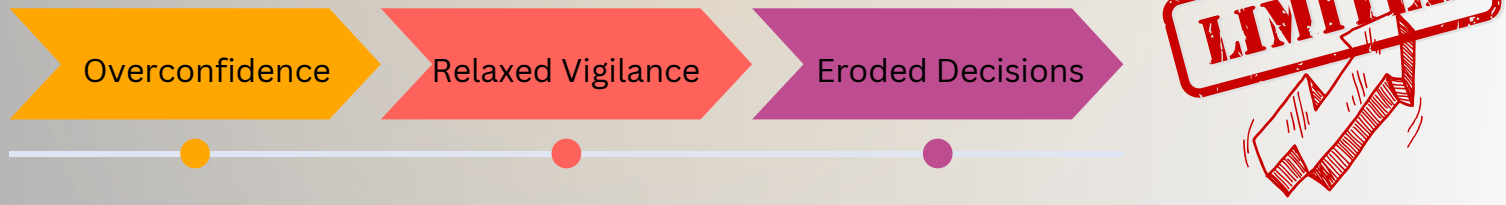
SOMETHING IS MISSING!

BOUNDED RATIONALITY OF MUTUAL FUND MANAGERS

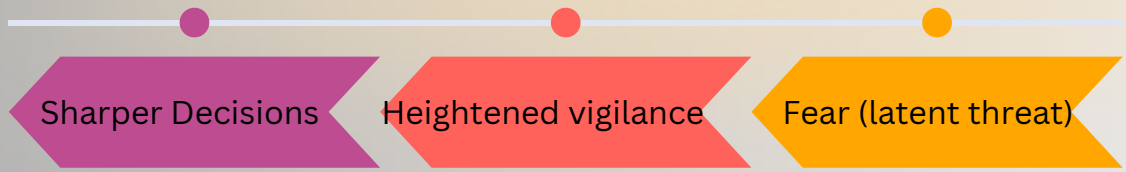
NEW QUESTION

Do heavy flows generate behavioral biases in mutual fund managers, and how do these biases influence fund-scale economies?

Hypothesis 1 (Overconfidence Bias During Heavy Inflows): During periods of heavy inflows, mutual fund managers experience significant rewards.

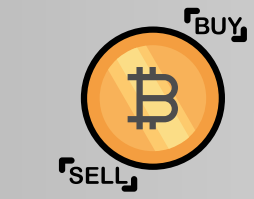


Hypothesis 2 (Career-Driven Vigilance During Heavy Outflows): During periods of heavy outflows, mutual fund managers are highly stressed about their careers.



METHODOLOGICAL APPROACH

Flow - Forecasting Ability



TRADES

+

FUTURE RISK-ADJUSTED RETURNS

- Analyzing individual trades can help **disentangle behavioral mechanisms** during heavy flow dynamics.
- Using ex-ante performance metrics allows us to look forward at the quality of decisions, exploring the **consequences of managerial actions**.

Trading-Selectivity Measures

- These measures assess the outcomes of trading actions separately from overall portfolio performance (independent trades by period).
- The outcome indicates the success of trades relative to a benchmark, reflecting the opportunity cost/benefit over alternative decisions.

MARGINALITY
OPORTUNITY COST

NOT INTERESTED
PERFORMANCE

METHODOLOGICAL APPROACH

Flow - Forecasting Ability

- Chen et al (2000). JFQA. Unc. An /DGTW[1975-1995]/Active Equity. Buys Against Sales (Momentum). **Not Explore Flows, and the entire set of trades**
- Alexander et al (2007). JFE. Unc An / DGTW [1980-2003]/ Equity. Rank Buys and Sales based on BF and SF metrrics (aggregations of monetary transactions and flows). Small set of trades (Value and Liquidity motivated). **Not Explore Flows, and the entire set of trades**
- Da et al (2011). RFS.Unc An/ DGTW [1983-2004]/ Active Equity. CS decomposition (Liquidity: Impatient or Provisions). **Not Explore Flows, and the entire set of trades**

First Paper !

COMPREHENSIVE ANALYSIS OF ALL TRADES WITH FLOW DYNAMICS

Ubdated Data on Causal Analysis

NOT INTERESTED
PERFORMANCE

Selectivity Value-Weighted MEASURES

$$SR_t^{fund} = \sum_{\text{stock}} W^{\text{Sale}}_{\text{stock},t}(R_{\text{stock},t+1} - R^{\text{Benchmark}}_{\text{stock},t+1})$$

$$W^{Sale}_{stock,t} = \frac{\Delta^{Sale}_{stock,t} \times Price_{stock,t}}{-\sum_{stock} \Delta^{Sale}_{stock,t} \times Price_{stock,t}} : \; W^{Sale}_{stock,t} \in [-1:0)$$

$$PR_t^{fund} = \sum_{\text{stock}} W^{\text{Purchase}}_{\text{stock},t}(R_{\text{stock},t+1} - R^{\text{Benchmark}}_{\text{stock},t+1})$$

$$W^{Purchase}_{stock,t} = \frac{\Delta^{Purchase}_{stock,t} \times Price_{stock,t}}{\sum_{stock,t} \Delta^{Purchase}_{stock,t} \times Price_{stock,t}} : \; W^{Purchase}_{stock,t} \in (0:1]$$

$$TR_t^{fund} = W_t^{TradePurchase} \times PR_t^{fund} + W_t^{TradeSale} \times SR_t^{fund}$$

$$W_t^{TradePurchase} + W_t^{TradeSale} = 1$$

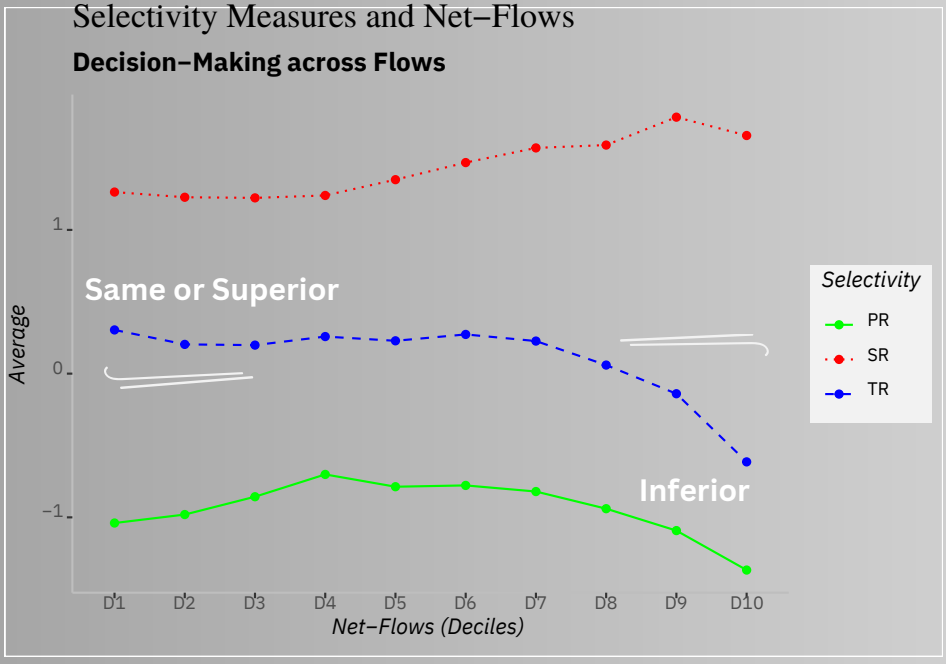
- **Benchmark Returns** are constructed following the methodology of Daniel et al. (1997). Stocks are categorized into 125 portfolios. Sorting criteria include market capitalization, book-to-market ratios, and momentum (5x5x5).

- **Weights on Sales** must be negative to ensure accurate interpretation. This adjustment reflects the cessation of gains or losses once assets are no longer held within the portfolio.

DATA

- **CRSP Mutual funds:** Family classification, investment objectives, fees, loads, cash, and portfolio holdings.
- **Thomson Reuters S12:** Portfolio holdings.: Following Chernenko and Sunderam (2020) we combine CRSP and T-R portfolio holdings to have more comprehensive and up-to-date information.
- **CRSP Stock:** All NYSE, AMEX, and NASDAQ securities that report prices and trading volume.
- **Data Description:**
- US Equity mutual funds, exclude sectors and international funds.
- Quarterly Data from 2000 to 2020.
- Winsorize at 1% and 99% to mitigate outliers.
- We drop funds with less than ten million in assets under management and with less than two years old.

FORESIGHT SELECTIVITY AND FLOW ASSOCIATION



	A. Trades (TR)		Purchases (PR)		Sales (SR)	
	(1)	(2)	(3)	(4)	(5)	(6)
Extreme Outflows (10%)	**0.1472*** **		0.1138		-0.1596**	
	(0.0548)		(0.0806)		(0.0664)	
Large Outflows (25%)		0.0189		-0.0474		-0.1765***
		(0.0423)		(0.0614)		(0.0516)
Extreme Inflows (10%)	**-0.8299*** **		-0.5391***		-0.1933*	
	(0.0674)		(0.0815)		(0.1002)	
Large Inflows (25%)		**-0.5954*** **		-0.4458***		-0.0493
		(0.0510)		(0.0640)		(0.0731)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47788	47788	47429	47429	47434	47434
Adjusted R2	0.132	0.132	0.207	0.207	0.139	0.139
Time x Style fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

- Standard errors, presented in parentheses, are clustered at the fund level. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.10.
- All control variables are lagged by one period to mitigate potential endogeneity concerns. Control variables include returns, cash balances, average portfolio illiquidity (as per Amihud, 2002), management fee, fund size, and family size. Fund and family sizes are expressed in logarithmic terms.
- Extreme/Large Outflows are within the first decile and 25th percentile, while Large/Extreme Inflows fall in the fourth quartile and beyond the 90th percentile.

Ruling Out Alternative Hypotheses
TO CONFIRM BEHAVIORAL BIASES

Challenge in Identifying Psychological Factors **(Non-Observability)**: Inherently difficult to observe directly, even expert lab settings and psychological tests use methods to imply possible factors rather than directly identifying them.

Identifying Biases Using Bayesian Inference

- Approach: Following Alex Edmans' (2024) methodology in "May Contain Lies: How Stories, Statistics, and Studies Exploit Our Biases—And What We Can Do about It.": **a) Does the information support my hypothesis? b) Is the information consistent with my hypothesis**, or with the alternative hypothesis (rationality on Externalities)?

Testing the Hypothesis:

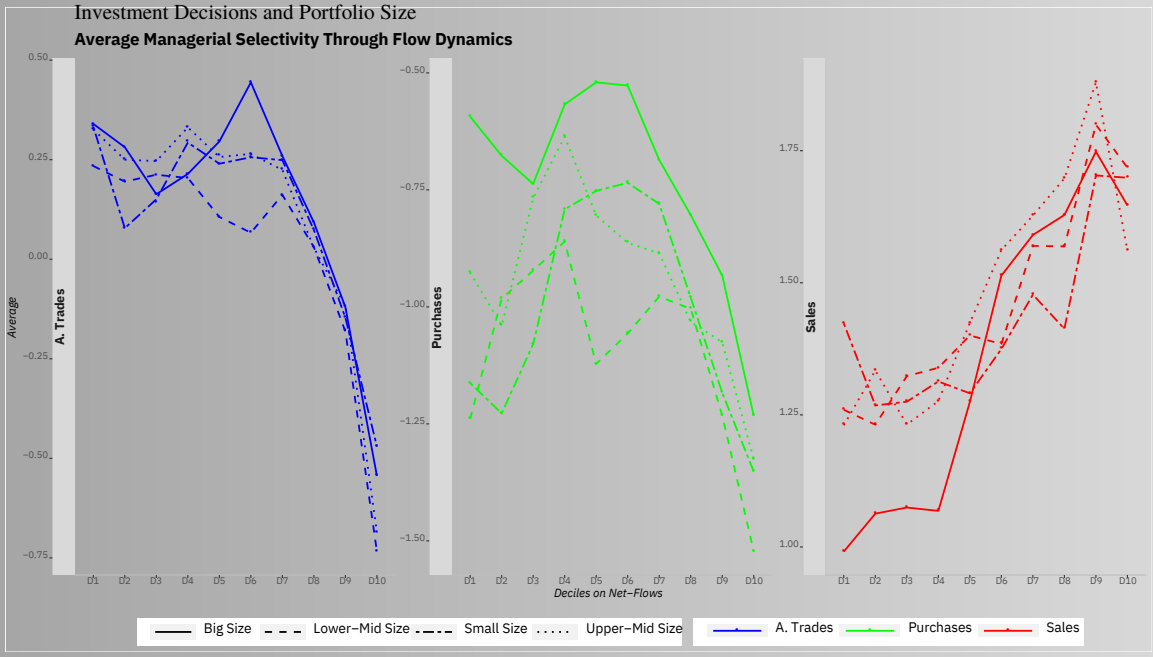
Objective: Support the theory by trying to disprove it.

- By ruling out alternative hypotheses, we strengthen our argument that behavioral biases influence managerial decisions.

Consistency Across Settings: The hypothesis should extend to all settings, demonstrating that biases are present **regardless of portfolio size or price pressures**.

- Robust framework to understand how perceptions and biases affect fund management beyond rational modeling

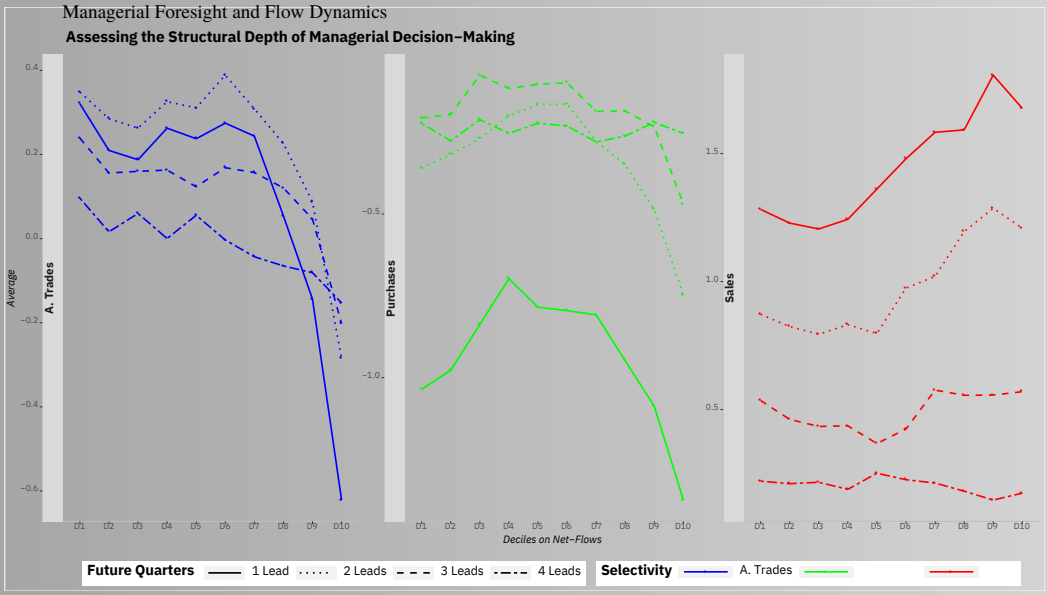
PORTFOLIO SIZE AND SELECTIVITY



	A. Trades	Purchases	Sales
Large Outflows (25%)	0.0741	0.0001	-0.1356**
	(0.0496)	(0.0008)	(0.0608)
Large Outflows (25%) x Large Portfolios (25%)	**-0.1875****	-0.0008	-0.1267
	(0.0762)	(0.0013)	(0.0927)
Large Inflows (25%)	-0.5802***	-0.0044***	0.0453
	(0.0600)	(0.0009)	(0.0907)
Large Inflows x Large Portfolios (25%)	-0.0321	0.0009	-0.2663*
	(0.0940)	(0.0013)	(0.1390)
Controls	Yes	Yes	Yes
Observations	47788	47653	47434
Adjusted R2	0.132	0.178	0.139
Time x Style fixed effects	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes

- Standard errors, presented in parentheses, are clustered at fund level. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.10.
- All control variables are lagged by one period to mitigate potential endogeneity concerns. Control variables include returns, cash balances, average portfolio illiquidity (as per Amihud, 2002), management fee, fund size, and family size. Fund and family sizes are expressed in logarithmic terms.
- Large Portfolios are defined as those in the top quartile of Total Net Assets (TNA) within each period, reflecting the scale of funds under management.

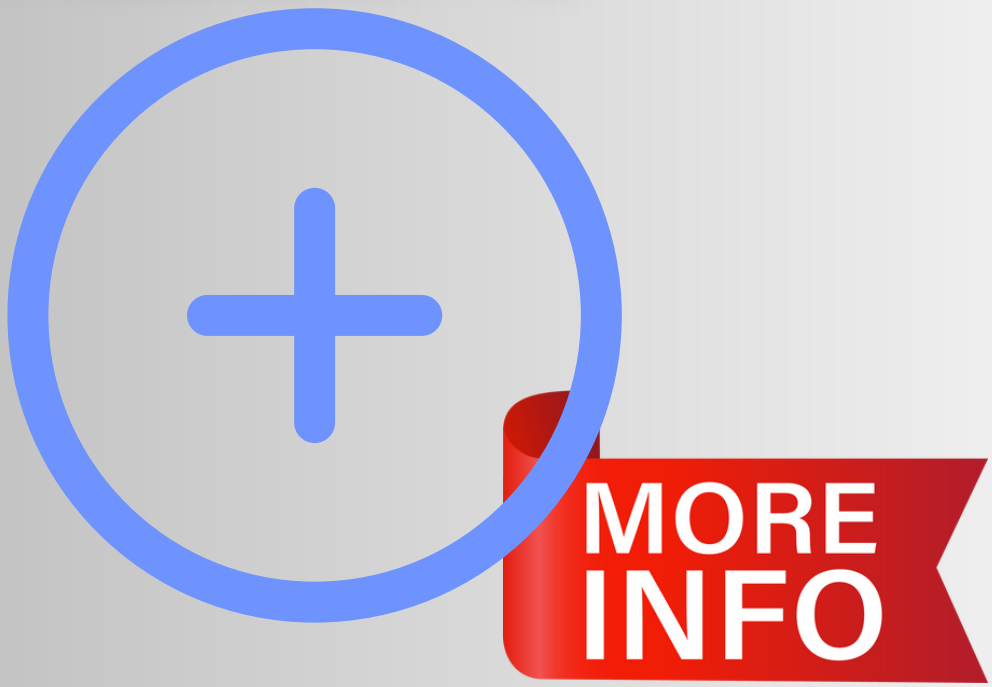
PRICE PRESSURE AND SELECTIVITY



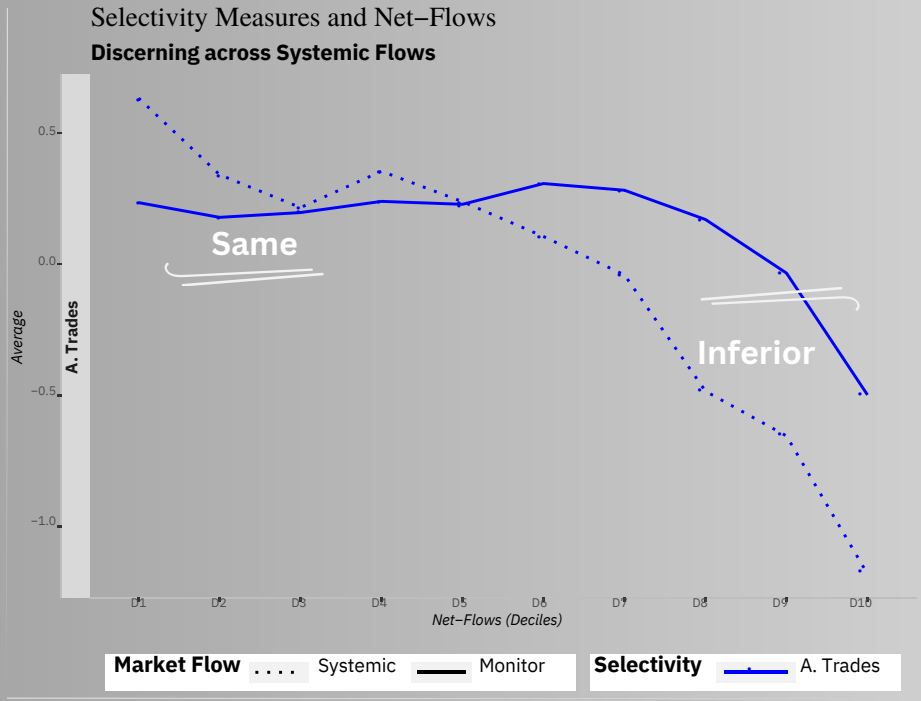
	A. Trades			
	(t+1)	(t+2)	(t+3)	(t+4)
Large Outflows (25%)	0.0189	0.0266	0.0525	0.0879**
	(0.0423)	(0.0387)	(0.0389)	(0.0371)
Large Inflows (25%)	-0.5954***	-0.3970***	-0.2538***	-0.0529
	(0.0510)	(0.0481)	(0.0456)	(0.0423)
Controls	Yes	Yes	Yes	Yes
Observations	47788	47334	46804	46253
Adjusted R2	0.132	0.098	0.039	0.023
Time x Style fixed effects	Yes	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes	Yes

- Standard errors, presented in parentheses, are clustered at fund level. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.10.
- All control variables are lagged by one period to mitigate potential endogeneity concerns. Control variables include returns, cash balances, average portfolio illiquidity (as per Amihud, 2002), management fee, fund size, and family size. Fund and family sizes are expressed in logarithmic terms.The dependent variable tracks the performance of aggregate trades from one quarter to a year following execution (t+1 to t+4)

ADDITIONAL RESULTS



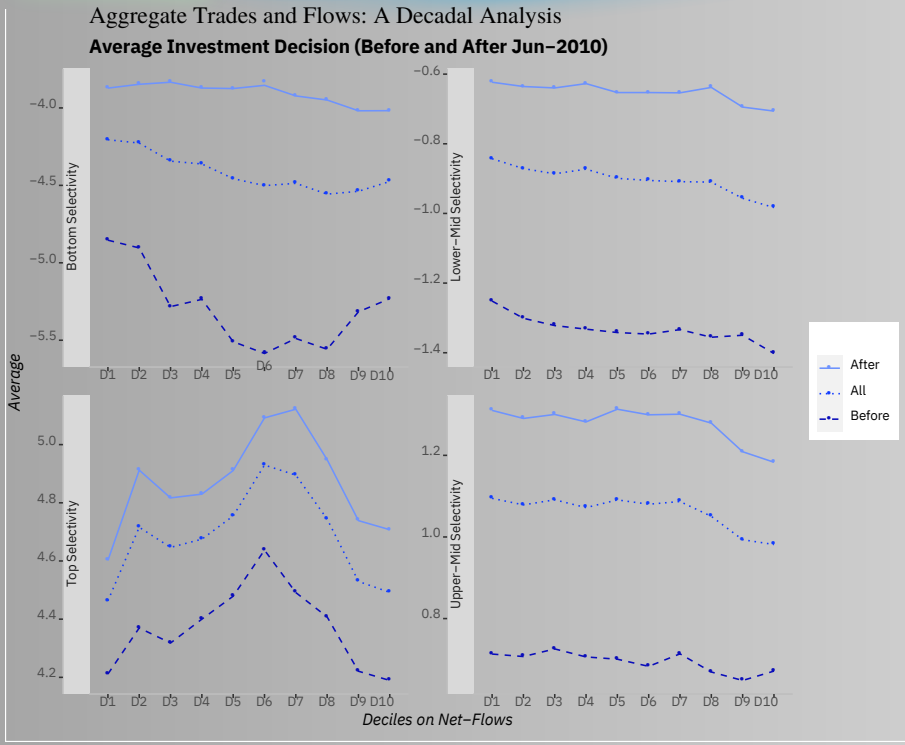
SYSTEMIC FLOWS AND SELECTIVITY



	A. Trades (TR)	Purchases (PR)	Sales (SR)
Large Outflows (25%)	-0.0548	-0.0623	-0.2084***
	(0.0452)	(0.0667)	(0.0536)
Large Outflows (25%) x Systemic	**0.5243*** **	0.1066	0.2279*
	(0.1200)	(0.1725)	(0.1375)
Large Inflows (25%)	-0.5536***	-0.4343***	0.0024
	(0.0505)	(0.0668)	(0.0748)
Large Inflows (25%) x Systemic	**-0.3082** **	-0.0847	-0.3756*
	(0.1376)	(0.1593)	(0.2085)
Controls	Yes	Yes	Yes
Observations	47788	47653	47434
Adjusted R2	0.133	0.178	0.139
Time x Style fixed effects	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes

- Standard errors, presented in parentheses, are clustered at the fund level. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.10.
- All control variables are lagged by one period to mitigate potential endogeneity concerns. Control variables include returns, cash balances, average portfolio illiquidity (as per Amihud, 2002), management fee, fund size, and family size. Fund and family sizes are expressed in logarithmic terms.
- Large Outflows are within the first 25th percentile, while Large Inflows fall in the fourth quartile.
- The **Systemic** dummy variable identifies 16/80 periods classified as systemic flows: Cross-Section (Mean/Stdv) x (rho).

ABILITY AND SELECTIVITY



	A. Trades (Tau)				
	0.1	0.25	0.5	0.75	0.9
Intercept	-3.9135***	-1.2263***	0.9430***	3.5091***	8.0078***
	(0.3900)	(0.2441)	(0.2054)	(0.2586)	(0.4160)
Flows	-0.0392***	-0.0285***	-0.0169***	-0.0099***	-0.0103***
	(0.0028)	(0.0020)	(0.0015)	(0.0021)	(0.0031)
Squared Flows	0.0259***	0.0180***	0.0088***	-0.0001	-0.0038*
	(0.0021)	(0.0022)	(0.0009)	(0.0021)	(0.0021)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	47788	47788	47788	47788	47788
RMSE	5.39	4.11	3.62	4.09	5.51

- Standard errors, presented in parentheses, are robust (HC3) to ensure heteroskedasticity-consistent estimates. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.10.
- All control variables are lagged by one period to mitigate potential endogeneity concerns. Control variables include returns, cash balances, average portfolio illiquidity (as per Amihud, 2002), management fee, fund size, and family size. Fund and family sizes are expressed in logarithmic terms.
- Flows are netflows (continous), and the Squared Flows is the quadratic representation .

CONCLUSIONS

Unexplored Aspects of Scale Economies

- Focus: Impact of managerial psychological factors on decision-making.
- Novel Perspective: Behavioral biases driven by managers' perceptions of threats and rewards.

Key Discoveries

- Perceptions of Threat:
  - Substantial Contractions: Managers capitalize on challenges, protecting and potentially increasing portfolio value.
  - Significant Expansions: Excessive rewards compromise strategic focus and reduce investment decision quality.
- Strategic Finesse:
  - Extreme Outflows: Managers often make superior decisions due to the scrutiny of perceived threats and industry reputation.
  - Extreme Inflows: Decline in securing portfolio benefits due to skewed perceptions, leading to less competitive outcomes and adverse investment returns.

Robustness Against Traditional Considerations

- Portfolio Size: Modifies managers' threat perceptions, especially during outflows.
- Price Pressures: Strategic decisions remain effective over time, despite large-scale pressures.

THANKS

thanks

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