Flow Hedging and Mutual Fund Performance

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MOTIVATION AND RESEARCH QUESTIONS

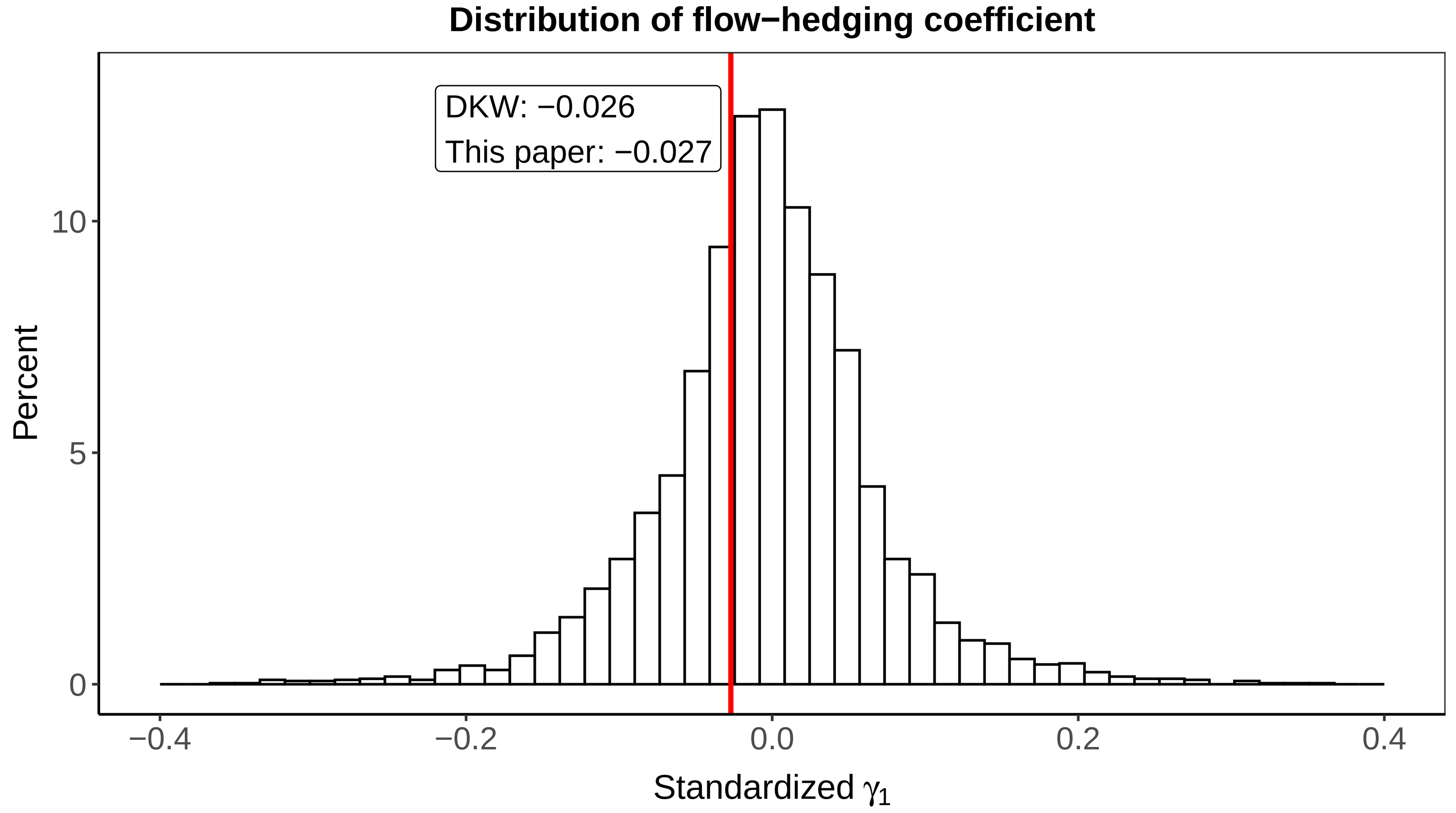
- Dou, Kogan, and Wu (2023) (DKW) show that the aggregate mutual fund hedges against systematic flow risk by titling away from stocks that have high flow beta.
- DKW show empirical evidence through the regression:

$$\underbrace{\omega_i^{\text{aggregate}} - \omega_i^{\text{market}}}_{\text{Deviation from stock } i\text{'s market weight}} = \gamma_0 + \overbrace{\gamma_1}^{\text{Flow-hedging coefficient}} \times \underbrace{\beta_i^{\text{flow}}}_{\text{Stock } i\text{'s flow risk}} + \gamma_2 \times \beta_i^{\text{market}} + \varepsilon_i. \qquad (1)$$

A negative estimate of γ_1 suggests a hedging behavior.

- However, there also exists a significant heterogeneity in this behavior in the cross-section of funds when re-estimating Equation 1 at the fund level.

Distribution of flow–hedging coefficient



- **Research questions**:
  1. Why almost half of active funds do not hedge against flow risk?
  2. What is the implication of hedging on fund performance?

PAPER SUMMARY

- I document that almost half of U.S. active funds do not exhibit flow hedging.
- A model in which funds that have more precise information about future flows can explain their weaker tilt away from high flow-beta stocks.
- Funds that do not hedge outperform hedging funds on risk-adjusted basis, and their behavior depends on the volatility of public information.

A MODEL OF FLOW HEDGING IN AN INFORMATION ECONOMY

- Payoff u and flow F of the risky asset:

$$u, F \sim N\left(\begin{bmatrix}\bar{u}\\ \bar{F}\end{bmatrix}, \begin{bmatrix}\rho_u & \psi\\ \psi & \rho_F\end{bmatrix}\right), \quad \psi > 0.$$

- Public signal (s_1) about u and private signal (s_2) about F:

$$s_1, s_2 | u, F \sim N\left(\begin{bmatrix}u\\ F\end{bmatrix}, \begin{bmatrix}\rho_1 & 0\\ 0 & \rho_2\end{bmatrix}\right)$$

- Terminal wealth in 2[nd] period:

$$\omega = \underbrace{e}_{\text{endowment}} + \underbrace{(u-p)}_{\text{capital gain}} \times \overbrace{x}^{\text{demand for risky asset}} + \underbrace{F}_{\text{common flow}}.$$

- Investors choose x to maximize CARA expected utility.
- Price p is partially revealing and obtained with the market clearing condition.
- Solutions:
  - Optimal demand:

$$x^{j*} = \underbrace{\frac{1}{\gamma}\frac{E_s(u^j - p)}{\text{Var}_s(u^j)}}_{\text{mean-variance tradeoff}} - \underbrace{\beta_{\text{flow}}\frac{\text{Var}_s(F^j)}{\text{Var}_s(u^j)}}_{\text{hedging component}}, \text{ for } j = \{\text{Informed}, \text{Uninformed}\}.$$

  - Difference in holdings between informed and uninformed:

$$\Delta \propto \underbrace{\left[\frac{\psi(\rho_\theta - \rho_2)(\rho_u + \rho_1)}{\gamma \qquad \kappa}\right]}_{\text{private signal coefficient}>0} s_2 + \underbrace{\left[\frac{(\rho_F\rho_1 + \rho_u\rho_F - \psi^2)(\rho_u\rho_F - \psi^2)(\rho_\theta - \rho_2)}{\rho_1\kappa_1\kappa_2}\right]}_{\text{flow risk coefficient}>0} \beta_{\text{flow}}.$$

- **Model predictions**:
  1. $\partial\Delta/\partial\beta_{\text{flow}} > 0$: informed investors hold more risky asset.
  2. $\partial\Delta/\partial\beta_{\text{flow}}\partial\rho_1 < 0$: informed investors reduce exposure to flow risk when public signal is noisy.

MEASURE OF FLOW RISK MANAGEMENT: ACTIVE FLOW BETA

- **Active flow beta** (AFB): covariance between fund holdings (relative to a benchmark) and holdings' flow betas:

$$AFB_q^j \approx \sum_{i=1}^{N_j} (\omega_{i,q}^j - \omega_{i,q}^{\text{benchmark}})\beta_{i,q}^{\text{flow}},$$

where:

- AFB_q^j: active flow beta of fund j in quarter q.
- $\omega_{i,q}^j$ ($\omega_{i,q}^{\text{benchmark}}$): weight of holding i in fund j (benchmark).
- $\beta_{i,q}^{\text{flow}}$: flow beta of holding i.

CHARACTERISTICS OF AFB-SORTED FUNDS

	Low (P1)	High (P10)	High-Low
TNA ($ million)	1059.16	957.41	-101.75
Age (Years)	18.52	19.24	0.72
Expense ratio (%)	1.17	1.08	-0.09***
Turnover ratio (%)	85.77	69.36	-16.40***
Quarterly flow (%)	0.44	1.22	0.78*
Return gap (%)	-0.25	-0.10	0.15**
Active share (%)	87.44	88.89	1.45
Response to public information (%)	12.43	12.02	-0.41

TESTING PREDICTION #1: PERFORMANCE OF LOW VS. HIGH AFB FUNDS

Prediction #1: High AFB funds outperform low AFB funds.

	Low (P1)	High (P10)	High-Low
Excess return (%)	0.48	0.90	0.43
	[1.34]	[3.53]	[1.71]
α (Carhart's 4 factors) (%)	-0.43	0.17	0.60
	[-3.26]	[1.51]	[2.78]
α (Carhart's 4 factors + LIQUIDITY) (%)	-0.41	0.12	0.53
	[-3.09]	[1.16]	[2.50]

TESTING PREDICTION #2: HEDGING BEHAVIOR WHEN PUBLIC INFORMATION IS NOISY

$$\underbrace{\omega_i^p - \omega_i^{\text{market}}}_{\text{Deviation from stock } i\text{'s market weight}} = \cdots + \gamma^p \times \beta_i^{\text{flow}} \times \underbrace{\sigma_i}_{\text{Proxy of public signal's volatility}} + \varepsilon^p, \quad \text{for p} = \{\text{Low}, \text{High}\}.$$

- σ_i: analysts' forecast dispersion
- Prediction #2: $\partial\Delta/\partial\beta^{\text{flow}}\partial\sigma < 0$

Portfolio	β_{flow}	β_{market}	σ	$\beta_{\text{flow}} \times \sigma$
Low (P1)	-0.074***	-0.022**	-0.158***	0.018**
	(0.006)	(0.009)	(0.020)	(0.009)
High (P10)	0.081***	-0.053***	-0.103***	-0.017
	(0.005)	(0.011)	(0.020)	(0.013)
Difference	0.155***	-0.032*	0.056	-0.035**
	(0.006)	(0.017)	(0.040)	(0.017)

REFERENCE

Dou, W. W., Kogan, L., & Wu, W. (2023). Common Fund Flows: Flow Hedging and Factor Pricing. *Journal of Finance*, Forthcoming.