A Flow-Based Explanation for Return Predictability
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Outline

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Introduction

- **Motivation**
  - **Explaining "return predictability"**
    - ⋆ The persistence of mutual fund performance
    - ⋆ The "smart money" effect
    - ⋆ Stock price momentum

- **Objectives**
  - ▶ To test a capital-flow-based explanation for return predictability

Introduction

- **Main results**
  - ▶ Mutual fund flows are highly predictable
  - ▶ Expected part of flow-induced trading forecasts mutual fund returns:
    - ★ **Positively** for the following year
    - ★ **Reversely** for the 2nd and 3rd year

- **Contributions**
  - ▶ A single mechanism: **Capital flows** from retail investors to mutual funds, and from mutual funds to individual stocks
    $\Rightarrow$ **Predictable price pressure**

Outline

Data

- **Mutual fund and stock data**
  - **Data**: Holdings, total net assets, net monthly returns, expense ratios, stock return, trading information, stock liquidity data
  - **Sources** CDA/Spectrum, CRSP, Joel Hasbrouck's Web site
  - **Period** 1980 - 2006
  - **Final Sample** 77,983 fund-quarter observations (2,989 distinct mutual funds)

- **Fund flows**:

$$flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} * (1 + RET_{i,t}) - MGN_{i,t}}{TNA_{i,t-1}} \quad (1)$$

where $MGN_{i,t}$ = an increase in TNA due to fund mergers

Table 1 Summary Statistics

Year	No. Funds	TNA ($ Million)		Total Equity Holdings ($ Million)		% Market Held	
		Median	Mean	Median	Mean	No. Stocks	% Held
1980	228	53.45	146.74	45.61	122.24	3,646	2.27
1981	226	53.66	137.71	42.11	109.31	3,543	2.21
1982	232	70.64	170.95	50.90	132.00	3,393	2.21
1983	255	97.41	222.14	79.74	182.20	4,173	2.74
1984	270	86.23	221.24	71.98	176.03	3,985	2.95
1985	297	114.12	275.98	89.48	222.04	3,845	3.08
1986	341	106.42	298.47	88.59	241.28	4,134	3.46
1987	376	87.00	286.30	74.03	238.41	4,544	3.89
1988	405	82.47	285.34	69.56	232.77	3,906	3.84
1989	440	95.08	340.49	77.91	265.36	3,798	3.92
1990	480	83.85	306.07	61.95	240.20	3,175	4.15
1991	579	100.23	379.32	79.85	309.56	3,548	4.78
1992	685	115.22	426.04	93.25	346.45	3,913	5.39
1993	925	105.56	442.40	90.00	350.65	4,663	6.54
1994	1,044	105.43	450.12	85.19	352.88	4,951	6.88
1995	1,168	134.35	610.98	112.60	488.36	5,338	9.02
1996	1,314	145.88	750.48	123.31	605.90	5,724	10.04
1997	1,480	163.42	933.60	135.21	774.02	5,858	11.07
1998	1,570	167.00	1,071.47	144.55	927.39	5,028	11.81
1999	1,686	187.52	1,307.48	164.05	1,139.49	4,958	12.95
2000	1,890	186.27	1,283.93	159.08	1,089.54	4,698	12.54
2001	1,915	155.22	1,018.79	133.73	882.57	3,670	13.36
2002	1,970	111.80	771.11	96.53	672.64	3,282	13.46
2003	2,001	146.05	976.25	128.51	852.98	3,760	13.54
2004	1,961	165.93	1,128.54	144.58	978.38	3,820	13.82
2005	1,918	196.90	1,251.72	169.84	1,067.81	3,884	14.02
2006	1,789	221.75	1,400.29	193.07	1,187.58	3,858	13.71

Outline

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Flow-Induced Price Pressure

- **Objectives**
  1. To study price pressure effect of flow-induced trading on individual stocks
  2. To test predictability of expected component of flow-induced trading on future stock and fund returns

1. Trading in response to capital flows

- **Question** How should mutual funds adjust their holdings in reponse to capital flows?

- **How to tackle..?**

$$trade_{i,j,t} = \beta_0 + \beta_1 flow_{i,t} + \gamma_2 X + \gamma_3 flow_{i,t} * X + \epsilon_{i,t} \qquad (2)$$

where:

- $trade_{i,j,t} = \dfrac{shares_{i,j,t}}{shares_{i,j,t-1}^{split_a dj}} - 1$

- X (trading cost variables):
  1. Ownership share of mutual fund i in stock j (size of flow-induced trading)
  2. The effective bid-ask spread of stock j (marginal trading cost)

Table 2 Fund responses to capital flows

	The Outflow Sample				The Inflow Sample			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	**−0.059**	−0.029	−0.022	−0.022	**−0.032**	0.000	0.020	0.020
	(−6.62)	(−1.32)	(−0.85)	(−0.88)	(−3.42)	(0.02)	(1.22)	(1.21)
$flow_{i,t}$	**0.970**	**1.028**	**1.107**	**1.107**	**0.618**	**0.737**	**0.858**	**0.855**
	(16.82)	(17.64)	(10.97)	(11.27)	(15.78)	(14.64)	(10.57)	(10.57)
$own_{i,j,t-1}$		0.429		**−1.196**		−0.766		−0.471
		(1.35)		(−2.35)		(−1.50)		(−0.65)
$flow_{i,t} \times own_{i,j,t-1}$		−2.355		**−20.588**		**−12.431**		−1.669
		(−0.58)		(−3.25)		(−3.74)		(−0.51)
$liqcost_{j,t-1}$		**−7.455**		**−5.755**		**−7.529**		**−3.416**
		(−2.97)		(−5.38)		(−3.95)		(−4.77)
$flow_{i,t} \times liqcost_{j,t-1}$		**−28.559**		**−13.999**		**−25.748**		**−8.433**
		(−2.48)		(−2.18)		(−3.71)		(−2.39)
$own_{i,t-1}$			**2.171**	**3.924**			−0.364	0.212
			(3.58)	(4.06)			(−0.44)	(0.18)
$flow_{i,t} \times own_{i,t-1}$			11.265	**41.242**			**−21.337**	**−19.235**
			(1.32)	(3.10)			(−3.20)	(−2.58)
$liqcost_{i,t-1}$			−11.127	−6.084			**−18.461**	**−15.505**
			(−1.89)	(−1.24)			(−3.08)	(−2.79)
$flow_{i,t} \times liqcost_{i,t-1}$			−57.295	−44.609			**−51.076**	**−42.332**
			(−1.90)	(−1.43)			(−3.01)	(−2.49)
Adjusted R^2	4.68%	6.31%	6.21%	6.43%	9.53%	10.07%	11.36%	11.46%
No. observations	1,207,060	1,044,623	1,207,060	1,044,623	2,462,355	2,215,898	2,462,355	2,215,898

2. The return pattern

- **Defining flow-induced trading (FIT) for each stock in each quarter**

$$FIT_{j,t} = \frac{\sum_i shares_{i,j,t-1} * flow_{i,t} * PSF_{i,t-1}}{\sum_i shares_{i,j,t-1}} \tag{3}$$

Table 3 The flow-induced price effect

Panel A: The magnitude of *FIT* from quarters −4 to +4

Decile	Qtr. -4	Qtr. -3	Qtr. -2	Qtr. -1	Qtr. 0	Qtr. 1	Qtr. 2	Qtr. 3	Qtr. 4
1	1.27%	0.81%	0.48%	−0.24%	−5.50%	0.20%	0.59%	0.61%	1.21%
10	5.00%	5.88%	6.69%	8.62%	16.76%	8.06%	6.10%	5.25%	4.23%
10 - 1	**3.73%**	**5.07%**	**6.21%**	**8.86%**	**22.27%**	**7.86%**	**5.51%**	**4.65%**	**3.02%**
	(11.00)	(13.20)	(15.98)	(14.37)	(22.94)	(12.54)	(14.91)	(15.25)	(12.61)

Panel B: Equal-weighted returns to portfolios ranked by *FIT*

Decile	Excess Return	3-Factor Alpha	4-Factor Alpha	Excess Return	3-Factor Alpha	4-Factor Alpha	Excess Return	3-Factor Alpha	Excess Return	3-Factor Alpha
	Qtr. 0 (Formation Qtr.)			Qtr. 1–4			Qtr. 5–8		Qtr. 5–12	
1	0.09%	−0.83%	−0.64%	0.68%	−0.22%	0.06%	0.90%	−0.06%	0.92%	0.05%
10	1.82%	1.08%	0.86%	0.66%	−0.02%	0.04%	0.49%	−0.33%	0.63%	−0.17%
10 - 1	**1.73%**	**1.91%**	**1.50%**	−0.03%	0.20%	−0.02%	**−0.40%**	−0.27%	**−0.30%**	**−0.23%**
	(7.77)	(8.31)	(7.38)	(−0.17)	(1.36)	(−0.10)	(−2.46)	(−1.46)	(−2.70)	(−2.10)

Panel C: Value-weighted returns to portfolios ranked by *FIT*

Decile	Excess Return	3-Factor Alpha	4-Factor Alpha	Excess Return	3-Factor Alpha	4-Factor Alpha	Excess Return	3-Factor Alpha	Excess Return	3-Factor Alpha
	Qtr 0 (Formation Qtr.)			Qtr. 1–4			Qtr. 5–8		Qtr. 5–12	
1	−0.22%	−1.05%	−0.82%	0.73%	−0.09%	−0.02%	0.87%	0.19%	0.82%	0.19%
10	1.90%	1.26%	0.93%	0.64%	0.05%	−0.22%	0.21%	−0.35%	0.36%	−0.23%
10 - 1	**2.12%**	**2.31%**	**1.76%**	−0.08%	0.15%	−0.21%	**−0.66%**	**−0.54%**	**−0.46%**	**−0.42%**
	(5.96)	(6.78)	(5.11)	(−0.35)	(0.68)	(−0.93)	(−3.04)	(−2.85)	(−2.80)	(−2.61)

2. The return pattern (cont.)

- **Question**: Continuation in short term vs Reversal in longer term?

- Countervailing forces between:
  - ▶ Flow-induced trading drives stock prices away from fundamental value
    ⇒ Immediate reversal
  - ▶ Mutual fund flows are highly persistent
    ⇒ Pushing stock prices further away from fundamental value

- Possible consequences:
  - ▶ Year 1: Counteraction between 2 forces ⇒ insignificant effect
  - ▶ Year 2 - 3: Persistence dismissal ⇒ reversal effect dominates

Figure 1

Equal- and value-weighted sotck return patterns of FIT

EW hedge portfolio returns ranked by FIT — VW hedge portfolio returns ranked by FIT
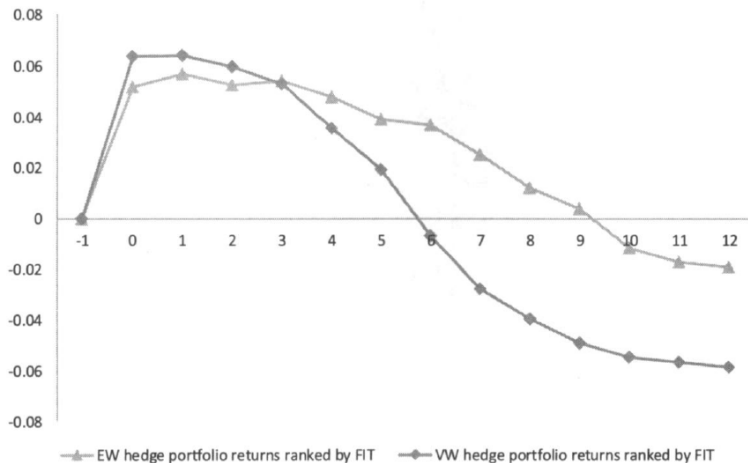
3. Expected flows and future returns

Forecastable flows

- **Question**: Can predictable flows to mutual funds help forecast **future stock and fund returns**?
- **How to tackle...?**

$$flow_{i,t+1} = \beta_0 + \beta_1 alpha_{i,t} + \beta_2 adjret_{i,t}$$
$$+ \beta_3 flow_{i,t} + \beta_4 flow_{i,t-1} + \beta_5 flow_{i,t-2} + \beta_6 flow_{i,t-3} + \epsilon_{i,t+1}$$
$$(4)$$

Table 4 Predicting future flows

	Fama-MacBeth			Pooled OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	**0.028**	**0.028**	**0.010**	**0.016**	**0.014**	**0.007**
	(5.38)	(5.77)	(3.65)	(25.89)	(18.77)	(7.72)
$alpha_{i,t}$	**4.827**	**1.766**	**0.953**	**4.232**	**2.453**	**1.330**
	(9.67)	(4.38)	(4.47)	(9.02)	(9.15)	(5.43)
$adjret_{i,t}$		**0.396**	**0.229**		**0.202**	**0.089**
		(7.34)	(6.72)		(5.17)	(2.74)
$flow_{i,t}$			**0.194**			**0.228**
			(8.78)			(17.21)
$flow_{i,t-1}$			**0.102**			**0.109**
			(5.28)			(7.55)
$flow_{i,t-2}$			**0.122**			**0.090**
			(6.29)			(6.03)
$flow_{i,t-3}$			**0.033**			**0.029**
			(5.47)			(3.67)
Adjusted R^2	4.53%	7.70%	24.79%	5.25%	7.14%	19.83%
No. observations	98,264	98,264	95,285	98,264	98,264	95,285

3. Expected flows and future returns (cont.)

- Expected flows - Stock level

$$E_t[FIT_j] = \frac{\sum_i shares_{i,j,t} * E_t[flow_i] * PSF_{i,t}}{\sum_i shares_{i,j,t}} \tag{5}$$

- Expected flows - Fund level

$$E_t[FIT_i^*] = \sum_j (E_t[FIT_j] * \omega_{i,j,t}) \tag{6}$$

- **Main results**
  - ▶ Expected capital flows and FIT forecast stock and fund returns:
    - ★ **Positively** in short run
    - ★ **Reversely** over the long run

Table 5 The expected flow-induced price effect

Panel A: Stocks ranked by E[FIT]

Decile	Excess Return	3-Factor Alpha	4-Factor Alpha	Excess Return	3-Factor Alpha	4-Factor Alpha	Excess Return	3-Factor Alpha	Excess Return	3-Factor Alpha	Excess Return	3-Factor Alpha
		Qtr. 1			Qtr. 1–4			Qtr. 5		Qtr. 6–8		Qtr. 6–12
1	0.38%	−0.50%	−0.25%	0.53%	−0.40%	−0.13%	0.52%	−0.24%	0.84%	−0.01%	0.94%	0.13%
10	1.21%	0.43%	0.27%	0.97%	0.18%	0.24%	0.63%	−0.01%	0.54%	−0.23%	0.67%	−0.14%
10 - 1	**0.84%**	**0.93%**	**0.53%**	**0.44%**	**0.58%**	**0.37%**	0.10%	0.23%	**−0.29%**	−0.22%	**−0.27%**	**−0.27%**
	(3.96)	(4.15)	(3.51)	(2.63)	(3.30)	(2.26)	(0.49)	(0.81)	(−2.06)	(−1.32)	(−2.17)	(−2.04)

Panel B: Mutual funds ranked by E[FIT*]

Decile	Excess Return	3-Factor Alpha	4-Factor Alpha	Excess Return	3-Factor Alpha	4-Factor Alpha	Excess Return	3-Factor Alpha	Excess Return	3-Factor Alpha	Excess Return	3-Factor Alpha
		Qtr. 1			Qtr. 1–4			Qtr. 5		Qtr. 6–8		Qtr. 6–12
1	0.58%	−0.17%	−0.03%	0.62%	−0.15%	−0.11%	0.71%	0.07%	0.87%	0.25%	0.79%	0.18%
10	1.14%	0.54%	0.37%	1.02%	0.40%	0.26%	0.70%	0.11%	0.56%	−0.05%	0.57%	−0.07%
10 - 1	**0.55%**	**0.71%**	**0.41%**	**0.40%**	**0.55%**	**0.37%**	−0.01%	0.04%	**−0.31%**	**−0.30%**	−0.22%	−0.25%
	(2.66)	(3.14)	(2.58)	(2.65)	(3.44)	(2.34)	(−0.06)	(0.22)	(−2.23)	(−2.07)	(−1.70)	(−1.87)

Figure 2

Return patterns of $E[FIT]$ and $E[FIT*]$
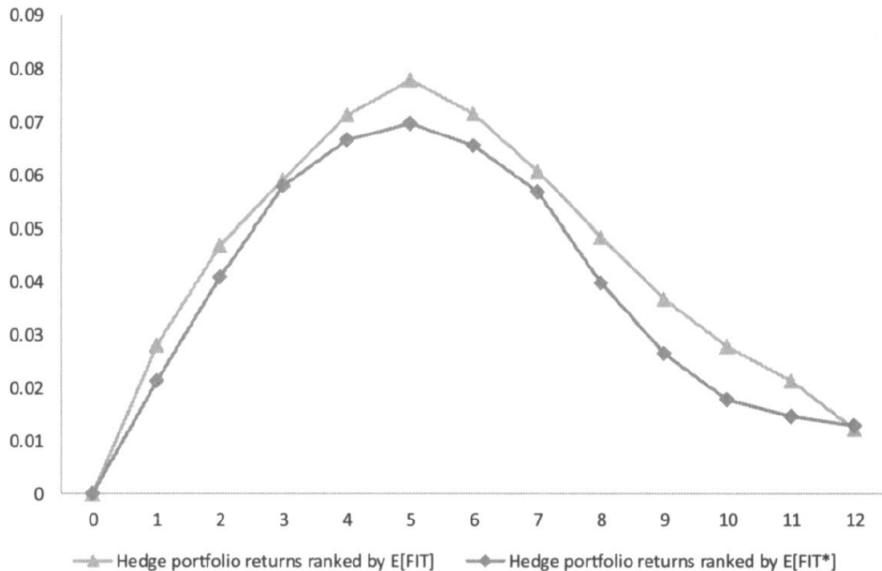
Outline

Mutual Fund Performance Predictability

- **Mutual fund performance predictability**

  - ▶ Performance persistence
  - ▶ The "smart money" effect

- **Objectives**

  - ▶ To test whether mutual fund performance predictability is driven by:

    1. Heterogeneous managerial ability
       or
    2. Predictable price pressure caused by mutual fund FIT

1. Mutual fund performance persistence

- Conducting a horse race between:
  - Four-factor fund alpha (Manager ability) and
  - $E[FIT^*]$ (Flow-induced trading)

- Interpretation:
  - If fund alpha captures ex-ante manager ability, after controlling for $E[FIT^*]$
    $\Rightarrow$ Remain significant predictor of future fund performance

  - If fund alpha predicts future performance because it predicts FIT, after controlling for $E[FIT^*]$
    $\Rightarrow$ Turn to be insignificant predictor of future fund performance

Table 6 Mutual fund performance persistence

Panel A: Mutual funds first ranked by E[FIT*] then by alpha

Quintiles of alpha	Quintiles of E[FIT*]					5 - 1	Average	Quintiles of E[FIT*]					5 - 1	Average
	1	2	3	4	5			1	2	3	4	5		
	Qtr. 1 (3-Factor Alpha)							Qtr. 1 (4-Factor Alpha)						
1	−0.17%	−0.06%	−0.06%	0.18%	0.36%	**0.53%**	0.05%	−0.09%	−0.07%	−0.08%	0.12%	0.27%	**0.36%**	0.03%
	(−1.33)	(−0.90)	(−1.03)	(2.35)	(3.33)	(2.81)	(1.08)	(−0.64)	(−1.16)	(−1.37)	(1.55)	(2.26)	(2.01)	(0.51)
2	−0.20%	−0.03%	0.01%	0.09%	0.37%	**0.57%**	0.05%	−0.11%	−0.02%	0.00%	0.06%	0.25%	**0.36%**	0.03%
	(−1.85)	(−0.49)	(0.13)	(1.50)	(3.74)	(3.27)	(1.29)	(−0.94)	(−0.40)	(−0.07)	(1.05)	(2.44)	(2.15)	(0.83)
3	−0.19%	−0.05%	−0.02%	0.09%	0.30%	**0.49%**	0.03%	−0.12%	−0.04%	−0.03%	0.08%	0.22%	**0.34%**	0.02%
	(−1.83)	(−0.88)	(−0.37)	(1.64)	(3.04)	(2.80)	(0.85)	(−1.17)	(−0.76)	(−0.54)	(1.53)	(2.12)	(1.96)	(0.55)
4	−0.09%	−0.04%	−0.03%	0.07%	0.34%	**0.42%**	0.05%	−0.03%	−0.03%	−0.03%	0.06%	0.23%	**0.25%**	0.04%
	(−0.86)	(−0.71)	(−0.46)	(1.27)	(3.40)	(2.43)	(1.32)	(−0.25)	(−0.45)	(−0.47)	(1.18)	(2.36)	(1.50)	(1.02)
5	−0.11%	0.01%	−0.01%	0.04%	0.57%	**0.69%**	0.10%	−0.05%	0.03%	0.00%	0.04%	0.48%	**0.52%**	0.10%
	(−1.02)	(0.17)	(−0.09)	(0.69)	(4.50)	(3.41)	(2.24)	(−0.41)	(0.56)	(0.01)	(0.62)	(3.44)	(2.58)	(1.95)
5 - 1	0.06%	0.07%	0.05%	−0.14%	**0.21%**		0.05%	0.04%	0.10%	0.08%	−0.08%	**0.20%**		0.07%
	(0.56)	(1.15)	(0.71)	(−1.71)	(2.67)		(1.05)	(0.35)	(1.28)	(1.07)	(−0.96)	(2.59)		(1.21)

Panel B: Mutual funds first ranked by alpha then by E[FIT*]

Quintiles of E[FIT*]	Quintiles of alpha					5 - 1	Average	Quintiles of alpha					5 - 1	Average
	1	2	3	4	5			1	2	3	4	5		
	Qtr. 1 (3-Factor Alpha)							Qtr. 1 (4-Factor Alpha)						
1	−0.31%	−0.10%	−0.05%	0.01%	0.02%	**0.32%**	−0.09%	−0.15%	−0.04%	0.00%	0.05%	0.03%	0.18%	−0.03%
	(−2.02)	(−0.96)	(−0.61)	(0.07)	(0.20)	(2.31)	(−1.01)	(−0.94)	(−0.33)	(−0.01)	(0.54)	(0.32)	(1.21)	(−0.26)
2	−0.13%	−0.08%	−0.05%	−0.03%	0.08%	0.21%	−0.04%	−0.09%	−0.05%	−0.04%	−0.01%	0.07%	0.16%	−0.03%
	(−1.26)	(−1.08)	(−0.99)	(−0.48)	(1.24)	(1.80)	(−0.79)	(−0.85)	(−0.74)	(−0.85)	(−0.20)	(1.07)	(1.36)	(−0.50)
3	−0.12%	0.00%	−0.02%	−0.06%	0.26%	**0.38%**	0.01%	−0.10%	0.00%	−0.03%	−0.04%	0.19%	**0.28%**	0.00%
	(−1.60)	(−0.03)	(−0.50)	(−1.03)	(2.75)	(2.90)	(0.29)	(−1.21)	(−0.05)	(−0.53)	(−0.76)	(1.97)	(2.31)	(0.09)
4	−0.06%	−0.04%	0.03%	0.16%	0.41%	**0.47%**	0.10%	−0.10%	−0.04%	0.02%	0.13%	0.30%	**0.40%**	0.06%
	(−1.05)	(−0.84)	(0.50)	(2.67)	(3.68)	(3.55)	(2.28)	(−1.72)	(−0.86)	(0.38)	(2.09)	(2.78)	(3.13)	(1.40)
5	0.13%	0.15%	0.29%	0.35%	0.61%	**0.48%**	0.31%	0.05%	0.10%	0.22%	0.25%	0.50%	**0.45%**	**0.23%**
	(1.53)	(1.87)	(3.55)	(3.46)	(4.73)	(4.50)	(3.70)	(0.51)	(1.23)	(2.64)	(2.24)	(3.61)	(4.21)	(2.49)
5 - 1	**0.44%**	0.26%	**0.34%**	**0.35%**	**0.60%**		**0.41%**	0.21%	0.14%	**0.23%**	0.20%	**0.47%**		**0.26%**
	(2.45)	(1.69)	(2.34)	(2.14)	(3.35)		(2.67)	(1.83)	(0.86)	(1.98)	(1.24)	(2.62)		(2.08)

2. The "smart money" effect

- **Smart Money Effect**
  - ▶ Investors are able to distinguish good managers from bad ones $\Rightarrow$ Capital flows to mutual funds should positively forecast future fund performance.

- Conducting a horse race between:
  - ▶ Past fund flows and
  - ▶ $E[FIT^*]$ (Flow-induced trading)

- Interpretation:
  - ▶ If past flows captures ex-ante manager ability, after controlling for $E[FIT^*]$
    $\Rightarrow$ Remain significant predictor of future fund performance

  - ▶ If past flows predicts future performance because it predicts FIT, after controlling for $E[FIT^*]$
    $\Rightarrow$ Turn to be insignificant predictor of future fund performance

Table 7 The smart money effect

Mutual funds independently sorted by $E[FIT^*]$ and *flow*

Quintiles of *flow*	Quintiles of $E[FIT^*]$							Quintiles of $E[FIT^*]$						
	1	2	3	4	5	5 - 1	Average	1	2	3	4	5	5 - 1	Average
	Qtr. 1 (Excess Return)							Qtr. 1 (3-Factor Alpha)						
1	0.57%	0.71%	0.68%	0.79%	1.01%	**0.45%**	**0.75%**	−0.23%	−0.04%	−0.03%	0.12%	0.36%	**0.59%**	0.03%
	(1.98)	(2.73)	(2.68)	(3.08)	(3.51)	(2.89)	(2.87)	(−2.13)	(−0.49)	(−0.54)	(1.84)	(3.67)	(3.51)	(0.68)
2	0.59%	0.69%	0.70%	0.74%	0.90%	0.30%	**0.72%**	−0.17%	−0.01%	0.00%	0.07%	0.25%	**0.43%**	0.03%
	(2.10)	(2.71)	(2.78)	(2.91)	(3.02)	(1.91)	(2.78)	(−1.65)	(−0.16)	(−0.03)	(1.33)	(2.35)	(2.54)	(0.68)
3	0.65%	0.65%	0.62%	0.69%	0.93%	0.29%	**0.71%**	−0.10%	−0.06%	−0.06%	0.04%	0.32%	**0.42%**	0.03%
	(2.30)	(2.54)	(2.51)	(2.60)	(3.21)	(1.78)	(2.73)	(−0.89)	(−0.84)	(−1.18)	(0.68)	(3.54)	(2.49)	(0.75)
4	0.66%	0.66%	0.70%	0.71%	0.91%	0.25%	**0.73%**	−0.09%	−0.05%	0.00%	0.08%	0.32%	**0.41%**	0.05%
	(2.33)	(2.54)	(2.73)	(2.69)	(3.07)	(1.60)	(2.77)	(−0.88)	(−0.66)	(0.01)	(1.48)	(3.00)	(2.21)	(1.31)
5	0.64%	0.71%	0.67%	0.80%	1.12%	**0.49%**	**0.79%**	−0.08%	−0.01%	−0.02%	0.14%	0.52%	**0.60%**	**0.10%**
	(2.19)	(2.69)	(2.53)	(2.95)	(3.66)	(2.68)	(2.92)	(−0.65)	(−0.06)	(−0.39)	(2.42)	(4.67)	(3.03)	(2.64)
5 - 1	0.07%	−0.01%	−0.01%	0.00%	0.11%		0.03%	0.14%	0.03%	0.01%	0.03%	**0.16%**		0.07%
	(0.83)	(−0.12)	(−0.19)	(0.06)	(1.25)		(0.61)	(1.56)	(0.44)	(0.18)	(0.40)	(2.02)		(1.33)

A regression approach

- **Objectives**: Separating marginal effect of $E[FIT^*]$, fund alpha, and fund flows

$$RET_{i,t+1} = \beta_0 + \beta_1 E_t[FIT_i^*] + \beta_2 alpha_{i,t} + \beta_3 flow_{i,t} + \gamma Control_t + \epsilon_{i,t+1} \tag{7}$$

Table 8 Mutual fund performance regression

Fama-MacBeth Regressions of Quarterly Fund Returns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	**0.050**	**0.053**	**0.053**	**0.054**	**0.049**	**0.051**	**0.051**
	(5.47)	(5.85)	(5.69)	(5.82)	(5.20)	(5.48)	(5.30)
$E[FIT^*]$	**3.081**				**2.602**	**2.952**	**2.687**
	(3.06)				(2.35)	(2.93)	(2.43)
$aplha_{i,t}$		**0.581**		**0.548**	0.042		0.005
		(3.82)		(3.64)	(0.24)		(0.03)
$flow_{i,t}$			**0.012**	**0.010**		0.004	0.004
			(2.28)	(2.08)		(0.82)	(0.93)
$expenses_{i,t}$	−0.351	−0.830	−0.765	−1.138	−0.319	−0.657	−0.653
	(−0.27)	(−0.55)	(−0.48)	(−0.75)	(−0.26)	(−0.51)	(−0.52)
$log(age_{i,t})$	0.000	0.000	0.001	0.001	0.000	0.000	0.001
	(0.17)	(0.47)	(0.63)	(0.90)	(0.37)	(0.65)	(0.84)
$log(numStocks_{i,t})$	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**
	(3.58)	(3.95)	(3.72)	(3.78)	(3.27)	(3.44)	(3.02)
$log(TNA_{i,t})$	−0.001	**−0.001**	**−0.001**	**−0.001**	−0.001	**−0.001**	**−0.001**
	(−1.91)	(−2.18)	(−2.18)	(−2.30)	(−1.82)	(−2.08)	(−2.00)
$turnover_{i,t}$	**0.002**	0.002	0.002	0.002	**0.001**	**0.002**	**0.001**
	(2.05)	(1.76)	(1.56)	(1.74)	(1.96)	(2.06)	(1.96)
Adjusted R^2	15.77%	11.03%	8.06%	11.91%	17.46%	16.53%	18.24%
No. observations	93,805	93,805	93,805	93,805	93,805	93,805	93,805

Recap

- Flow-induced trading drives both:
  - Mutual fund performance persistence
  - Smart money effect

Outline

Stock Price Momentum

- **Stock price momentum**
  - ▶ Investors' underreaction to information, slow diffusion of information across investors

  - ▶ Disposition effect - i.e., the tendency to sell winners and hold on to losers

  - ▶ Self-serving attribution bias

- **Flow-based explanation**

$$ret_{j,t+1:t+3} = \beta_0 + \beta_1 E_t[FIT_j^k] + \beta_2 ret_{j,t-k:t-1} + \gamma Control_t + \epsilon_{j,t+1:t+3}$$
(8)

where $E_t[FIT_j^k] = E[FIT]$ conditioned on market-adjusted fund returns in the previous k months

Table 9 Stock price momentum

Panel A: The full sample

	k = 12		k = 6		k = 3	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	**0.103**	**0.092**	**0.096**	**0.077**	**0.094**	**0.084**
	(2.81)	(2.36)	(2.63)	(2.01)	(2.58)	(2.34)
$E_t[FIT_j^k]$		**0.085**		**0.145**		**0.250**
		(3.07)		(2.93)		(3.32)
$ret_{j,t-k:t-1}$	**0.020**	**0.015**	**0.027**	**0.020**	**0.024**	0.014
	(4.06)	(3.31)	(3.59)	(2.82)	(2.29)	(1.40)
$ret_{j,t}$	−0.024	**−0.029**	−0.024	**−0.030**	−0.020	**−0.029**
	(−1.67)	(−2.16)	(−1.63)	(−2.26)	(−1.35)	(−2.18)
$ret_{j,t-36,t-k-1}$	**−0.005**	**−0.004**	**−0.004**	**−0.004**	**−0.004**	**−0.004**
	(−3.19)	(−3.05)	(−2.64)	(−2.56)	(−2.54)	(−2.54)
$bm_{j,t}$	0.005	0.005	0.005	0.005	0.006	0.006
	(1.33)	(1.37)	(1.25)	(1.42)	(1.40)	(1.78)
$\log(mktcap_{j,t})$	**−0.003**	−0.003	**−0.003**	−0.002	−0.003	−0.002
	(−2.16)	(−1.73)	(−1.96)	(−1.33)	(−1.88)	(−1.59)
$turnover_{j,t}$	**−0.004**	**−0.005**	−0.004	**−0.004**	−0.004	**−0.004**
	(−2.02)	(−2.26)	(−1.87)	(−2.06)	(−1.63)	(−2.05)
Adjusted R^2	7.08%	7.85%	6.75%	7.85%	6.38%	7.88%
No. observations	198,692	198,692	198,692	198,692	198,692	198,692

Table 9 Stock price momentum

	Panel B: Subsample analyses ($k=6$)							
	1980–1993		1994–2006		Small-Cap Stocks		Large-Cap Stocks	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.072	0.065	**0.119**	0.090	**0.653**	**0.631**	**0.223**	**0.190**
	(1.37)	(1.29)	(2.54)	(1.65)	(5.53)	(5.16)	(5.84)	(4.28)
$E_t[FIT_j^k]$		0.106		**0.203**		**0.158**		**0.175**
		(1.80)		(3.44)		(3.50)		(3.35)
$ret_{j,t-k:t-1}$	**0.032**	**0.027**	**0.023**	0.014	**0.035**	**0.028**	**0.021**	0.011
	(2.77)	(2.75)	(2.44)	(1.92)	(4.82)	(4.62)	(3.10)	(1.57)
$ret_{j,t}$	−0.022	−0.027	−0.022	−0.029	−0.012	−0.018	−0.031	**−0.041**
	(−1.10)	(−1.43)	(−1.07)	(−1.60)	(−0.85)	(−1.39)	(−1.55)	(−2.36)
$ret_{j,t-36,t-k-1}$	−0.003	−0.003	**−0.006**	**−0.006**	**−0.005**	**−0.004**	−0.003	−0.003
	(−1.83)	(−1.83)	(−4.13)	(−4.11)	(−2.41)	(−2.27)	(−1.68)	(−1.62)
$bm_{j,t}$	0.004	0.003	0.007	0.008	0.006	0.006	0.002	0.003
	(0.78)	(0.77)	(1.12)	(1.36)	(1.45)	(1.47)	(0.43)	(0.86)
$\log(mktcap_{j,t})$	−0.002	−0.001	**−0.004**	−0.003	**−0.033**	**−0.032**	**−0.008**	**−0.007**
	(−0.76)	(−0.60)	(−2.21)	(−1.35)	(−6.47)	(−6.12)	(−5.57)	(−3.93)
$turnover_{j,t}$	**−0.007**	**−0.007**	−0.001	−0.001	**−0.006**	**−0.006**	−0.001	−0.002
	(−2.23)	(−2.31)	(−0.29)	(−0.41)	(−2.49)	(−2.73)	(−0.44)	(−0.84)
Adjusted R^2	7.76%	8.44%	5.69%	6.99%	6.78%	7.55%	8.81%	9.96%
No. observations	65,047	65,047	133,645	133,645	89,255	89,255	109,437	109,437

Outline

Flow-Induced Stock Return Comovement

- **Objectives**
  - ▶ To test whether stocks held by mutual funds with similar flows would experience correlated flow-induced trading
    ⇒ Comoving with each other

- **How to tackle...?**
  - ▶ Comovement in FIT

$$FIT_{j,t} = \beta_0 + \beta_1 FIT_{grp,t} + \beta_2 FIT_{ffind,t} + \epsilon_{j,t} \tag{9}$$

where:
$FIT_{grp,t}$ = average flow-induced trading in the $E[FIT]$ quintile to which stock j belongs
$FIT_{ffind,t}$ = average FIT of FF-48 industry to which stock j belongs

Flow-Induced Stock Return Comovement

- Comovement in stock returns

$$ret_{j,t} = \beta_0 + \beta_1 ret_{grp,t} + \beta_2 ret_{ffind,t} + \gamma CommonRiskFactors_t + \epsilon_{j,t} \quad (10)$$

where:
$ret_{grp,t}$ = value-weighted return of the quintile to which stock j belongs
$ret_{ffind,t}$ = value-weighted return of FF-48 industry to which stock j belongs

- **Result**
  - ▶ FIT could be important factor driving both the first and second moments of asset returns

Table 10 Stock return comovement

Panel A: Comovement in monthly *FIT*					
Rank by $E[FIT]$	1	2	3	4	5
$FIT_{grp,t}$	0.626	0.413	0.169	0.573	0.751
	(2.69)	(2.54)	(0.91)	(3.16)	(2.84)
$FIT_{ffind,t}$	1.072	0.993	0.978	0.907	0.962
	(4.63)	(6.42)	(10.13)	(7.34)	(4.11)
Adjusted R^2	53.82%	52.69%	51.70%	53.17%	54.98%
No. observations	31,329	31,329	31,329	31,329	31,329

Panel B: Comovement in weekly stock returns					
Rank by $E[FIT]$	1	2	3	4	5
$ret_{grp,t}$	0.199	0.128	0.116	0.152	0.230
	(6.84)	(6.00)	(7.60)	(8.30)	(8.78)
$ret_{ffind,t}$	0.419	0.487	0.507	0.483	0.402
	(18.10)	(26.85)	(29.84)	(27.46)	(24.32)
$ret_{mkt,t}$	0.369	0.370	0.368	0.372	0.368
	(13.50)	(17.02)	(17.13)	(14.66)	(9.45)
$ret_{smb,t}$	0.658	0.562	0.521	0.589	0.668
	(25.14)	(35.46)	(33.36)	(31.65)	(17.26)
$ret_{hml,t}$	0.149	0.127	0.143	0.134	0.129
	(7.07)	(6.75)	(6.72)	(5.02)	(4.28)
$ret_{umd,t}$	−0.100	−0.068	−0.055	−0.045	−0.027
	(−8.78)	(−6.72)	(−4.62)	(−3.24)	(−2.36)
Adjusted R^2	27.22%	30.65%	31.73%	30.34%	26.74%
No. observations	39,170	39,170	39,170	39,170	39,170

Outline

Conclusion

- Flow-induced trading by mutual fund:

  1. Positively forecasts future stock and fund returns in short run, Negatively in the long run

  2. Drives mutual fund performance persistence, smart money effect, and partially stock price momentum

Thank you!

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