Online Appendix

to accompany

Do Funds Make More When They Trade More?

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1. Results for the Recent Subsample

Table A1
Turnover-Performance Relation in the Cross Section and Time Series

This table is the same as Table 1 in the main paper, but uses data from 2000–2011.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	-0.000237	-0.000364
	(-1.00)	(-1.71)
Yes	0.00104	0.000732
	(4.37)	(3.74)

Table A2
Turnover-Performance Relation in Fund-Size and Expense-Ratio Categories

This table is the same as Table 2 in the main paper, but uses data from 2000–2011.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
All	0.00073	0.00105	0.00046	0.00035	0.00070
	(3.74)	(3.58)	(2.14)	(1.50)	(2.16)
Small	0.00152	0.00167	0.00197	0.00005	0.00163
	(5.27)	(4.54)	(4.15)	(0.15)	(3.38)
Medium	0.00019	0.00030	0.00002	0.00003	0.00027
	(0.74)	(0.71)	(0.05)	(0.08)	(0.52)
Large	-0.00027	0.00007	-0.00099	0.00026	-0.00019
	(-0.75)	(0.10)	(-2.50)	(0.71)	(-0.26)
Small–Large	0.00178	0.00160	0.00296	-0.00021	0.00141*
	(3.97)	(1.95)	(4.37)	(-0.45)	(2.87)

* Small/High – Large/Low

Table A3
Properties of Fund Turnover in Fund-Size and Expense-Ratio Categories

This table is the same as Table 3 in the main paper, but uses data from 2000–2011.

	Fund Expense Ratio					
Fund Size	All	High	Medium	Low	High–Low	(t-stat.)
			Panel A: Average Fund Turnover			
All	0.872	1.004	0.847	0.764	0.240	(8.18)
Small	0.931	1.035	0.831	0.865	0.170	(3.53)
Medium	0.926	1.062	0.893	0.802	0.260	(5.91)
Large	0.767	0.850	0.813	0.696	0.154	(3.52)
Small–Large	0.164	0.185	0.019	0.169	0.339*	
(t-statistic)	(5.95)	(3.99)	(0.47)	(3.83)	(8.21)	
			Panel B: Within-Fund Volatility of Turnover			
All	0.409	0.480	0.383	0.354	0.126	(6.63)
Small	0.443	0.516	0.369	0.380	0.137	(4.37)
Medium	0.420	0.489	0.398	0.353	0.135	(5.27)
Large	0.365	0.389	0.378	0.342	0.047	(1.81)
Small–Large	0.079	0.127	-0.009	0.037	0.174*	
(t-statistic)	(4.21)	(4.23)	(-0.37)	(1.42)	(5.70)	
			Panel C: Within-Fund Autocorrelation of Turnover			
All	0.431	0.440	0.442	0.400	0.041	(1.09)
Small	0.379	0.412	0.319	0.339	0.073	(0.97)
Medium	0.411	0.448	0.414	0.333	0.115	(2.02)
Large	0.512	0.502	0.565	0.471	0.030	(0.61)
Small–Large	-0.133	-0.089	-0.246	-0.132	-0.059*	
(t-statistic)	(-3.62)	(-1.56)	(-3.93)	(-1.96)	(-1.17)	

Table A4
Average Fund Returns Within Fund-Size and Expense-Ratio Categories

This table is the same as Table 4 in the main paper, but uses data from 2000–2011.

	Fund Expense Ratio					
Fund Size	All	High	Medium	Low	High–Low	(t-stat.)
Panel A: Average Benchmark-Adjusted Gross Return ($GrossR$)						
All	0.0832	0.0827	0.0919	0.0750	0.0077	(0.34)
Small	0.0883	0.0825	0.1102	0.0688	0.0137	(0.45)
Medium	0.0851	0.0934	0.1047	0.0523	0.0411	(1.37)
Large	0.0772	0.0681	0.0622	0.0919	-0.0237	(-0.77)
Small–Large	0.0111	0.0144	0.0479	-0.0230	-0.0093*	
(t-statistic)	(0.57)	(0.42)	(1.78)	(-0.95)	(-0.33)	
Panel B: Average Benchmark-Adjusted Net Return						
All	-0.0209	-0.0589	-0.0089	0.0047	-0.0637	(-2.79)
Small	-0.0270	-0.0643	0.0081	-0.0036	-0.0607	(-1.96)
Medium	-0.0211	-0.0476	0.0041	-0.0197	-0.0279	(-0.93)
Large	-0.0152	-0.0647	-0.0378	0.0236	-0.0883	(-2.85)
Small–Large	-0.0118	0.0004	0.0459	-0.0271	-0.0878*	
(t-statistic)	(-0.60)	(0.01)	(1.70)	(-1.13)	(-3.06)	

Table A5
What Explains Average Turnover?

This is the same as Table 5 in the main paper, but uses data from 2000–2011.

	(1)	(2)	(3)	(4)
$Sentiment_t$	0.0430			0.0262
	(4.47)			(3.62)
$Volatility_t$		0.853		0.462
		(3.93)		(5.34)
$Liquidity_t$			-0.235	-0.109
			(-2.62)	(-3.84)
$Business\ Cycle_t$				-0.0270
				(-5.31)
$Market\ Return_t$				-0.0380
				(-1.06)
$Time\ Trend_t$	-0.000705	-0.000702	-0.00109	-0.000742
	(-1.73)	(-2.24)	(-2.71)	(-2.60)
R^2	0.393	0.618	0.398	0.791
$R^2 - R^2$(trend only)	0.048	0.274	0.053	0.446
Observations	132	142	142	132

Table A6
Relation Between Fund Performance and Average Turnover

This table is the same as Table 6 in the main paper, but uses data from 2000–2011.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$AvgTurn_{t-1}$	0.0116	0.0113	0.000627	0.0125	0.0275	0.0375	0.0375
	(2.70)	(2.62)	(0.15)	(1.76)	(2.70)	(2.31)	(2.31)
$AvgTurn_{t-1} \times AvgCorr_{t-1}$					-0.350	-0.668	-0.659
					(-2.70)	(-3.25)	(-3.21)
$AvgCorr_{t-1}$				-0.0414	0.290	0.584	0.576
				(-2.19)	(2.54)	(3.25)	(3.21)
$FundTurn_{i,t-1}$		0.000757	0.000771	0.000749	0.000738	0.000813	*
		(3.71)	(3.78)	(3.69)	(3.64)	(3.89)	
$IndustrySize_{t-1}$			-0.0917	-0.0902	-0.0972	-0.0523	-0.0531
			(-4.11)	(-4.14)	(-4.34)	(-2.67)	(-2.70)
$Sentiment_{t-1}$						0.00290	0.00291
						(3.42)	(3.43)
$Volatility_{t-1}$						0.0139	0.0137
						(1.24)	(1.22)
$Liquidity_{t-1}$						-0.00568	-0.00577
						(-1.25)	(-1.27)
Observations	221316	214970	214970	214970	214970	199226	199195

Table A7
Commonality in Turnover

This table is the same as Table 7 in the main paper, but uses data from 2000–2011.

	Fund Expense Ratio			
Fund Size	All	High	Medium	Low
	Panel A: Average Correlation of $FundTurn$ and $AvgTurn$			
All	0.171	0.159	0.187	0.167
Small	0.131	0.106	0.159	0.139
Medium	0.143	0.180	0.145	0.095
Large	0.233	0.224	0.255	0.222
	Panel B: Average Correlation of $FundTurn$ and $OwnCellAvgTurn$			
All	0.179	0.156	0.177	0.205
Small	0.143	0.122	0.142	0.187
Medium	0.153	0.169	0.135	0.157
Large	0.235	0.198	0.249	0.242

Table A8
Relation Between Fund Performance and Within-Category Average Turnover

This table is the same as Table 8 in the main paper, but uses data from 2000–2011.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$OwnCellAvgTurn_{i,t-1}$	0.00980	0.00807	0.00801	0.00664	0.00625	0.0126	0.00503
	(4.71)	(7.20)	(7.41)	(7.28)	(6.97)	(5.61)	(1.76)
$OwnCellAvgTurn_{i,t-1} \times AvgCorr_{t-1}$						-0.0954	-0.0645
						(-3.16)	(-2.03)
$AvgCorr_{t-1}$					-0.0437	0.0449	0.0155
					(-2.19)	(1.91)	(0.62)
$AvgTurn_{t-1}$		0.00411	0.00400	-0.0148	-0.00150	-0.00296	0.00286
		(1.00)	(0.96)	(-2.34)	(-0.17)	(-0.35)	(0.33)
$FundTurn_{i,t-1}$			0.000598	0.000711	0.000700	0.000699	*
			(2.99)	(3.41)	(3.37)	(3.37)	
$IndustrySize_{t-1}$				-0.0594	-0.0559	-0.0542	-0.0557
				(-2.93)	(-2.83)	(-2.76)	(-2.82)
$Sentiment_{t-1}$				0.00175	0.00203	0.00213	0.00214
				(2.69)	(2.88)	(2.99)	(3.00)
$Volatility_{t-1}$				0.0179	0.0149	0.0145	0.0151
				(1.53)	(1.31)	(1.28)	(1.33)
$Liquidity_{t-1}$				-0.00782	-0.00678	-0.00659	-0.00672
				(-1.80)	(-1.53)	(-1.48)	(-1.52)
Observations	221252	221252	214970	199226	199226	199226	199195

Table A9
Timing Investment Strategy

This table is the same as Table 9 in the main paper, but uses data from 2000–2011.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
Panel A: Dollar-Weighted Average Excess Timing-Strategy Return					
All	0.0174	0.0339	0.0137	0.0045	0.0294
	(4.30)	(4.45)	(2.75)	(1.26)	(4.00)
Small	0.0347	0.0470	0.0410	0.0015	0.0454
	(5.58)	(4.26)	(4.87)	(0.18)	(3.37)
Medium	0.0124	0.0248	0.0090	0.0016	0.0232
	(2.10)	(1.92)	(1.32)	(0.29)	(1.73)
Large	0.0069	0.0241	-0.0051	0.0075	0.0166
	(1.26)	(2.26)	(-0.70)	(1.23)	(1.74)
Small–Large	0.0278	0.0228	0.0461	-0.0060	0.0394*
	(3.97)	(1.66)	(4.66)	(-0.54)	(3.45)
Panel B: Time-Weighted Average Excess Timing-Strategy Return					
All	0.0189	0.0368	0.0148	0.0052	0.0316
	(2.62)	(3.11)	(1.98)	(0.95)	(3.63)
Small	0.0400	0.0584	0.0431	0.0027	0.0556
	(4.23)	(3.69)	(3.37)	(0.26)	(3.40)
Medium	0.0129	0.0260	0.0095	0.0017	0.0243
	(1.88)	(1.99)	(1.21)	(0.28)	(1.87)
Large	0.0074	0.0233	-0.0056	0.0083	0.0150
	(0.88)	(1.79)	(-0.58)	(1.10)	(1.61)
Small–Large	0.0325	0.0350	0.0487	-0.0056	0.05*
	(4.32)	(2.40)	(3.56)	(-0.47)	(3.99)

Table A10
Cross-Sectional Investment Strategy

This table is the same as Table 10 in the main paper, but uses data from 2000–2011.

	$FundTurn_{i,t-1}$/trailing-average turnover				
Sample months	Low	Medium	High	High - Low	F-test p-value
		Panel A: Gross Returns			
Full Sample	0.0838	0.1125	0.0939	0.0101	0.308
	(2.04)	(2.09)	(1.93)	(0.47)	
High Sentiment	0.1793	0.2757	0.2259	0.0466	0.044
	(2.39)	(2.65)	(2.45)	(1.27)	
Low Sentiment	-0.0034	-0.0116	-0.0093	-0.0060	0.926
	(-0.07)	(-0.25)	(-0.20)	(-0.22)	
High–Low	0.1826	0.2873	0.2352	0.0526	
	(2.08)	(2.51)	(2.27)	(1.16)	
		Panel B: Net Returns			
Full Sample	-0.0193	0.0088	-0.0098	0.0095	0.311
	(-0.47)	(0.16)	(-0.20)	(0.45)	
High Sentiment	0.0783	0.1726	0.1234	0.0451	0.046
	(1.05)	(1.66)	(1.34)	(1.24)	
Low Sentiment	-0.1096	-0.1172	-0.1157	-0.0061	0.939
	(-2.38)	(-2.50)	(-2.42)	(-0.23)	
High–Low	0.1879	0.2898	0.2391	0.0512	
	(2.14)	(2.54)	(2.30)	(1.13)	

2. Additional Results

Table A11
Summary Statistics

Variable	N	Mean	Stdev	P1	P25	P50	P75	P99
Fund Return	314,580	0.0064	0.0537	-0.1539	-0.0210	0.0100	0.0375	0.1329
Benchmark-adjusted return	314,580	-0.0005	0.0229	-0.0638	-0.0106	-0.0009	0.0090	0.0669
Expense ratio	314,580	0.0010	0.0004	0.0003	0.0008	0.0010	0.0012	0.0021
GrossR	314,580	0.0005	0.0229	-0.0627	-0.0095	0.0001	0.0100	0.0680
FundTurn	285,897	0.8480	0.7212	0.0300	0.3500	0.6500	1.1200	3.9900
Sentiment	296,500	0.1767	0.6085	-0.7785	-0.2113	0.0501	0.4034	2.1290
Volatility	314,580	0.1678	0.0493	0.1067	0.1355	0.1564	0.1865	0.3434
Liquidity	314,580	-0.0316	0.0748	-0.3036	-0.0605	-0.0232	0.0119	0.1212
Business Cycle	314,580	-0.2279	0.9275	-4.1400	-0.5500	-0.0800	0.3900	1.2500
Lagged Mkt. Return	314,580	0.0897	0.1931	-0.3820	-0.0420	0.1275	0.2099	0.5149
AvgTurn	309,695	0.8576	0.0820	0.7036	0.7977	0.8399	0.9252	1.0217
AvgCorr	313,367	0.0599	0.0339	0.0159	0.0347	0.0512	0.0791	0.1529
IndustrySize	314,580	0.1407	0.0394	0.0237	0.1274	0.1451	0.1719	0.1842

Table A12
Counterpart of Paper's Table 1 with Fund and Benchmark-Month Fixed Effects

This table is the same as Table 1 in the main paper, except we replace month fixed effects with benchmark-month fixed effects.

	Benchmark-Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	0.000400	0.000268
	(1.92)	(1.48)
Yes	0.00123	0.00122
	(6.63)	(7.96)

Table A13
Counterpart of Paper's Table 1 with Benchmark-Adjusted Net Returns

This table is the same as Table 1 in the main paper, except we replace benchmark-adjusted gross fund returns ($GrossR$) with benchmark-adjusted net fund returns.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	0.000308	0.000216
	(1.48)	(1.14)
Yes	0.00119	0.00103
	(6.45)	(6.56)

Table A14
Counterpart of Paper's Table 1 with Passive Index Funds

This table is the same as Table 1 in the main paper, except we use data on mutual funds that Morningstar classifies as index funds. To remove active funds that may be accidentally classified as passive funds, we exclude funds with turnover greater than 100% per year and funds with expense ratio greater than 1% per year. There are 12,520 observations in each regression.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	0.0000363	0.00000786
	(0.05)	(0.01)
Yes	-0.000467	-0.000851
	(-0.51)	(-1.07)

Table A15
Robustness to Flow-Induced Turnover

The dependent variable in each regression is $GrossR_{i,t}$, fund i's benchmark-adjusted gross return in month t. We consider two measures of lagged flow-induced turnover, denoted $FlowTurn1_{i,t-1}$ and $FlowTurn2_{i,t-1}$. Both measures are computed from the monthly series of fund size and fund returns, and both are measured over the same 12-month period as $FundTurn_{i,t-1}$. $FlowTurn1_{i,t-1}$ is the sum of the absolute values of the 12 monthly dollar flows, divided by the average fund size during the 12-month period. $FlowTurn2_{i,t-1}$ is the smaller of two sums, one of all positive dollar flows and one of all negative flows during the 12-month period, divided by average fund size. We winsorize both measures at the 1st and 99th percentiles. The remaining variables are defined in Table 6 in the paper. All regressions include fund fixed effects. t-statistics are computed as in Table 1. Data are from 1979–2011.

	(1)	(2)	(3)	(4)	(5)	(6)
$FlowTurn1_{i,t-1}$	0.000258	0.000189	-0.000272			
	(1.11)	(0.83)	(-1.23)			
$FlowTurn2_{i,t-1}$				0.000838	0.000438	-0.000518
				(1.35)	(0.72)	(-0.81)
$FundTurn_{i,t-1}$		0.00103	0.000881		0.00103	0.000879
		(5.08)	(4.72)		(5.03)	(4.66)
$AvgTurn_{t-1}$			0.0271			0.0272
			(2.32)			(2.32)
$AvgTurn_{t-1} \times AvgCorr_{t-1}$			-0.275			-0.275
			(-2.11)			(-2.11)
$AvgCorr_{t-1}$			0.199			0.200
			(1.85)			(1.85)
$IndustrySize_{t-1}$			-0.0164			-0.0159
			(-1.68)			(-1.63)
$Sentiment_{t-1}$			0.00260			0.00260
			(3.49)			(3.48)
$Volatility_{t-1}$			0.0106			0.0106
			(1.24)			(1.23)
$Liquidity_{t-1}$			-0.00252			-0.00252
			(-0.73)			(-0.73)
Observations	214200	214200	200180	214200	214200	200180

Table A16
Counterpart of Paper's Table 1 with Annual Data

This table is the same as Table 1 in the main paper, except for four changes: the unit of observation is the fund-fiscal year; $GrossR$ is the fund's annual benchmark-adjusted gross return; we replace month FEs with fiscal year FEs; and we cluster by Morningstar sector × fiscal year. There are 16,629 observations in each regression.

	Fiscal Year Fixed Effects	
Fund Fixed Effects	No	Yes
No	0.0120	0.0107
	(2.76)	(2.53)
Yes	0.0200	0.0169
	(5.56)	(4.95)

Table A17
Interacting Turnover with Time Since Turnover

The dependent variable is $GrossR_{i,t}$. Columns 1 and 3 match the bottom row of Table 1 in the main paper. $NmonthsSince_{i,t}$ is the number of months elapsed between the end of 12-month period used to measure $FundTurn_{i,t-1}$ and the end of month t. Its value ranges from 1 to 12.

	(1)	(2)	(3)	(4)
$FundTurn_{i,t-1}$	0.00123	0.00146	0.00106	0.00121
	(6.63)	(5.03)	(6.77)	(5.71)
$FundTurn_{i,t-1} \times NmonthsSince_{i,t}$		-0.0000365		-0.0000235
		(-1.25)		(-1.24)
Observations	285897	285897	285897	285897
Fund FEs	Yes	Yes	Yes	Yes
Month FEs	No	No	Yes	Yes

Table A18
Additional Lags of Turnover

The dependent variable is $GrossR_{i,t}$. $FundTurn_{i,t-1}$ is fund turnover in the previous fiscal year, $FundTurn_{i,t-2}$ is fund turnover two fiscal years ago, and $FundTurn_{i,t-3}$ is fund turnover three fiscal years ago. The regression includes fund fixed effects. t-statistics are computed as in Table 1. Data are from 1979–2011.

$FundTurn_{i,t-1}$	0.000751
	(3.84)
$FundTurn_{i,t-2}$	-0.000167
	(-0.89)
$FundTurn_{i,t-3}$	0.0000654
	(0.39)
Observations	200498

Table A19
Counterpart of Paper's Table 1 in Cold-IPO-Market Subperiod (2001–2011)

This table is the same as Table 1 in the main paper, but uses data from 2001–2011.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	-0.000404	-0.000464
	(-1.95)	(-2.67)
Yes	0.000701	0.000520
	(3.21)	(3.23)

Table A20
Counterpart of Paper's Table 1 with Fama-French-Adjusted Returns

This table is the same as Table 1 in the main paper, except it replaces $GrossR$ with Fama-French adjusted gross returns. Specifically, the dependent variable equals the fund's gross return minus the risk-free rate minus the three Fama-French excess factor returns times their respective estimated betas. Beta estimates are fund-specific. If the fund has fewer than 24 monthly observations, we use the average estimated betas across all funds in the same Morningstar category.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	0.000245	0.000230
	(1.24)	(1.32)
Yes	0.00110	0.00107
	(7.14)	(8.17)

Table A21
Counterpart of Paper's Table 1 with Four-Factor-Adjusted Returns

This table is the same as Table 1 in the main paper, except it replaces $GrossR$ with four-factor-adjusted gross returns. Specifically, the dependent variable equals the fund's gross return minus the risk-free rate, minus the three Fama-French excess factor returns times their respective estimated betas, minus the momentum excess return times the fund's momentum beta. Beta estimates are fund-specific. If the fund has fewer than 24 monthly observations, we use the average estimated betas across all funds in the same Morningstar category.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	-0.00000560	-0.0000321
	(-0.03)	(-0.23)
Yes	0.00114	0.00109
	(7.95)	(8.76)

Table A22
Counterpart of Paper's Table 1 with Estimated Morningstar Betas

This table is the same as Table 1 in the main paper, except it replaces $GrossR$ with Morningstar-adjusted returns with estimated betas. Specifically, the dependent variable equals the fund's gross return minus the product of Morningstar's benchmark return and the fund's estimated beta against that benchmark. If the fund has fewer than 24 monthly observations, we use the average estimated beta across all funds in the same Morningstar category.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	0.000291	0.000230
	(1.48)	(1.26)
Yes	0.00122	0.00106
	(7.67)	(7.62)

Table A23
Counterpart of Paper's Table 1 Allowing Morningstar Betas to Vary with Turnover

This table is the same as Table 1 in the main paper, except it replaces $GrossR$ with Morningstar-adjusted returns with estimated betas that vary over time with lagged turnover. For each fund we regress the fund's excess gross return on the excess Morningstar benchmark and its interaction with lagged fund turnover. The dependent variable equals the estimated intercept plus residual from those regressions. If the fund has fewer than 24 monthly observations, we use the average estimated slopes across all funds in the same Morningstar category.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	0.000232	0.000181
	(1.21)	(1.01)
Yes	0.00114	0.00100
	(7.49)	(7.39)

Table A24
Counterpart of Paper's Table 1 Allowing Fama-French Betas to Vary with Turnover

This table is the same as Table 1 in the main paper, except it replaces $GrossR$ with Fama-French-adjusted returns with estimated betas that vary over time with lagged turnover. For each fund we regress the fund's excess gross return on the three Fama-French factors and their interaction with lagged fund turnover. The dependent variable equals the estimated intercept plus residual from those regressions. If the fund has fewer than 24 monthly observations, we use the average estimated slopes across all funds in the same Morningstar category.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
No	0.0000744	0.0000757
	(0.40)	(0.46)
Yes	0.000734	0.000725
	(5.21)	(6.07)

Table A25
Counterpart of Paper's Table 2 with Adjusted Gross Alpha

This table is the same as Table 2 in the main paper, except it replaces the fund's expense ratio with the fund's adjusted gross alpha, the measure of fund skill from Pastor, Taylor, Stambaugh (2014).

	Adjusted Gross Alpha				
Fund Size	All	High	Medium	Low	High–Low
All	0.00123	0.00203	0.00102	-0.00006	0.00209
	(6.63)	(6.90)	(5.03)	(-0.29)	(5.79)
Small	0.00186	0.00252	0.00106	-0.00013	0.00265
	(7.56)	(6.48)	(3.34)	(-0.37)	(5.20)
Medium	0.00086	0.00158	0.00092	-0.00007	0.00166
	(3.74)	(4.43)	(3.02)	(-0.24)	(3.81)
Large	0.00043	0.00093	0.00081	-0.00025	0.00118
	(1.46)	(1.91)	(2.61)	(-0.88)	(2.09)
Small–Large	0.00143	0.00159	0.00025	0.00012	0.00277*
	(4.11)	(2.77)	(0.57)	(0.27)	(5.50)

* Small/High – Large/Low

Table A26
Counterpart of Paper's Table 2 with Unadjusted Gross Alpha

This table is the same as Table 2 in main paper, except it replaces the expense ratio with the fund's unadjusted alpha, defined as the fund's full-sample average $GrossR$.

	Unadjusted Gross Alpha				
Fund Size	All	High	Medium	Low	High–Low
All	0.00123	0.00231	0.00089	0.00036	0.00195
	(6.63)	(6.93)	(4.35)	(1.44)	(4.78)
Small	0.00186	0.00337	0.00128	0.00069	0.00267
	(7.56)	(7.03)	(4.10)	(1.65)	(4.03)
Medium	0.00086	0.00154	0.00066	0.00013	0.00141
	(3.74)	(4.13)	(2.40)	(0.36)	(2.87)
Large	0.00043	0.00076	0.00065	-0.00015	0.00091
	(1.46)	(1.69)	(2.00)	(-0.31)	(1.48)
Small–Large	0.00143	0.00261	0.00064	0.00085	0.00352*
	(4.11)	(5.05)	(1.43)	(1.20)	(5.50)

* Small/High – Large/Low

Table A27
Counterpart of Paper's Table 2 with Fama-French-Adjusted Returns

This table is the same as Table 2 in main paper, except it replaces $GrossR$ with Fama-French adjusted gross returns. Specifically, the dependent variable equals the fund's gross return minus the risk-free rate minus the three Fama-French excess factor returns times their respective estimated betas. Beta estimates are fund-specific. If the fund has fewer than 24 monthly observations, we use the average estimated betas across all funds in the same Morningstar category.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
All	0.00110	0.00133	0.00091	0.00076	0.00057
	(7.14)	(6.50)	(4.72)	(4.20)	(2.63)
Small	0.00156	0.00147	0.00215	0.00076	0.00070
	(7.75)	(5.47)	(6.40)	(2.69)	(1.90)
Medium	0.00080	0.00092	0.00075	0.00066	0.00026
	(4.31)	(3.33)	(2.94)	(2.74)	(0.75)
Large	0.00043	0.00119	-0.00012	0.00052	0.00067
	(1.58)	(2.27)	(-0.43)	(1.90)	(1.44)
Small–Large	0.00113	0.00028	0.00228	0.00025	0.00095*
	(3.37)	(0.46)	(5.20)	(0.64)	(2.55)

* Small/High – Large/Low

Table A28
Counterpart of Paper's Table 2 with Four-Factor-Adjusted Returns

This table is the same as Table 2 in main paper, except it replaces $GrossR$ with four-factor-adjusted gross returns. Specifically, the dependent variable equals the fund's gross return minus the risk-free rate minus the three Fama-French excess factor returns times their respective estimated betas, minus the momentum excess return times the fund's momentum beta. Beta estimates are fund-specific. If the fund has fewer than 24 monthly observations, we use the average estimated betas across all funds in the same Morningstar category.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
All	0.00114	0.00135	0.00095	0.00081	0.00054
	(7.95)	(7.03)	(5.39)	(4.74)	(2.58)
Small	0.00148	0.00136	0.00204	0.00086	0.00050
	(7.68)	(5.35)	(6.27)	(3.19)	(1.43)
Medium	0.00090	0.00105	0.00087	0.00064	0.00041
	(5.28)	(4.24)	(3.66)	(2.78)	(1.29)
Large	0.00052	0.00130	-0.00003	0.00059	0.00071
	(2.14)	(2.66)	(-0.10)	(2.38)	(1.55)
Small–Large	0.00096	0.00006	0.00206	0.00027	0.00077*
	(3.20)	(0.11)	(5.00)	(0.76)	(2.27)

* Small/High – Large/Low

Table A29
Counterpart of Paper's Table 2 with Estimated Morningstar Betas

This table is the same as Table 2 in the main paper, except it replaces $GrossR$ with Morningstar-adjusted returns with estimated betas. Specifically, the dependent variable equals the fund's gross return minus the product of Morningstar's benchmark return and the fund's estimated beta against that benchmark. If the fund has fewer than 24 monthly observations, we use the average estimated beta across all funds in the same Morningstar category.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
All	0.00122	0.00167	0.00095	0.00060	0.00106
	(7.67)	(7.69)	(4.99)	(3.10)	(4.60)
Small	0.00172	0.00180	0.00221	0.00039	0.00141
	(8.37)	(6.59)	(6.06)	(1.34)	(3.61)
Medium	0.00095	0.00125	0.00087	0.00046	0.00079
	(5.07)	(4.36)	(3.47)	(1.83)	(2.23)
Large	0.00045	0.00149	-0.00017	0.00045	0.00104
	(1.64)	(2.62)	(-0.56)	(1.58)	(2.01)
Small–Large	0.00126	0.00031	0.00237	-0.00006	0.00135*
	(3.86)	(0.49)	(5.06)	(-0.16)	(3.57)

* Small/High – Large/Low

Table A30
Counterpart of Paper's Table 2 Allowing Fama-French Betas to Vary with Turnover

This table is the same as Table 2 in the main paper, except it replaces $GrossR$ with Fama-French-adjusted returns with estimated betas that vary over time with lagged fund turnover. For each fund we regress the fund's excess gross return on the three Fama-French factors and their interaction with lagged fund turnover. The dependent variable equals the estimated intercept plus residual from those regressions. If the fund has fewer than 24 monthly observations, we use the average estimated slopes across all funds in the same Morningstar category.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
All	0.00073	0.00096	0.00046	0.00050	0.00046
	(5.21)	(5.06)	(2.64)	(2.95)	(2.27)
Small	0.00117	0.00116	0.00140	0.00053	0.00063
	(6.05)	(4.54)	(4.30)	(1.98)	(1.80)
Medium	0.00044	0.00052	0.00035	0.00040	0.00012
	(2.59)	(2.04)	(1.48)	(1.80)	(0.36)
Large	0.00014	0.00077	-0.00037	0.00026	0.00050
	(0.53)	(1.52)	(-1.36)	(1.02)	(1.10)
Small–Large	0.00103	0.00039	0.00178	0.00026	0.00089*
	(3.17)	(0.68)	(4.18)	(0.72)	(2.53)

* Small/High – Large/Low

Table A31
Counterpart of Paper's Table 2 Allowing Morningstar Betas to Vary with Turnover

This table is the same as Table 2 in the main paper, except it replaces $GrossR$ with Morningstar-adjusted returns with estimated betas that vary over time with lagged fund turnover. For each fund we regress the fund's excess gross return on the excess Morningstar benchmark return and its interaction with lagged fund turnover. The dependent variable equals the estimated intercept plus residual from those regressions. If the fund has fewer than 24 monthly observations, we use the average estimated slopes across all funds in the same Morningstar category.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
All	0.00114	0.00164	0.00078	0.00055	0.00110
	(7.49)	(7.70)	(4.43)	(2.89)	(4.74)
Small	0.00160	0.00176	0.00180	0.00038	0.00139
	(8.00)	(6.59)	(5.09)	(1.33)	(3.60)
Medium	0.00086	0.00126	0.00064	0.00034	0.00092
	(4.80)	(4.63)	(2.64)	(1.41)	(2.68)
Large	0.00046	0.00142	-0.00009	0.00042	0.00100
	(1.72)	(2.52)	(-0.34)	(1.53)	(1.92)
Small–Large	0.00114	0.00034	0.00190	-0.00004	0.00134*
	(3.62)	(0.56)	(4.16)	(-0.12)	(3.68)

* Small/High – Large/Low

Table A32
Counterpart of Paper's Table 2 with Fund and Month Fixed Effects

This table is the same as Table 2 in the main paper, except every regression includes both fund and month fixed effects.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
All	0.00106	0.00155	0.00072	0.00044	0.00111
	(6.77)	(6.35)	(4.30)	(2.38)	(4.18)
Small	0.00186	0.00194	0.00233	0.00041	0.00153
	(7.71)	(6.10)	(5.80)	(1.38)	(3.52)
Medium	0.00066	0.00102	0.00041	0.00026	0.00076
	(3.20)	(2.84)	(1.71)	(0.92)	(1.67)
Large	0.00005	0.00072	-0.00048	0.00021	0.00051
	(0.21)	(1.21)	(-1.71)	(0.81)	(0.90)
Small–Large	0.00181	0.00122	0.00281	0.00020	0.00173*
	(5.18)	(1.81)	(5.36)	(0.53)	(4.36)

* Small/High – Large/Low

Table A33
Counterpart of Paper's Table 2 with Fund and Benchmark-Month Fixed Effects

This table is the same as Table 2 in the main paper, except every regression includes both fund and benchmark-month fixed effects.

	Fund Expense Ratio				
Fund Size	All	High	Medium	Low	High–Low
All	0.00122	0.00169	0.00096	0.00057	0.00111
	(7.96)	(7.27)	(5.91)	(3.16)	(4.56)
Small	0.00196	0.00204	0.00240	0.00060	0.00144
	(8.16)	(6.57)	(6.01)	(2.04)	(3.48)
Medium	0.00091	0.00127	0.00075	0.00038	0.00089
	(4.80)	(4.01)	(3.21)	(1.38)	(2.23)
Large	0.00015	0.00063	-0.00024	0.00030	0.00033
	(0.59)	(1.05)	(-0.93)	(1.23)	(0.57)
Small–Large	0.00181	0.00141	0.00264	0.00029	0.00174*
	(5.18)	(2.06)	(5.16)	(0.82)	(4.47)

* Small/High – Large/Low

Table A34
Turnover-Performance Relation Across Fund Styles

This table is the same as Table 2 in our paper, except we replace the fund-size and -fee categories with the Morningstar Style Box categories. Since these categories are constant over a fund's life, the non-interacted category dummy variables are dropped since they are collinear with the fund dummies.

	Fund Value/Growth Category				
Stock Size	All	Value	Blend	Growth	Value–Growth
All	0.00123	0.00125	0.00141	0.00147	-0.00021
	(6.63)	(4.66)	(5.45)	(5.06)	(-0.54)
Small Cap	0.00313	0.00218	0.00254	0.00353	-0.00135
	(5.87)	(2.34)	(3.36)	(4.63)	(-1.12)
Mid Cap	0.00143	0.00119	0.00245	0.00115	0.00004
	(2.88)	(2.32)	(4.06)	(1.60)	(0.05)
Large Cap	0.00091	0.00114	0.00060	0.00098	0.00016
	(4.72)	(3.40)	(2.25)	(3.35)	(0.36)
Small–Large	0.00222	0.00105	0.00194	0.00255	0.00121*
	(3.92)	(1.06)	(2.42)	(3.13)	(1.23)

* Small/Value – Large/Growth