Internet Appendix for "Do Funds Make More When They Trade More?"

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This Internet Appendix presents additional empirical results, mostly robustness results, complementing the results presented in the paper. Most of the results presented here are summarized in the paper.

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I. Results for the Recent (2000 to 2011) Subsample

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

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

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	0.00101	0.000841
	(4.29)	(4.09)
No	-0.000130	-0.000194
	(-0.55)	(-0.90)

Table IAII
Heterogeneity in the Turnover-Performance Relation

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

Panel A: Stock Size Categories				
Small Cap	Mid Cap	Large Cap	Small - Large	Controls
0.00246	0.00050	0.00114	0.00132	No
(4.99)	(1.06)	(4.04)	(2.41)	
0.00125	-0.00037	0.00043	0.00082	Yes
(2.10)	(-0.75)	(1.04)	(1.48)	
Panel B: Stock Value-Growth Categories				
Growth	Blend	Value	Growth–Value	Controls
0.00149	0.00095	0.00103	0.00046	No
(4.24)	(2.97)	(1.75)	(0.62)	
0.00026	-0.00037	-0.00036	0.00062	Yes
(0.52)	(-0.75)	(-0.50)	(0.81)	
Panel C: Fund Size Categories				
Small	Medium	Large	Small–Large	Controls
0.00154	0.00054	0.00029	0.00124	No
(5.27)	(2.14)	(0.70)	(2.75)	
0.00057	-0.00037	-0.00070	0.00127	Yes
(1.13)	(-0.75)	(-1.15)	(2.45)	
Panel D: Fund Expense Ratio Categories				
High	Medium	Low	High–Low	Controls
0.00111	0.00096	0.00080	0.00030	No
(3.43)	(3.79)	(3.06)	(0.94)	
-0.00018	-0.00037	-0.00048	0.00030	Yes
(-0.32)	(-0.75)	(-0.98)	(0.81)	

Table IAIII
Properties of Fund Turnover and Performance Across Fund Categories

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

Funds included	Number of funds	Fund turnover (fraction/year)			Average benchmark-adjusted return (%/month)	
		Average	Volatility	Autocorr.	Gross	Net
Panel A: Full Sample						
All	2699	0.874	0.411	0.422	0.0407	-0.0620
Panel B: Stock Size Categories						
Small-Cap	551	0.951	0.396	0.413	0.1631	0.0513
Mid-Cap	546	0.991	0.447	0.444	-0.0418	-0.1483
Large-Cap	1347	0.787	0.393	0.411	0.0384	-0.0584
Small – Large		0.163	0.004	0.002	0.1247	0.1097
(t-statistic)		(4.41)	(0.16)	(0.08)	(2.17)	(1.89)
Panel C: Stock Value-Growth Categories						
Growth	1052	1.071	0.458	0.430	0.0795	-0.0215
Blend	773	0.803	0.397	0.449	0.0314	-0.0767
Value	618	0.623	0.318	0.337	0.0207	-0.0778
Growth – Value		0.448	0.140	0.093	0.0588	0.0563
(t-statistic)		(14.11)	(6.89)	(2.25)	(1.07)	(1.01)
Panel D: Fund Size Categories						
Small	1229	0.936	0.446	0.359	0.0406	-0.0669
Medium	794	0.928	0.422	0.407	0.0588	-0.0489
Large	674	0.768	0.365	0.514	0.0238	-0.0691
Small – Large		0.168	0.081	-0.155	0.0168	0.0022
(t-statistic)		(5.98)	(4.72)	(-3.63)	(0.96)	(0.13)
Panel E: Fund Expense Ratio Categories						
High	1004	1.004	0.481	0.431	0.0486	-0.0931
Medium	851	0.847	0.383	0.439	0.0470	-0.0538
Low	844	0.763	0.353	0.393	0.0265	-0.0438
High – Low		0.240	0.128	0.038	0.0221	-0.0493
(t-statistic)		(6.52)	(6.74)	(1.11)	(1.15)	(-2.56)

Table IAIV
Correlations of Average Turnover Across Fund Categories

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

Stock Size	S	M	L
Small	1.00		
Mid	0.94	1.00	
Large	0.66	0.65	1.00

Stock Value-Growth	G	B	V
Growth	1.00		
Blend	0.92	1.00	
Value	0.76	0.85	1.00

Fund Size	S	M	L
Small	1.00		
Medium	0.74	1.00	
Large	0.86	0.89	1.00

Fund Expense Ratio	L	M	H
Low	1.00		
Medium	0.66	1.00	
High	0.51	0.92	1.00

Table IAV
Commonality in Fund Turnover

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

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AvgTurn	0.828							0.547
	(14.08)							(7.95)
AvgTurn_Stock_Size		0.737				0.369		
		(14.16)				(4.25)		
AvgTurn_Stock_VG			0.624			0.160		
			(9.75)			(2.14)		
AvgTurn_Fund_Size				0.703		0.219		
				(14.76)		(2.70)		
AvgTurn_Fund_Exp					0.671	0.204		
					(12.12)	(2.30)		
AvgTurnSim							0.429	0.298
							(11.35)	(7.12)
Observations	217,508	196,555	196,555	217,390	214,916	194,275	194,275	194,275
Within-fund R^2 (%)	1.96	2.83	2.04	2.16	2.05	3.35	2.44	3.08

Table IAVI
What Explains Turnover?

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

	Dependent variable: $FundTurn_{it}$				Dependent variable: $AvgTurn_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Sentiment_t$	0.0316			0.0182	0.0430			0.0262
	(2.53)			(2.02)	(4.47)			(3.62)
$Volatility_t$		0.750		0.381		0.853		0.462
		(5.19)		(4.30)		(3.93)		(5.34)
$Liquidity_t$			-0.212	-0.0930			-0.235	-0.109
			(-4.03)	(-4.61)			(-2.62)	(-3.84)
$Business\ Cycle_t$				-0.0226				-0.0270
				(-2.97)				(-5.31)
$Market\ Return_t$				-0.0475				-0.0380
				(-1.22)				(-1.06)
$Time\ Trend_t$	-0.0004	-0.0004	-0.0008	-0.0004	-0.0007	-0.0007	-0.0011	-0.0007
	(-0.86)	(-1.37)	(-1.96)	(-1.54)	(-1.73)	(-2.24)	(-2.71)	(-2.60)
R^2	0.005	0.013	0.007	0.017	0.393	0.618	0.398	0.791
$R^2 - R^2$(trend only)	0.002	0.008	0.002	0.014	0.048	0.273	0.053	0.446
Observations	191,266	199,784	199,784	191,266	132	142	142	132

Table IAVII
Relation Between Fund Performance and Average Turnover

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

	(1)	(2)	(3)	(4)	(5)	(6)
$AvgTurnSim_{i,t-1}$	0.00409			0.00380		0.00261
	(3.74)			(3.54)		(2.98)
$AvgTurn_{i,t-1}$		0.00858			0.00811	0.00504
		(2.74)			(2.60)	(1.49)
$FundTurn_{i,t-1}$			0.00101	0.00105	0.000816	0.000984
			(4.29)	(4.51)	(3.88)	(4.45)
Observations	199,715	221,234	214,916	194,275	214,916	194,275

II. Alternative Fixed Effects

Table IAVIII
Counterpart of Paper's Table I with Fund and Benchmark-Month Fixed Effects

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

	Benchmark-Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	0.00125	0.00124
	(6.67)	(7.81)
No	0.000427	0.000292
	(2.05)	(1.66)

Table IAIX
Counterpart of Paper Table I with Fund × Manager Fixed Effects

This table is the same as Table I in the paper, except it replaces fund fixed effects with fund×manager fixed effects. Data on manager identities are from Morningstar. If a manager manages multiple funds in a given month, the same manager's fixed effect appears in multiple fund-month observations in that month. If a fund has multiple managers in a given month, we follow a simple seniority-based approach to assign the manager fixed effects. When there are multiple managers, we define the fund's manager to be the person who arrived at the fund first. If there is a tie, we take the person who stays at the fund longest.

	Month Fixed Effects	
Fund×Manager Fixed Effects	No	Yes
Yes	0.00129	0.00117
	(6.37)	(6.69)
No	0.00043	0.00039
	(2.05)	(2.04)

III. Placebo Test with Passive Funds

Table IAX
Counterpart of Paper's Table I with Passive Index Funds, Conservative Filter

This table is the same as Table I 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
Yes	-0.000324	-0.000797
	(-0.36)	(-1.02)
No	0.000137	0.0000806
	(0.21)	(0.14)

Table IAXI
Counterpart of Paper's Table I with Passive Index Funds, No Expense Ratio Filter

This table is the same as the previous table, except we remove the expense ratio filter to create the sample of passive funds. There are 13,590 observation in each regression.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	-0.000295	-0.000774
	(-0.32)	(-0.98)
No	0.000352	0.000355
	(0.54)	(0.63)

Table IAXII
Counterpart of Paper's Table I with Passive Index Funds, Higher Turnover Filter

This table is the same as Table IAX, except we apply a 500% turnover filter instead of a 100% filter to create the sample of passive funds. There are 12,669 observations in each regression.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	-0.000261	-0.000873
	(-0.35)	(-1.31)
No	0.000274	0.000166
	(0.42)	(0.27)

IV. Finite-Sample Bias?

Table IAXIII
Does Performance Predict Turnover?

This table shows results from regressing fiscal-year fund turnover on contemporaneous and lagged fund performance. We work at the fiscal-year frequency so the timing of turnover and performance overlaps. The dependent variable is $FundTurn(i,t)$ [FYR], defined here as fund i's turnover in fiscal year t. $GrossR(i,t)$ [FYR] is the fund's benchmark-adjusted gross return during fiscal year t. $GrossR(i,t-1)$ [FYR] is the fund's benchmark-adjusted gross return during the 12-month period prior to $GrossR(i,t)$ [FYR]. All regressions include fund fixed effects and cluster by fund to account for persistence in turnover.

	(1)	(2)	(3)
$GrossR(i,t)$ [FYR]	0.0559		-0.00436
	(1.07)		(-0.07)
$GrossR(i,t-1)$ [FYR]		-0.0772	-0.0706
		(-1.52)	(-1.39)
Observations	21,737	19,679	18,790

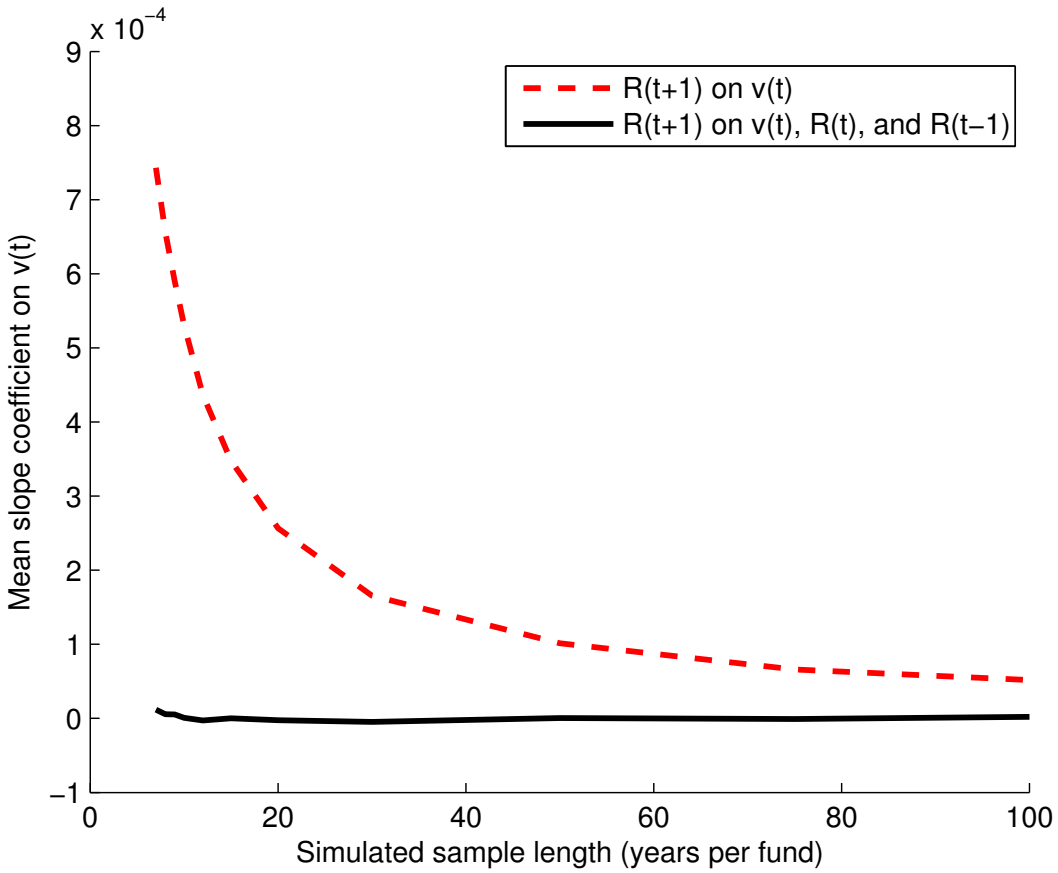

Figure IA1. Simulation to assess finite-sample bias. This figure shows results from simulations used to quantify potential finite-sample bias in our main turnover-performance regressions. The figure also shows how controlling for lagged performance eliminates the bias. We simulate many samples, each of which has τ yearly observations. We plot τ on the horizontal axis. Simulated returns R are i.i.d. normal with mean zero and standard deviation 10.3% per year, which matches the empirical volatility. Simulated turnover follows $v(t) = -0.0903R(t-1) + u(t)$, where $u(t)$ is i.i.d. normally distributed with mean zero and standard deviation 0.44. The numbers -0.0903 and 0.44 are the slope and residual volatility, respectively, from an actual regression of annual $FundTurn_{it}$ on lagged $GrossR_{i,t-1}$, both measured at the fiscal-year frequency, and fund fixed effects. The dashed red line shows the slope from a regression of $R(t+1)$ on $v(t)$, averaged across simulated samples. The solid black line shows the slope from a regression of $R(t+1)$ on $v(t)$, $R(t)$, and $R(t-1)$, averaged across simulated samples.

Table IAXIV
Turnover-Performance Relation Controlling for Lagged Performance

The dependent variable is $GrossR_{it}$, the fund's benchmark-adjusted gross return in month t. The first column matches the top left cell of our paper's Table I. The second column is the same but only uses observations with nonmissing values of $GrossRFYR_{i,t-1}$ and $GrossRFYR_{i,t-2}$. Abusing notation slightly, $GrossRFYR_{i,t-1}$ is the fund's benchmark-adjusted gross return during the fiscal year that coincides with the timing of $FundTurn_{i,t-1}$. $GrossRFYR_{i,t-2}$ is the fund's benchmark-adjusted gross return during the 12-month period prior to $GrossRFYR_{i,t-1}$. Column (2) shows that we lose some observations when we require the additional regressors, and the smaller subsample has a slightly weaker, but still strong, turnover-performance relation. All regressions include fund fixed effects and cluster by sector × month.

	(1)	(2)	(3)
$FundTurn(i,t-1)$	0.00125	0.00109	0.00107
	(6.67)	(5.48)	(5.43)
$GrossR(i,t-1)$ [FYR]			0.00127
			(0.45)
$GrossR(i,t-2)$ [FYR]			-0.00814
			(-4.43)
Observations	282,738	203,798	203,798

V. Alternative Clustering

Table IAXV
Counterpart of Paper's Table I, Clustering by Month

This table is the same as the paper's Table I, except we compute t-statistics differently: whereas Table I in the paper clusters by sector×month, this table clusters by month.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	0.00125	0.00118
	(4.25)	(4.65)
No	0.00043	0.00039
	(1.16)	(1.09)

Table IAXVI
Counterpart of Paper's Table I, Clustering by Fund and Month

This table is the same as the paper's Table I, except we compute t-statistics differently: whereas Table I in the paper clusters by sector×month, this table clusters by fund and month.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	0.00125	0.00118
	(3.92)	(4.27)
No	0.00043	0.00039
	(1.14)	(1.07)

Table IAVII
Counterpart of Paper's Table I, Clustering by Year

This table is the same as the paper's Table I, except we compute t-statistics differently: whereas Table I in the paper clusters by sector×month, this table clusters by calendar year.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	0.00125	0.00118
	(3.66)	(3.63)
No	0.00043	0.00039
	(0.88)	(0.81)

Table IAXVIII
Counterpart of Paper's Table II, Clustering by Month

This table is the same as Table II in the paper, except we compute t-statistics clustering by month instead of by sector × month.

Panel A: Stock Size Categories				
Small Cap	Mid Cap	Large Cap	Small - Large	Controls
0.00302	0.00114	0.00100	0.00202	No
(5.04)	(2.38)	(2.96)	(3.27)	
0.00171	0.00014	0.00025	0.00145	Yes
(2.99)	(0.31)	(0.77)	(2.39)	
Panel B: Stock Value-Growth Categories				
Growth	Blend	Value	Growth–Value	Controls
0.00155	0.00111	0.00184	-0.00029	No
(3.24)	(3.62)	(2.52)	(-0.29)	
0.00062	0.00014	0.00077	-0.00016	Yes
(1.06)	(0.31)	(0.98)	(-0.16)	
Panel C: Fund Size Categories				
Small	Medium	Large	Small–Large	Controls
0.00195	0.00089	0.00037	0.00158	No
(5.79)	(3.05)	(0.91)	(3.96)	
0.00113	0.00014	-0.00025	0.00138	Yes
(2.24)	(0.31)	(-0.46)	(2.82)	
Panel D: Fund Expense Ratio Categories				
High	Medium	Low	High–Low	Controls
0.00161	0.00099	0.00077	0.00084	No
(4.36)	(3.50)	(2.67)	(3.22)	
0.00065	0.00014	0.00003	0.00062	Yes
(1.23)	(0.31)	(0.07)	(1.99)	

Table IAXIX
Counterpart of Paper's Table II, Clustering by Fund and Month

This table is the same as Table II in the paper, except we compute t-statistics clustering by fund and month instead of by sector × month.

Panel A: Stock Size Categories				
Small Cap	Mid Cap	Large Cap	Small - Large	Controls
0.00302	0.00114	0.00100	0.00202	No
(4.26)	(2.16)	(2.86)	(2.74)	
0.00171	0.00014	0.00025	0.00145	Yes
(2.60)	(0.28)	(0.74)	(2.03)	
Panel B: Stock Value-Growth Categories				
Growth	Blend	Value	Growth–Value	Controls
0.00155	0.00111	0.00184	-0.00029	No
(3.11)	(3.36)	(2.55)	(-0.29)	
0.00062	0.00014	0.00077	-0.00016	Yes
(0.98)	(0.28)	(0.99)	(-0.16)	
Panel C: Fund Size Categories				
Small	Medium	Large	Small–Large	Controls
0.00195	0.00089	0.00037	0.00158	No
(5.15)	(2.66)	(0.88)	(3.51)	
0.00113	0.00014	-0.00025	0.00138	Yes
(2.07)	(0.28)	(-0.42)	(2.60)	
Panel D: Fund Expense Ratio Categories				
High	Medium	Low	High–Low	Controls
0.00161	0.00099	0.00077	0.00084	No
(3.72)	(3.36)	(2.56)	(2.46)	
0.00065	0.00014	0.00003	0.00062	Yes
(1.04)	(0.28)	(0.07)	(1.71)	

Table IAXX
Counterpart of Paper's Table VII, Clustering by Month

This table is the same as Table VII in the paper, except we compute t-statistics clustering by month instead of by sector × month.

	(1)	(2)	(3)	(4)	(5)	(6)
$AvgTurnSim(i,t-1)$	0.00210			0.00184		0.00158
	(2.02)			(1.68)		(2.23)
$AvgTurn(i,t-1)$		0.00359			0.00339	0.00133
		(0.89)			(0.85)	(0.36)
$FundTurn(i,t-1)$			0.00125	0.00135	0.00118	0.00134
			(4.25)	(4.52)	(4.68)	(4.78)
Observations	281,406	306,897	282,738	259,234	282,738	259,234

Table IAXXI
Counterpart of Paper's Table VII, Clustering by Fund and Month

This table is the same as Table II in the paper, except we compute t-statistics clustering by fund and month instead of by sector × month.

	(1)	(2)	(3)	(4)	(5)	(6)
$AvgTurnSim(i,t-1)$	0.00210			0.00184		0.00158
	(1.99)			(1.66)		(2.15)
$AvgTurn(i,t-1)$		0.00359			0.00339	0.00133
		(0.88)			(0.85)	(0.36)
$FundTurn(i,t-1)$			0.00125	0.00135	0.00118	0.00134
			(3.92)	(4.24)	(4.19)	(4.44)
Observations	281,406	306,897	282,738	259,234	282,738	259,234

VI. Measuring Turnover

Table IAXXII
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. Column (1) reproduces the results with fund fixed effects from the paper's Table I. 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. $FlowVol_{i,t-1}$ is the standard deviation of the 12 monthly flows, measured as fractions during the same time window as $FundTurn_{i,t-1}$. We winsorize all flow measures at the 1st and 99th percentiles. All regressions include fund fixed effects. t-statistics are computed as in Table I. Data are from 1979 to 2011.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$FundTurn_{i,t-1}$	0.00125		0.00105		0.00104			0.00122
	(6.67)		(5.47)		(5.44)			(6.40)
$FlowTurn1_{i,t-1}$		0.000319	0.000248					
		(1.58)	(1.25)					
$FlowTurn2_{i,t-1}$				0.00115	0.000744			
				(1.88)	(1.24)			
$FundTurn_{i,t-1} - FlowTurn2_{i,t-1}$						0.000994		
						(5.34)		
$FlowVol_{i,t-1}$							0.000325	0.000124
							(0.66)	(0.25)
Observations	282,738	214,068	214,068	214,068	214,068	214,068	253,796	253,796

Table IAXXIII
Counterpart of Paper's Table I with Benchmark-Adjusted Turnover

This table is the same as the paper's Table I, except we replace $FundTurn_{i,t-1}$ with benchmark-adjusted turnover, computed as $FundTurn_{i,t-1}$ minus the median turnover computed across all index funds in the same Morningstar Category (e.g., Large Blend) as fund i and whose turnover is measured in the same time window as $FundTurn_{i,t-1}$.

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	0.00076	0.00071
	(3.35)	(3.28)
No	0.00024	0.00021
	(1.11)	(0.98)

Table IAXXIV
Turnover-Performance Relation with Rescaled Turnover Measure

Column (1) reproduces the results with fund fixed effects from the paper's Table I. Column (2) is the same but uses a rescaled version of $FundTurn_{i,t-1}$: whereas $FundTurn_{i,t-1}$ divides $\min(Buys, Sells)$ by the fund's average size during the previous fiscal year, the rescaled version divides by the fund's size at the beginning of the previous fiscal year. $FundTurn_{i,t-1}$ and its rescaled versions are both winsorized at the 1st and 99th percentiles. We lose some observations in the second column because of missing fund size. Both regressions include fund fixed effects.

	(1)	(2)
$FundTurn_{i,t-1}$	0.00125	
	(6.67)	
Rescaled $FundTurn_{i,t-1}$		0.00247
		(11.77)
Observations	282,738	274,440

Table IAXXV
Turnover-Performance Relation Controlling for Stock Holdings

Column (1) reproduces the results with fund fixed effects from the paper's Table I. Column (2) controls for *PercentStock*, the percent of the fund's assets held in long stock positions. To remove extreme outliers, we set *PercentStock* equal to 100% when it exceeds 100%; this change affects fewer than 1% of observations. *PercentStock* is from Morningstar and is typically reported quarterly. We use the most recent portfolio report date before month t, but we do not look back more than 12 months. All regressions include fund fixed effects.

	(1)	(2)
$FundTurn_{i,t-1}$	0.00125	0.00127
	(6.67)	(6.86)
PercentStock		0.0000398
		(3.12)
Observations	282,738	282,738

VII. Alternative Benchmark Models

Table IAXXVI
Counterpart of Paper's Table I with Estimated Morningstar Betas

This table is the same as Table I 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
Yes	0.00122	0.00114
	(7.46)	(7.70)
No	0.000333	0.000319
	(1.69)	(1.74)

Table IAXXVII
Version of Table IAXXVI with Betas Conditional on $FundTurn$

This table is the same as the previous table, except we allow estimated betas to vary over time with lagged fund turnover. For each fund we regress the fund's excess gross return on the benchmark return and its interaction with lagged $FundTurn$. The dependent variable in this table 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.00118	0.00111
	(7.63)	(7.90)
No	0.000287	0.000279
	(1.49)	(1.56)

Table IAXXVIII
Counterpart of Paper's Table I with Three-Factor Fama-French Benchmark

This table is the same as Table I in the main paper, except it replaces $GrossR$ with three-factor 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 (MktRf, HML, SMB) 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.00101	0.00101
	(7.09)	(8.27)
No	0.000241	0.000236
	(1.27)	(1.41)

Table IAXXIX
Version of Table IAXXVIII with Betas Conditional on $FundTurn$

This table is the same as the previous table, except we allow estimated betas to vary over time with lagged fund turnover. For each fund we regress the fund's excess gross return on the benchmark returns and their interaction with lagged $FundTurn$. The dependent variable in this table 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.000691	0.000702
	(5.28)	(6.32)
No	0.0000783	0.0000877
	(0.44)	(0.55)

Table IAXXX
Counterpart of Paper's Table I with Four-Factor Fama-French-Carhart Benchmark

This table is the same as Table I 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 (MktRf, HML, SMB) 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.00105	0.00102
	(7.89)	(8.87)
No	-0.00000180	-0.0000170
	(-0.01)	(-0.13)

Table IAXXXI
Version of Table IAXXX with Betas Conditional on $FundTurn$

This table is the same as the previous table, except we allow estimated betas to vary over time with lagged fund turnover. For each fund we regress the fund's excess gross return on the benchmark returns and their interaction with lagged $FundTurn$. The dependent variable in this table 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.000609	0.000601
	(5.18)	(5.92)
No	-0.000194	-0.000195
	(-1.36)	(-1.60)

Table IAXXXII
Counterpart of Paper's Table I with Five-Factor Fama-French Benchmark

This table is the same as Table I in the main paper, except it replaces $GrossR$ with five-factor Fama-French adjusted gross returns. Specifically, the dependent variable equals the fund's gross return minus the risk-free rate minus the five Fama-French excess factor returns (MktRf, HML, SMB, RMV, CMA) 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.000808	0.000829
	(5.93)	(7.17)
No	0.000570	0.000587
	(3.15)	(3.71)

Table IAXXXIII
Version of Table IAXXXII with Betas Conditional on $FundTurn$

This table is the same as the previous table, except we allow estimated betas to vary over time with lagged fund turnover. For each fund we regress the fund's excess gross return on the benchmark returns and their interaction with lagged $FundTurn$. The dependent variable in this table 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.000605	0.000630
	(5.07)	(6.06)
No	0.000424	0.000445
	(2.65)	(3.16)

Table IAXXXIV
Counterpart of Paper's Table I with Cremers-Petajisto-Zitzewitz Benchmark

This table is the same as Table I in the main paper, except it replaces $GrossR$ with gross returns adjusted using the modified Fama-French factors of Cremers, Petajisto, and Zitzewitz (2013). Specifically, the dependent variable equals the fund's gross return minus the risk-free rate minus the three excess factor returns (S5RF, R3VR3G, and R2S5) 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.00115	0.00106
	(8.84)	(9.34)
No	0.000345	0.000303
	(2.05)	(2.05)

Table IAXXXV
Version of Table IAXXXIV with Betas Conditional on $FundTurn$

This table is the same as the previous table, except we allow estimated betas to vary over time with lagged fund turnover. For each fund we regress the fund's excess gross return on the benchmark returns and their interaction with lagged $FundTurn$. The dependent variable in this table 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 Effect	
Fund Fixed Effect	No	Yes
Yes	0.000889	0.000818
	(7.51)	(7.93)
No	0.000170	0.000135
	(1.07)	(0.97)

VIII. Alternative Skill Proxies

Table IAXXXVI
Counterpart of Paper's Table II with Unadjusted Gross Alpha

This table is the same as Table II in the paper, except it replaces the fund's expense ratio with the fund's unadjusted gross alpha, defined as the fund's full-sample average $GrossR$. This change mainly affects Panel D, but it also affects the other panels via the change in control variables.

Panel A: Stock Size Categories				
Small Cap	Mid Cap	Large Cap	Small - Large	Controls
0.00302	0.00114	0.00100	0.00202	No
(7.60)	(3.38)	(4.17)	(4.49)	
0.00194	0.00043	0.00053	0.00141	Yes
(4.20)	(1.06)	(1.95)	(3.05)	
Panel B: Stock Value-Growth Categories				
Growth	Blend	Value	Growth–Value	Controls
0.00155	0.00111	0.00184	-0.00029	No
(5.61)	(4.85)	(4.35)	(-0.54)	
0.00085	0.00043	0.00110	-0.00025	Yes
(2.06)	(1.06)	(1.97)	(-0.45)	
Panel C: Fund Size Categories				
Small	Medium	Large	Small–Large	Controls
0.00195	0.00089	0.00037	0.00158	No
(7.86)	(4.12)	(1.24)	(4.51)	
0.00161	0.00043	-0.00014	0.00175	Yes
(3.70)	(1.06)	(-0.32)	(4.75)	
Panel D: Fund Unadjusted Gross Alpha Categories				
High	Medium	Low	High–Low	Controls
0.00217	0.00119	0.00020	0.00197	No
(6.56)	(5.86)	(0.86)	(4.98)	
0.00096	0.00043	-0.00049	0.00145	Yes
(2.05)	(1.06)	(-1.17)	(3.67)	

Table IAXXXVII
Counterpart of Paper's Table II with Adjusted Gross Alpha

This table is the same as Table II in the paper, except it replaces the fund's expense ratio with the fund's adjusted gross alpha, the measure of fund skill from Pástor, Stambaugh, and Taylor (2015). This change mainly affects Panel D, but it also affects the other panels via the change in control variables.

Panel A: Stock Size Categories				
Small Cap	Mid Cap	Large Cap	Small - Large	Controls
0.00302	0.00114	0.00100	0.00202	No
(7.60)	(3.38)	(4.17)	(4.49)	
0.00203	0.00045	0.00059	0.00143	Yes
(3.98)	(1.09)	(1.89)	(2.94)	
Panel B: Stock Value-Growth Categories				
Growth	Blend	Value	Growth–Value	Controls
0.00155	0.00111	0.00184	-0.00029	No
(5.61)	(4.85)	(4.35)	(-0.54)	
0.00084	0.00045	0.00114	-0.00030	Yes
(2.14)	(1.09)	(2.24)	(-0.61)	
Panel C: Fund Size Categories				
Small	Medium	Large	Small–Large	Controls
0.00195	0.00089	0.00037	0.00158	No
(7.86)	(4.12)	(1.24)	(4.51)	
0.00145	0.00045	-0.00002	0.00146	Yes
(3.59)	(1.09)	(-0.04)	(3.91)	
Panel D: Fund Adjusted Gross Alpha Categories				
High	Medium	Low	High–Low	Controls
0.00193	0.00118	0.00020	0.00173	No
(6.72)	(5.66)	(0.86)	(4.71)	
0.00061	0.00045	-0.00058	0.00119	Yes
(1.42)	(1.09)	(-1.23)	(2.76)	

Table IAXXXVIII
Manager Age, Tenure, and the Turnover-Performance Relation

The dependent variable is $GrossR_{it}$, fund i's benchmark-adjusted gross return in month t. Column (1) matches the top left cell in Table I in the paper. $Avg.Mgr.Tenure$ is the average number of years managing the fund, computed across the fund's managers in the given month. $Avg.Mgr.Age$ is the average age across fund's managers in the given month. Manager tenure and age are highly correlated within funds, so we avoid including both in the same regression. All regressions include fund fixed effects and cluster by sector x month. Data on fund managers are from Morningstar.

	(1)	(2)	(3)	(4)	(5)
$FundTurn(i,t-1)$	0.00125	0.00121	0.00179	0.00132	0.00453
	(6.67)	(6.04)	(7.36)	(5.59)	(4.83)
$Avg.Mgr.Tenure$		-0.000121	-0.0000237		
		(-5.94)	(-0.97)		
$FundTurn(i,t-1) * Avg.Mgr.Tenure$			-0.000140		
			(-4.87)		
$Avg.Mgr.Age$				-0.0000593	-0.00000546
				(-3.78)	(-0.27)
$FundTurn(i,t-1) * Avg.Mgr.Age$					-0.0000673
					(-3.49)
Observations	282,738	267,739	267,739	147,157	147,157

Table IAXXXIX
Counterpart of Paper's Table II with Fund Size and Expense Ratio Terciles Computed Within Style-Months

This table is the same as Table II in the paper, except instead of computing fund size and expense ratio terciles within months, it computes them within style-months. Style here is Morningstar's Category, for example, Large-Cap Growth. This change mainly affects Panels C and D, but it also affects Panels A and B via the change in control variables.

Panel A: Stock Size Categories				
Small Cap	Mid Cap	Large Cap	Small - Large	Controls
0.00302	0.00114	0.00100	0.00202	No
(7.60)	(3.38)	(4.17)	(4.49)	
0.00179	0.00008	0.00000	0.00179	Yes
(3.81)	(0.20)	(0.00)	(3.95)	
Panel B: Stock Value-Growth Categories				
Growth	Blend	Value	Growth–Value	Controls
0.00155	0.00111	0.00184	-0.00029	No
(5.61)	(4.85)	(4.35)	(-0.54)	
0.00056	0.00008	0.00077	-0.00021	Yes
(1.47)	(0.20)	(1.41)	(-0.40)	
Panel C: Fund Size Categories (Within Style-Month)				
Small	Medium	Large	Small–Large	Controls
0.00184	0.00086	0.00051	0.00133	No
(7.86)	(4.02)	(1.62)	(3.83)	
0.00093	0.00008	-0.00022	0.00116	Yes
(2.32)	(0.20)	(-0.49)	(3.00)	
Panel D: Fund Expense Ratio Categories (Within Style-Month)				
High	Medium	Low	High–Low	Controls
0.00168	0.00075	0.00103	0.00065	No
(7.27)	(3.45)	(4.25)	(2.68)	
0.00073	0.00008	0.00022	0.00051	Yes
(1.78)	(0.20)	(0.54)	(1.90)	

Table IAXL
Comparing Broker-Sold and Direct-Sold Funds

This table compares the turnover-performance slope across direct-sold and broker-sold funds in our sample. This table is the same as Table II Panel D in our paper, except we replace expense ratio terciles with three distribution channel categories: direct-sold, broker-sold, and "not sure." Following Sun (2014), we say that a share class is broker-sold if it has a nonzero front load, a nonzero back load, or a 12b-1 fee exceeding 25 basis points; otherwise, the share class is direct-sold. Data on loads and 12b-1 fees are from Morningstar. Similar to Del Guercio and Reuter (2014), we classify a fund as broker-sold (direct-sold) if at least 75% of its assets are broker-sold (direct-sold) on average over time. If 25 to 75% of the fund's assets are broker-sold on average, we categorize the fund's distribution channel as "not sure." In our full sample, 32% of fund-month observations are for broker-sold funds, 59% are for direct-sold funds, and 9% are "not sure."

Direct-Sold	Not Sure	Broker-Sold	Direct - Broker	Controls
0.00148	0.00095	0.00100	0.00048	No
(6.27)	(2.62)	(4.13)	(1.70)	
0.00044	0.00006	0.00037	0.00007	Yes
(1.03)	(0.11)	(0.93)	(0.26)	

IX. Out-Of-Sample Evidence

In each month τ, starting with τ =January 1984, we estimate the following panel regressions:

$$\begin{aligned} GrossR_{i,t} &= a_{i,\tau} + b_{\tau} FundTurn_{i,t-1} + \varepsilon_{i,t,\tau},\ t = Jan1979, ..., \tau \\ GrossR_{i,t} &= c_{i,\tau} + \delta_{i,t,\tau},\ t = Jan1979, ..., \tau. \end{aligned}$$

The following figure shows the time series of estimates of b_{τ} along with their 95% CIs.

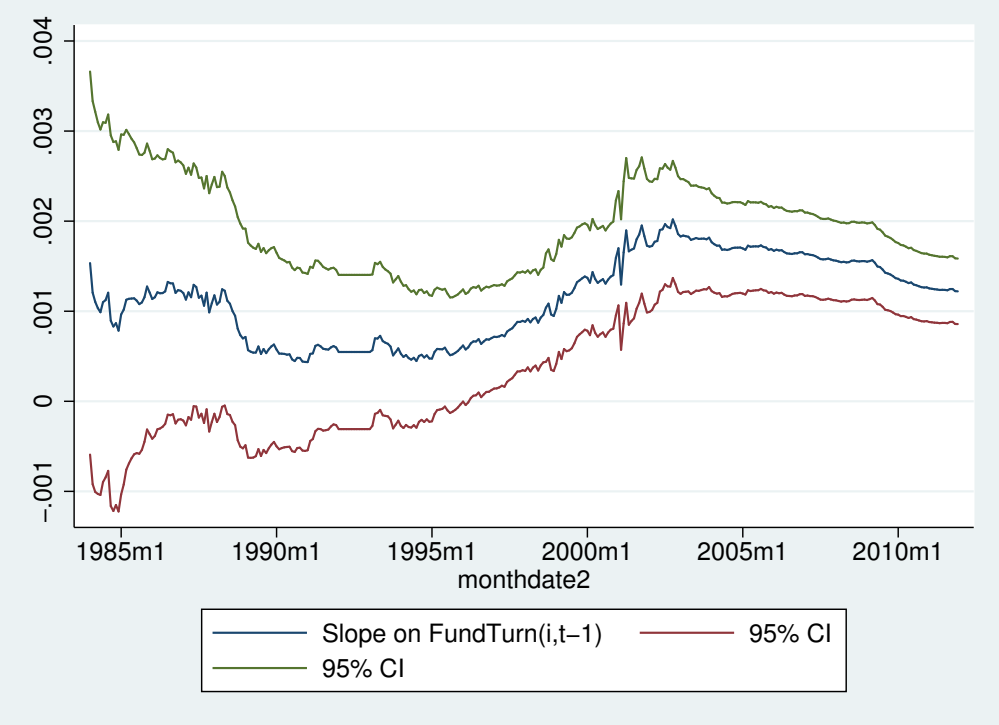

Figure IA2. Time series of turnover-performance slopes.

The last estimate is 0.00125, which matches the value in Table I in our paper.

Next, we estimate the one-period-ahead forecast error from the two models as

$$\begin{aligned} \widehat{e}_{i,t} &= GrossR_{i,t} - \widehat{a}_{i,t-1} - \widehat{b}_{t-1} FundTurn_{i,t-1} \\ \widehat{d}_{i,t} &= GrossR_{i,t} - \widehat{c}_{i,t-1}. \end{aligned}$$

To test whether including turnover reduces the forecast errors, we test the hypotheses

$$\begin{aligned} H_0 &: E\left[d_{i,t}^2 - e_{i,t}^2\right] = 0 \\ H_a &: E\left[d_{i,t}^2 - e_{i,t}^2\right] > 0. \end{aligned}$$

We cluster by sector $\times$ month, because we find an 12% correlation between $\widehat{d}_{i,t}^2 - \widehat{e}_{i,t}^2$ and that same variable averaged across funds $j \neq i$ in the same sector as fund i and the same month. We find a negligible ($< 5\%$) autocorrelation within funds over time, and across funds in different sectors but the same month.

The estimated mean of $\widehat{d}_{i,t}^2 - \widehat{e}_{i,t}^2$ is 2.64e-7, in units of squared fraction returns per month. The mean is significantly different from zero with a t-statistic of 2.63, implying a one-sided p-value of 0.004. The mean of $\widehat{d}_{i,t}^2$ is 0.0005199, so including $FundTurn$ in the forecasting model reduces the average squared forecast error by 2.64e-7/0.0005199 = 0.05%.

X. Additional Results

Table IAXLI
Summary Statistics

This table shows summary statistics on fund-month observations with nonmissing $GrossR$.

Variable	N	Mean	Stdev	P1	P25	P50	P75	P99
$FundReturn$	310,557	0.0063	0.0537	-0.1541	-0.0211	0.0100	0.0374	0.1328
$Benchmark - AdjustedReturn$	310,557	-0.0006	0.0223	-0.0619	-0.0104	-0.0010	0.0086	0.0643
$ExpenseRatio$	310,557	0.0010	0.0004	0.0003	0.0008	0.0010	0.0012	0.0021
$GrossR$	310,557	0.0004	0.0223	-0.0608	-0.0094	0.0000	0.0097	0.0654
$FundTurn$	282,738	0.8470	0.7199	0.0300	0.3500	0.6500	1.1200	3.9900
$Sentiment$	292,483	0.1732	0.6057	-0.7785	-0.2060	0.0501	0.4026	2.1290
$Volatility$	310,557	0.1681	0.0495	0.1067	0.1355	0.1566	0.1865	0.3434
$Liquidity$	310,557	-0.0318	0.0751	-0.3036	-0.0605	-0.0232	0.0124	0.1212
$BusinessCycle$	310,557	-0.2296	0.9265	-4.1400	-0.5500	-0.0800	0.3900	1.1300
$LaggedMkt.Return$	310,557	0.0887	0.1933	-0.3820	-0.0496	0.1270	0.2099	0.5149

Table IAXLII
Counterpart of Paper's Table I with Benchmark-Adjusted Net Returns

This table is the same as Table I 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
Yes	0.00122	0.00115
	(6.50)	(6.90)
No	0.000334	0.000303
	(1.61)	(1.58)

Table IAXLIII
Counterpart of Paper's Table I with Annual Data

This table is the same as Table I 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 fixed effects with fiscal year fixed effects, and we cluster by Morningstar sector $\times$ fiscal year. There are 16,468 observations in each regression.

	Fiscal Year Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	0.0200	0.0185
	(5.05)	(4.96)
No	0.0125	0.0118
	(2.82)	(2.87)

Table IAXLIV
Interacting Turnover with Time Since Turnover

The dependent variable is $GrossR_{i,t}$. Columns (1) and (3) match the bottom row of Table I 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)
$FundTurn_{i,t-1}$	0.00125	0.00144	0.00118	0.00138
	(6.67)	(5.30)	(7.08)	(6.30)
$FundTurn_{i,t-1} \times NMonthsSince_{i,t}$		-0.0000305		-0.0000308
		(-1.20)		(-1.67)
Observations	282,738	282,738	282,738	282,738
Fund fixed effects	Yes	Yes	Yes	Yes
Month fixed effects	No	No	Yes	Yes

Table IAXLV
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 I. Data are from 1979 to 2011.

$FundTurn_{i,t-1}$	0.000847
	(4.39)
$FundTurn_{i,t-2}$	-0.000151
	(-0.84)
$FundTurn_{i,t-3}$	-0.0000962
	(-0.59)
Observations	198,793

Table IAXLVI
Counterpart of Paper's Table I in Cold IPO Market Subperiod (2001 to 2011)

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

	Month Fixed Effects	
Fund Fixed Effects	No	Yes
Yes	0.000721	0.000632
	(3.47)	(3.80)
No	-0.000328	-0.000350
	(-1.68)	(-2.03)

Table IAXLVII
Economic Significance

This table computes the economic significance of the turnover-performance slopes. To conform as closely as possible to our turnover-performance regressions, we compute the within-fund standard deviation of each turnover variable using monthly data, and we require that $GrossR$ is nonmissing. The last column indicates the source of the estimated slope coefficient. All slopes are from regressions of $GrossR_{it}$ on lagged turnover.

Variable	Within-fund Stdev.	Slope	Economic significance =Stdev*Slope*1200	Source of slope
$FundTurn_{i,t-1}$	0.4367	0.00125	0.655	Table VII column (3)
	0.4367	0.00134	0.702	Table VII column (6)
$AvgTurnSim_{i,t-1}$	0.1716	0.00210	0.433	Table VII column (1)
	0.1716	0.00158	0.325	Table VII column (6)
$AvgTurn_{i,t-1}$	0.0751	0.00359	0.323	Table VII column (2)
	0.0751	0.00133	0.120	Table VII column (6)

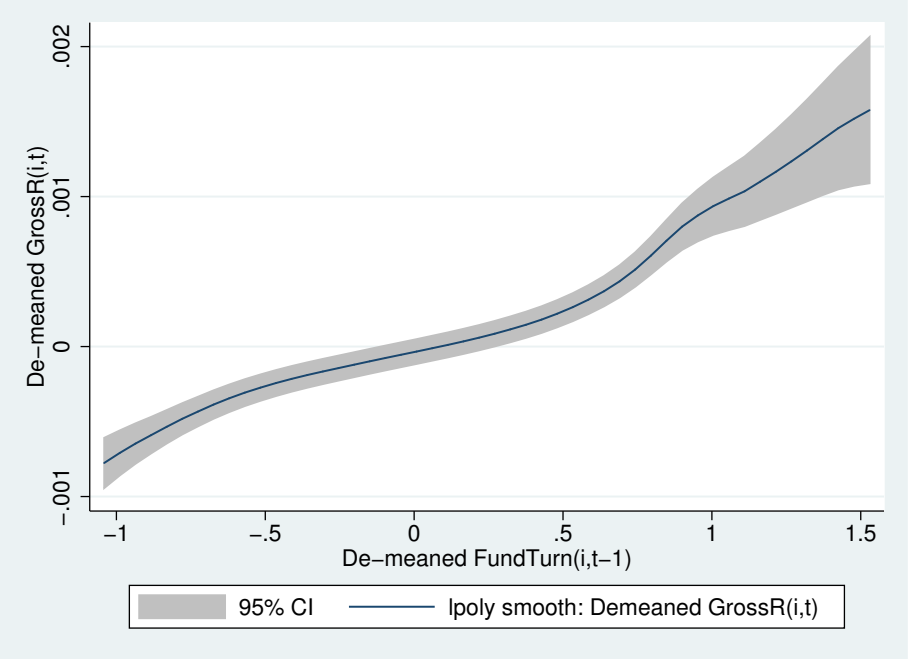

Figure IA3. Nonlinearities in the turnover-performance relation? We perform a kernel-weighted local polynomial regression of $GrossR_{i,t}$ on $FundTurn_{i,t-1}$, both demeaned at the fund level. We plot the smoothed values with 95% confidence bands. We use the rule-of-thumb bandwidth, Epanechnikov kernel, and local-mean smoothing. We drop the bottom 1% of fund-demeaned $FundTurn$ observations (values less than -104%) and the top 1% (values greater than 153%).

Table IAXLVIII
Counterpart of Paper's Table I with Additional Controls

This table matches Table I in the paper, except we include additional controls in the four regressions, and the formatting is different. We take logs of the fund's scaled assets under management ($FundSize$), expense ratio ($ExpRatio$), and age ($FundAge$) since these variables are skewed. Our measures of flow-driven turnover, $FlowTurn1$ and $FlowTurn2$, as well as the volatility of fund flows ($FlowVol$), are defined in Table IAXXII. $1(FrontLoad)$ and $1(RearLoad)$ are dummies for whether the fund has a front or rear load, as reported by CRSP. Since these variables are constant over a fund's life, their slope coefficients are not identified in specifications with fund fixed effects. The last four control variables measure fund style as reported by Morningstar, and their values do vary over time within funds. The omitted style category dummies are $1(MidCap)$ and $1(Blend)$. Including all these controls reduces our sample size by roughly 25% compared to Table I in the paper. The negative slope on $Log(FundSize)$ has a negative bias in the presence of fund fixed effects, as discussed in Pástor, Stambaugh, and Taylor (2015).

	(1)	(2)	(3)	(4)
$FundTurn(i,t-1)$	0.000695	0.000600	0.000170	0.000129
	(3.55)	(3.39)	(1.04)	(0.80)
$Log(FundSize)$	-0.00189	-0.00185	-0.0000166	-0.0000291
	(-12.04)	(-11.34)	(-0.30)	(-0.54)
$Log(ExpRatio)$	-0.000112	0.000803	0.0000470	0.000229
	(-0.24)	(2.13)	(0.24)	(1.22)
$Log(FundAge)$	-0.000950	-0.000409	-0.000125	-0.0000627
	(-2.94)	(-1.55)	(-1.40)	(-0.83)
$FlowTurn1$	-0.000359	-0.000574	0.000487	0.000233
	(-1.12)	(-1.81)	(1.79)	(0.87)
$FlowTurn2$	0.00104	0.000892	0.00149	0.00107
	(1.34)	(1.20)	(2.03)	(1.56)
$FlowVol$	-0.00000913	0.000708	-0.00304	-0.00212
	(-0.01)	(0.73)	(-3.47)	(-2.49)
$1(FrontLoad)$	N/A	N/A	0.0000451	-0.000121
			(0.32)	(-0.91)
$1(RearLoad)$	N/A	N/A	0.000175	0.000179
			(1.30)	(1.33)
$1(SmallCapStocks)$	0.00282	0.00279	0.00175	0.00179
	(3.31)	(3.30)	(3.62)	(4.32)
$1(LargeCapStocks)$	0.00165	0.00134	0.000542	0.000561
	(2.63)	(2.19)	(1.48)	(1.72)
$1(ValueStocks)$	0.000167	-0.0000505	0.000265	0.000274
	(0.29)	(-0.08)	(0.81)	(0.90)
$1(GrowthStocks)$	0.000900	0.000846	0.000912	0.00101
	(1.69)	(1.54)	(2.63)	(3.17)
Observations	213,196	213,196	213,196	213,196
Fund fixed effects	Yes	Yes	No	No
Month fixed effects	No	Yes	No	Yes

Table IAXLIX
Expanded Version of Paper's Table II With Tabulated Coefficients on Control Variables

This table contains detailed results on the regressions from Table II in the paper. Panel A's column (1) ((2)) shows results from Table II's Panel A without (with) controls. Panel A's column (3) ((4)) show results from Table II's Panel C without (with) controls. Panel B's column (1) ((2)) shows results from Table II's Panel D without (with) controls. Panel B's columns (3) ((4)) show results from Table II's Panel B without (with) controls. To conserve space, we only tabulate the coefficients for interaction variables.

Panel A				
	(1)	(2)	(3)	(4)
$FundTurn * 1(SmlCapFund)$	0.00302	0.00171		0.00157
	(7.60)	(3.57)		(3.39)
$FundTurn * 1(MidCapFund)$	0.00114	0.000139		
	(3.38)	(0.35)		
$FundTurn * 1(LrgCapFund)$	0.00100	0.000253		0.000115
	(4.17)	(0.85)		(0.29)
$FundTurn * 1(LowFundSize)$		0.000994	0.00195	0.00113
		(3.47)	(7.86)	(2.76)
$FundTurn * 1(Med.FundSize)$			0.000895	0.000139
			(4.12)	(0.35)
$FundTurn * 1(HighFundSize)$		-0.000391	0.000374	-0.000252
		(-1.28)	(1.24)	(-0.59)
$FundTurn * 1(GrowthFund)$		0.000478		0.000478
		(1.57)		(1.57)
$FundTurn * 1(ValueFund)$		0.000635		0.000635
		(1.57)		(1.57)
$FundTurn * 1(LowExpRatio)$		-0.000106		-0.000106
		(-0.45)		(-0.45)
$FundTurn * 1(HighExpRatio)$		0.000511		0.000511
		(1.81)		(1.81)
Observations	259,758	259,714	282,693	259,714

Panel B				
	(1)	(2)	(3)	(4)
$FundTurn * 1(HighExpRatio)$	0.00161	0.000650		0.000511
	(6.02)	(1.47)		(1.81)
$FundTurn * 1(Med.ExpRatio)$	0.000992	0.000139		
	(5.02)	(0.35)		
$FundTurn * 1(LowExpRatio)$	0.000772	0.0000333		-0.000106
	(3.60)	(0.08)		(-0.45)
$FundTurn * 1(GrowthFund)$		0.000478	0.00155	0.000617
		(1.57)	(5.61)	(1.56)
$FundTurn * 1(BlendFund)$			0.00111	0.000139
			(4.85)	(0.35)
$FundTurn * 1(ValueFund)$		0.000635	0.00184	0.000774
		(1.57)	(4.35)	(1.42)
$FundTurn * 1(SmlCapFund)$		0.00157		0.00157
		(3.39)		(3.39)
$FundTurn * 1(LrgCapFund)$		0.000115		0.000115
		(0.29)		(0.29)
$FundTurn * 1(LowFundSize)$		0.000994		0.000994
		(3.47)		(3.47)
$FundTurn * 1(HighFundSize)$		-0.000391		-0.000391
		(-1.28)		(-1.28)
Observations	282,738	259,714	259,758	259,714

Table IAL
Counterpart of Paper's Table II with Continuous Fund Size and Expense Ratio

This table is the same as Table II in the paper, except instead of using three categories for fund size and expense ratio, we use continuous values for these variables. This change affects all panels' results with controls, because instead of controlling for fund size dummies and their interaction with turnover, we now control for $\log(FundSize_{i,t-1})$ and its interaction with $FundTurn_{i,t-1}$. Similarly, instead of controlling for expense ratio dummies and their interaction with turnover, we now control for $\log(ExpRatio_{i,t-1})$ and its interaction with $FundTurn_{i,t-1}$. We demean $\log(FundSize)$ and $\log(ExpRatio)$ using their full-sample means to make coefficients easier to interpret. For the results without controls in Panel C [D], we regress $GrossR_{i,t}$ on $FundTurn_{i,t-1}$, $\log(FundSize_{i,t-1})$ [$\log(ExpRatio_{i,t-1})$], their interaction, and fund fixed effects. We tabulate the coefficient on the interaction variable.

Panel A: Stock Size Categories				
Small Cap	Mid Cap	Large Cap	Small - Large	Controls
0.00302	0.00114	0.00100	0.00202	No
(7.60)	(3.38)	(4.17)	(4.49)	
0.00170	0.00014	0.00039	0.00132	Yes
(3.94)	(0.38)	(1.44)	(2.85)	
Panel B: Stock Value-Growth Categories				
Growth	Blend	Value	Growth–Value	Controls
0.00155	0.00111	0.00184	-0.00029	No
(5.61)	(4.85)	(4.35)	(-0.54)	
0.00059	0.00014	0.00041	0.00018	Yes
(1.63)	(0.38)	(0.86)	(0.37)	
Panel C: Fund Size				
Slope coefficient on $FundTurn_{i,t-1} * \log(FundSize_{i,t-1})$				Controls
-0.00048				No
(-5.06)				
-0.00045				Yes
(-4.18)				
Panel D: Fund Expense Ratio				
Slope coefficient on $FundTurn_{i,t-1} * \log(ExpRatio_{i,t-1})$				Controls
0.00084				No
(2.47)				
0.00019				Yes
(0.45)				

Table IALI
Counterpart of Paper's Table V Controlling for Average $FlowTurn1$

This table is the same as Table V in the paper, except we include controls for average lagged $FlowTurn1$. $FlowTurn1$, a proxy for flow-driven turnover measured at the fund level, is the sum of the absolute values of the fund's 12 monthly dollar flows, divided by the average fund size during the 12-month period. See Table IAXXII for a detailed definition. Each month, we average $FlowTurn1$ across funds in the indicated category, in the same way we average $FundTurn$ to compute the $AvgTurn$ measures in Table V.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$AvgTurn$	0.655							0.433
	(8.77)							(5.69)
$AvgTurn\_Stock\_Size$		0.573				0.235		
		(9.47)				(3.03)		
$AvgTurn\_Stock\_VG$			0.444			0.135		
			(6.41)			(1.87)		
$AvgTurn\_Fund\_Size$				0.610		0.227		
				(10.21)		(2.99)		
$AvgTurn\_Fund\_Exp$					0.583	0.235		
					(10.85)	(2.96)		
$AvgTurn\_Sim$							0.378	0.283
							(10.31)	(7.91)
$AvgFlowTurn1$	-0.108							-0.0339
	(-0.90)							(-0.23)
$AvgFlowTurn1\_Stock\_Size$		0.0201				0.0591		
		(0.19)				(0.41)		
$AvgFlowTurn1\_Stock\_VG$			-0.0453			-0.156		
			(-0.58)			(-1.36)		
$AvgFlowTurn1\_Fund\_Size$				0.0441		0.194		
				(0.49)		(1.60)		
$AvgFlowTurn1\_Fund\_Exp$					0.00919	0.0710		
					(0.20)	(1.07)		
$AvgFlowTurn1\_Sim$							0.0748	0.0976
							(1.88)	(2.62)
Observations	302,181	261,130	267,857	298,909	274,386	249,666	247,243	247,243
Within-fund R^2	0.011	0.017	0.011	0.017	0.018	0.027	0.021	0.025

Table IALII
Counterpart of Paper's Table V Controlling for Average $FlowTurn2$

This table is the same as Table V in the paper, except we include controls for average lagged $FlowTurn2$. $FlowTurn2$, a proxy for flow-driven turnover measured at the fund level, 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. See Table IAXXII for a detailed definition. Each month, we average $FlowTurn2$ across funds in the indicated category, in the same way we average $FundTurn$ to compute the $AvgTurn$ measures in Table V.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$AvgTurn$	0.591							0.383
	(7.25)							(4.26)
$AvgTurn\_Stock\_Size$		0.528				0.223		
		(8.05)				(2.69)		
$AvgTurn\_Stock\_VG$			0.409			0.128		
			(5.90)			(1.79)		
$AvgTurn\_Fund\_Size$				0.555		0.179		
				(8.85)		(2.44)		
$AvgTurn\_Fund\_Exp$					0.575	0.251		
					(10.69)	(3.40)		
$AvgTurn\_Sim$							0.369	0.284
							(10.01)	(7.70)
$AvgFlowTurn2$	0.569							0.398
	(1.03)							(0.53)
$AvgFlowTurn2\_Stock\_Size$		0.932				-0.0313		
		(2.21)				(-0.05)		
$AvgFlowTurn2\_Stock\_VG$			0.665			-0.278		
			(2.02)			(-0.72)		
$AvgFlowTurn2\_Fund\_Size$				0.955		1.301		
				(2.59)		(2.65)		
$AvgFlowTurn2\_Fund\_Exp$					0.170	0.0203		
					(0.97)	(0.15)		
$AvgFlowTurn2\_Sim$							0.485	0.361
							(2.95)	(2.58)
Observations	302,181	261,130	267,857	298,909	274,386	249,666	247,243	247,243
Within-fund R^2	0.011	0.018	0.011	0.017	0.018	0.027	0.022	0.026

Table IALIII
Counterpart of Paper's Table V Controlling for Average Flow Volatility

This table is the same as Table V in the paper, except we include controls for average lagged $FlowVol$. $FlowVol$, a proxy for within-fund flow volatility, is the standard deviation of a fund's 12 fraction flows within the year. See Table IAXXII for a detailed definition. Each month, we average $FlowVol$ across funds in the indicated category, in the same way we average $FundTurn$ to compute the $AvgTurn$ measures.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$AvgTurn$	0.696							0.445
	(9.68)							(5.43)
$AvgTurn\_Stock\_Size$		0.580				0.230		
		(9.26)				(2.91)		
$AvgTurn\_Stock\_VG$			0.448			0.118		
			(6.59)			(1.67)		
$AvgTurn\_Fund\_Size$				0.607		0.248		
				(9.52)		(3.34)		
$AvgTurn\_Fund\_Exp$					0.596	0.283		
					(11.58)	(3.79)		
$AvgTurn\_Sim$							0.373	0.288
							(10.10)	(7.74)
$AvgFlowVol$	-0.799							-0.530
	(-1.36)							(-0.78)
$AvgFlowVol\_Stock\_Size$		-0.0815				-0.367		
		(-0.15)				(-0.56)		
$AvgFlowVol\_Stock\_VG$			-0.133			-0.668		
			(-0.31)			(-1.32)		
$AvgFlowVol\_Fund\_Size$				0.187		0.704		
				(0.39)		(1.35)		
$AvgFlowVol\_Fund\_Exp$					-0.158	-0.157		
					(-0.40)	(-0.30)		
$AvgFlowVol\_Sim$							0.317	0.291
							(2.03)	(2.15)
Observations	302,181	261,130	268,961	301,184	277,270	252,206	248,462	248,462
Within-fund R^2	0.012	0.017	0.011	0.016	0.018	0.027	0.021	0.025

Table IALIV
Do Aggregate Flows Explain Aggregate Turnover?

The dependent variable in all regressions is $AvgTurn_t$, the average turnover across funds in month t. Column (4) in this table matches column (8) in the paper's Table VI. $AvgFlowTurn1_t$, $AvgFlowTurn2_t$, and $AvgFlowVol_t$ are proxies for average flow-driven turnover in month t. See Tables IAXXII and IALI through IALIII for detailed definitions of these three variables, and see Table VI in the paper for the other variables' definitions. We estimate Newey-West time-series regressions using 60 months of lags. $R^2 - R^2$(trend only) equals the R^2 from the given regression minus the R^2 from a regression on the time trend only. Data are from 1979 to 2011. t-statistics are in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$AvgFlowTurn1_t$	0.0626				0.0198		
	(0.25)				(0.13)		
$AvgFlowTurn2_t$		1.068				0.770	
		(1.15)				(2.37)	
$AvgFlowVol_t$			1.422				0.537
			(1.02)				(0.60)
$Sentiment_t$				0.0487	0.0489	0.0490	0.0485
				(4.65)	(4.51)	(4.96)	(5.00)
$Volatility_t$				0.809	0.800	0.742	0.744
				(7.98)	(8.83)	(8.26)	(6.25)
$Liquidity_t$				-0.138	-0.140	-0.147	-0.144
				(-4.58)	(-5.28)	(-5.14)	(-5.36)
$Business\ Cycle_t$				-0.00334	-0.00337	-0.00200	-0.00352
				(-0.66)	(-0.65)	(-0.34)	(-0.61)
$Market\ Return_t$				0.0171	0.0155	0.00970	0.00862
				(0.34)	(0.28)	(0.18)	(0.16)
$Time\ Trend_t$	0.000479	0.000473	0.000364	0.000523	0.000514	0.000501	0.000469
	(3.04)	(4.37)	(2.58)	(5.20)	(4.27)	(6.46)	(3.89)
R^2	0.395	0.438	0.430	0.677	0.678	0.700	0.682
$R^2 - R^2$(trend only)	0.042	0.085	0.077	0.324	0.325	0.347	0.329
Observations	372	372	372	372	372	372	372

Table IALV
Counterpart of Paper's Table II Controlling for Lagged Fund Performance

This table is the same as Table II in the paper, except we expand the set of controls to include $GrossR$ from each of the two previous fiscal years. Specifically, we add the controls $GrossRFYR_{i,t-1}$ and $GrossRFYR_{i,t-2}$, both defined in Table IAXIV. Including these controls makes us lose roughly 28% of our sample.

Panel A: Stock Size Categories				
Small Cap	Mid Cap	Large Cap	Small - Large	Controls
0.00302	0.00114	0.00100	0.00202	No
(7.60)	(3.38)	(4.17)	(4.49)	
0.00179	0.00055	0.00040	0.00138	Yes
(3.26)	(1.22)	(1.17)	(2.63)	
Panel B: Stock Value-Growth Categories				
Growth	Blend	Value	Growth–Value	Controls
0.00155	0.00111	0.00184	-0.00029	No
(5.61)	(4.85)	(4.35)	(-0.54)	
0.00103	0.00055	0.00113	-0.00010	Yes
(2.28)	(1.22)	(2.08)	(-0.21)	
Panel C: Fund Size Categories				
Small	Medium	Large	Small–Large	Controls
0.00195	0.00089	0.00037	0.00158	No
(7.86)	(4.12)	(1.24)	(4.51)	
0.00081	0.00055	0.00007	0.00075	Yes
(1.45)	(1.22)	(0.15)	(1.73)	
Panel D: Fund Expense Ratio Categories				
High	Medium	Low	High–Low	Controls
0.00161	0.00099	0.00077	0.00084	No
(6.02)	(5.02)	(3.60)	(3.09)	
0.00113	0.00055	0.00049	0.00064	Yes
(2.40)	(1.22)	(1.06)	(1.94)	

Table IALVI
Counterpart of Table IAXIV with Fund and Benchmark-Month Fixed Effects

This table is the same as Table IAXIV (Turnover-Performance Relation Controlling for Lagged Performance), except all regressions include not only fund fixed effects, but also benchmark-month fixed effects. Column (1) matches the result in Table IAVIII, which also considers benchmark-month fixed effects.

	(1)	(2)	(3)
$FundTurn(i,t-1)$	0.00124	0.00113	0.00106
	(7.81)	(6.96)	(6.72)
$GrossR(i,t-1)$ [FYR]			-0.00188
			(-0.60)
$GrossR(i,t-2)$ [FYR]			-0.00948
			(-4.24)
Observations	282,738	203,798	203,798

Table IALVII
Adding Benchmark-Month Fixed Effects to Column (4) of Paper's Table VII

The first column of this table matches column (4) of Table VII in the paper. The second column is identical except includes benchmark-month fixed effects in the regression. We thank the referee for suggesting this analysis.

	(1)	(2)
$AvgTurnSim_{i,t-1}$	0.00184	0.000919
	(2.76)	(2.38)
$FundTurn_{i,t-1}$	0.00135	0.00134
	(7.30)	(7.76)
Observations	259,234	259,234
Fund fixed effects	Yes	Yes
Benchmark-Month fixed effects	No	Yes

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