

Internet Appendix to “Artificial Market Timing in Mutual Funds”

Appendix A

In Section IV.A, we estimate fund beta during each half-month using daily fund returns and OLS. As an alternative to OLS, we follow Bali and Engle (2010) and use daily returns over the past 252 trading days to estimate time-varying daily betas for each fund based on the dynamic conditional correlation (DCC) model (Engle (2002)). In our context, by aggregating information across the past year, the DCC-based beta reduces the impact of noise associated with shorter estimation horizons. Moreover, compared to traditional OLS estimation, DCC estimation captures the dynamic feature of market factor loadings by weighing recent observations more heavily. By taking the average of the daily DCC betas during the first half of the month (from the 1st to 15th) and during the second half of the month (from 16th to 31st), we get betas for each fund during each half month:

$$\beta_{t,1}^i = \frac{1}{N_{t,1}} \sum_{d=1}^{N_{t,1}} \beta_d^i, \quad \beta_{t,2}^i = \frac{1}{N_{t,2}} \sum_{d=1}^{N_{t,2}} \beta_d^i, \quad (\text{A1})$$

where β_d^i is the DCC beta of fund i on day d , and $N_{t,1}$ and $N_{t,2}$ represent the number of trading days during the first and second half of month t , respectively. In addition to estimating betas during half-month intervals, we apply the same method based on one-month and one-quarter intervals.

We use the DCC-based beta estimates to analyze artificial timing as in equations (5) and (6), and we present the results in Table A.1. Similar to the results in Table 3, the results in Table A.1 suggest that, on average, fund managers behave as positive feedback traders.

Table A.1. Beta Based on DCC versus Past Market Return

This table examines the relationship between the DCC beta and the lagged market return. Panel A shows the results based on TM, and Panel B shows the results based on HM. The OLS columns are based on timing measures estimated from each fund's time series of returns and reflect a weighted average calculated across all funds with weights given by the inverse of the standard errors of the estimates of the individual timing measures. The panel regression columns reflect the average timing measure of all funds computed via a panel regression with fixed fund effects using clustered standard errors at the fund level. Standard errors are adjusted for heteroskedasticity. *t*-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level respectively. The sample includes 3,267 actively-managed funds across a 2000-2016 sample period.

	OLS			Panel Regressions		
	½ Month	1 Month	1 Quarter	½ Month	1 Month	1 Quarter
Panel A. TM						
$R_{t,1}^M$	2.793*** (33.53)	7.167*** (41.16)	11.631*** (31.98)	4.324*** (40.52)	10.477*** (48.42)	16.666*** (37.06)
Constant	0.960*** (277)	0.962*** (284)	0.974*** (330)	0.983*** (69,447)	0.982*** (28,415)	0.981*** (11,237)
Panel B. HM						
$I_{R_{t,1}^M > 0}$	0.025*** (39.15)	0.028*** (39.91)	0.032*** (28.58)	0.038*** (46.83)	0.041*** (47.30)	0.047*** (32.36)
Constant	0.944*** (269)	0.944*** (271)	0.955*** (307)	0.962*** (2,071)	0.959*** (1,830)	0.954*** (990)

Appendix B

This appendix provides complete results for the robustness tests discussed in the paper. Below, we briefly describe the contents.

Table B.1. Summary Statistics of CRSP Sample and Abel Noser sample discussed in Section III of the paper.

Table B.2. Feedback Trading Persistence discussed in Section IV of the paper.

Table B.3. Relation between Fund Beta and Past Market Return (Reduced Sample) discussed in Section IV of the paper.

Table B.4. Summary Statistics of Fund Trade Betas discussed in Section IV of the paper.

Table B.5. Fund Trade Beta versus Market Return: Univariate Sorts discussed in Section IV of the paper.

Table B.6. Feedback Trading and the Disposition Effect discussed in Section IV of the paper.

Table B.7. Lag Investor Flows and Positive Feedback Trading discussed in Section IV of the paper.

Table B.8. Feedback Trading and Transaction Costs discussed in Section IV of the paper.

Table B.9. Time-Varying Feedback Trading and Transaction Costs discussed in Section IV of the paper.

Table B.10. Feedback Trading and Fund Performance discussed in Section IV of the paper.

Table B.11. Time-varying Feedback Trading and Fund Performance discussed in Section IV of the paper.

Table B.12. Feedback Trading and CPZ Fund Performance discussed in Section IV of the paper.

Table B.1. Summary Statistics of CRSP Sample and Abel Noser sample

This table reports descriptive statistics of fund market timing measures, beta exposures and fund characteristics. Market timing measures are estimated based on fund monthly returns during the sample period. We estimate fund betas based on daily fund returns and set the period to be one-half month, one month and one quarter. Fund characteristics include fund total net assets (TNA), total net assets of fund family, fund age, investor net flow, expense ratio, turnover ratio and net return at fund-month level. Panel A is based on the sample of 3383 actively-managed funds across a September 1998 to December 2018 sample period. Panel B is based on the sample of 581 actively-managed funds across a January 1999 to March 2012 sample period.

Variable	Mean	Std.Dev.	p5	p25	p50	p75	p95
Panel A: CRSP Sample							
Market Timing							
TM Measure	-0.27	1.92	-2.77	-0.67	-0.13	0.29	1.52
HM Measure	-0.03	0.36	-0.46	-0.12	-0.02	0.07	0.31
Beta Exposure							
1/2 Month Beta	0.97	0.31	0.48	0.80	0.97	1.15	1.46
1 Month Beta	0.97	0.27	0.53	0.82	0.97	1.13	1.40
1 Quarter Beta	0.97	0.25	0.56	0.83	0.97	1.12	1.36
Characteristics							
Total Net Asset (\$M)	1,539	5,419	25	93	318	1,082	6,102
Family TNA (\$B)	170.7	375.4	0.2	4.3	31.6	138.6	1,302.3
Age (#year)	15.39	12.86	2.71	7.91	12.44	18.06	42.17
Expense Ratio (%)	1.21	0.43	0.56	0.95	1.18	1.45	1.90
Turnover Ratio (%)	81.89	103.42	9.57	31.98	59.98	102.44	209.41
Return (%)	0.68	2.42	-3.00	-0.70	0.64	2.04	4.51
Panel B: Abel Noser Sample							
Market Timing							
TM Measure	-0.14	1.08	-1.51	-0.53	-0.11	0.27	1.14
HM Measure	-0.02	0.18	-0.28	-0.10	-0.01	0.08	0.25
Beta Exposure							
1/2 Month Beta	0.99	0.29	0.56	0.82	0.98	1.16	1.46
1 Month Beta	0.99	0.26	0.59	0.83	0.98	1.15	1.43
1 Quarter Beta	0.99	0.24	0.62	0.84	0.98	1.14	1.40
Characteristics							
Total Net Asset (\$M)	2,962	7,710	29	135	479	1,852	16,364
Family TNA (\$B)	517.1	512.7	2.0	23.1	497.5	912.8	1,371.4
Age (#year)	15.43	12.80	2.33	6.83	12.75	19.75	41.42
Expense Ratio (%)	1.17	0.46	0.39	0.88	1.14	1.47	1.99
Turnover Ratio (%)	98.47	71.57	19.00	50.00	81.00	127.00	240.00
Return (%)	0.50	5.80	-9.39	-2.49	0.98	3.93	8.81

Table B.2. Feedback Trading Persistence

Panel A and B are based on fund returns. At the end of every other calendar year from 2000 to 2016, funds are ranked into quintile portfolios based on feedback trading measures based on equation (5) and (6). Panels C and D are based on fund transactions. At the end of each quarter, funds are ranked into quintile portfolios based on feedback trading measures estimated by equations (11) and (12). We pair the initial quintile rankings with the fund's subsequent quarter feedback trading ranking. These initial quintile rankings are paired with the fund's subsequent two-year feedback trading ranking. We report the transition probabilities for mutual funds conditional on fund survival. All probabilities are expressed in percentage. We estimate feedback trading based on mutual fund two year's daily returns by regressing fund market beta estimated over a half month interval on the market return from the prior half-month. Panels A and C report results based on TM, and Panels B and D reports results based on HM. We also report the persistence test statistics (Malkiel (1995) Z-test, Brown and Goetzmann (1995) Z-test, and the chi-squared test of Kahn and Rudd (1995)). *** denotes statistical significance at 1% level.

Panel A: TM											
$\hat{\delta}$ Initial Ranking	Subsequent Ranking					$\hat{\delta}^{adj}$ Initial Ranking	Subsequent Ranking				
	1	2	3	4	5		1	2	3	4	5
1	31.29	20.66	17.29	14.72	16.05	1	33.15	22.29	17.90	14.16	12.49
2	22.68	24.38	23.08	17.38	12.48	2	21.90	22.18	21.22	19.21	15.49
3	17.31	24.13	24.74	20.50	13.32	3	17.93	21.06	20.81	21.43	18.77
4	16.11	18.00	20.48	25.56	19.86	4	16.42	19.05	19.73	21.00	23.79
5	12.74	12.81	14.42	21.83	38.20	5	10.73	15.38	20.34	24.19	29.36
Malkiel Z-test 20.25***	B&G Z-test 22.50***		Chi-Square test 581.83***			Malkiel Z-test 16.71***	B&G Z-test 23.12***		Chi-Square test 595.28***		

Panel B: HM											
$\hat{\delta}$ Initial Ranking	Subsequent Ranking					$\hat{\delta}^{adj}$ Initial Ranking	Subsequent Ranking				
	1	2	3	4	5		1	2	3	4	5
1	31.29	24.15	17.81	13.73	13.02	1	34.01	24.61	18.09	13.02	10.27
2	24.57	27.76	23.54	14.87	9.26	2	25.40	23.51	20.72	16.14	14.22
3	19.29	22.98	24.53	20.35	12.85	3	18.49	20.53	20.04	19.85	21.09
4	14.68	15.52	21.19	26.21	22.40	4	13.38	16.95	20.45	24.47	24.75
5	10.29	9.55	12.93	24.84	42.39	5	8.84	14.36	20.71	26.54	29.55
Malkiel Z-test 25.11***	B&G Z-test 27.19***		Chi-Square test 929.68***			Malkiel Z-test 18.99***	B&G Z-test 26.12***		Chi-Square test 790.16***		

Table B.2 continued

Panel C. TM											
$\hat{\gamma}$	Subsequent Ranking					$\hat{\gamma}^{adj}$	Subsequent Ranking				
Initial Ranking	1	2	3	4	5	Initial Ranking	1	2	3	4	5
1	29.74	19.77	17.42	15.54	17.52	1	26.90	21.60	21.33	17.42	12.75
2	20.52	21.71	21.93	19.71	16.13	2	21.77	20.52	20.57	21.17	15.97
3	16.93	23.80	23.58	21.09	14.60	3	20.01	20.82	21.20	19.58	18.39
4	15.16	18.46	21.28	24.53	20.57	4	18.57	20.14	19.76	20.79	20.74
5	18.60	16.24	15.91	19.20	30.06	5	13.66	16.90	17.22	21.12	31.10
Malkiel Z-test	B&G Z-test		Chi-Square test			Malkiel Z-test	B&G Z-test		Chi-Square test		
7.02***	10.28***		108.17***			11.13***	14.34***		223.28***		

Panel D. HM											
$\hat{\gamma}$	Subsequent Ranking					$\hat{\gamma}^{adj}$	Subsequent Ranking				
Initial Ranking	1	2	3	4	5	Initial Ranking	1	2	3	4	5
1	28.03	19.51	16.24	17.74	18.49	1	24.81	21.81	21.01	17.95	14.42
2	19.83	23.40	22.26	18.31	16.20	2	21.45	21.56	19.50	20.31	17.17
3	16.11	20.86	24.16	21.03	17.84	3	19.46	19.35	21.41	19.84	19.95
4	17.28	19.34	21.51	24.16	17.71	4	19.99	19.07	19.01	21.72	20.21
5	19.75	16.84	16.02	18.76	28.63	5	15.25	18.16	19.25	20.19	27.15
Malkiel Z-test	B&G Z-test		Chi-Square test			Malkiel Z-test	B&G Z-test		Chi-Square test		
5.45***	8.09***		66.32***			7.80***	10.45***		113.71***		

Table B.3. Relation between Fund Beta and Past Market Return (Reduced Sample)

This table examines the relation between fund beta and the lagged market return. Panel A reports mean regression coefficients based on TM in Panel A1 and based on HM in Panel A2. We base the OLS columns on timing measures estimated from each fund's time series of returns. The OLS columns reflect a weighted average calculated across all funds with weights given by the inverse of the standard errors of the estimates of the individual timing measures. The panel regression columns reflect the average timing measure of all funds computed via a panel regression with fund fixed effects using clustered standard errors at the fund level. Standard errors are adjusted for heteroskedasticity. *t*-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level respectively. Panel B reports the fraction of funds that respond positively or negatively to previous market returns at different significant levels (1%, 5%, and 10%). The sample includes 581 actively-managed funds across a 1999-2012 sample period.

Panel A. Regression Coefficients

	OLS			Panel Regressions		
	½ Month	1 Month	1 Quarter	½ Month	1 Month	1 Quarter
A1. TM						
$R_{t,1}^M$	2.323*** (11.33)	4.095*** (10.90)	6.384*** (8.43)	3.421*** (15.27)	6.026*** (14.29)	7.553*** (9.15)
Constant	0.990*** (166)	0.990*** (167)	0.990*** (565)	0.998*** (37,087)	0.998*** (19,312)	0.997*** (8,439)
A2. HM						
$I_{R_{t,1}^M > 0}$	0.025*** (13.54)	0.018*** (11.09)	0.027*** (10.27)	0.038*** (17.86)	0.029*** (15.44)	0.036*** (11.69)
Constant	0.975*** (174)	0.980*** (169)	0.974*** (156)	0.976*** (798)	0.982*** (894)	0.976*** (512)

Panel B. Significant Feedback Trading Estimates

	Positive Feedback			Negative Feedback		
	½ Month	1 Month	1 Quarter	½ Month	1 Month	1 Quarter
B1. TM						
0.5%	4.33	4.51	1.59	0.87	0.69	0.18
1%	7.63	7.63	3.36	1.21	1.21	0.71
5%	22.70	18.20	11.50	3.29	3.12	2.30
10%	35.18	28.25	18.94	6.41	5.03	4.25
B2. HM						
0.5%	14.21	2.60	4.25	1.39	0.35	0.88
1%	21.14	3.99	6.02	2.43	0.35	1.24
5%	37.26	16.98	16.99	4.16	2.95	4.25
10%	45.58	27.73	25.84	5.55	4.85	6.90

Table B.4. Summary Statistics of Fund Trade Betas

The table provides summary statistics for the fund trade betas. We compute the buy beta and the sell beta via equation (8), and we compute the trade beta via equation (9). The sample consists of 581 actively-managed funds from January 1999 to March 2012.

Variable	Mean	Std.Dev.	p5	p25	p50	p75	p95
Buy Beta	1.107	0.608	0.257	0.770	1.057	1.385	2.116
Sell Beta	1.090	0.598	0.251	0.754	1.042	1.365	2.098
Trade Beta	0.038	0.938	-1.439	-0.560	0.031	0.645	1.521

Table B.5. Fund Trade Beta versus Market Return: Univariate Sorts

This table reports trade-based fund betas as a function of past, contemporaneous, or future market excess returns. Based on each horizon ranging from the past 10 trading days to the future 10 trading days, we divide the sample into quintiles according to cumulative market excess returns. For instance, a sub-sample period characterized by relatively large negative market returns would be assigned to quintile 1, and a sub-sample period characterized by large positive market returns would be assigned to quintile 5. We then examine the trade betas of each quintile to see if the betas traded by funds differ as a function of the performance of the stock market. For each quintile, we report the average market excess percentage return and the average fund beta. We also report differences between the top and bottom quintiles. *t*-statistics are in parentheses. ***, **, and * reflect significance at the 1%, 5%, and 10% level respectively. The sample consists of 581 actively-managed funds across a January 1999 to March 2012 sample period.

R^M Quintile	R^M	Beta			
		Buy	Sell	Buy-Sell	Trade
Panel A. Sort on past 10-day market excess returns					
1	-5.185	1.104	1.094	0.009	0.014
2	-1.299	1.102	1.090	0.013	0.037
3	0.461	1.097	1.088	0.009	0.038
4	1.873	1.107	1.094	0.013	0.034
5	4.780	1.118	1.088	0.030	0.039
Diff (5-1)		0.015***	-0.006	0.021***	0.025***
<i>t</i> -stat		(3.190)	(-1.30)	(3.58)	(3.20)
Panel B. Sort on past 5-day market excess returns					
1	-3.838	1.100	1.095	0.005	0.009
2	-1.047	1.101	1.092	0.008	0.031
3	0.222	1.101	1.090	0.012	0.031
4	1.349	1.106	1.088	0.018	0.050
5	3.639	1.120	1.090	0.031	0.041
Diff (5-1)		0.020***	-0.006	0.026***	0.033***
<i>t</i> -stat		(4.27)	(-1.30)	(4.64)	(4.26)
Panel C. Sort on past 3-day market excess returns					
1	-3.081	1.100	1.091	0.009	0.005
2	-0.836	1.098	1.095	0.003	0.030
3	0.178	1.106	1.094	0.012	0.040
4	1.050	1.106	1.087	0.019	0.049
5	2.890	1.118	1.087	0.031	0.038
Diff (5-1)		0.018***	-0.004	0.022***	0.034***
<i>t</i> -stat		(3.73)	(-0.93)	(3.88)	(4.37)
Panel D. Sort on past 1-day market excess returns					
1	-1.815	1.100	1.093	0.006	-0.002
2	-0.461	1.103	1.096	0.007	0.027
3	0.062	1.101	1.087	0.014	0.037
4	0.528	1.104	1.088	0.016	0.049
5	1.776	1.120	1.089	0.030	0.051
Diff (5-1)		0.020***	-0.004	0.024***	0.053***
<i>t</i> -stat		(4.33)	(-0.81)	(4.27)	(6.84)

Table B.5 continued.

R^M Quintile	R^M	Beta			
		Buy	Sell	Buy-Sell	Trade
Panel E. Sort on contemporaneous market excess returns					
1	-1.815	1.100	1.099	0.001	0.064
2	-0.461	1.103	1.092	0.011	0.058
3	0.063	1.106	1.088	0.018	0.036
4	0.528	1.103	1.090	0.013	0.017
5	1.776	1.117	1.086	0.031	-0.014
Diff (5-1)		0.016***	-0.013***	0.029***	-0.078***
t -stat		(3.65)	(-2.78)	(5.38)	(-10.11)
Panel F. Sort on future 1-day market excess returns					
1	-1.815	1.106	1.097	0.009	0.023
2	-0.454	1.110	1.090	0.019	0.041
3	0.067	1.105	1.090	0.016	0.032
4	0.528	1.103	1.084	0.020	0.039
5	1.776	1.104	1.094	0.010	0.026
Diff (5-1)		-0.002	-0.003	0.001	0.002
t -stat		(-0.51)	(-0.54)	(0.03)	(0.31)
Panel G. Sort on future 2-day market excess returns					
1	-2.540	1.108	1.090	0.017	0.021
2	-0.708	1.107	1.090	0.018	0.040
3	0.091	1.108	1.091	0.017	0.040
4	0.840	1.102	1.087	0.015	0.035
5	2.455	1.103	1.096	0.007	0.025
Diff (5-1)		-0.005	0.005	-0.010*	0.004
t -stat		(-1.09)	(1.14)	(-1.85)	(0.50)
Panel H. Sort on future 3-day market excess returns					
1	-3.081	1.106	1.086	0.020	0.025
2	-0.837	1.110	1.090	0.019	0.043
3	0.176	1.105	1.091	0.014	0.041
4	1.047	1.103	1.091	0.012	0.029
5	2.888	1.104	1.097	0.007	0.023
Diff (5-1)		-0.002	0.011**	-0.013**	-0.001
t -stat		(-0.39)	(2.21)	(-2.12)	(-0.15)
Panel I. Sort on future 5-day market excess returns					
1	-3.838	1.108	1.090	0.018	0.029
2	-1.050	1.106	1.097	0.009	0.045
3	0.215	1.109	1.087	0.023	0.024
4	1.340	1.102	1.089	0.012	0.035
5	3.633	1.104	1.092	0.011	0.028
Diff (5-1)		-0.004	0.003	-0.007	-0.001
t -stat		(-0.87)	(0.55)	(-1.14)	(-0.17)

Table B.5 continued.

R^M Quintile	R^M	Beta			
		Buy	Sell	Buy-Sell	Trade
Panel J. Sort on future 10-day market excess returns					
1	-5.190	1.106	1.092	0.014	0.033
2	-1.314	1.110	1.094	0.015	0.039
3	0.445	1.110	1.092	0.018	0.038
4	1.855	1.099	1.085	0.013	0.032
5	4.751	1.104	1.091	0.013	0.021
Diff (5-1)		-0.002	-0.001	-0.001	-0.012
t-stat		(-0.50)	(-0.16)	(-0.28)	(-0.16)

Table B.6. Feedback Trading and the Disposition Effect

This table reports results that estimate fund feedback trading after controlling for capital gain overhang. For day d , after controlling for the CGO of traded stocks in the previous month, we examine the exposure of a fund's betas to prior market returns based on estimating the TM and HM equations via panel regressions,

$$\beta_d^{i,trade} = \alpha + \lambda^i + \gamma R_{d-1}^M + \varphi PastCGO_d^{i,trade} + \epsilon_d^i, \quad (B1)$$

$$\beta_d^{i,trade} = \alpha + \lambda^i + \gamma I_{R_{d-1}^M > 0} + \varphi PastCGO_d^{i,trade} + \epsilon_d^i. \quad (B2)$$

Capital gain overhang are the value-weighted prior return and capital gain overhang of the stocks funds buy, sell, or trade. Columns (1)-(3) are based on TM, and columns (4)-(6) are based on HM. We compute the average timing measure of all funds via a panel regression with fund fixed effects using clustered standard errors at the fund level. t -statistics are reported in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level respectively. The sample consists of 581 actively-managed funds across a January 4, 1999 to March 30, 2012 sample period.

	TM			HM		
	Buy Beta (1)	Sell Beta (2)	Trade Beta (3)	Buy Beta (4)	Sell Beta (5)	Trade Beta (6)
R_{d-1}^M	0.4042*** (5.58)	-0.1942*** (-2.68)	1.1660*** (5.58)			
$I_{R_{d-1}^M > 0}$				0.0096*** (4.24)	-0.0024 (-1.14)	0.0316*** (5.89)
$PastCGO_d^{i,buy}$	-0.1577*** (-13.00)			-0.1581*** (-13.04)		
$PastCGO_d^{i,sell}$		-0.1107*** (-7.72)			-0.1107*** (-7.72)	
$PastCGO_d^{i,trade}$			-0.7069*** (-29.63)			-0.7070*** (-29.63)
Observations	383,422	367,125	453,578	383,422	367,125	453,578
R-squared	0.004	0.003	0.032	0.004	0.003	0.032
# Funds	579	580	580	579	580	580

Table B.7. Lag Investor Flows and Positive Feedback Trading

In this table, we regress feedback trading measures on fund flows from the previous month. We include other mutual fund characteristics (lagged one month) as control variables. For each fund, we estimate the feedback trading measure ($\hat{\gamma}$) via equations (11) and (12). $\hat{\gamma}^{adj}$ reflects normalized feedback trading estimates (by dividing by its standard error). Columns (1) and (2) report regression results based on the TM measure. Columns (3) and (4) are based on the HM measure. We estimate cross-sectional regressions each month and report the time-series average of the monthly coefficients. We base the t -statistics in parentheses on Newey and West's (1986) correction for time-series correlation with three lags. The coefficients are scaled by 100 for ease of reading. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level respectively. The sample consists of 581 actively managed funds across a January 1999 to September 2011 sample period.

	TM		HM	
	(1) $\hat{\gamma}$	(2) $\hat{\gamma}^{adj}$	(3) $\hat{\gamma}$	(4) $\hat{\gamma}^{adj}$
Fund Flow	1.475 (1.07)	0.285 (1.22)	0.009 (0.14)	0.135 (0.59)
Log(TNA)	-25.376*** (-3.72)	-3.368*** (-2.93)	-1.288*** (-3.33)	-2.563* (-1.91)
Log(Age)	11.582 (0.89)	0.914 (0.50)	0.879 (1.30)	2.764 (1.21)
Log(family TNA)	15.156*** (2.95)	2.196*** (2.86)	0.605*** (2.63)	1.838** (2.39)
Expense Ratio	-18.857 (-0.60)	-3.366 (-0.77)	-0.496 (-0.32)	-0.621 (-0.13)
Turnover Ratio	0.172 (0.91)	0.065*** (2.77)	0.008 (0.93)	0.040* (1.74)
Fund Return	-7.889* (-1.82)	-0.860 (-1.50)	-0.032 (-0.17)	1.495 (0.76)
Constant	-10.404 (-0.11)	-6.705 (-0.45)	-1.333 (-0.29)	-21.364 (-0.98)
Observations	28,175	28,175	27,895	27,895
R-squared	0.066	0.062	0.068	0.065
# months	151	151	151	151

Table B.8. Feedback Trading and Transaction Costs

This table reports cross-sectional coefficient estimates from regressions of fund-level transaction costs on fund feedback trading estimates based on fund trades and fund-level variables as in equation (18). We base each fund's feedback trading estimate ($\hat{\gamma}$) on equations (11) and (12). $\hat{\gamma}^{adj}$ reflects normalizing each feedback trading estimate by dividing by its standard error. We estimate transaction costs by execution shortfall, prior-day close cost, and open price cost. We estimate cross-sectional regressions each month and report the time-series average of the monthly coefficients. We base the t -statistics in parentheses on Newey and West's (1986) correction for time-series correlation with twelve lags to account for persistence in trading cost estimates. The coefficients are scaled by 100 for ease of reading. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level respectively. The sample consists of 581 actively-managed funds across a January 1999 to September 2011 sample period.

Panel A. TM

	Execution Shortfall		Prior-Day Close Cost		Open Price Cost	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\gamma}$	0.002*** (4.33)		0.009*** (6.03)		0.006*** (6.20)	
$\hat{\gamma}^{adj}$		0.003*** (6.88)		0.018*** (7.33)		0.011*** (7.91)
Log(TNA)	-0.004*** (-3.30)	-0.004*** (-3.71)	-0.007** (-2.35)	-0.010*** (-3.74)	-0.005*** (-3.27)	-0.007*** (-4.77)
Log(Age)	-0.007*** (-2.64)	-0.006*** (-2.61)	-0.016*** (-3.52)	-0.016*** (-3.82)	-0.013*** (-4.48)	-0.013*** (-4.81)
Log(family TNA)	-0.005*** (-5.04)	-0.005*** (-5.23)	-0.004** (-2.55)	-0.004*** (-3.21)	-0.005*** (-4.36)	-0.005*** (-4.87)
Expense Ratio	-0.011*** (-2.78)	-0.011*** (-2.61)	-0.040*** (-3.08)	-0.041*** (-3.42)	-0.031*** (-4.08)	-0.031*** (-4.53)
Turnover Ratio	0.024*** (9.79)	0.023*** (9.29)	0.061*** (7.05)	0.054*** (6.41)	0.045*** (9.00)	0.041*** (8.43)
Fund Flow	-0.000 (-0.45)	-0.000 (-0.50)	0.000 (0.03)	-0.000 (-0.12)	-0.000 (-0.42)	-0.000 (-0.56)
Lag Fund Return	-0.000 (-1.21)	-0.000 (-1.16)	-0.002* (-1.95)	-0.002* (-1.83)	-0.001* (-1.72)	-0.001 (-1.57)
Constant	0.128*** (6.06)	0.131*** (6.22)	0.166*** (3.73)	0.197*** (4.71)	0.163*** (5.61)	0.181*** (6.65)
Observations	24,053	24,053	24,378	24,378	24,387	24,387
R-squared	0.125	0.121	0.133	0.131	0.142	0.139
# months	153	153	153	153	153	153

Table B.8 continued.

	Execution Shortfall		Prior-Day Close Cost		Open Price Cost	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\gamma}$	0.094*** (5.89)		0.376*** (6.63)		0.246*** (7.00)	
$\hat{\gamma}^{adj}$		0.004*** (9.47)		0.019*** (7.14)		0.012*** (8.23)
Log(TNA)	-0.004*** (-3.35)	-0.005*** (-3.79)	-0.007** (-2.47)	-0.010*** (-3.85)	-0.006*** (-3.43)	-0.007*** (-4.93)
Log(Age)	-0.006** (-2.44)	-0.006** (-2.53)	-0.013*** (-2.84)	-0.013*** (-3.08)	-0.011*** (-3.76)	-0.011*** (-4.10)
Log(family TNA)	-0.005*** (-5.04)	-0.005*** (-5.25)	-0.004*** (-2.74)	-0.004*** (-3.06)	-0.005*** (-4.19)	-0.005*** (-4.68)
Expense Ratio	-0.011*** (-2.73)	-0.011** (-2.58)	-0.037*** (-2.90)	-0.038*** (-3.25)	-0.029*** (-3.82)	-0.029*** (-4.35)
Turnover Ratio	0.023*** (8.90)	0.021*** (8.50)	0.058*** (7.06)	0.053*** (6.48)	0.043*** (9.11)	0.040*** (8.46)
Fund Flow	-0.000 (-0.47)	-0.000 (-0.53)	-0.000 (-0.06)	-0.000 (-0.15)	-0.000 (-0.45)	-0.000 (-0.55)
Lag Fund Return	-0.000 (-1.22)	-0.000 (-1.16)	-0.002* (-1.81)	-0.002* (-1.81)	-0.001 (-1.51)	-0.001 (-1.48)
Constant	0.130*** (6.07)	0.132*** (6.24)	0.168*** (3.53)	0.188*** (4.48)	0.164*** (5.28)	0.177*** (6.48)
Observations	24,048	24,048	24,373	24,373	24,382	24,382
R-squared	0.125	0.122	0.130	0.129	0.140	0.138
# months	153	153	153	153	153	153

Table B.9. Time-Varying Feedback Trading and Transaction Costs

This table reports cross-sectional coefficient estimates from regressions of fund-level transaction costs on fund feedback trading estimates based on fund trades and fund-level variables as in equation (18). For each fund, each month, we estimate feedback trading ($\hat{\gamma}$) via equations (11) and (12). $\hat{\gamma}^{adj}$ reflects normalizing each feedback trading estimate by dividing by its standard error. We estimate transaction costs by execution shortfall, prior-day close cost, and open price cost. We estimate cross-sectional regressions each month and report the time-series average of the monthly coefficients. We base the t -statistics in parentheses on Newey and West's (1986) correction for time-series correlation with twelve lags. The coefficients are scaled by 10,000 for ease of reading. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level respectively. The sample consists of 581 actively-managed funds across a January 1999 to September 2011 sample period.

	Execution Shortfall		Prior-Day Close Cost		Open Price Cost	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\gamma}$	0.023*** (3.29)		0.112*** (4.14)		0.064*** (4.36)	
$\hat{\gamma}^{adj}$		0.481*** (5.15)		2.024*** (7.27)		1.246*** (6.97)
Log(TNA)	-0.568*** (-4.01)	-0.583*** (-4.16)	-0.909*** (-3.00)	-0.982*** (-3.17)	-0.761*** (-3.97)	-0.799*** (-4.16)
Log(Age)	-0.672** (-2.55)	-0.671** (-2.55)	-1.383*** (-2.74)	-1.374*** (-2.78)	-1.210*** (-3.76)	-1.208*** (-3.82)
Log(family TNA)	-0.568*** (-5.61)	-0.571*** (-5.63)	-0.294* (-1.97)	-0.317** (-2.14)	-0.487*** (-4.44)	-0.499*** (-4.51)
Expense Ratio	-1.333*** (-2.88)	-1.346*** (-2.92)	-4.201*** (-3.41)	-4.277*** (-3.43)	-3.318*** (-4.64)	-3.351*** (-4.64)
Turnover Ratio	2.343*** (7.91)	2.316*** (7.85)	7.239*** (6.35)	7.134*** (6.33)	5.189*** (7.75)	5.117*** (7.68)
Fund Flow	-0.027 (-0.57)	-0.024 (-0.51)	0.007 (0.10)	0.013 (0.18)	-0.018 (-0.41)	-0.016 (-0.36)
Lag Fund Return	-0.068* (-1.67)	-0.064 (-1.54)	-0.261** (-2.31)	-0.264** (-2.37)	-0.152** (-2.38)	-0.150** (-2.35)
Constant	15.269*** (6.94)	15.427*** (6.96)	17.277*** (4.13)	18.139*** (4.19)	18.117*** (6.59)	18.563*** (6.53)
Observations	21,429	21,429	21,739	21,739	21,739	21,739
R-squared	0.130	0.132	0.123	0.127	0.134	0.137
# months	153	153	153	153	153	153

Table B.9 continued.

	Execution Shortfall		Prior-Day Close Cost		Open Price Cost	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\gamma}$	0.879*** (3.97)		3.284*** (4.99)		2.160*** (5.37)	
$\hat{\gamma}^{adj}$		0.402*** (4.99)		1.646*** (6.01)		1.082*** (6.63)
Log(TNA)	-0.563*** (-3.99)	-0.572*** (-4.08)	-0.905*** (-2.97)	-0.935*** (-3.10)	-0.753*** (-3.89)	-0.776*** (-4.06)
Log(Age)	-0.674** (-2.53)	-0.674** (-2.57)	-1.406*** (-2.78)	-1.392*** (-2.82)	-1.216*** (-3.72)	-1.216*** (-3.84)
Log(family TNA)	-0.577*** (-5.70)	-0.577*** (-5.68)	-0.306** (-2.08)	-0.314** (-2.12)	-0.499*** (-4.52)	-0.501*** (-4.56)
Expense Ratio	-1.347*** (-2.86)	-1.344*** (-2.86)	-4.290*** (-3.45)	-4.258*** (-3.42)	-3.376*** (-4.67)	-3.362*** (-4.66)
Turnover Ratio	2.356*** (7.77)	2.363*** (7.81)	7.279*** (6.30)	7.269*** (6.38)	5.209*** (7.64)	5.190*** (7.67)
Fund Flow	-0.026 (-0.56)	-0.025 (-0.53)	0.011 (0.16)	0.011 (0.16)	-0.015 (-0.33)	-0.015 (-0.33)
Lag Fund Return	-0.068 (-1.63)	-0.066 (-1.57)	-0.227* (-1.90)	-0.223* (-1.92)	-0.133** (-1.98)	-0.130* (-1.94)
Constant	15.333*** (6.77)	15.362*** (6.81)	17.499*** (4.14)	17.710*** (4.17)	18.244*** (6.48)	18.383*** (6.53)
Observations	21,371	21,371	21,681	21,681	21,681	21,681
R-squared	0.131	0.132	0.123	0.125	0.135	0.137
# months	153	153	153	153	153	153

Table B.10. Feedback Trading and Fund Performance

This table reports cross-sectional coefficient estimates from regressions of fund net return or risk-adjusted returns on fund feedback trading estimates,

$$Perf_t^i = a + b_1 FeedbackTrading^i + b_2 Z_{t-1}^i + \zeta_t^i,$$

where $Perf_t^i$ is net return, four-factor alpha, or five-factor alpha of mutual fund i during month t . To calculate the four- and five-factor alpha, we use betas based on the previous 36 months of factors and fund returns to risk-adjust the current month's excess return. We base $FeedbackTrading^i$ on $\hat{\gamma}$ or $\hat{\gamma}^{adj}$ in equations (11) and (12). $\hat{\gamma}^{adj}$ reflects normalizing each feedback trading estimate by dividing by its standard error. Z_{t-1}^i is a set of fund-level control variables at the end of the prior month, including the log of total net assets, expense ratio, turnover ratio, net flow, log of fund age, log of family TNA, and fund net return. We estimate the cross-sectional regressions each month and report the time-series average of the monthly coefficients. We base the t -statistics in parentheses on Newey and West's (1986) correction for time-series correlation with twelve lags. The coefficients are scaled by 100 for ease of reading. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level respectively. The sample consists of 581 actively managed funds across a January 1999 to September 2011 sample period.

Panel A. TM						
	Net Return		Carhart Alpha		Five-Factor Alpha	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\gamma}$	-0.012**		-0.008*		-0.008**	
	(-2.21)		(-1.80)		(-2.01)	
$\hat{\gamma}^{adj}$		-0.035**		-0.019**		-0.019**
		(-2.47)		(-2.02)		(-2.22)
Log(TNA)	-0.030	-0.024	-0.021	-0.018	-0.026	-0.022
	(-0.78)	(-0.63)	(-1.19)	(-0.99)	(-1.61)	(-1.35)
Log(Age)	0.006	0.003	0.004	0.002	0.008	0.006
	(0.24)	(0.10)	(0.20)	(0.10)	(0.33)	(0.24)
Log(family TNA)	0.009	0.011	0.027***	0.027***	0.023***	0.024***
	(0.93)	(1.12)	(2.94)	(3.03)	(2.63)	(2.76)
Expense Ratio	-0.015	-0.024	-0.013	-0.023	-0.046	-0.052
	(-0.25)	(-0.40)	(-0.25)	(-0.44)	(-0.89)	(-1.00)
Turnover Ratio	0.027	0.044	-0.023	-0.014	-0.030	-0.020
	(0.30)	(0.48)	(-0.66)	(-0.38)	(-0.92)	(-0.58)
Fund Flow	0.007	0.007	-0.004	-0.005	-0.004	-0.004
	(1.37)	(1.33)	(-1.15)	(-1.21)	(-1.13)	(-1.22)
Lag Fund Return	0.083***	0.082***	0.017	0.018	0.016	0.017
	(2.67)	(2.61)	(0.98)	(0.99)	(0.97)	(0.99)
Constant	0.346	0.307	-0.071	-0.073	-0.013	-0.029
	(0.77)	(0.70)	(-0.50)	(-0.50)	(-0.08)	(-0.18)
Observations	29,174	29,174	29,030	29,030	29,030	29,030
R-squared	0.223	0.225	0.146	0.145	0.142	0.141
# months	153	153	153	153	153	153

Table B.10 continued.

Panel B. HM

	Net Return		Carhart Alpha		Five-Factor Alpha	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\gamma}$	-0.625**		-0.384*		-0.363*	
	(-2.58)		(-1.68)		(-1.81)	
$\hat{\gamma}^{adj}$		-0.040**		-0.020*		-0.020*
		(-2.36)		(-1.72)		(-1.84)
Log(TNA)	-0.030	-0.024	-0.020	-0.017	-0.025	-0.022
	(-0.75)	(-0.63)	(-1.12)	(-0.98)	(-1.54)	(-1.34)
Log(Age)	0.001	-0.001	0.002	0.001	0.006	0.004
	(0.05)	(-0.02)	(0.10)	(0.05)	(0.22)	(0.17)
Log(family TNA)	0.011	0.012	0.027***	0.027***	0.024***	0.0240***
	(1.11)	(1.16)	(2.91)	(2.94)	(2.61)	(2.66)
Expense Ratio	-0.018	-0.028	-0.0120	-0.024	-0.045	-0.053
	(-0.28)	(-0.47)	(-0.23)	(-0.47)	(-0.86)	(-1.05)
Turnover Ratio	0.033	0.047	-0.019	-0.013	-0.025	-0.019
	(0.35)	(0.50)	(-0.52)	(-0.35)	(-0.77)	(-0.55)
Fund Flow	0.007	0.006	-0.005	-0.005	-0.004	-0.004
	(1.32)	(1.28)	(-1.21)	(-1.24)	(-1.20)	(-1.23)
Lag Fund Return	0.082***	0.082***	0.017	0.017	0.016	0.016
	(2.66)	(2.63)	(0.96)	(0.97)	(0.97)	(0.99)
Constant	0.338	0.315	-0.087	-0.073	-0.026	-0.024
	(0.75)	(0.72)	(-0.60)	(-0.50)	(-0.17)	(-0.15)
Observations	29,169	29,169	29,025	29,025	29,025	29,025
R-squared	0.223	0.224	0.145	0.144	0.141	0.140
# months	153	153	153	153	153	153

Table B.11. Time-varying Feedback Trading and Fund Performance

This table reports cross-sectional coefficient estimates from regressions of fund net return or risk-adjusted returns on fund feedback trading estimates,

$$Perf_t^i = a + b_1 FeedbackTrading^i + b_2 Z_{t-1}^i + \zeta_t^i,$$

where $Perf_t^i$ is net return, four-factor alpha, or five-factor alpha of mutual fund i during month t . To calculate the four- and five-factor alpha, we use betas based on the previous 36 months of factors and fund returns to risk-adjust the current month's excess return. We use time-varying estimates of $FeedbackTrading^i$, where we estimate $\hat{\gamma}$ and $\hat{\gamma}^{adj}$ in equations (11) and (12) for each fund each month. $\hat{\gamma}^{adj}$ reflects normalizing each feedback trading estimate by dividing by its standard error. Z_{t-1}^i is a set of fund-level control variables at the end of the prior month, including the log of total net assets, expense ratio, turnover ratio, net flow, log of fund age, log of family TNA, and fund net return. We estimate the cross-sectional regressions each month and report the time-series average of the monthly coefficients. We base the t -statistics in parentheses on Newey and West's (1986) correction for time-series correlation with three lags. The coefficients are scaled by 100 for ease of reading. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level respectively. The sample consists of 581 actively managed funds across a January 1999 to September 2011 sample period.

Panel A. TM

	Net Return		Carhart Alpha		Five-Factor Alpha	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\gamma}$	-0.004*** (-2.94)		-0.002* (-1.85)		-0.002* (-1.70)	
$\hat{\gamma}^{adj}$		-0.069*** (-3.37)		-0.041** (-2.17)		-0.043** (-2.13)
Log(TNA)	-0.035 (-0.95)	-0.032 (-0.90)	-0.028 (-1.55)	-0.026 (-1.43)	-0.032* (-1.77)	-0.030 (-1.65)
Log(Age)	0.001 (0.05)	0.002 (0.06)	0.013 (0.72)	0.013 (0.76)	0.012 (0.65)	0.013 (0.67)
Log(family TNA)	0.007 (0.64)	0.008 (0.69)	0.027*** (2.88)	0.028*** (2.95)	0.023** (2.43)	0.023** (2.52)
Expense Ratio	-0.021 (-0.34)	-0.018 (-0.29)	-0.009 (-0.17)	-0.005 (-0.11)	-0.036 (-0.68)	-0.033 (-0.63)
Turnover Ratio	0.022 (0.25)	0.022 (0.25)	-0.039 (-1.07)	-0.038 (-1.01)	-0.043 (-1.19)	-0.042 (-1.13)
Fund Flow	0.006 (1.07)	0.006 (1.13)	-0.006 (-1.38)	-0.006 (-1.39)	-0.005 (-1.23)	-0.005 (-1.25)
Lag Fund Return	0.082** (2.57)	0.081** (2.55)	0.016 (0.88)	0.015 (0.85)	0.016 (0.91)	0.015 (0.87)
Constant	0.424 (0.88)	0.395 (0.84)	-0.018 (-0.10)	-0.049 (-0.28)	0.037 (0.19)	0.012 (0.06)
Observations	25,769	25,769	25,698	25,698	25,698	25,698
R-squared	0.229	0.228	0.154	0.153	0.150	0.149
# months	153	153	153	153	153	153

Table B.11 continued.

	Net Return		Carhart Alpha		Five-Factor Alpha	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\gamma}$	-0.152***		-0.068*		-0.078*	
	(-2.89)		(-1.69)		(-1.83)	
$\hat{\gamma}^{adj}$		-0.064***		-0.044**		-0.047**
		(-3.04)		(-2.31)		(-2.31)
Log(TNA)	-0.034	-0.033	-0.029	-0.027	-0.033*	-0.031*
	(-0.94)	(-0.92)	(-1.63)	(-1.51)	(-1.85)	(-1.74)
Log(Age)	0.002	0.003	0.014	0.013	0.012	0.012
	(0.07)	(0.12)	(0.80)	(0.77)	(0.63)	(0.60)
Log(family TNA)	0.007	0.007	0.026***	0.027***	0.022**	0.023**
	(0.61)	(0.62)	(2.82)	(2.91)	(2.40)	(2.49)
Expense Ratio	-0.021	-0.018	-0.007	-0.001	-0.034	-0.029
	(-0.34)	(-0.29)	(-0.15)	(-0.02)	(-0.66)	(-0.55)
Turnover Ratio	0.020	0.018	-0.042	-0.044	-0.047	-0.048
	(0.24)	(0.21)	(-1.16)	(-1.19)	(-1.31)	(-1.34)
Fund Flow	0.006	0.006	-0.005	-0.006	-0.005	-0.005
	(1.15)	(1.17)	(-1.37)	(-1.40)	(-1.24)	(-1.28)
Lag Fund Return	0.083**	0.083**	0.016	0.015	0.016	0.015
	(2.59)	(2.59)	(0.89)	(0.86)	(0.92)	(0.89)
Constant	0.423	0.412	-0.016	-0.038	0.043	0.025
	(0.89)	(0.88)	(-0.09)	(-0.22)	(0.23)	(0.13)
Observations	25,694	25,694	25,623	25,623	25,623	25,623
R-squared	0.231	0.230	0.154	0.154	0.149	0.149
# months	153	153	153	153	153	153

Table B.12. Feedback Trading and CPZ Fund Performance

This table reports cross-sectional coefficient estimates from regressions of fund risk-adjusted returns on fund feedback trading estimates,

$$Perf_t^i = a + b_1 FeedbackTrading^i + b_2 Z_{t-1}^i + \zeta_t^i,$$

where $Perf_t^i$ is measured by the CPZ 4-factor alpha or the CPZ 7-factor alpha of mutual fund i during month t . To calculate the CPZ 4-factor alpha and CPZ 7-factor alpha, we use betas based on the previous 36 months of factors and fund returns to risk-adjust the current month's excess return. We base $FeedbackTrading^i$ on $\hat{\gamma}$ or $\hat{\gamma}^{adj}$ in equations (11) and (12). $\hat{\gamma}^{adj}$ reflects normalizing each feedback trading estimate by dividing by its standard error. Z_{t-1}^i is a set of fund-level control variables at the end of the prior month, including the log of total net assets, expense ratio, turnover ratio, net flow, log of fund age, log of family TNA, and fund net return. We estimate the cross-sectional regressions each month and report the time-series average of the monthly coefficients. We base the t -statistics in parentheses on Newey and West's (1986) correction for time-series correlation with three lags. The coefficients are scaled by 100 for ease of reading. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level respectively. The sample consists of 581 actively managed funds across a January 1999 to September 2011 sample period.

Panel A. TM

	CPZ 4-factor Alpha		CPZ 7-factor Alpha	
	(1)	(2)	(3)	(4)
$\hat{\gamma}$	-0.013** (-2.56)		-0.009* (-1.91)	
$\hat{\gamma}^{adj}$		-0.029*** (-2.93)		-0.022** (-2.27)
Log(TNA)	-0.046** (-2.34)	-0.042** (-2.14)	-0.052*** (-2.78)	-0.049** (-2.60)
Log(Age)	0.015 (0.64)	0.012 (0.52)	0.001 (0.05)	-0.001 (-0.03)
Log(family TNA)	0.031*** (3.22)	0.032*** (3.31)	0.027*** (2.73)	0.027*** (2.76)
Expense Ratio	-0.006 (-0.11)	-0.024 (-0.45)	-0.033 (-0.53)	-0.048 (-0.78)
Turnover Ratio	-0.019 (-0.57)	-0.008 (-0.23)	-0.051 (-1.48)	-0.040 (-1.08)
Fund Flow	-0.004 (-1.02)	-0.005 (-1.06)	-0.005 (-1.26)	-0.005 (-1.34)
Lag Fund Return	0.043** (2.18)	0.043** (2.13)	0.037** (2.07)	0.037** (2.03)
Constant	-0.033 (-0.16)	-0.030 (-0.16)	0.130 (0.60)	0.135 (0.62)
Observations	28,492	28,492	28,492	28,492
R-squared	0.134	0.133	0.129	0.129
# months	153	153	153	153

Table B.12 continued.

Panel B. HM				
	CPZ 4-factor Alpha		CPZ 7-factor Alpha	
	(1)	(2)	(3)	(4)
$\hat{\gamma}$	-0.624**		-0.454**	
	(-2.56)		(-2.00)	
$\hat{\gamma}^{adj}$		-0.031***		-0.023**
		(-2.66)		(-2.09)
Log(TNA)	-0.046**	-0.043**	-0.052***	-0.049***
	(-2.26)	(-2.15)	(-2.75)	(-2.65)
Log(Age)	0.013	0.010	0.000	-0.001
	(0.56)	(0.45)	(0.02)	(-0.05)
Log(family TNA)	0.033***	0.032***	0.028***	0.027***
	(3.24)	(3.28)	(2.76)	(2.76)
Expense Ratio	-0.005	-0.027	-0.032	-0.050
	(-0.10)	(-0.52)	(-0.53)	(-0.82)
Turnover Ratio	-0.013	-0.007	-0.045	-0.040
	(-0.38)	(-0.21)	(-1.28)	(-1.07)
Fund Flow	-0.005	-0.005	-0.005	-0.005
	(-1.07)	(-1.10)	(-1.30)	(-1.36)
Lag Fund Return	0.043**	0.042**	0.037**	0.037**
	(2.15)	(2.13)	(2.05)	(2.03)
Constant	-0.059	-0.022	0.110	0.141
	(-0.29)	(-0.11)	(0.51)	(0.66)
Observations	28,487	28,487	28,487	28,487
R-squared	0.133	0.132	0.128	0.128
# months	153	153	153	153