It Pays to Set the Menu: Mutual Fund Investment Options in 401(k) Plans

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Introduction

401(k) plans are employer-sponsored defined contribution (DC) retirement plans:

- 401(k) plans cover more than half of the retirement assets in the private sector.
- The value of assets reached $4.2 trillion dollars in 2013, over half of which is invested in mutual funds.
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In this study, we focus on the incentives of the service providers in a plan (i.e., trustee, record keeper).

Sponsors are required by law to appoint a trustee to the plan:

- Mutual fund family (most often): Fidelity, Vanguard, T.Rowe Price, etc.
- Bank /Financial institution (occasionally): Metlife, First Union NB, etc.
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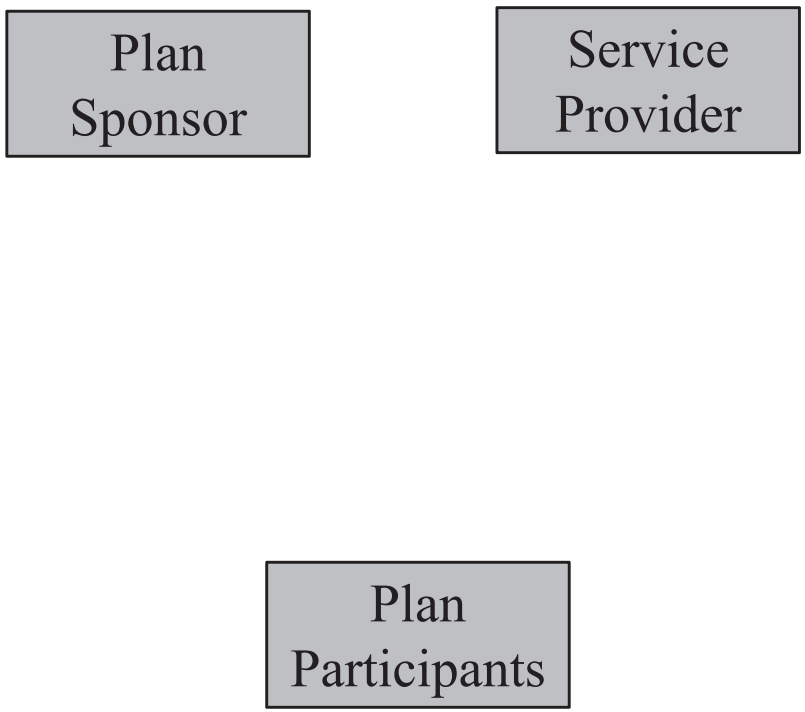

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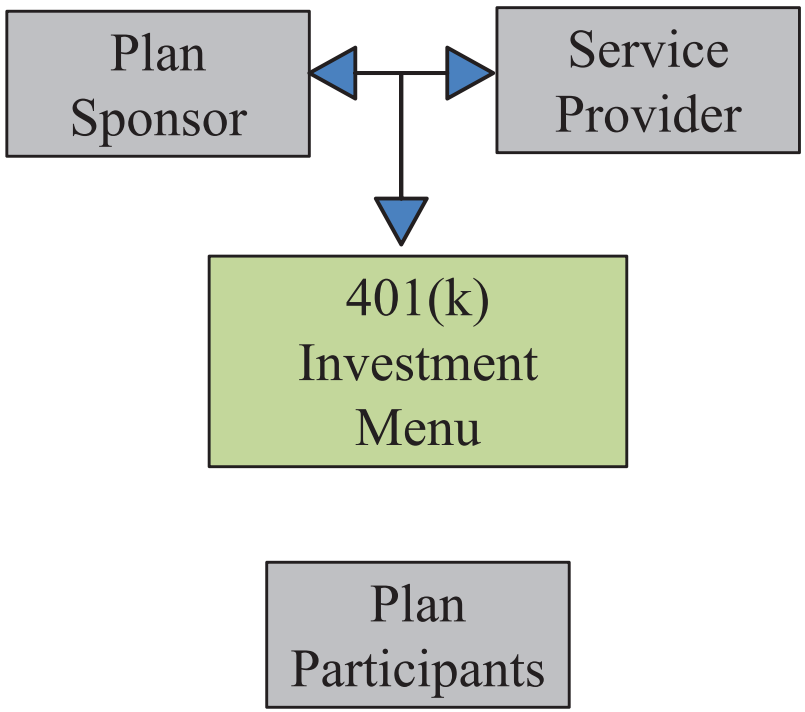

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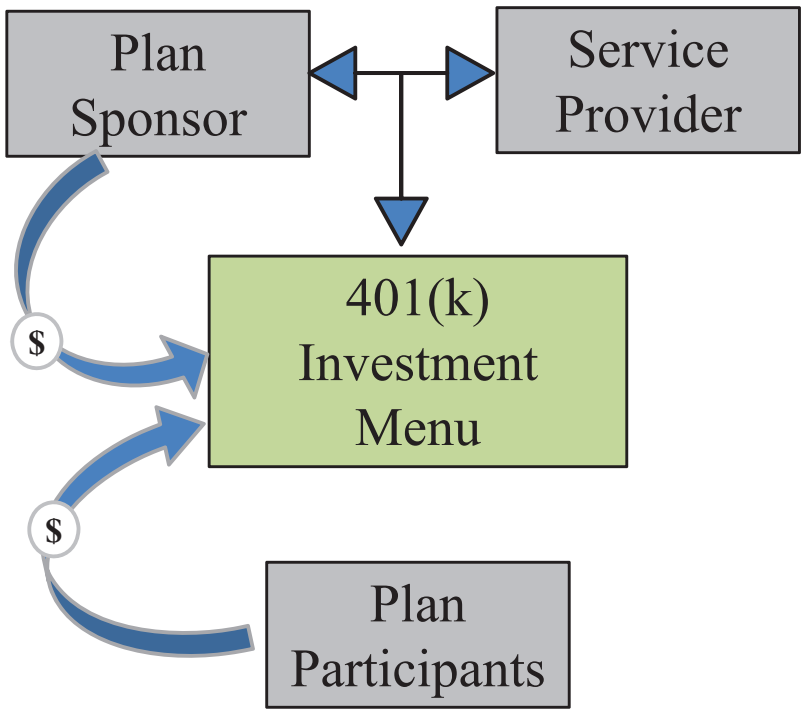

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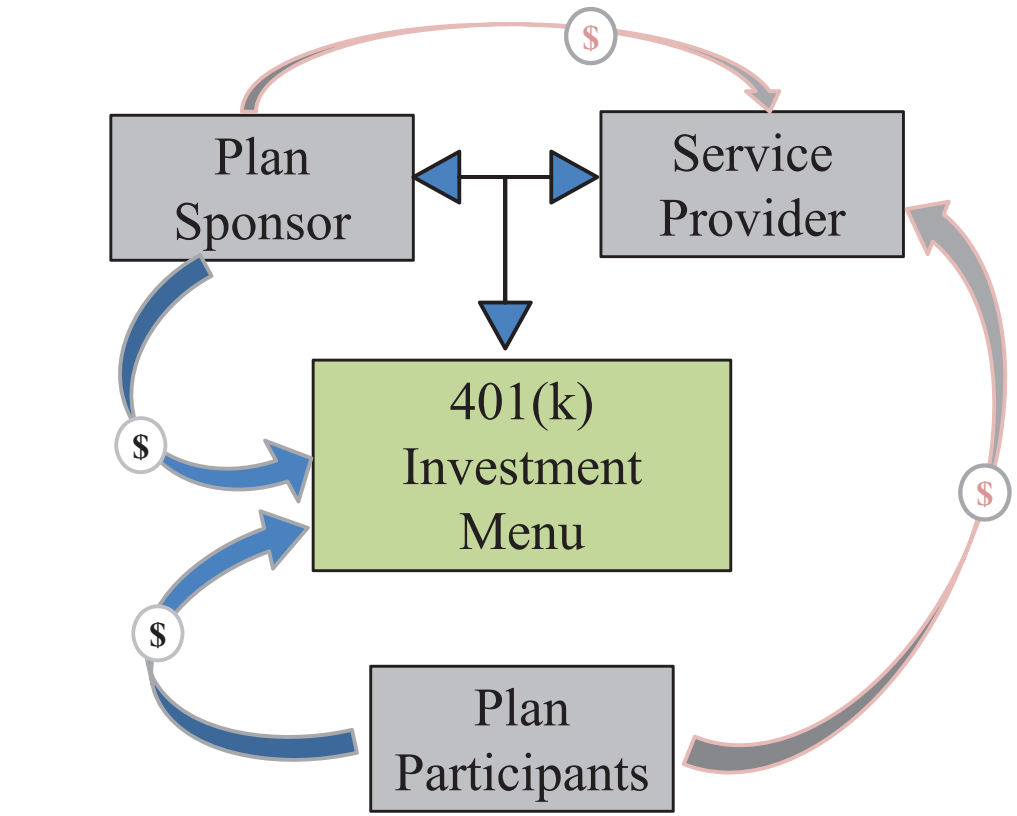

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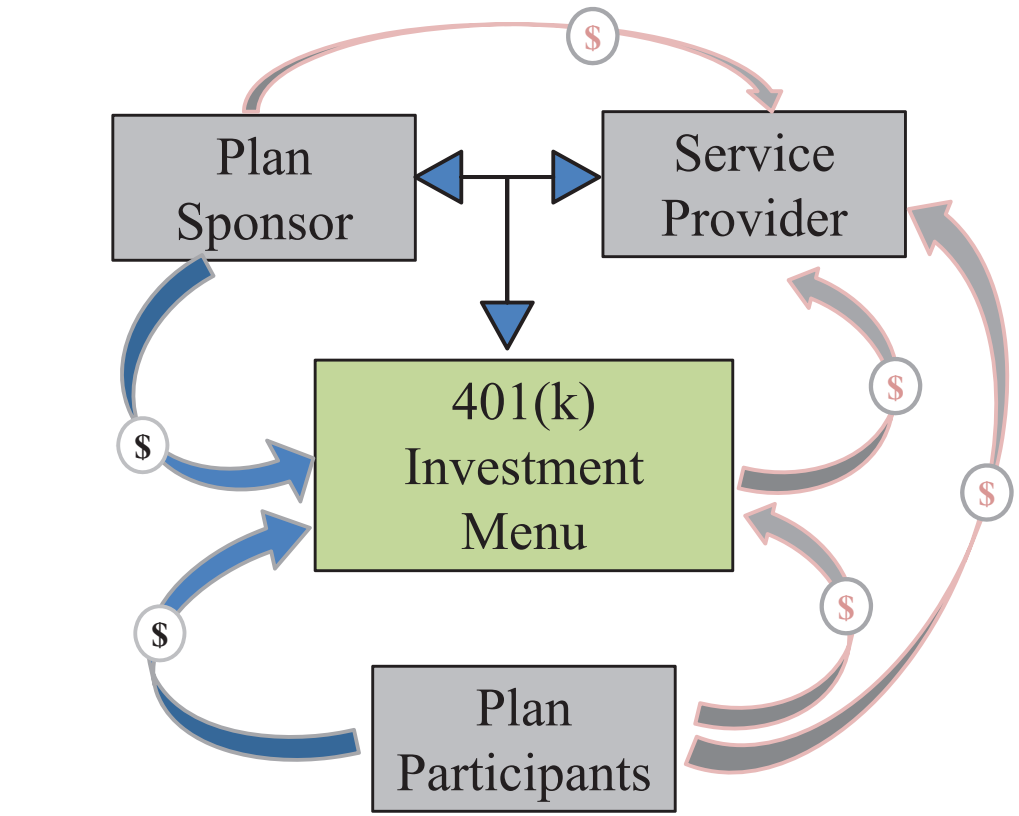

Example: Plexus Corp. 401(k) Plan, 2003

Option	Current Value
MFS Conservative Allocation Fund	1,128,499
MFS Moderate Allocation Fund	1,679,086
MFS Aggressive Growth Allocation Fund	2,633,942
MFS Capital Opportunities Fund	7,783,267
MFS Fixed Fund	6,207,087
MFS Mid Cap Growth Fund	5,621,723
MFS Money Market Fund	55,012
MFS New Discovery Fund	6,080,534
MFS Value Fund	6,099,327
American Balanced Fund	2,756,692
American EuroPacific Growth Fund	5,702,903
Calvert Income Fund	2,597,419
Dreyfus Premier Technology Fund	1,860,792
Janus Aspen Worldwide Fund	1,716,129
Munder Index 500 Fund	9,711,499
Plexus Corp. Common Stock	20,113,297
Participant Loans	2,048,345
Total	**83,795,553**

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Employer Stock: Plexus Corp.

Conflicts of Interest

The existence of affiliated funds on these menus generates conflicting incentives for service providers:

- Service providers have to act to the benefit of participants. Their actions are governed by the Employee Retirement Income Security Act of 1974 ("ERISA").
- Service providers have a financial interest to maximize their firms' profits.

Surprisingly, little is known about how these conflicted incentives affect the investment choices offered to the participants and their consequences.

Research Questions

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- Are participants able to see through these incentives?
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Preview of the Results

- Poorly-performing affiliated funds are less likely to be removed from 401(k) plans than poorly-performing unaffiliated funds.
- Plan participants are not very sensitive to past performance and do not compensate for the favoritism bias in their asset allocations.
- Favoritism toward poorly performing affiliated funds is costly for plan participants.

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Contribution to the Literature

Role of service providers in DC plans:

- Davis and Kim (2007); Cohen and Schmidt (2009); Duan, Hotchkiss, and Jiao (2012).

Design of DC plans:

- Benartzi and Thaler (2001); Madrian and Shea (2001); Choi, Laibson, Madrian, and Metrick (2002, 2004); Agnew, Balduzzi, and Sunden (2003); Huberman and Jiang (2006); Sialm, Starks, and Zhang (2014).

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Data Collection

We hand collect from Form 11-K filed with SEC the investment options offered in 401(k) plans.

- Plans offering company stock as an option need to file Form 11-K with the SEC.
- Sample covers the period between 1998-2009.
- We obtain a total of 26,624 filings.
- From the "Schedule of Assets" we obtain the name of the option and the current value of the investment into this option.
  - We use Form 5500 to track plans over time and for additional information at the plan level.
  - We link mutual fund options to the CRSP mutual fund database.
  - For sponsor characteristics we link plans to Compustat.

Sample Description

Sample Coverage:

Proportion of plans filing IRS Form 5500 (1998-2009)	30-35%
Number of participants	9 million
Number of plans	2,494
Number of sponsors	1,826
Number of trustees	112
Proportion of mutual fund trustees	82%
Proportion of assets with mutual fund trustees	96%

Plan Characteristics:

Plan size (average)	$328 million
Participant account size (average)	$42,107
Employer securities	17%

Plan Architecture

Year	Number of Sponsors	Number of Plans	Average Plan Size (in $M)	Plans with MF Trustees (in %)	Number of Options	Number of Affiliated Options	Trustee Share (in %)	Number of Mgmt. Companies	Herfindahl Index
1998	618	713	286.26	60.31	7.01	2.38	34.01	2.96	0.67
1999	760	895	241.48	68.94	7.85	2.85	34.11	3.48	0.64
2000	829	1,004	295.43	73.21	9.29	3.53	35.68	4.00	0.59
2001	920	1,100	278.42	74.36	10.43	4.10	36.91	4.56	0.57
2002	1,012	1,230	250.27	76.59	11.50	4.60	37.26	5.01	0.54
2003	1,102	1,325	296.54	83.09	12.00	4.73	36.00	5.48	0.51
2004	1,106	1,314	327.38	83.33	13.19	5.18	33.85	5.89	0.48
2005	1,093	1,281	350.02	83.53	13.79	5.40	32.50	6.18	0.45
2006	1,034	1,225	401.53	78.12	14.57	5.81	31.56	6.29	0.44
2007	1,002	1,175	436.04	75.06	15.93	5.91	28.37	6.65	0.42
2008	970	1,126	322.47	75.40	17.20	6.49	28.99	7.08	0.42
2009	849	979	407.33	75.08	17.82	6.40	27.13	7.36	0.40
Average	941	1,114	324.43	75.59	12.55	4.78	33.03	5.41	0.51

Mutual Funds - Summary Statistics

Mutual Funds Kept

Affiliated Fund	Number of Obs.	Relative Option Size (in %)	Total Option Size (in %)	Option Size (in $M)	Fund Age (in Years)	Fund Size (in $B)	Return Std. Dev. (in %)	Turnover (in %)	Expense Ratio (in %)	Prior 3-Yr. Performance (in %)
0	82,550	8.56	85.42	8.92	19.61	15.50	3.98	76.54	0.94	60.24
1	52,239	7.60	88.64	13.47	17.29	12.03	3.38	52.12	0.57	58.19
Diff	134,789	−0.96*	3.21***	4.54**	−2.32*	−3.47	−0.60***	−24.42***	−0.37***	−2.05*

Mutual Funds Deletions

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0	14,189	7.60	14.57	6.66	18.19	8.30	4.08	93.34	1.06	51.29
1	4,285	7.19	11.35	9.59	17.54	7.01	3.48	80.68	0.80	51.37
Diff	18,474	−0.41	−3.21***	2.92**	−0.65	−1.29	−0.60***	−12.66**	−0.26***	0.08

Mutual Funds Additions

Affiliated Fund	Number of Obs.	Relative Option Size (in %)	Total Option Size (in %)	Option Size (in $M)	Fund Age (in Years)	Fund Size (in $B)	Return Std. Dev. (in %)	Turnover (in %)	Expense Ratio (in %)	Prior 3-Yr. Performance (in %)
0	21,872	6.26	20.74	4.93	15.14	10.06	3.98	80.65	0.95	67.49
1	7,816	4.57	14.35	5.13	10.35	5.42	3.23	53.23	0.60	63.91
Diff	29,688	−1.69***	−6.38***	0.20	−4.79***	−4.64*	−0.75***	−27.42***	−0.35***	−3.58***

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Compute the proportion of deletions from affiliated and non-affiliated menus for funds in different performance deciles.

- Overall Sample
- Sample of funds that appear on both affiliated and unaffiliated menus

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East West Bank 401(k) Plan, 2003

Trustee: Prudential

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AIM Constellation Fund	501,133
AIM Value Fund	653,670
Alliance Bond Fund	220,384
Fidelity Advisor Equity Growth Fund	825,860
Franklin California Growth Fund	2,059,546
Franklin Convertible Securities Fund	638,580
MFS Capital Opportunities Fund	495,507
MFS Government Securities Fund A	442,641
MFS Research Fund	311,508
MFS Total Return Fund	1,287,121
Prudential Global Growth Fund A	320,942
Prudential Money Market Fund	990,254
Prudential Privilege Money Market Fund	372,008
Prudential Stable Value Fund	782,155
Prudential Stock Index Fund Z	1,370,671
Putnam Diversified Income Fund A	354,771
Putnam Global Growth Fund	463,706
Putnam New Opportunities Fund	1,222,891
Putnam OTC Emerging Growth Fund	342,661
Common Stock East West Bancorp, Inc.	10,363,035
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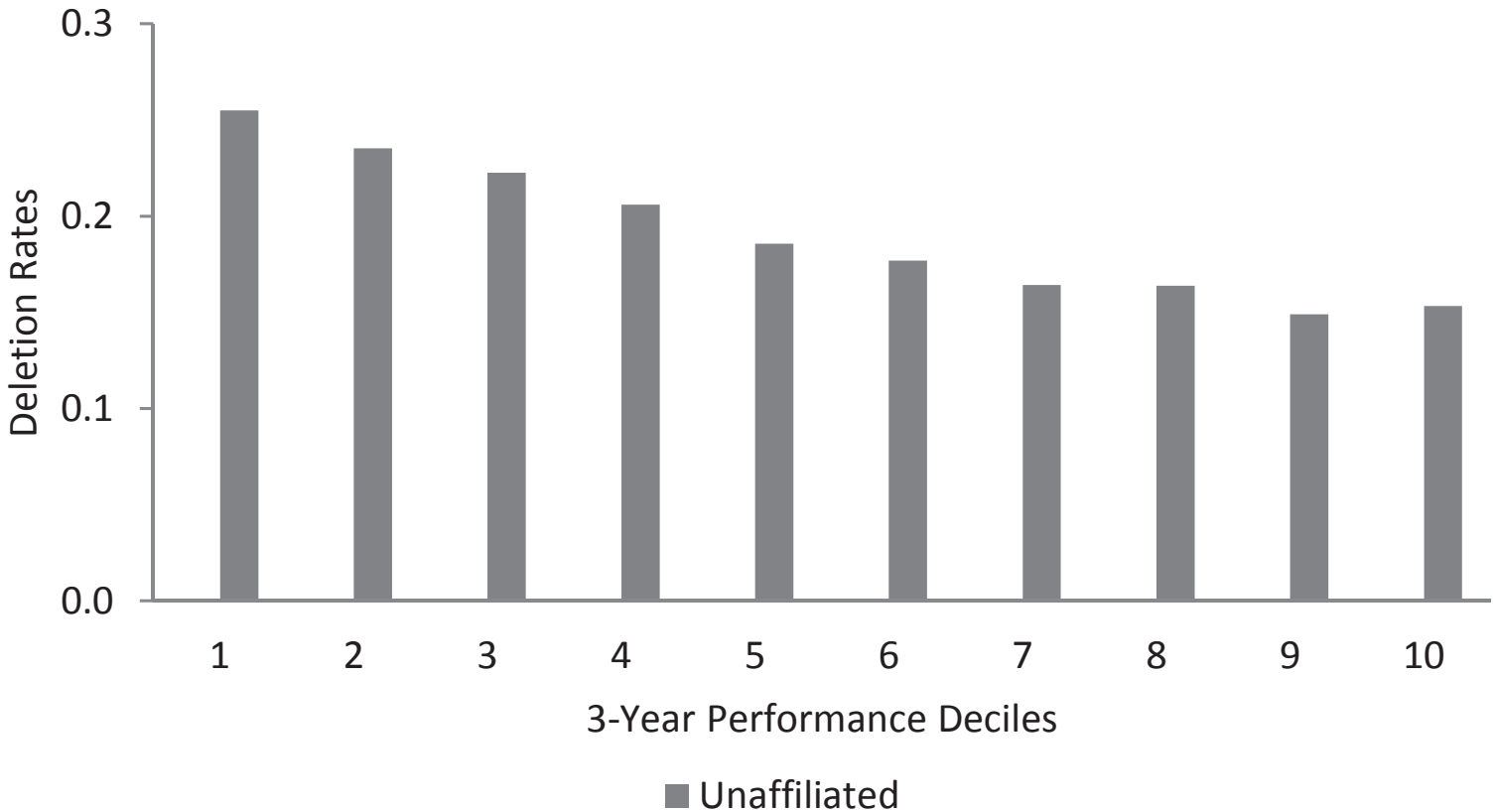
Mutual Fund Deletions

In 2003, the MFS Capital Opportunities Fund was ranked in the lowest performance decile relative to funds in the same style over the prior 3 years:

- It appeared on 29 menus: 7 times as an affiliated fund and 22 times as an unaffiliated fund.
- It was deleted during 2004 once as an affilaited fund and 10 times as an unaffiliated fund.

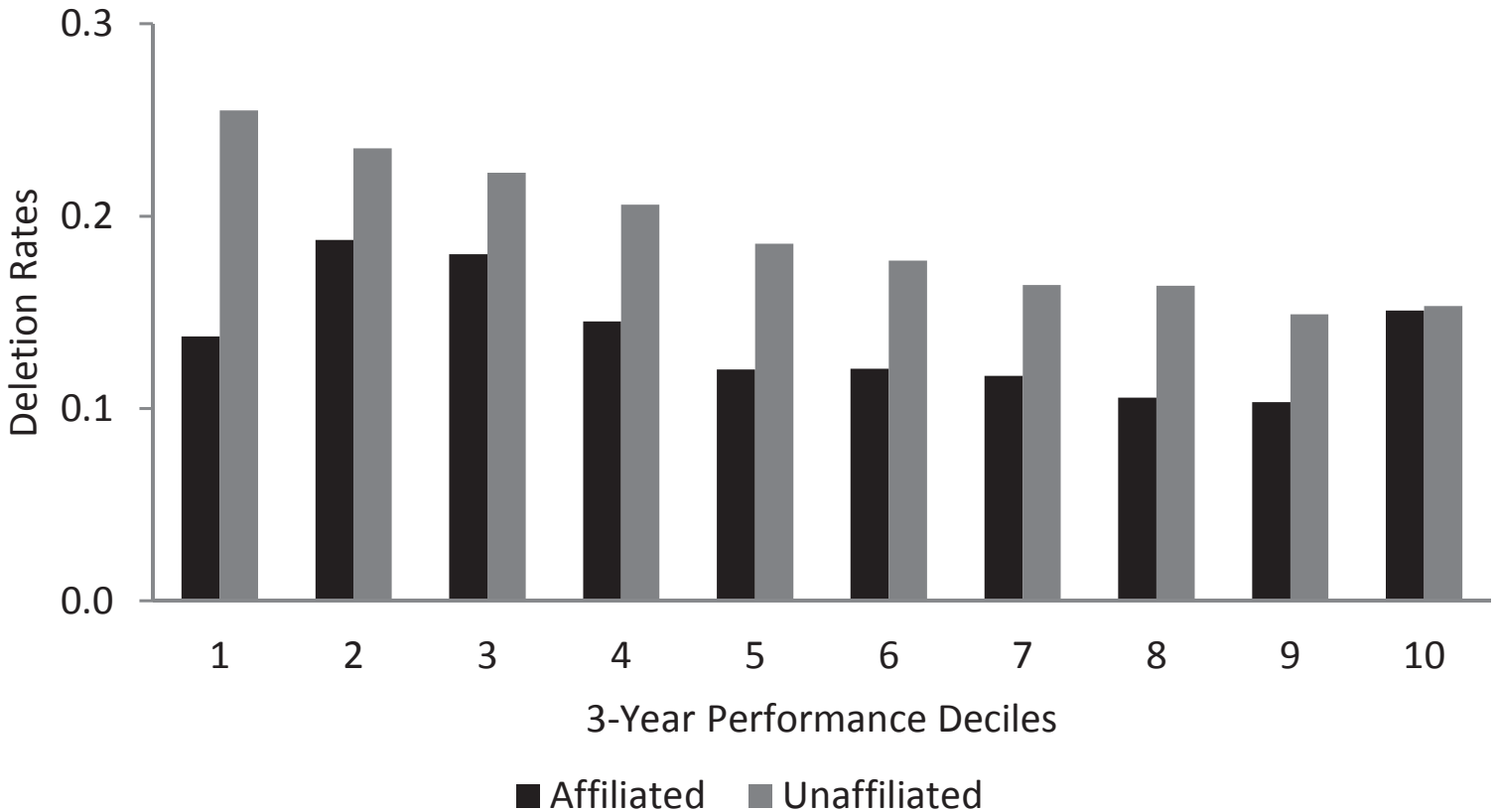
Deletion Rates by Performance Deciles

Unaffiliated Fund Sample
(3-Year Style-Adjusted Performance)



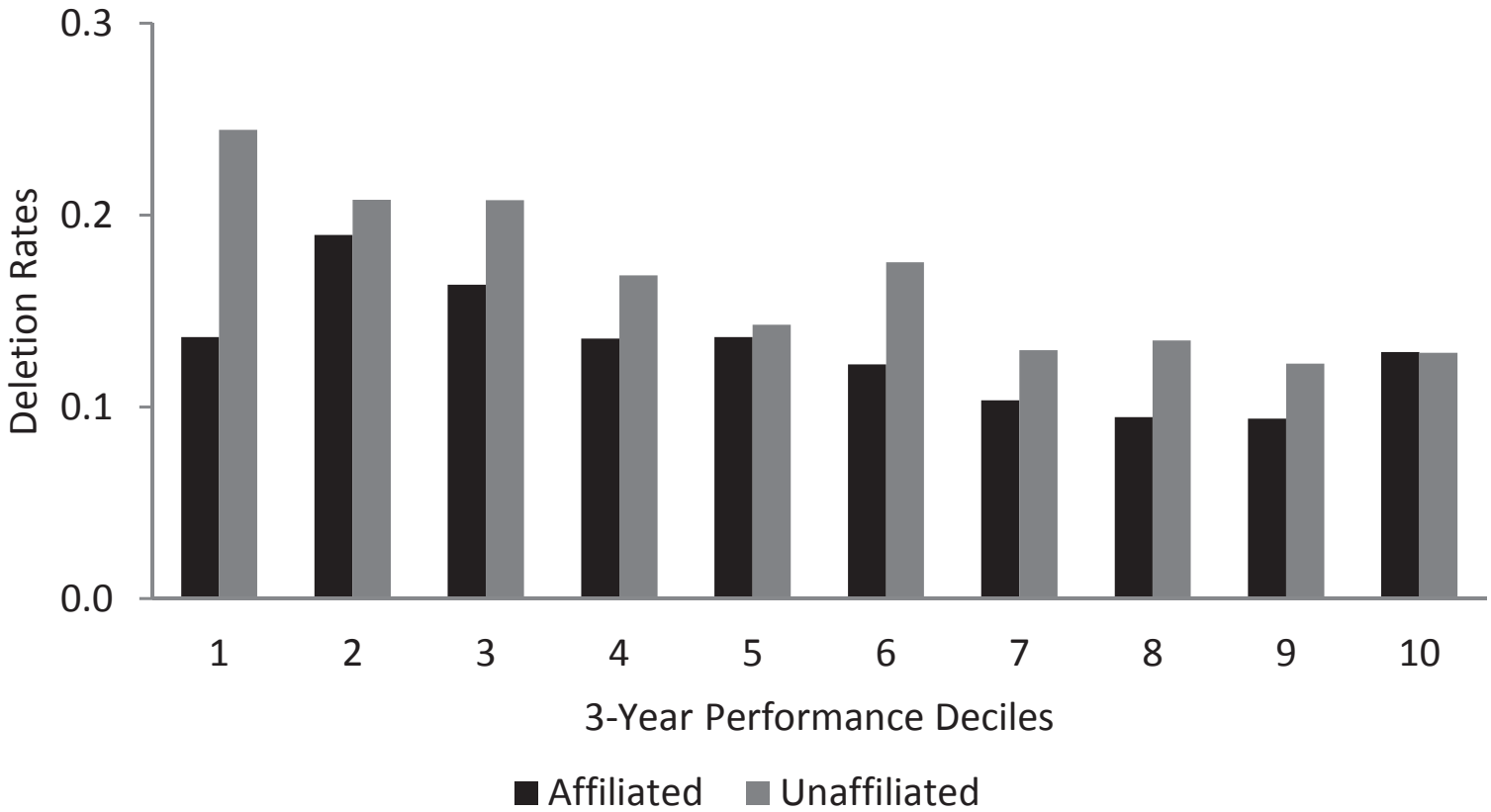
Deletion Rates by Performance Deciles

Overall Sample
(3-Year Style-Adjusted Performance)



Deletion Rates by Performance Deciles

Sample of Funds on Both Affiliated and Unaffiliated Menus
(3-Year Style-Adjusted Performance)



Pool, Sialm, and Stefanescu (2015)

Logit Model of Fund Deletions

We estimate the following model:

$$\begin{aligned} Prob(DEL_{p,f,t}=1) &= \Lambda(AF_{p,f,t-1}\beta_{AF} + \mathbf{R^T_{f,t-1}}\beta_{\mathbf{R}} + AF_{p,f,t-1}\mathbf{R^T_{f,t-1}}\beta_{\mathbf{AF\times R}} \\ &+ \mathbf{Z^T_{p,f,t-1}}\beta_{\mathbf{Z}}), \end{aligned}$$

- Performance vector $\mathbf{R_{f,t-1}}$ is based on piecewise linear performance percentiles $Perf_{f,t-1}$ (Sirri and Tufano 1997).
- Performance percentiles $Perf_{f,t-1}$ are evaluated using style-adjusted returns of all mutual funds in the CRSP database over the prior 3 years.
- Specification includes fund type fixed effects (domestic equity, etc.), time fixed effects, and standard errors clustered at fund level.

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Piecewise Linear Performance Specification

To adjust for non-linearities we use a piecewise linear performance specification (Sirri and Tufano 1997).

- Linear Specification:

$$Perf_{p,f,t}$$

- Two-Segment Specification:

$$\begin{aligned} LowPerf_{p,f,t} &= min(Perf_{p,f,t}, 0.5), \\ HighPerf_{p,f,t} &= max(Perf_{p,f,t} - 0.5, 0). \end{aligned}$$

- Three-Segment Specification:

$$\begin{aligned} LowPerf_{p,f,t} &= min(Perf_{p,f,t}, 0.2), \\ MidPerf_{p,f,t} &= min(max(Perf_{p,f,t} - 0.2, 0), 0.6), \\ HighPerf_{p,f,t} &= max(Perf_{p,f,t} - 0.8, 0). \end{aligned}$$

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Pool, Sialm, and Stefanescu (2015)

Logit Model of Fund Deletions

	Linear Model		Two-Segment Model		Three-Segment Model	
Affiliated	−0.76***	−0.62***	−0.71***	−0.75***	−0.70***	−0.82***
	(0.07)	(0.07)	(0.08)	(0.09)	(0.12)	(0.14)
LowPerf			−2.26***	−1.82***	−2.39***	−2.06***
			(0.11)	(0.11)	(0.35)	(0.39)
LowPerf×Affiliated			0.45**	0.77***	0.40	1.48**
			(0.20)	(0.22)	(0.66)	(0.75)
Midperf	−1.64***	−1.11***			−1.82***	−1.34***
	(0.06)	(0.07)			(0.07)	(0.08)
MidPerf×Affiliated	0.58***	0.32***			0.50***	0.32**
	(0.11)	(0.11)			(0.14)	(0.15)
HighPerf			−1.06***	−0.44***	0.56	1.72***
			(0.13)	(0.11)	(0.42)	(0.37)
HighPerf×Affiliated			0.67***	−0.10	1.43*	−0.62
			(0.21)	(0.22)	(0.78)	(0.80)
Maximum Corr		0.08***		0.09***		0.09***
		(0.00)		(0.00)		(0.00)
Log(Option Size)		−0.07***		−0.07***		−0.07***
		(0.01)		(0.01)		(0.01)
No. of Options		−0.02***		−0.02***		−0.02***
		(0.00)		(0.00)		(0.00)
Exp. Ratio		0.61***		0.59***		0.59***
		(0.06)		(0.06)		(0.06)
Turnover		0.10***		0.10***		0.10***
		(0.01)		(0.01)		(0.01)
Log(Fund Size)		−0.15***		−0.16***		−0.15***
		(0.01)		(0.01)		(0.01)
Fund Age		0.01		0.01		0.01
		(0.01)		(0.01)		(0.01)
Std. Dev.		−0.18		−0.82		−0.89
		(1.06)		(1.04)		(1.01)
Observations	167,952	106,848	167,952	106,848	167,952	106,848

Pool, Sialm, and Stefanescu (2015)

Linear Probability Model of Fund Deletions

	Linear Model		Two-Segment Model		Three-Segment Model	
Affiliated	−0.10***	−0.10***	−0.11***	−0.15***	−0.12***	−0.17***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)
LowPerf			−0.30***	−0.32***	−0.46***	−0.52***
			(0.03)	(0.03)	(0.08)	(0.12)
LowPerf×Affiliated			0.16***	0.25***	0.25**	0.47***
			(0.03)	(0.04)	(0.12)	(0.18)
MidPerf	−0.17***	−0.17***			−0.19***	−0.19***
	(0.01)	(0.01)			(0.01)	(0.02)
MidPerf×Affiliated	0.10***	0.10***			0.10***	0.11***
	(0.01)	(0.02)			(0.02)	(0.02)
HighPerf			−0.08***	−0.05**	0.09*	0.21***
			(0.02)	(0.02)	(0.05)	(0.07)
HighPerf*Affiliated			0.06**	−0.01	0.06	−0.17*
			(0.02)	(0.03)	(0.07)	(0.09)
Maximum Corr		0.01***		0.01***		0.01***
		(0.00)		(0.00)		(0.00)
Log(Option Size)		−0.01***		−0.01***		−0.01***
		(0.00)		(0.00)		(0.00)
No. of Options		−0.00***		−0.00***		−0.00***
		(0.00)		(0.00)		(0.00)
Expense Ratio		0.08***		0.08***		0.08***
		(0.01)		(0.01)		(0.01)
Turnover		0.02***		0.02***		0.02***
		(0.00)		(0.00)		(0.00)
Log(Fund Size)		−0.02***		−0.02***		−0.02***
		(0.00)		(0.00)		(0.00)
Fund Age		0.00		0.00		0.00
		(0.00)		(0.00)		(0.00)
Std. Dev.		−0.09		−0.18		−0.19
		(0.15)		(0.15)		(0.14)
Observations	167,952	106,848	167,952	106,848	167,952	106,848
R-squared	0.03	0.08	0.03	0.08	0.03	0.08

Pool, Sialm, and Stefanescu (2015)

Subsample Analysis for Deletions (Logit Model)

	Small Trustees	Large Trustees	Small Plans	Large Plans	1998-2006	2007-2009
Affiliated	−0.83***	−0.71***	−0.94***	−0.66***	−0.73***	−0.65***
	(0.11)	(0.19)	(0.13)	(0.12)	(0.11)	(0.15)
LowPerf	−1.78***	−2.26***	−1.90***	−1.99***	−1.72***	−2.05***
	(0.12)	(0.31)	(0.15)	(0.19)	(0.14)	(0.19)
LowPerf×Affiliated	1.16***	0.64	1.10***	0.55*	0.22	1.12***
	(0.28)	(0.44)	(0.34)	(0.32)	(0.27)	(0.36)
HighPerf	−0.41***	−0.67**	−0.62***	−0.31*	0.04	−0.93***
	(0.12)	(0.28)	(0.15)	(0.17)	(0.15)	(0.16)
HighPerf×Affiliated	−0.75**	0.57	−0.03	−0.22	−0.13	0.05
	(0.31)	(0.38)	(0.36)	(0.29)	(0.28)	(0.32)
Maximum Corr	0.07***	0.12***	0.08***	0.09***	0.09***	0.08***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Log(Option Size)	−0.08***	−0.09***	−0.02	−0.17***	−0.08***	−0.07***
	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
No. of Options	−0.01***	−0.05***	−0.01	−0.03***	−0.02***	−0.02***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Exp. Ratio	0.45***	1.33***	0.54***	0.69***	0.55***	0.76***
	(0.06)	(0.12)	(0.07)	(0.09)	(0.07)	(0.08)
Turnover	0.08***	0.19***	0.07***	0.16***	0.08***	0.11***
	(0.01)	(0.04)	(0.01)	(0.02)	(0.02)	(0.03)
Log(Fund Size)	−0.14***	−0.20***	−0.18***	−0.12***	−0.13***	−0.18***
	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.02)
Fund Age	0.01	0.03	0.02*	0.01	0.02	0.01
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Std. Dev.	0.03	−7.19***	−1.44	−0.47	0.48	−9.45***
	(1.12)	(2.03)	(1.28)	(1.57)	(1.01)	(1.78)
Observations	69,912	36,936	47,559	52,697	54,547	52,301

Additional Robustness Tests for Deletions (Logit Model)

	1-Year Perf.	5-Year Perf.	Include Trustee FE	Include Fund FE	Only Fund Trustees	Fund Trustees With $\geq$ 10 Funds	Exclude Trustee Changes	Exclude Target Funds	Only Equity Funds	Only Active Funds
Affiliated	−0.67***	−0.45***	−0.92***	−0.92***	−0.88***	−0.92***	−0.73***	−0.70***	−0.38***	−0.73***
	(0.08)	(0.10)	(0.10)	(0.11)	(0.10)	(0.10)	(0.10)	(0.09)	(0.11)	(0.09)
LowPerf	−1.16***	−0.94***	−1.91***	−1.70***	−1.79***	−1.73***	−1.97***	−2.01***	−2.24***	−1.85***
	(0.10)	(0.13)	(0.12)	(0.14)	(0.13)	(0.16)	(0.13)	(0.12)	(0.13)	(0.12)
LowPerf×Affiliated	0.75***	−0.24	0.86***	0.81***	0.81***	0.75***	0.88***	0.56**	−0.07	0.89***
	(0.21)	(0.24)	(0.22)	(0.25)	(0.24)	(0.25)	(0.24)	(0.22)	(0.28)	(0.22)
HighPerf	−0.14	−1.13***	−0.48***	−0.40***	−0.39***	−0.46***	−0.39***	−0.44***	−0.67***	−0.48***
	(0.11)	(0.11)	(0.11)	(0.13)	(0.13)	(0.15)	(0.13)	(0.11)	(0.13)	(0.11)
HighPerf×Affiliated	−0.47**	0.55**	−0.03	0.35	−0.17	−0.16	−0.23	0.09	0.16	−0.30
	(0.22)	(0.22)	(0.22)	(0.24)	(0.23)	(0.25)	(0.24)	(0.22)	(0.36)	(0.23)
Maximum Corr	0.09***	0.08***	0.09***	0.16***	0.09***	0.10***	0.08***	0.09***	0.11***	0.08***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Log(Option Size)	−0.07***	−0.08***	−0.08***	−0.08***	−0.08***	−0.09***	−0.07***	−0.08***	−0.10***	−0.08***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
No. of Options	−0.02***	−0.02***	−0.02***	−0.03***	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Exp. Ratio	0.62***	0.62***	0.68***	−0.30*	0.61***	0.66***	0.56***	0.57***	0.41***	0.56***
	(0.06)	(0.06)	(0.05)	(0.16)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)
Turnover	0.09***	0.10***	0.09***	0.05**	0.09***	0.12***	0.10***	0.09***	0.14***	0.10***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)	(0.01)
Log(Fund Size)	−0.17***	−0.14***	−0.17***	−0.31***	−0.16***	−0.17***	−0.16***	−0.15***	−0.18***	−0.16***
	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Fund Age	0.02***	0.00	0.02***	0.12	0.01	0.02*	0.01	0.01	−0.00	0.01*
	(0.01)	(0.01)	(0.01)	(0.16)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Std. Dev.	−3.15***	0.00	−1.80*	−6.60***	−0.94	−1.63	0.43	0.13	2.98***	−0.02
	(1.04)	(0.98)	(0.98)	(1.14)	(1.18)	(1.35)	(1.22)	(0.98)	(0.94)	(1.03)
Observations	106,848	106,848	100,133	103,523	86,761	72,879	96,168	92,235	56,588	95,809

Pool, Sialm, and Stefanescu (2015)

Mutual Fund Additions

Do the competing incentives of mutual fund service providers leave a footprint on the plan's menu?

Compute the ratio of the number of affiliated (unaffiliated) menus to which the fund is added during the year to the total number of affiliated (unaffiliated) menus that do not yet include the fund as an option.

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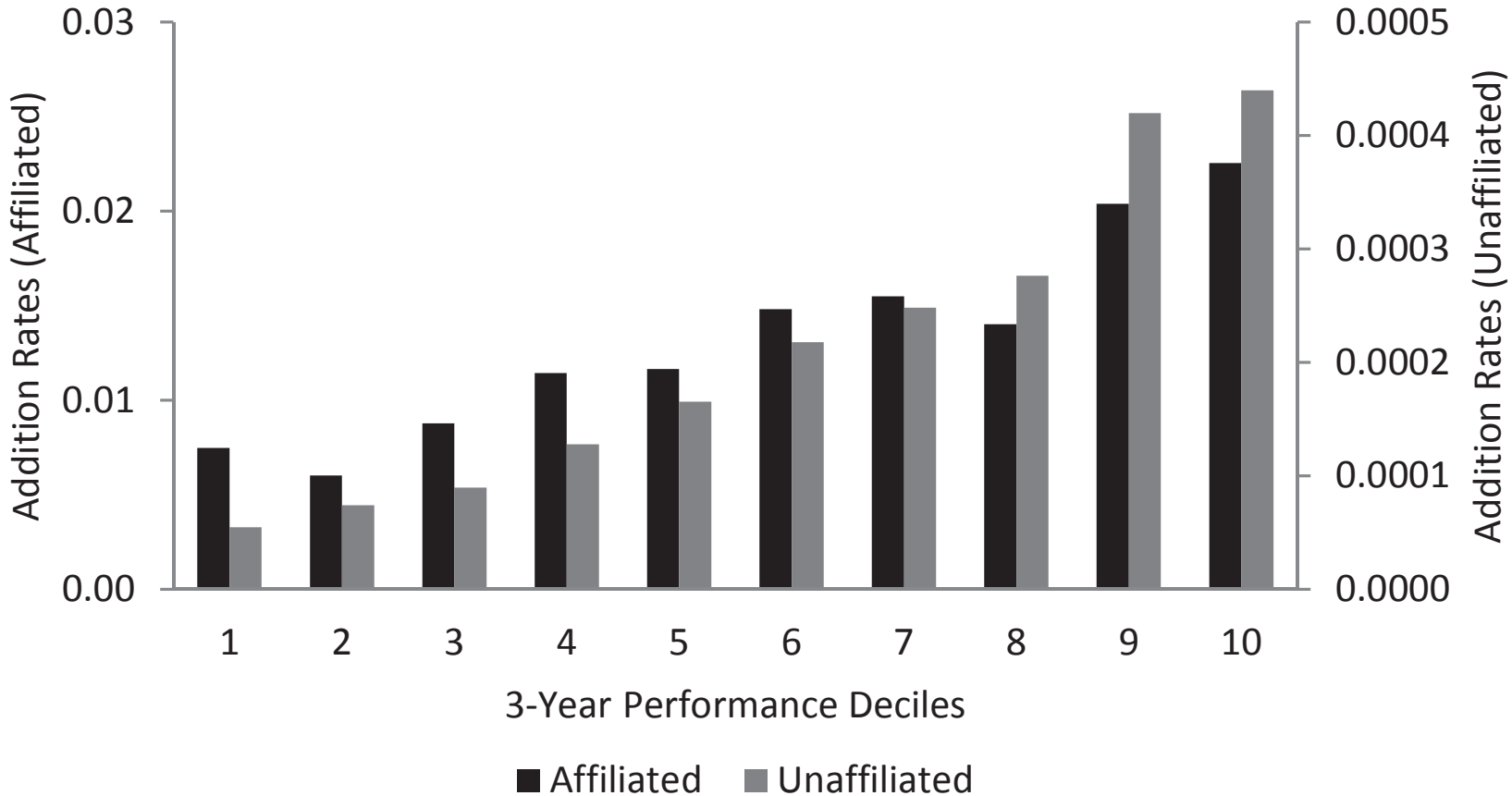
Addition Rates by Performance Deciles

Overall Sample
(3-Year Style-Adjusted Performance)



Addition Rates by Performance Deciles

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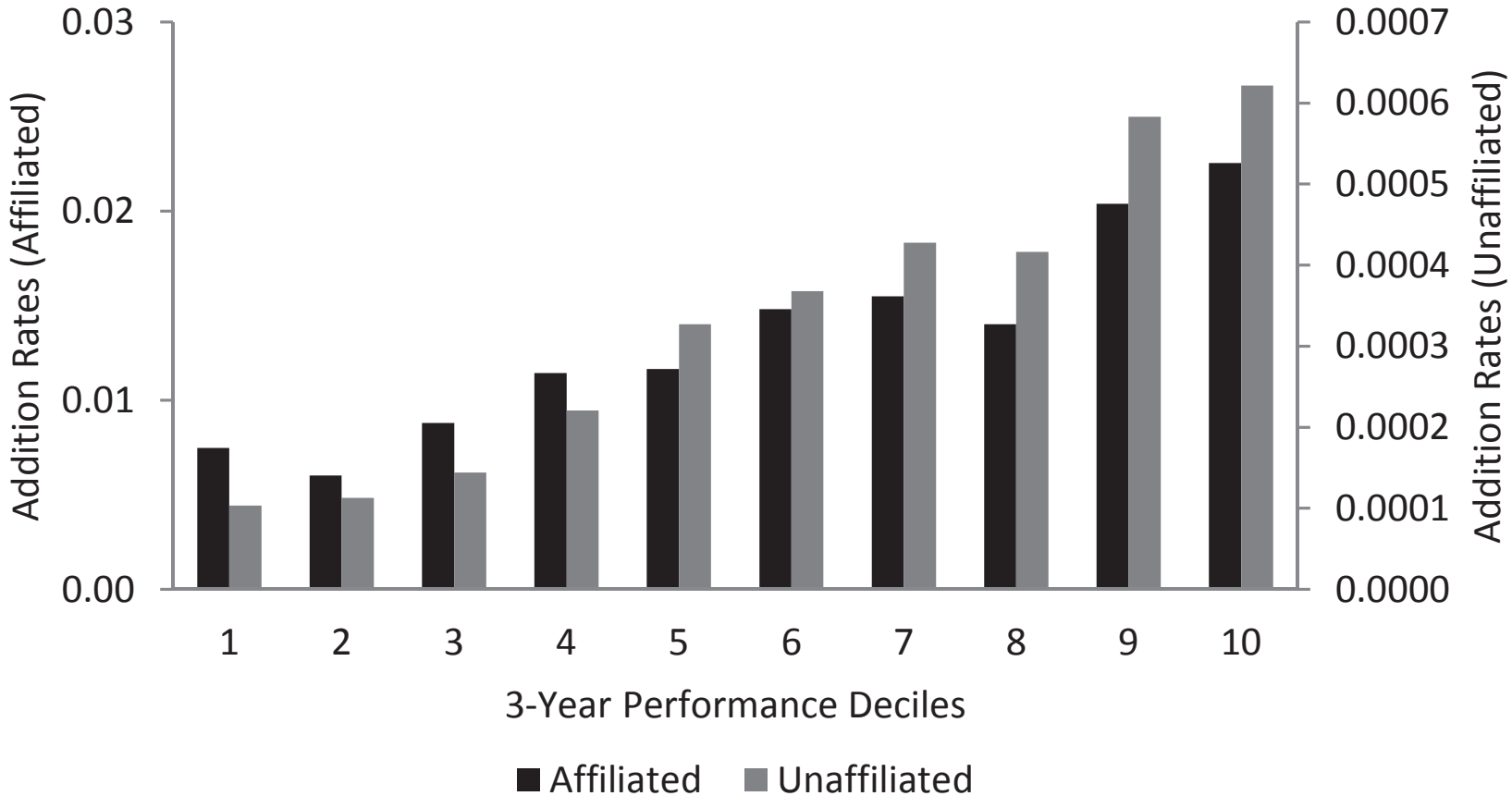

Pool, Sialm, and Stefanescu (2015)

Logit Model of Fund Additions

	Linear Model		Two-Segment Model		Three-Segment Model	
Affiliated	3.44***	2.61***	3.44***	2.75***	3.33***	2.82***
	(0.12)	(0.16)	(0.14)	(0.19)	(0.21)	(0.23)
LowPerf			2.86***	1.11***	2.70***	−1.24
			(0.34)	(0.29)	(0.78)	(0.77)
LowPerf×Affiliated			−0.75*	−1.11**	0.37	−1.71
			(0.43)	(0.49)	(1.33)	(1.45)
Midperf	1.99***	1.88***			2.33***	1.90***
	(0.11)	(0.11)			(0.16)	(0.16)
MidPerf×Affiliated	−0.78***	−0.68***			−1.16***	−0.82***
	(0.18)	(0.22)			(0.24)	(0.30)
HighPerf			1.51***	2.29***	0.19	2.77***
			(0.28)	(0.24)	(0.58)	(0.55)
HighPerf×Affiliated			−0.85**	−0.41	0.43	0.54
			(0.41)	(0.43)	(0.93)	(1.02)
Maximum Corr		0.79***		0.80***		0.81***
		(0.18)		(0.19)		(0.19)
No. of Options		0.01***		0.01***		0.01***
		(0.00)		(0.00)		(0.00)
Exp. Ratio		0.11		0.08		0.08
		(0.08)		(0.08)		(0.08)
Turnover		0.00*		0.00		0.00*
		(0.00)		(0.00)		(0.00)
Log(Fund Size)		0.71***		0.71***		0.71***
		(0.04)		(0.04)		(0.04)
Fund Age		−0.11***		−0.10***		−0.10***
		(0.04)		(0.04)		(0.04)
Std. Dev.		−3.16**		−3.96***		−4.09***
		(1.23)		(1.25)		(1.24)
Observations	63,234,618	51,062,968	63,234,618	51,062,968	51,062,968	63,234,618

Pool, Sialm, and Stefanescu (2015)

Subsample Analysis for Additions (Logit Model)

	Small Trustees	Large Trustees	Small Plans	Large Plans	1998-2006	2007-2009
Affiliated	3.50***	2.71***	3.08***	2.56***	2.91***	2.40***
	(0.16)	(0.29)	(0.18)	(0.23)	(0.22)	(0.29)
LowPerf	0.96***	1.82***	1.02***	1.35***	0.96***	1.53***
	(0.31)	(0.41)	(0.32)	(0.33)	(0.33)	(0.39)
LowPerf×Affiliated	−1.65***	−1.28*	−1.60***	−0.77	−1.15**	−0.79
	(0.47)	(0.68)	(0.50)	(0.58)	(0.57)	(0.81)
HighPerf	2.38***	1.93***	2.23***	2.27***	2.46***	1.88***
	(0.24)	(0.33)	(0.24)	(0.26)	(0.30)	(0.24)
HighPerf×Affiliated	−0.30	0.17	−0.42	−0.28	−0.87*	0.25
	(0.41)	(0.53)	(0.44)	(0.47)	(0.48)	(0.60)
Maximum Corr	0.89***	0.70**	0.85***	0.75***	0.54***	1.07***
	(0.17)	(0.34)	(0.16)	(0.24)	(0.17)	(0.25)
No. of Options	0.02***	0.00	0.02***	0.01***	0.02***	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Exp. Ratio	0.21***	−0.41***	0.25***	−0.13	0.16*	−0.07
	(0.07)	(0.16)	(0.07)	(0.09)	(0.08)	(0.11)
Turnover	0.00**	0.00	0.00*	0.00	0.04***	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Log(Fund Size)	0.72***	0.72***	0.74***	0.69***	0.74***	0.68***
	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
Fund Age	−0.08**	−0.20***	−0.08**	−0.13***	−0.09**	−0.12**
	(0.04)	(0.05)	(0.03)	(0.04)	(0.04)	(0.05)
Std. Dev.	−3.02**	−5.97***	−3.98***	−3.85***	−5.67***	−2.31
	(1.19)	(2.00)	(1.28)	(1.43)	(1.36)	(2.45)
Observations	36,237,738	14,825,230	23,506,083	24,356,706	30,534,441	20,528,527

Additional Robustness Tests for Additions (Logit Model)

	1-Year Perf.	5-Year Perf.	Only Fund Trustees	Fund Trustees With $\geq$ 10 Funds	Exclude Trustee Changes	Exclude Target Funds	Only Equity Funds	Only Active Funds
Affiliated	2.40***	2.65***	2.88***	3.00***	2.91***	2.78***	2.44***	2.76***
	(0.17)	(0.22)	(0.19)	(0.19)	(0.20)	(0.20)	(0.26)	(0.19)
LowPerf	0.97***	0.50*	1.28***	1.31***	1.04***	1.70***	2.32***	1.02***
	(0.22)	(0.30)	(0.31)	(0.31)	(0.31)	(0.32)	(0.43)	(0.31)
LowPerf×Affiliated	−0.32	−0.74	−1.31***	−1.44***	−0.94*	−1.54***	−0.99	−1.13**
	(0.44)	(0.54)	(0.50)	(0.50)	(0.53)	(0.52)	(0.69)	(0.51)
HighPerf	1.41***	2.57***	2.26***	2.27***	2.31***	2.38***	2.49***	2.44***
	(0.20)	(0.21)	(0.25)	(0.27)	(0.25)	(0.25)	(0.32)	(0.25)
HighPerf×Affiliated	−0.71*	−0.75*	−0.38	−0.35	−0.58	−0.93**	−1.51***	−0.51
	(0.39)	(0.39)	(0.43)	(0.44)	(0.46)	(0.41)	(0.51)	(0.45)
Maximum Corr	0.74***	0.72***	0.71***	0.74***	0.77***	0.52***	0.56***	0.76***
	(0.18)	(0.18)	(0.20)	(0.22)	(0.20)	(0.17)	(0.19)	(0.20)
No. of Options	0.01***	0.01***	0.01***	0.01***	0.01***	0.02***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Exp. Ratio	0.10	0.05	0.07	0.06	0.12	0.29***	0.41***	0.13
	(0.08)	(0.08)	(0.08)	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)
Turnover	0.00	0.00	0.00	0.00	0.00	0.05***	0.03***	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
Log(Fund Size)	0.73***	0.70***	0.71***	0.72***	0.70***	0.74***	0.76***	0.74***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Fund Age	−0.13***	−0.09**	−0.11***	−0.11***	−0.10***	−0.08**	−0.06*	−0.12***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)
Std. Dev.	0.71	−4.14***	−4.08***	−4.73***	−3.67***	−5.39***	−6.06***	−3.73***
	(0.67)	(1.25)	(1.29)	(1.38)	(1.30)	(1.15)	(1.54)	(1.29)
Observations	51,062,968	51,062,968	41,718,951	34,267,381	45,213,976	50,167,798	25,046,361	47,609,055

Pool, Sialm, and Stefanescu (2015)

Mutual Fund Flows

Are participants able to see through these incentives?

We look at three measures of new money growth (flows) into menu options:

$$NMG1_{p,f,t} = \frac{V_{p,f,t} - V_{p,f,t-1}(1+R_{f,t})}{V_{p,f,t-1}(1+R_{f,t})}$$

$$NMG2_{p,f,t} = \frac{V_{p,f,t} - V_{p,f,t-1}(1+R_{f,t})}{V_{p,f,t} + V_{p,f,t-1}(1+R_{f,t})}$$

$$NMG3_{p,f,t} = \frac{V_{p,f,t} - V_{p,f,t-1}(1+R_{f,t})}{\sum_f V_{p,f,t-1}(1+R_{f,t})}$$

We decompose flows into two components:

- Sponsor Flows: Flows due to additions and deletions.
- Participant Flows: Flows due to reallocations across menu options.

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Sensitivity of Flows to Fund Performance

	All Fund Flows		
	NMG1	NMG2	NMG3
Affiliated	0.27***	0.20***	1.14***
	(0.04)	(0.02)	(0.24)
LowPerf	0.55***	0.41***	3.77***
	(0.07)	(0.04)	(0.51)
LowPerf×Affiliated	−0.47***	−0.29***	−1.55**
	(0.10)	(0.05)	(0.61)
HighPerf	0.35***	0.15***	0.94***
	(0.05)	(0.02)	(0.33)
HighPerf×Affiliated	0.08	−0.03	−0.85**
	(0.08)	(0.04)	(0.43)
(...)			
Observations	96,483	117,461	116,342
R-squared	0.16	0.52	0.14

Sensitivity of Flows to Fund Performance

	All Fund Flows			Participant Flows Only		
	NMG1	NMG2	NMG3	NMG1	NMG2	NMG3
Affiliated	0.27***	0.20***	1.14***	0.08**	0.03**	0.06
	(0.04)	(0.02)	(0.24)	(0.03)	(0.01)	(0.12)
LowPerf	0.55***	0.41***	3.77***	0.17***	0.08***	1.26***
	(0.07)	(0.04)	(0.51)	(0.06)	(0.02)	(0.28)
LowPerf×Affiliated	−0.47***	−0.29***	−1.55**	−0.14*	−0.04	−0.60*
	(0.10)	(0.05)	(0.61)	(0.08)	(0.03)	(0.34)
HighPerf	0.35***	0.15***	0.94***	0.34***	0.11***	0.86***
	(0.05)	(0.02)	(0.33)	(0.04)	(0.02)	(0.25)
HighPerf×Affiliated	0.08	−0.03	−0.85**	0.03	−0.00	−0.13
	(0.08)	(0.04)	(0.43)	(0.07)	(0.02)	(0.29)
(...)						
Observations	96,483	117,461	116,342	82,711	82,711	82,711
R-squared	0.16	0.52	0.14	0.25	0.22	0.11

Pool, Sialm, and Stefanescu (2015)

Subsequent Fund Performance

Are the decisions costly or beneficial to plan participants?

We form equal-weighted portfolios at the end of each year:

- For Affiliated and Unaffiliated Funds:
  - Kept Funds;
  - Deleted Funds;
  - Added Funds;
- Based on Past Performance Percentiles

The abnormal return $\alpha_{f,t}$ of fund portfolio f at time t is:

$$\begin{aligned} R_{f,t} - R_{TB,t} &= \alpha_{f,t} + \beta^{M}_{f,t}(R_{M,t} - R_{TB,t}) + \beta^{SMB}_{f,t}(R_{S,t} - R_{B,t}) \\ &\quad + \beta^{HML}_{f,t}(R_{H,t} - R_{L,t}) + \beta^{UMD}_{f,t}(R_{U,t} - R_{D,t}) + \epsilon_{f,t}. \end{aligned}$$

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Subsequent Fund Performance

	No Changes	
	Affiliated Funds	Unaffiliated Funds
Lowest Decile	−0.33**	−0.08
	(0.14)	(0.14)
Lowest Quintile	−0.20*	−0.11
	(0.11)	(0.10)
All Funds	−0.00	−0.06
	(0.04)	(0.05)

Subsequent Fund Performance

	No Changes		Deletions	
	Affiliated Funds	Unaffiliated Funds	Affiliated Funds	Unaffiliated Funds
Lowest Decile	−0.33**	−0.08	−0.28*	−0.15
	(0.14)	(0.14)	(0.17)	(0.17)
Lowest Quintile	−0.20*	−0.11	−0.19*	−0.13
	(0.11)	(0.10)	(0.11)	(0.12)
All Funds	−0.00	−0.06	−0.07	−0.09
	(0.04)	(0.05)	(0.05)	(0.06)

Subsequent Fund Performance

	No Changes		Deletions		Additions	
	Affiliated Funds	Unaffiliated Funds	Affiliated Funds	Unaffiliated Funds	Affiliated Funds	Unaffiliated Funds
Lowest Decile	−0.33**	−0.08	−0.28*	−0.15	−0.01	0.12
	(0.14)	(0.14)	(0.17)	(0.17)	(0.28)	(0.18)
Lowest Quintile	−0.20*	−0.11	−0.19*	−0.13	−0.11	−0.02
	(0.11)	(0.10)	(0.11)	(0.12)	(0.14)	(0.11)
All Funds	−0.00	−0.06	−0.07	−0.09	−0.00	−0.06
	(0.04)	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)

Conclusions

Our paper documents favoritism in retirement plans towards investment options affiliated with the service provider:

- Mutual fund families display leniency toward their own funds following poor fund performance.
- Their decision is not based on an informational advantage as these funds do not subsequently outperform.
- Finally, participants do not counteract the biased decisions of the trustees.