

Out of Sight No More?

The Effect of Fee Disclosures on 401(k) Investment Allocations

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November 2019

Introduction

Recent decades have seen significant changes in the structure of retirement savings in the United States:

- Decline in relative importance of social security.
- Switch from Defined Benefit (DB) to Defined Contribution (DC) plans.

⇒ More responsibility now falls on households to decide **how much** to save and **how to allocate** their savings across different investment options.

Access to Information

Retail investors may not have the necessary information, time, and ability to make optimal investment decisions.

- Households more likely to react to **salient and attention-grabbing** information, but ignore information that is **'out of sight.'** (Barber, Odean, and Zheng (2005))
- Participants in DC plans have been shown to be **inert** (e.g., Benartzi and Thaler (2001); Madrian and Shea (2001); Agnew, Balduzzi, and Sunden (2003); Sialm, Starks, and Zhang (2015))

Participant-Level Disclosure Reform

In 2012, the Department of Labor (DOL) introduced a new disclosure rule (404(a)(5)):

- Employers have to provide **expense- and performance-related summary statements** directly to plan participants.
- Aim: increase participants' awareness of **key features** of their investment options
- Information contained in these disclosures was publicly available before the reform, but often buried in long fund prospectuses or regulatory filings.

⇒ New rule brings this information more *'in sight'*

Example of Fee Disclosure

Name/ Type of Option	TOTAL ANNUAL OPERATING EXPENSES		Shareholder-Type Fees
	As a %	Per \$1,000	
Equity Funds			
A Index Fund/S&P 500	0.18%	\$1.80	The \$20 annual service charge is subtracted from investments held in this option if valued at less than \$10,000.
B Fund/Large Cap	2.45%	\$24.50	The 2.25% deferred sales charge is subtracted from the amounts withdrawn within 12 months of purchase.
C Fund/Int'l Stock	0.79%	\$7.90	The 5.75% sales charge is subtracted from the amounts invested.
D Fund/Mid Cap ETF	0.20%	\$2.00	The 4.25% sales charge is subtracted from the amounts withdrawn.

Example of Performance Disclosure

Name/ Type of Option	Average Annual Total Return as of 12/31/XX				Benchmark			
	1yr	5yr	10yr	Since Inception	1yr	5yr	10yr	Since Inception
Equity Funds								
A Index Fund/ S&P 500	26.5%	.34%	-1.03%	9.25%	26.5%	.42%	-.95%	9.3%
					S&P 500			
B Fund/ Large Cap	27.6%	.99%	N/A	2.26%	27.8%	1.02%	N/A	2.77%
					U.S. Prime Market 750 Index			
C Fund/ Int'l Stock	36.73%	5.26%	2.29%	9.37%	40.40%	5.40%	2.40%	12.09%
					MSCI EAFE			
D Fund/ Mid Cap	40.22%	2.28%	6.13%	3.29%	46.29%	2.40%	-.52%	4.16%
					Russell Midcap			

Research Questions

- Does the disclosure of fund **expenses** affect the flows to the investment options in a plan?
- Does the disclosure of prior **performance** affect the flows to the investment options in a plan?
- Does the disclosure effect differ across participants with different **financial sophistication**?

Preview of the Results

- Flows by 401(k) participants become more sensitive to expenses after the disclosure reform.
- Flows by 401(k) participants become more sensitive to short-term performance after the disclosure reform.
- The disclosure effects are less pronounced for plans with relatively small average contributions and for plans that have many options.

Contribution to the Literature

Impact of information on household behavior:

- Bertrand and Morse (2011); Dranove et al. (2003); Figlio and Lucas (2016); and Gao and Huang (2017).

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); Elton, Gruber, Blake (2006, 2007); Brown, Liang, and Weisbenner (2007); Carroll et al. (2009); Tang et al. (2010); Dvorak (2015); Sialm, Starks, and Zhang (2015); Pool, Sialm, and Stefanescu (2016); and Badoer, Costello, and James (2018).

Relevance of 401(k) Plans

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 401(k) assets reached \$5.3 trillion dollars in 2017, and 67% is invested in mutual funds.
- 401(k) savings are the main source of retirement wealth for many participants.
- Some terms:
 - Employee / Participant (e.g., Jacqueline Kronlund)
 - Employer / Sponsor / Fiduciary (e.g., Decatur Memorial Hospital)
 - Plan provider / Record-keeper (e.g., Empower)

Example: Protective Life Corp. 401(k) Plan, 2012

Option	Current Value	Expense Ratio
Open Architecture Options:		
Columbia Mid Cap Index Fund	11,233,894	0.20
Dodge & Cox International Stock Fund	11,698,068	0.75
Dodge & Cox Stock Fund	18,436,885	0.52
Legg Mason Batterymarch Emerging Markets Fund	1,126,377	1.27
Neuberger Berman Genesis Fund	15,648,724	1.12
PIMCO Real Return Fund	4,408,954	0.47
T. Rowe Price Growth Stock Fund	15,089,112	0.70
T. Rowe Price Retirement 2015 Fund	3,263,493	0.65
T. Rowe Price Retirement 2025 Fund	5,392,003	0.73
T. Rowe Price Retirement 2035 Fund	3,267,995	0.77
T. Rowe Price Retirement 2045 Fund	2,841,702	0.78
Vanguard Total Bond Market Index Fund	6,442,237	0.22
Options from Recordkeeper (Fidelity):		
Spartan 500 Index Fund	14,487,232	0.05
Fidelity Managed Income II-1 Collective Trust Fund	24,679,252	0.54
Other Options:		
Protective Life Corp. Common Stock	49,272,779	
Participant Loans	5,456,741	
Total	192,745,448	

Disclosure Reform

The DOL issued a series of regulatory initiatives to enhance the information about the plans for both plan fiduciaries and participants:

- Rule 404(a)(5): requires plan fiduciaries to disclose information on plan fees, expenses, and performance to participants.
 - First step in developing the disclosure rule was in 2007 (Request for Information).
 - Final compliance date was April 1, 2012.
- Rule 408(b)(2): Requires service providers to furnish information to the plan's fiduciaries on the direct and indirect fees these providers collect for the services rendered to the plan.
 - Proposed rule was published in 2007.
 - Effective date was January 1, 2012.

Data Sources

- Plan menu information:
 - **Form 11-K** filings from Pool, Sialm, and Stefanescu (2016).
 - Supplemented with 1000 largest 401(k) plans, based on **Form 5500** filed with the DOL.
 - Limit sample to plans with between 3 and 100 fund options.
 - 5,577 plan-year observations between 2010–2013 (\approx 1,400 plans per year).
 - Represents \$1.3 trillion in retirement assets for 18 million participants (25% of total DC assets in U.S.).
- Match menu options with CRSP Survivorship-Bias-Free Mutual Fund database.
 - Matching at share class level when possible; otherwise assume share class with lowest expense ratio.
 - Exclude options that are newly added or deleted in a year.
 - Exclude target-date funds.
 - Each plan has 12 (continuing, non-target date) options, on average.

Plan-Year Level Summary Statistics

	mean	sd	p1	p25	p50	p75	p99	N
Plan size (\$m)	799	2,004	2	67	322	747	8,536	5,577
# Plan participants ('000)	13.0	41.9	0.1	1.3	4.4	11.5	139.4	5,576
Contributions per participant (\$)	4,586	2,448	601	2,650	4,274	6,470	8,794	5,492
Assets per participant (\$ '000)	77.2	62.7	2.1	34.6	61.9	102.1	301.5	5,576
# Funds in plan (incl. newly added)	20.57	10.07	4	14	20	25	62	5,577
# Funds in plan (continued)	17.63	9.17	1	11	18	23	46	5,577
# Funds in plan, (cont. non-target date)	11.85	7.23	1	8	11	14	41	5,577
# Funds in plan, (cont. target date)	5.78	5.09	0	0	6	11	13	5,577
Average fee across all funds in plan (%)	0.57	0.19	0.16	0.44	0.61	0.69	1.05	5,575
Fee dispersion within plan (%)	0.70	0.25	0.10	0.54	0.71	0.86	1.29	5,575

Measures of Fund Flows

We use three measures of fund flows:

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

$$Flow_{f,p,t}^2 = \frac{V_{f,p,t} - V_{f,p,t-1}(1 + R_{f,t})}{V_{f,p,t-1}}$$

$$Flow_{f,p,t}^3 = I(V_{f,p,t} - V_{f,p,t-1}(1 + R_{f,t}) > 0)$$

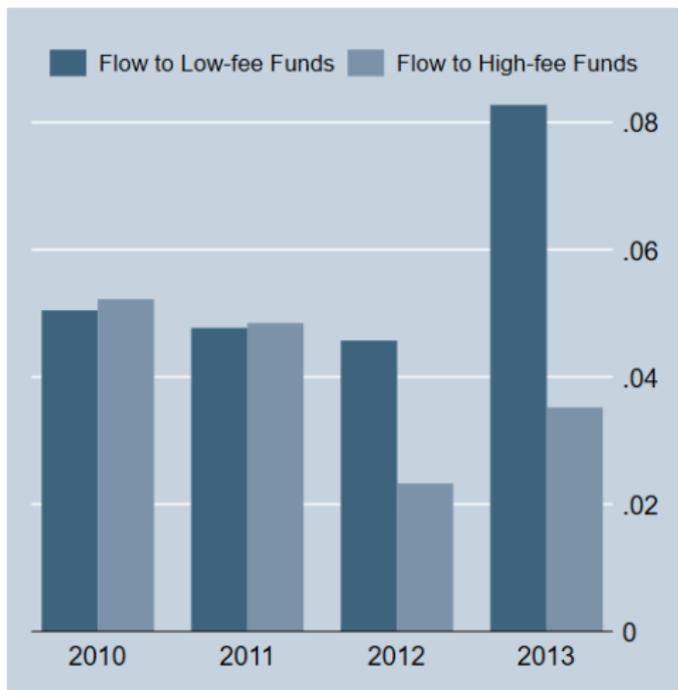
Option-Year Level Summary Statistics

	mean	sd	p1	p25	p50	p75	p99	N
Fund value (\$1,000)	25,821	75,439	2	1,037	6,050	23,737	299,173	64,995
Fund plan share (%)	4.0	3.9	0.0	1.1	2.9	5.7	17.0	64,559
Expense ratio (%)	0.60	0.36	0.04	0.32	0.62	0.85	1.39	64,483
Flow (\$1,000)	213	5,308	-16,453	-435	9	539	25,368	60,957
Flow (to sum of fund assets) (%)	0.117	1.708	-4.459	-0.355	0.023	0.430	7.89	60,957
Flow (to fund size) (%)	6.69	37.79	-100	-7.08	1.09	13.20	171.48	60,957
Positive flow (indicator)	0.537	0.499	0	0	1	1	1	60,957
Return 1-year (%)	14.5	15.0	-16.0	4.0	13.8	23.0	57.4	64,881
Return 5-year (%)	3.1	3.3	-4.6	1.1	3.0	5.3	11.8	63,438
Return 10-year (%)	6.1	3.6	-1.9	3.6	6.2	8.2	15.6	59,543

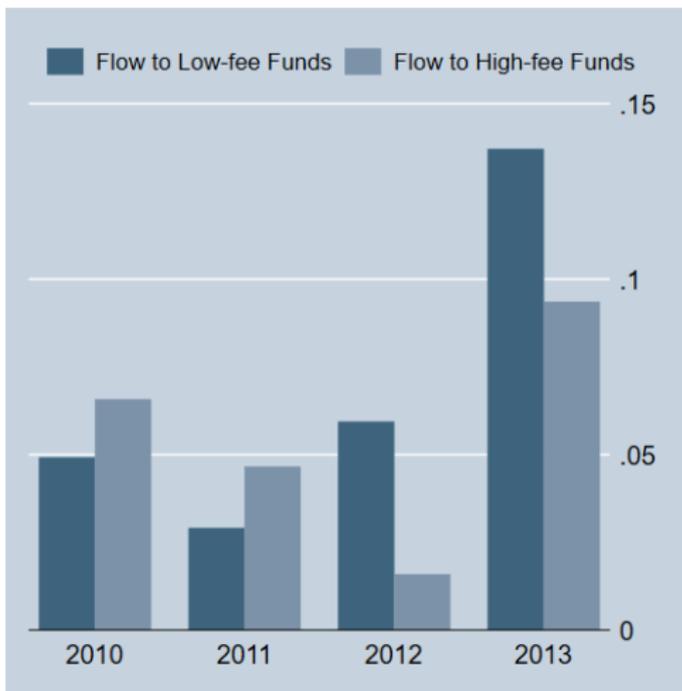
Option Choice Sets

	% with any option	# funds	p10	p50	p90	Avg.Exp.Ratio
Balanced	48%	1.35	1	1	2	0.55%
Domestic equity	98%	6.76	3	6	10	0.58%
Domestic fixed income	92%	2.63	1	2	4	0.39%
Foreign equity	93%	2.08	1	2	3	0.70%
Foreign fixed income	8%	1.19	1	1	2	0.74%
Other	13%	1.31	1	1	2	0.80%

Aggregate Fund Flows By Fee (All Funds)



Aggregate Fund Flows By Fee (Domestic Equity Funds)



Empirical Specification

Baseline specification:

$$Flow_{f,p,t} = \beta_1 Exp_{f,p,t-1} + \beta_2 Exp_{f,p,t-1} \times Post_t + \Gamma Controls_{f,p,t-1} + \epsilon_{f,p,t}$$

- $Flow_{f,p,t}$ is one of three measures of fund flow to fund f in plan p in year t .
- $Exp_{f,p,t-1}$ is the lagged expense ratio of fund f in plan p .
- $Post$ takes a value of one for 2012 and 2013.
- $Size \times Year$ controls for the impact of relative option size in plan.
- Fixed Effects: Plan \times Fund ; Plan \times Style \times Year ; Fund Company \times Year.
- Cluster (two-way) by fund management company and DC plan.

Fee-Flow Sensitivities: All Funds

	Flow (to sum of mutual fund assets)		Flow (to fund size)		I[Positive flow]	
	(1)	(2)	(3)	(4)	(5)	(6)
Expense ratio * Post	-0.561*** (-10.14)	-0.559*** (-5.86)	-5.900*** (-4.39)	-5.882*** (-3.07)	-0.196*** (-8.31)	-0.230*** (-9.33)
Expense ratio	0.186 (1.47)	0.204 (1.64)	3.355 (1.11)	5.739* (1.78)	0.097* (1.71)	0.183*** (3.20)
Plan*Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Plan*Style*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund Company*Year FE	No	Yes	No	Yes	No	Yes
R ²	0.812	0.821	0.745	0.758	0.688	0.702
N	47,840	47,634	47,840	47,634	47,840	47,634

Fee-Flow Sensitivities: Domestic Equity Funds

	Flow (to sum of mutual fund assets)		Flow (to fund size)		I[Positive flow]	
	(1)	(2)	(3)	(4)	(5)	(6)
Expense ratio * Post	-0.672*** (-11.64)	-0.586*** (-6.40)	-9.109*** (-8.15)	-6.517*** (-3.34)	-0.242*** (-10.79)	-0.229*** (-7.94)
Expense ratio	0.128 (0.62)	0.179 (0.92)	4.165 (1.02)	9.463** (2.37)	0.123* (1.69)	0.204*** (2.72)
Plan*Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Plan*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund Company*Year FE	No	Yes	No	Yes	No	Yes
R ²	0.805	0.815	0.738	0.753	0.673	0.690
N	29,692	29,545	29,692	29,545	29,692	29,545

Fee-Flow Sensitivities: Fees from 2009

	All funds (1)	Domestic equity only (2)
Expense ratio (2009) * Post	-0.521*** (-10.56)	-0.598*** (-10.24)
Plan*Fund FE	Yes	Yes
Size*Year controls	Yes	Yes
Plan*Style*Year FE	Yes	Yes
R ²	0.812	0.805
N	47,661	29,628

“Placebo” Periods: Fee-Flow Sensitivities (All Funds)

	Period:	2000- 2003 (1)	2001- 2004 (2)	2002- 2005 (3)	2003- 2006 (4)	2004- 2007 (5)	2005- 2008 (6)	2006- 2009 (7)	2007- 2010 (8)	2008- 2011 (9)
Expense ratio * Post		0.022 (0.11)	-0.441** (-2.02)	-0.163 (-1.03)	0.011 (0.09)	0.124 (1.15)	-0.128 (-1.10)	-0.130 (-1.34)	0.144 (1.08)	0.030 (0.29)
Expense ratio		0.094 (0.26)	0.502 (1.06)	0.472 (1.06)	0.354 (1.22)	0.383 (1.19)	0.552* (1.73)	0.482** (2.11)	0.114 (0.45)	-0.073 (-0.38)
Plan*Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plan*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund Company *Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²		0.838	0.840	0.830	0.822	0.824	0.814	0.784	0.791	0.803
N		12,965	18,158	22,445	25,719	26,821	27,396	27,756	28,150	37,233

Placebo Periods: Fee-Flow Sensitivities (Domestic Equity)

	Period:	2000- 2003 (1)	2001- 2004 (2)	2002- 2005 (3)	2003- 2006 (4)	2004- 2007 (5)	2005- 2008 (6)	2006- 2009 (7)	2007- 2010 (8)	2008- 2011 (9)
Expense ratio * Post		0.062 (0.23)	-0.400 (-1.42)	-0.218 (-1.22)	-0.034 (-0.29)	0.092 (0.82)	-0.108 (-0.82)	-0.046 (-0.30)	0.223 (1.12)	0.186 (1.45)
Expense ratio		-0.492 (-1.29)	0.237 (0.34)	0.508 (0.80)	0.299 (0.78)	0.591 (1.50)	0.441 (1.24)	-0.013 (-0.03)	-0.324 (-0.83)	-0.385 (-1.40)
Plan*Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plan*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund Company *Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²		0.833	0.843	0.835	0.832	0.835	0.825	0.788	0.796	0.803
N		8,730	12,347	15,389	17,687	18,604	19,079	19,334	19,582	24,885

Minimum and Maximum fees

	All funds			Domestic equity only		
	(1)	(2)	(3)	(4)	(5)	(6)
Minimum fee * Post	0.529*** (9.21)	0.515*** (8.97)	0.317*** (3.97)	0.595*** (10.03)	0.565*** (9.93)	0.356*** (5.19)
Minimum fee	-0.290*** (-3.85)	-0.209*** (-4.55)	-0.018 (-0.34)	-0.283** (-2.50)	-0.211*** (-4.70)	-0.038 (-0.80)
Maximum fee * Post		-0.280*** (-3.77)	-0.163*** (-2.63)		-0.263** (-2.34)	-0.136 (-1.18)
Maximum fee		0.048 (1.11)	-0.042 (-0.94)		0.061 (1.49)	-0.009 (-0.22)
Expense ratio * Post			-0.406*** (-5.47)			-0.435*** (-5.78)
Expense ratio			0.152 (1.06)			0.078 (0.33)
Plan*Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Plan*Style*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.812	0.812	0.812	0.805	0.806	0.806
N	47,840	47,840	47,840	29,692	29,692	29,692

Differential effects across Active vs. Index funds

	Only active funds		Only index funds	
	(1)	(2)	(3)	(4)
Expense ratio * Post	-0.250***	-0.405***	-0.605*	-0.661
	(-2.89)	(-4.49)	(-1.77)	(-1.64)
Expense ratio	0.032	-0.039	-0.293	0.056
	(0.21)	(-0.18)	(-0.39)	(0.06)
Sample	All	Domestic equity	All	Domestic equity
Plan*Fund FE	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes
Plan*Style*Year FE	Yes	Yes	Yes	Yes
R ²	0.831	0.833	0.840	0.847
N	36,591	22,539	5,759	5,157

Placebo: Fee-sensitivities Among Target Funds

	(1)	(2)
Expense ratio * Post	-0.122	-0.111
	(-0.40)	(-0.35)
Expense ratio	1.834***	1.897***
	(4.27)	(4.37)
Plan*Fund FE	Yes	Yes
Size*Year controls	Yes	Yes
Plan*Style*Year FE	Yes	Yes
Fund Company*Year FE	No	Yes
R ²	0.751	0.751
N	28,021	28,019

Other robustness

Results are also robust to:

- Limiting sample to only 2011–12 (one year pre and post)
- Fewer fixed effects and no controls
- Controlling for changes to plan menus and defaults
 - E.g., exclude plan-years with any deleted options

Cross-Sectional Differences in Flow-Fee Sensitivities

- Average Contribution Amount
 - Proxy for Sophistication, Economic Importance
- Number of fund options
 - Many options to choose from may make relative comparison more difficult.

Fee-Flow Sensitivities by Participant Contributions

	All fund styles	Domestic equity
	(1)	(2)
Expense ratio (plan-year adj.)	0.145 (0.77)	0.155 (0.61)
Expense ratio * Post	-0.454*** (-5.43)	-0.526*** (-5.60)
Expense ratio * Large contributions	0.056 (0.25)	-0.095 (-0.39)
<i>Expense ratio * Post * Large contributions</i>	-0.208** (-2.12)	-0.274** (-2.51)
Plan*Fund FE	Yes	Yes
Size*Year controls	Yes	Yes
Plan*Style*Year FE	Yes	Yes
R ²	0.813	0.806
N	46,187	28,664

Fee-Flow Sensitivities by Number of Choices

	All fund styles	Domestic equity
	(1)	(2)
Expense ratio (plan-year adj.)	0.480**	0.434
	(2.19)	(1.50)
Expense ratio * Post	-0.699***	-0.847***
	(-6.34)	(-7.22)
Expense ratio * Number of choices	-0.011***	-0.012*
	(-3.18)	(-1.77)
<i>Expense ratio * Post * Number of choices</i>	0.006*	0.008**
	(1.75)	(2.16)
Plan*Fund FE	Yes	Yes
Size*Year controls	Yes	Yes
Plan*Style*Year FE	Yes	Yes
R ²	0.812	0.805
N	46,636	28,930

Reallocations across broader asset classes

- Affiliated vs. Unaffiliated Investment Options
 - Affiliated options are mutual funds that are managed by the service provider of the 401(k) plan.
 - 60% of plans have some affiliated options, and in these plans, 55% of assets invested in affiliated funds.
 - Disclosure might level the playing field between affiliated and unaffiliated investment options reducing favoritism (Pool, Sialm, and Stefanescu 2016).
- Company Stock vs. Mutual Fund Options
 - Two-thirds of our plans have employer stock option, and in these plans, 15% of assets invested in employer stock.
 - Typically zero fees if investing in company stock.
 - An unintended consequence of the disclosure reform could be an increase in investments in zero-fee option.

Plan-Level Reallocation between Affiliated and Unaffiliated Funds

Dependent variable: Percent of total fund assets in affiliated funds

Expense ratio difference [Aff – Non-aff funds] * Post	-0.026*** (-2.79)
Expense ratio difference [Aff – Non-aff funds]	-0.008 (-0.23)
Plan FE	Yes
Time FE	Yes
R ²	0.950
N	2,567

Plan-Level Reallocation between Employer Stock and Cash vs. Mutual Fund Options

Dependent variable: Percent of total plan assets in employer stock

Expense ratio (plan average) * Post	0.013* (1.74)
Expense ratio (plan average)	-0.020* (-1.77)
Plan FE	Yes
Time FE	Yes
R ²	0.969
N	3,415

Empirical Specification

We estimate the following baseline specification:

$$\begin{aligned} Flow_{f,p,t} = & \beta_1 Perf_{f,t-1} + \beta_2 Perf_{f,t-1} \times Post_t \\ & + \beta_3 Exp_{f,p,t-1} + \beta_4 Exp_{f,p,t-1} \times Post_t + \Gamma' \mathbf{Controls}_{f,p,t-1} + \epsilon_{f,p,t}. \end{aligned}$$

- $Flow_{f,p,t}$ is one of three measures of fund flow to fund f in plan p in year t .
- $Perf_{f,t-1}$ is the lagged raw return over the prior 1, 5, or 10 years of fund f .
- $Exp_{f,p,t-1}$ is the lagged expense ratio of fund f in plan p .
- $Post$ takes a value of one for 2012 and 2013.
- $Size \times Year$ controls for the impact of relative option size in plan.
- Fixed Effects:
 - Plan \times Fund
 - Plan \times Style \times Year
 - Fund Company \times Year

Performance-Flow Sensitivities

	All funds		Domestic equity only	
	(1)	(2)	(3)	(4)
Return 1-year * Post	1.465*** (3.30)	2.008*** (4.23)	1.836*** (4.16)	0.860** (2.41)
Return 5-year * Post	1.436 (1.18)	2.659*** (2.87)	-0.852 (-0.68)	0.892 (1.17)
Return 10-year * Post	0.074 (0.07)	-1.043 (-0.81)	-1.228 (-1.12)	-1.500* (-1.82)
Expense ratio * Post	-0.459*** (-8.90)	-0.512*** (-5.34)	-0.446*** (-7.90)	-0.235*** (-4.26)
Return 1-year	0.445*** (3.35)	0.442*** (3.52)	0.587*** (2.82)	0.458*** (3.18)
Return 5-year	1.455 (0.90)	-0.281 (-0.18)	4.263** (2.45)	0.595 (0.54)
Return 10-year	3.934*** (4.27)	3.720*** (4.10)	3.811*** (4.44)	1.825*** (3.22)
Expense ratio	0.047 (0.39)	0.156 (1.19)	-0.027 (-0.14)	0.127 (1.04)
Plan*Fund FE	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes
Plan*Year FE	No	No	Yes	Yes
Plan*Style*Year FE	Yes	Yes	No	No
Fund Company*Year FE	No	Yes	No	Yes
R ²	0.818	0.826	0.812	0.802
N	43,486	43,343	27,499	27,390

Fund-level results

- Previous results at option-level (fund by plan), within 401(k) plans.
- Can these effects be traced also to **fund-level**?
- Empirical strategy: “Triple-diff”
 - Some funds have more ‘exposure’ to asset flows from 401(k) plans than others
 - Exposure measure to DC plans both at extensive and intensive margins
 - Do these funds see a larger increase in fee-sensitivities compared to funds with less exposure?

⇒ Can help account for changes in fee-sensitivities over time that are unrelated to the disclosure reform among 401(k) plans.

Aggregate Fund-Level Specifications

$$\begin{aligned} Flow_{f,t} &= \beta_1 Exp_{f,t-1} + \beta_2 Exp_{f,t-1} \times Post_t + \beta_3 Exp_{f,t-1} \times DC_{f,t-1} \\ &+ \beta_4 Post_t \times DC_{f,t-1} + \beta_5 Exp_{f,t-1} \times Post_t \times DC_{f,t-1} \\ &+ \Gamma Controls_{f,t-1} + \epsilon_{f,t}. \end{aligned}$$

- $Flow_{f,t}$ is growth of new money to fund f in year t .
- $Exp_{f,t-1}$ is the lagged expense ratio of fund f .
- $Post$ takes a value of one for 2012 and 2013.
- $DC_{f,t-1}$ is the lagged DC intensity of fund f :
 - Indicator whether fund is included in any DC plan
 - $\text{Log}(1 + \text{Number of Plans that Include Fund } f)$
 - Percent of 401(k) assets for fund f .
- $Size \times Year$ is based on $\text{log}(1 + TNA_{t-1})$
- Fixed Effects:
 - Fund
 - Style \times Year
 - Index \times Year

Fund-Level Summary Statistics

	mean	sd	p1	p25	p50	p75	p99	N
Flow, monthly average (%)	1.67	7.91	-7.42	-1.17	-0.13	1.62	54.30	37,934
Expense ratio (%)	0.86	0.45	0.09	0.54	0.83	1.11	2.25	29,630
Return, 1-year (%)	11.88	16.24	-25.70	1.05	10.85	19.41	65.32	36,975
Return, 5-year (%)	2.17	3.90	-9.76	0.40	2.42	4.41	11.80	22,084
Return, 10-year (%)	4.59	3.71	-5.01	2.17	4.37	6.44	15.36	16,294
Log(Total Net Assets)	5.25	1.99	0.69	3.88	5.32	6.62	9.74	39,081
Fund included in any plan	0.28	0.45	0.00	0.00	0.00	1.00	1.00	35,838
Percent of fund assets in plans (%)	2.53	11.38	0.00	0.00	0.00	0.01	78.68	35,838
Number of plans with fund	2.20	13.96	0	0	0	1	43	35,838
Percent of fund assets in plans >0 (%)	8.77	19.40	0.00	0.15	1.52	7.44	100.00	9,944
Number of plans with fund >0	7.93	25.63	1	1	2	5	101	9,944

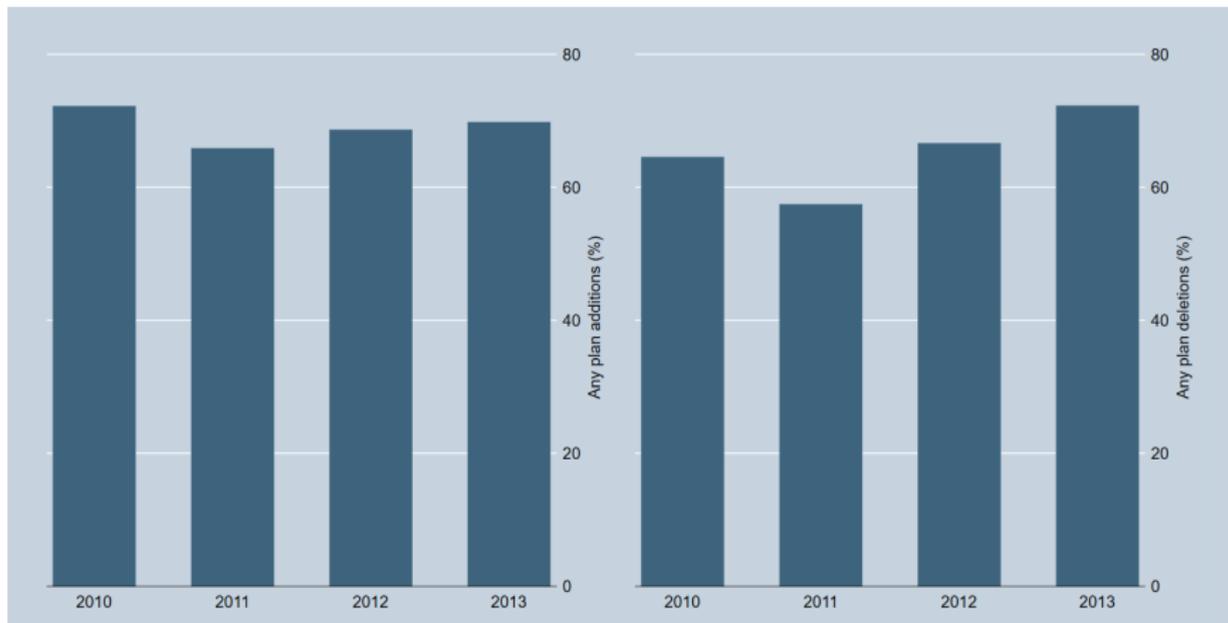
Fund-Level Sensitivity to Expenses

Dependent variable: Fund flow	<i>Measure of DC intensity:</i>					
	<i>Fund in any plan</i>		<i>Percent of fund assets in plan</i>		<i>Log(Number of plans with fund+1)</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
Expense ratio (lagged, style adj.)	0.8010 (1.55)	0.7283 (1.39)	0.7682 (1.59)	0.6761 (1.37)	0.9058* (1.81)	0.8373* (1.65)
Expense ratio * Post	-0.3907 (-1.57)	-0.2944 (-1.00)	-0.5453** (-2.54)	-0.4214 (-1.56)	-0.3287 (-1.38)	-0.2463 (-0.86)
Expense ratio * DC intensity	0.0953 (0.08)	0.0536 (0.05)	3.3936 (0.47)	3.4379 (0.48)	-0.3988 (-0.69)	-0.4165 (-0.72)
Post * DC intensity	-0.4790*** (-2.99)	-0.4630*** (-2.88)	-0.6994 (-0.77)	-0.6402 (-0.71)	-0.3736*** (-4.32)	-0.3601*** (-4.16)
<i>Expense ratio * Post * DC intensity</i>	-0.7974** (-2.10)	-0.7494** (-1.99)	-3.8053** (-2.31)	-3.6615** (-2.23)	-0.7307*** (-3.87)	-0.6993*** (-3.76)
Size*Year control	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund-style * Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Indefund * Year FE	No	Yes	No	Yes	No	Yes
R ²	0.489	0.489	0.489	0.489	0.489	0.489
N	26,635	26,635	26,635	26,635	26,635	26,635

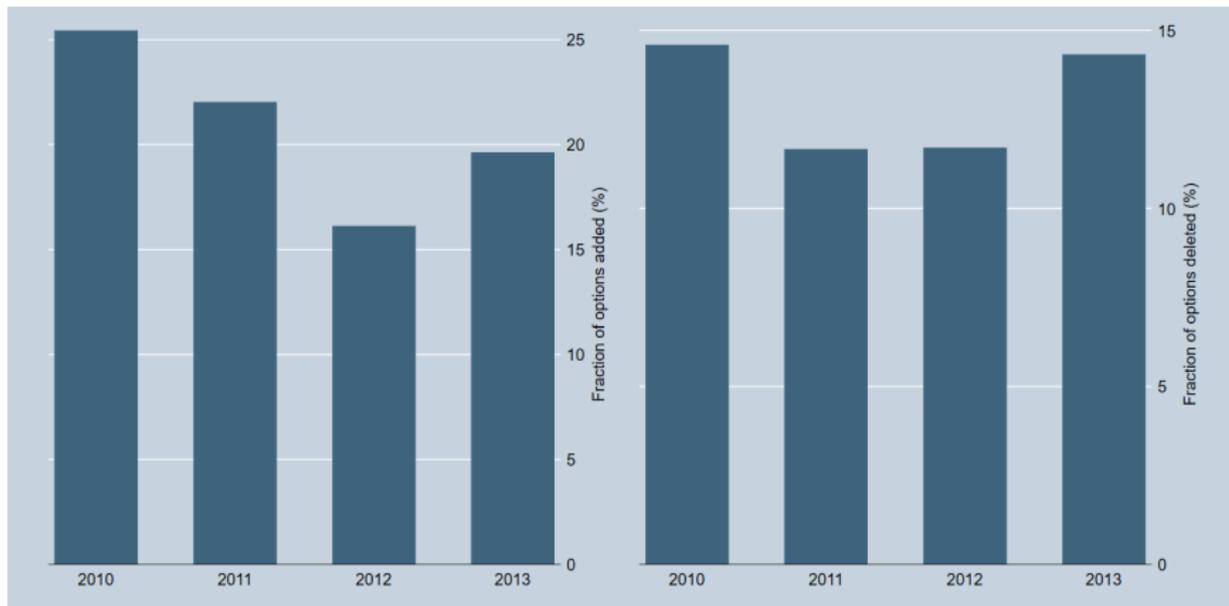
Changes in 401(k) Menus Around Reform

- Plan sponsors and providers could also adjust plans around regulatory reform.
- To address this question, we study fund deletions and fund additions around reform.

Reshuffling of Menus: Any Plan Additions and Deletions



Reshuffling of Menus: Fraction of Options Added or Deleted



Sensitivity of Plan Deletions to Fees

Dependent variable: Option deleted (indicator)

	All funds Domestic equity	
	(1)	(2)
Expense ratio * Post	0.001 (0.07)	-0.023 (-0.43)
Expense ratio	-0.016 (-0.92)	-0.065* (-1.75)
Log (Total Net Assets of Fund)	-0.041*** (-16.05)	-0.039*** (-8.43)
Pct of Plan Assets Invested in Fund (lagged)	-0.018*** (-5.43)	-0.018*** (-4.53)
Target Fund*Year FE	Yes	Yes
Plan*Style*Year FE	Yes	No
Plan*Year FE	No	Yes
R ²	0.372	0.405
N	70,611	39,276

Robustness: Excluding Plans with Deletions

	No deleted funds in plan		No deleted funds within style	
	(1)	(2)	(3)	(4)
Expense ratio * Post	-0.595***	-0.699***	-0.407***	-0.548***
	(-6.61)	(-4.20)	(-6.12)	(-3.89)
Expense ratio	0.167	0.125	0.017	0.110
	(0.50)	(0.46)	(0.10)	(0.62)
Plan*Fund FE	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes
Plan*Style*Year FE	Yes	Yes	Yes	Yes
Fund Company*Year FE	No	Yes	No	Yes
R ²	0.859	0.872	0.842	0.853
N	11,236	11,058	25,646	25,423

Conclusions

- Flows by 401(k) participants become more sensitive to *expenses* after the disclosure reform.
 - Especially for “extreme-fee” funds.
 - Effects less pronounced in plans with relatively small contributions and plans with many options.
- Flows by 401(k) participants become more sensitive to *short-term performance* after the disclosure reform.
- More even playing-field between affiliated and non-affiliated options.