

Out of Sight No More? The Effect of Fee Disclosures on 401(k) Investment Allocations

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Introduction

Over the last decades there have been significant changes in the structure of retirement savings in the United States:

- The relative importance of government-provided social security has declined.
- Firms have switched from Defined Benefit (DB) to Defined Contribution (DC) plans.

More responsibility about retirement savings has been transferred to households, who have to decide how much to save and how to allocate their savings across different investment options.

Access to Information

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

- Barber, Odean, and Zheng (2005) find that households are more likely to react to salient and attention-grabbing information and ignore information that is 'out of sight.'
- Participants in DC pension 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 new participant-level disclosure rules (404(a)(5)) aiming to increase participant's awareness of key features on the investment menu in 401(k) plans:

- Fiduciaries have to provide expense- and investment-related summary statements directly to participants.
- While the information contained in these disclosures was publicly available before the reform, it was often buried in long fund prospectuses or regulatory filings.
- Hence, the new rule brings the information more 'in sight.'

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 account sizes and for plans that are unionized.

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); and 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, where 67% are invested in mutual funds.
- 401(k) savings are the main source of retirement wealth for many participants.

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

Option	Current Value	Expense Ratio	Revenue Share
Open Architecture Options:			
Columbia Mid Cap Index Fund	11,233,894	0.20	0.10
Dodge & Cox International Stock Fund	11,698,068	0.64	0.10
Dodge & Cox Stock Fund	18,436,885	0.52	0.10
Legg Mason Batterymarch Emerging Markets Fund	1,126,377	1.27	0.10
Neuberger Berman Genesis Fund	15,648,724	1.12	0.40
PIMCO Real Return Fund	4,408,954	0.47	0.02
T. Rowe Price Growth Stock Fund	15,089,112	0.70	0.15
T. Rowe Price Retirement 2015 Fund	3,263,493	0.65	0.15
T. Rowe Price Retirement 2025 Fund	5,392,003	0.73	0.15
T. Rowe Price Retirement 2035 Fund	3,267,995	0.77	0.15
T. Rowe Price Retirement 2045 Fund	2,841,702	0.78	0.15
Vanguard Total Bond Market Index Fund	6,442,237	0.22	0
Options from Recordkeeper (Fidelity):			
Spartan 500 Index Fund	14,487,232	0.05	-
Fidelity Managed Income II-1 Collective Trust Fund	24,679,252		
Other Options:			
Protective Life Corp. Common Stock	49,272,779		
Participant Loans	5,456,741		
Total	192,745,448		

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2012 Reform: 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.

Source: AICPA

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 website address	26.5%	.34%	-1.03%	9.25%	26.5%	.42%	-.95%	9.3%
					S&P 500			
B Fund/ Large Cap website address	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 website address	36.73%	5.26%	2.29%	9.37%	40.40%	5.40%	2.40%	12.09%
					MSCI EAFE			
D Fund/ Mid Cap website address	40.22%	2.28%	6.13%	3.29%	46.29%	2.40%	-.52%	4.16%
					Russell Midcap			

Source: AICPA

Data Sources

- We collect plan menus from 2010 to 2013.
 - Hand-collected plan menus from Form 11-K filings between 1998-2013 from Pool, Sialm, and Stefanescu (2016).
 - Plan menus from the 1000 largest 401(k) plans between 2010-2013 based on Form 5500 filed with the DOL.
 - Form 5500 also provides information on compensation and other plan characteristics.
 - Match menu options with CRSP Survivorship-Bias-Free Mutual Fund database if possible at the share class level.

Our Sample

- Main sample period: 2010-2013
- Our final sample contains the investment menus for 5,577 plan-year observations or around 1,395 plans per year.
- In 2013, our sample covers around \$1.3 trillion in retirement assets for approximately 18 million participants.
- This represents around 25% of the total 401(k) assets.

Plan-Year Level Summary Statistics

	mean	p1	p50	p99	N
Plan size (millions)	799	2	322	8,536	5,577
Plan participants	13,023	125	4,442	139,439	5,576
Assets per participant (thousands)	77	2	62	302	5,576
Funds in plan (incl. newly added)	20.57	4	20	62	5,577
Funds in plan (continued)	17.63	1	18	46	5,577
Funds in plan, (continued non-target)	11.85	1	11	41	5,577
Funds in plan, (continued target)	5.78	0	6	13	5,577
Collective bargaining plan (indicator)	0.16	0	0	1	5,577
Fee dispersion within plan (%)	0.776	0.09	0.8	1.29	5,566

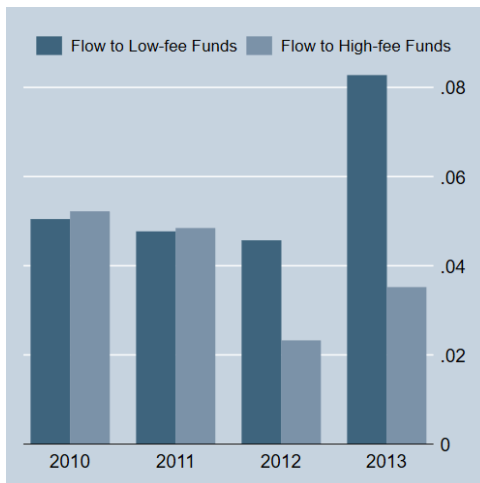
Option-Plan-Year Level Summary Statistics

	mean	p1	p50	p99	N
Option value (\$1,000)	25,821	2	6,050	299,173	64,995
Option plan share (%)	4	0	2.9	17	64,559
Expense ratio (%)	0.6	0.04	0.62	1.39	64,483
Flow (to lag sum of funds) (%)	0.117	-4.459	0.023	7.89	60,957
Flow (to lag fund size) (%)	6.624	-41.692	1.086	90.44	60,957
Negative flow (indicator)	0.463	0	0	1	60,957
Return 1-year	0.14	-0.16	0.14	0.57	64,881
Return 5-year	0.03	-0.05	0.03	0.12	63,438
Return 10-year	0.06	-0.02	0.06	0.16	59,543

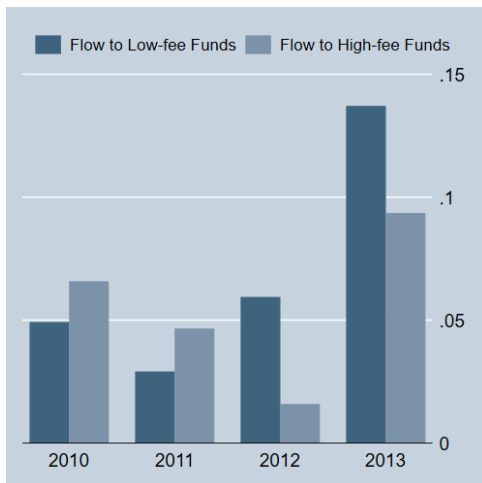
Option Choice Sets

	Fund-Plan-Year level			Plan-year level
	Total funds	Target funds	Exp. ratio (%)	% Funds with this style
Balanced	18,525	14,929	0.545	77%
Domestic Equity	50,461	13,724	0.583	98%
Domestic Fixed Income	17,187	3,603	0.39	94%
Foreign Equity	10,653	0	0.703	92%
Foreign Fixed Income	530	0	0.743	8%
Other	973	0	0.804	13%

Aggregate Fund Flows By Fee (All Funds)



Aggregate Fund Flows By Fee (Domestic Equity Funds)



Fees: Empirical Specification

We estimate the following baseline specification:

$$Flow_{p,f,t} = \beta_1 Exp_{p,f,t-1} + \beta_2 Exp_{p,f,t-1} \times Post_t + \mathbf{\Gamma}' \mathbf{Controls}_{p,f,t-1} + \epsilon_{p,f,t}.$$

- $Flow_{p,f,t}$ is fund flow to fund f in plan p in year t .
- $Exp_{p,f,t-1}$ 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

Fee-Flow Sensitivities (All Funds)

	Flow		Flow		I	
	(to lagged sum across funds)		(to lagged fund size)		[Negative flow]	
Expense ratio * Post	-0.561***	-0.559***	-6.046***	-6.573***	0.196***	0.230***
	-10.14	-5.86	-5.32	-4.73	-8.31	-9.33
Expense ratio	0.186	0.204	2.518	5.663**	-0.097*	-0.183***
	-1.47	-1.64	-1.05	-2.42	-1.71	-3.2
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
R2	0.812	0.821	0.745	0.758	0.688	0.702
N	47,829	47,623	47,829	47,623	47,829	47,623

Placebo Period Fee-Flow Sensitivities (All Funds)

Period:	2000-2003	2001-2004	2002-2005	2003-2006	2004-2007	2005-2008	2006-2009	2007-2010	2008-2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Expense ratio * Post	0.022	-0.441**	-0.163	0.011	0.124	-0.128	-0.13	0.144	0.03
	-0.11	-2.02	-1.03	-0.09	-1.15	-1.1	-1.34	-1.08	-0.29
Expense ratio	0.094	0.502	0.472	0.354	0.383	0.552*	0.482**	0.114	-0.073
	-0.26	-1.06	-1.06	-1.22	-1.19	-1.73	-2.11	-0.45	-0.38
Plan*Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size*Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plan*Style*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund Company *Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.838	0.84	0.83	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

Cross-Sectional Differences in Flow-Fee Sensitivities

- **Average Account Size:** proxy for sophistication or for economic Importance
 - Plans with smaller account balances are less sensitive to disclosures
- **Unionization:** Participants might delegate monitoring of plan menus to union and might be less active themselves.
 - Unionized plans are less sensitive to disclosures

Cross-Sectional Differences in Flow-Fee Sensitivities

- **Affiliated vs. Unaffiliated Investment Options**

- Disclosure might level the playing field between affiliated and unaffiliated investment options reducing favoritism (Pool, Sialm, and Stefanescu 2016). Affiliated funds are more sensitive.

- **Target-Date vs. Non-Target-Date Options**

- Target-date funds are typically default investment options with very limited cross-sectional variability within plans (i.e., different retirement dates). Target date funds are less sensitive.

- **Company Stock vs. Mutual Fund Options**

- There are typically no fees of investing in company stock.
- An unintended consequence of the disclosure reform is the increase in investments in zero-fee company stock.

Performance: Option-Level

$$\begin{aligned} \text{Flow}_{p,f,t} &= \beta_1 \text{Perf}_{f,t-1} + \beta_2 \text{Perf}_{f,t-1} \times \text{Post}_t \\ &+ \beta_3 \text{Exp}_{p,f,t-1} + \beta_4 \text{Exp}_{p,f,t-1} \times \text{Post}_t + \mathbf{\Gamma}' \mathbf{Controls}_{p,f,t-1} + \epsilon_{p,f,t}. \end{aligned}$$

- $\text{Flow}_{p,f,t}$ is fund flow to fund f in plan p in year t .
- $\text{Perf}_{f,t-1}$ is lagged raw return over the prior 1, 5, or 10 years of fund f .
- $\text{Exp}_{p,f,t-1}$ is lagged expense ratio of fund f in plan p .
- Post takes a value of one for 2012 and 2013.
- $\text{Size} \times \text{Year}$ 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	
Return 1-year * Post	1.465***	2.008***	1.836***	0.860**
	-3.3	-4.23	-4.16	-2.41
Return 5-year * Post	1.436	2.659***	-0.852	0.892
	-1.18	-2.87	(-0.68)	-1.17
Return 10-year * Post	0.074	-1.043	-1.228	-1.500*
	-0.07	(-0.81)	(-1.12)	(-1.82)
Expense ratio * Post	-0.459***	-0.512***	-0.446***	-0.235***
	(-8.90)	(-5.34)	(-7.90)	(-4.26)
Return 1-year	0.445***	0.442***	0.587***	0.458***
	-3.35	-3.52	-2.82	-3.18
Return 5-year	1.455	-0.281	4.263**	0.595
	-0.9	(-0.18)	-2.45	-0.54
Return 10-year	3.934***	3.720***	3.811***	1.825***
	-4.27	-4.1	-4.44	-3.22
Expense ratio	0.047	0.156	-0.027	0.127
	-0.39	-1.19	(-0.14)	-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
R2	0.818	0.826	0.812	0.802
N	43,486	43,343	27,499	27,390

Aggregate Fund-Level Analysis

$$\begin{aligned}
 Flow_{f,t} &= \beta_1 Exp_{f,t-1} + \beta_2 Exp_{f,t-1} \times Post_t + \beta_3 Exp_{f,t-1} \times DC_{f,t-1} \\
 &+ \beta_4 Post_t \times DC_{f,t-1} + \beta_5 Exp_{f,t-1} \times Post_t \times DC_{f,t-1} \\
 &+ \mathbf{\Gamma}' \mathbf{Controls}_{p,f,t-1} + \epsilon_{p,f,t}.
 \end{aligned}$$

- $Flow_{f,t}$ is growth of new money to fund f in year t .
- $Exp_{f,t-1}$ is lagged expense ratio of fund f .
- $DC_{f,t-1}$ is lagged DC intensity of fund f :
 - $\text{Log}(1 + \text{Number of Plans that Include Fund } f)$
 - Percent of 401(k) assets for fund f .
- $\text{Size} \times \text{Year}$ is based on $\text{log}(1 + TNA_{t-1})$
- Fixed Effects: Plan \times Fund ; Plan \times Style \times Year ; Fund Company \times Year

Fund-Level Sensitivity to Expenses

Dependent variable: Fund flow	Measure of DC intensity:	
	Log (no. plans with fund+1)	Perc of fund assets in plans
	-1	-2
Expense ratio (lagged, style adj.)	0.6362	0.6619
	-1.24	-1.3
Expense ratio * Post	-0.4380*	-0.6055***
	(-1.81)	(-2.63)
Expense ratio * DC intensity	-0.2729	-2.709
	(-0.39)	(-0.59)
Post * DC intensity	-0.1964**	-1.0675
	(-2.36)	(-1.20)
Expense ratio * Post * DC intensity	-0.5705***	-3.3401**
	(-3.65)	(-2.04)
Log fund value * Year controls	Yes	Yes
Fund FE	Yes	Yes
Fundstyle * Year FE	Yes	Yes
Indexfund * Year FE	Yes	Yes
Targetfund * Year FE	Yes	Yes
R2	0.51	0.51
N	28,201	28,201

Fund-Level Sensitivity to Performance

	Measure of DC intensity:	
	Log(number of plans with fund+1)	Percent of fund assets in plans
	(1)	(2)
Expense ratio (lagged, style adj.)	0.3971 -0.54	0.359 -0.48
Return (1-year, style adj., lagged)	1.5301 -1.36	1.6961* -1.93
Return (5-year, style adj., lagged)	15.6074*** -2.61	15.1056*** -3.13
Return (10-year, style adj., lagged)	8.3319* -1.83	12.6741*** -3.38
Post * DC intensity	-0.2696*** (-2.81)	-2.1975* (-1.73)
Expense ratio * Post	-0.3242 (-1.17)	-0.5575** (-2.15)
Return 1-year * Post	3.4616 -1.48	4.1137** -2.22
Return 5-year * Post	-2.5548 (-0.49)	0.6625 -0.15
Return 10-year * Post	14.5681*** -2.8	14.3993*** -3.56
Expense ratio * DC intensity	0.0551 -0.06	3.025 -0.48
Return 1-year * DC intensity	0.296 -0.35	3.995 -0.41
Return 5-year * DC intensity	1.408 -0.4	76.5986 -1.11
Return 10-year * DC intensity	2.7893 -1.02	-56.5130* (-1.72)
Expense ratio*Post*DC intensity	-0.6096*** (-2.92)	-5.8764** (-2.21)
Return 1-year*Post*DC intensity	-0.1441 (-0.10)	-49.2055* (-1.67)
Return 5-year*Post*DC intensity	7.0984** -2.3	47.4008 -1.11
Return 10-year*Post*DC intensity	1.8906 -0.62	13.5998 -0.36

Conclusions

- 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 account sizes and for plans that are unionized.