Defined Contribution Pension Plans: Sticky or Discerning Money?

Clemens Sialm
University of Texas at Austin and NBER

Laura Starks
University of Texas at Austin

Hanjiang Zhang
Nanyang Technological University, Singapore

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Motivation

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.

DC pension plans (e.g., 401(k) and 403(b)) have become an important source of retirement funding for many households.

Mutual Funds and DC Plans

- Mutual funds are the main investment vehicle in tax-qualified DC plans.
- However, the same mutual funds can also be held directly in traditional taxable accounts.
- These mixed clienteles have different investment horizons, different tax statuses, and different distribution channels.

Our paper analyzes the properties of money flows into mutual funds from DC investors and other investors.

Mutual Fund Choice

- Directly Held Accounts
  - Investors generally have the flexibility to choose among the universe of mutual funds.
- DC Plan Accounts
  - Plan sponsors (i.e., employers) offer a limited number of mutual fund investment options and adjust these menus by removing or adding options.
  - Plan participants (i.e., employees) allocate DC balances among the available investment options.

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Mutual Funds and DC Plans

- Conventional wisdom suggests that the DC plan assets are sticky and not very discerning.
- The decisions regarding the composition of DC plan menus are made by plan sponsors (i.e., employers) and by plan participants (i.e., employees).
- Sponsors and participants might differ in their allocation decisions.

Our paper analyzes whether the investment decisions of plan sponsors and participants result in sticky or discerning money flows.

Importance of Fund Flows

- Fund flows can affect asset prices and influence which fund managers, sectors, and companies obtain financial resources.
- Performance-based compensation in the mutual fund industry occurs primarily through fund flows.
- Fund flows exert externalities on the remaining fund investors:
  - Fund flows can require fund managers to adjust their portfolio and incur trading costs.
  - Fund flows can affect the investment strategy of mutual fund managers.
  - Fund flows can affect the tax burden of fund investors.

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Research Questions

- Is DC money sticky?
  - Sensitivity of fund flows to prior performance
  - Decomposition of flows by sponsors and participants
- Is DC money discerning?
  - Predictability of fund returns by fund flows

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Main Results

- Is DC money sticky?
  - DC fund flows have a more sensitive flow-performance sensitivity than non-DC flows.
  - Most of the sensitivity of DC money is driven by plan sponsors and not by plan participants.
- Is DC pension plan money discerning?
  - DC fund flows do not have significant predictability for future performance, whereas non-DC flows predict future performance negatively.

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Contribution to the Literature

DC Savings:

- Benartzi and Thaler (2001); Madrian and Shea (2001); Agnew, Balduzzi, and Sunden (2003); Duflo and Saez (2003); Huberman and Jiang (2006); Elton, Gruber, Blake (2007); Carroll, Choi, Laibson, Madrian, and Metrick (2009); Sialm and Starks (2012); Pool, Sialm, and Stefanescu (2013).

Fund Flows:

- Brown, Harlow, and Starks (1996); Chevalier and Ellison (1997); Sirri and Tufano (1998); Del Guercio and Tkac (2002); Berk and Green (2004); Huang, Wei, and Yan (2007); Ivkovich and Weisbenner (2009); Kim (2010).

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Data

- Assets held in DC plans:
  - Annual surveys of *Pensions & Investments* of large mutual fund families between 1997-2010.
- Mutual fund size, characteristics, and performance:
  - CRSP survivor-bias free mutual fund database.
- Plan flows into mutual funds:
  - Hand-collected data from Form 11-K filed with the SEC on the allocation of plan assets from Pool, Sialm, and Stefanescu (2013).

Sample Description

- We focus our sample on domestic equity funds from fund families that participate in the surveys.
- Families in the sample control about 77% of total mutual fund assets.
- Our sample covers 1,078 distinct equity funds and 5,808 fund-year observations over the period between 1997 and 2010.

DC and Non-DC Fund Flows

Which fund flows are more sticky and more sensitive to prior performance?

- Retail mutual fund investors may be subject to behavioral biases and may chase prior fund performance.

  Brown, Harlow, and Starks (1996); Chevalier and Ellison (1997); Sirri and Tufano (1998)

- Participants in DC pension plans may be inert and reluctant to adjust portfolio allocations.

  Benartzi and Thaler (2001); Madrian and Shea (2001); Choi, Laibson, Madrian, and Metrick (2002, 2004); Huberman and Jiang (2006)

- Sponsors in DC pension plans may actively monitor investment options.

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Fund Flow Definitions

- DC Flows:

$$DCFlow_{f,t} = \frac{DCAssets_{f,t} - DCAssets_{f,t-1}(1 + R_{f,t})}{DCAssets_{f,t-1}(1 + R_{f,t})}$$

- Non-DC Flows:

$$NonDCFlow_{f,t} = \frac{NonDCAssets_{f,t} - NonDCAssets_{f,t-1}(1 + R_{f,t})}{NonDCAssets_{f,t-1}(1 + R_{f,t})}$$

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Flow Performance Sensitivity

We estimate the following model:

$$\begin{aligned} Flow_{f,t} &= \beta_t + \beta_1 LowPerf_{f,t-1} + \beta_2 MidPerf_{f,t-1} + \beta_3 HighPerf_{f,t-1} \\ &+ \beta_4 DCSize_{f,t-1} + \beta_5 NonDCSize_{f,t-1} + \beta_6 FamSize_{f,t-1} \\ &+ \beta_7 Age_{f,t-1} + \beta_8 Exp_{f,t-1} + \beta_9 Vol_{f,t-1} \\ &+ \beta_{10} Turn_{f,t-1} + \beta_{11} Vol_{f,t-1} + \beta_{12} StyleFlow_{f,t} + \epsilon_{f,t} \end{aligned}$$

- Performance percentiles $Perf_{f,t}$ are calculated based on various performance measures of all mutual funds in the CRSP database over the prior 1 or 5 years.
- To adjust for non-linearities we use a piecewise linear performance specification following Sirri and Tufano (1997):
  $LowPerf_{f,t} = min(Perf_{p,f,t}, 0.2)$,
  $MidPerf_{f,t} = min(Perf_{p,f,t} - LowPerf_{f,t}, 0.6)$,
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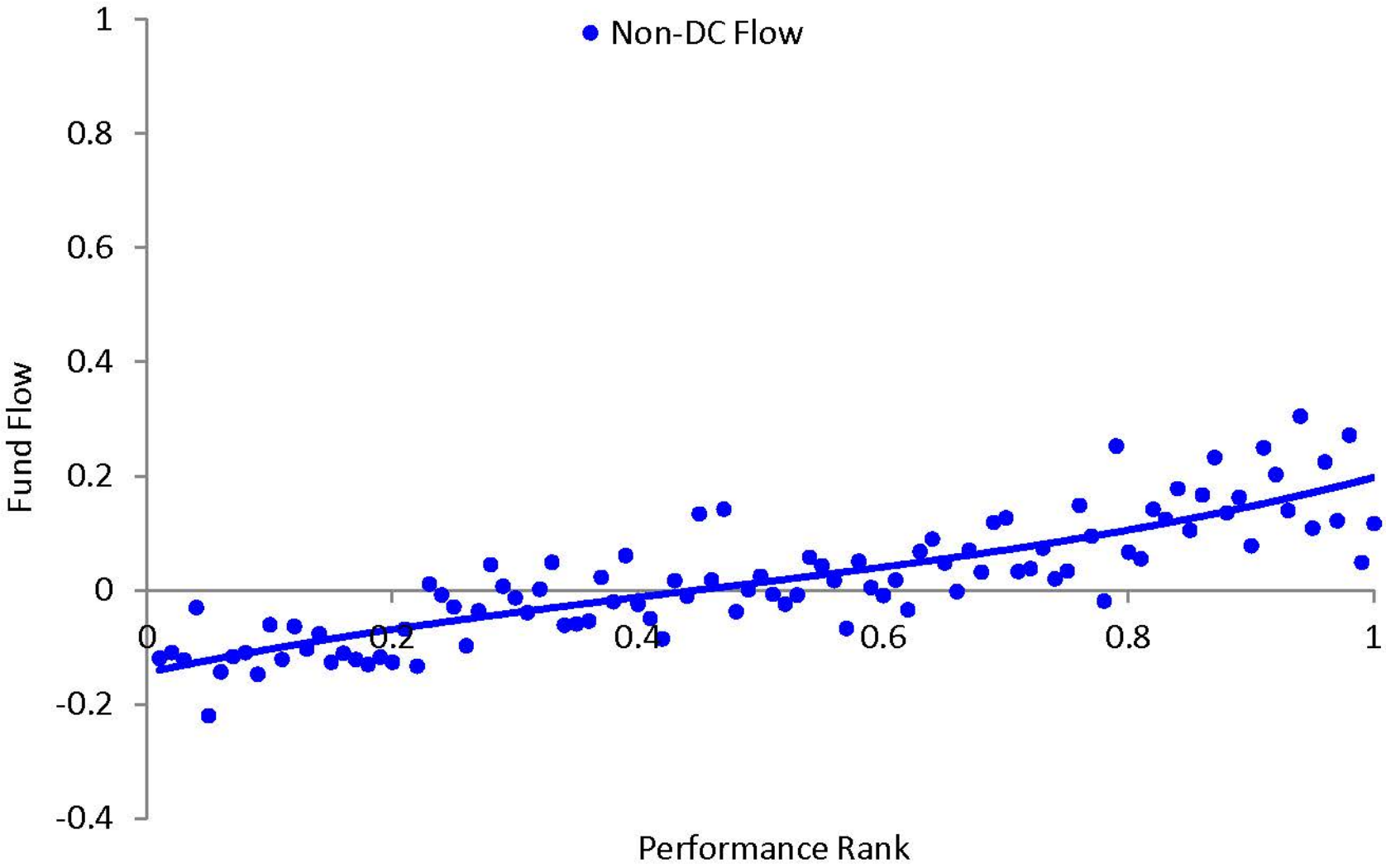
Flow-Performance Relation



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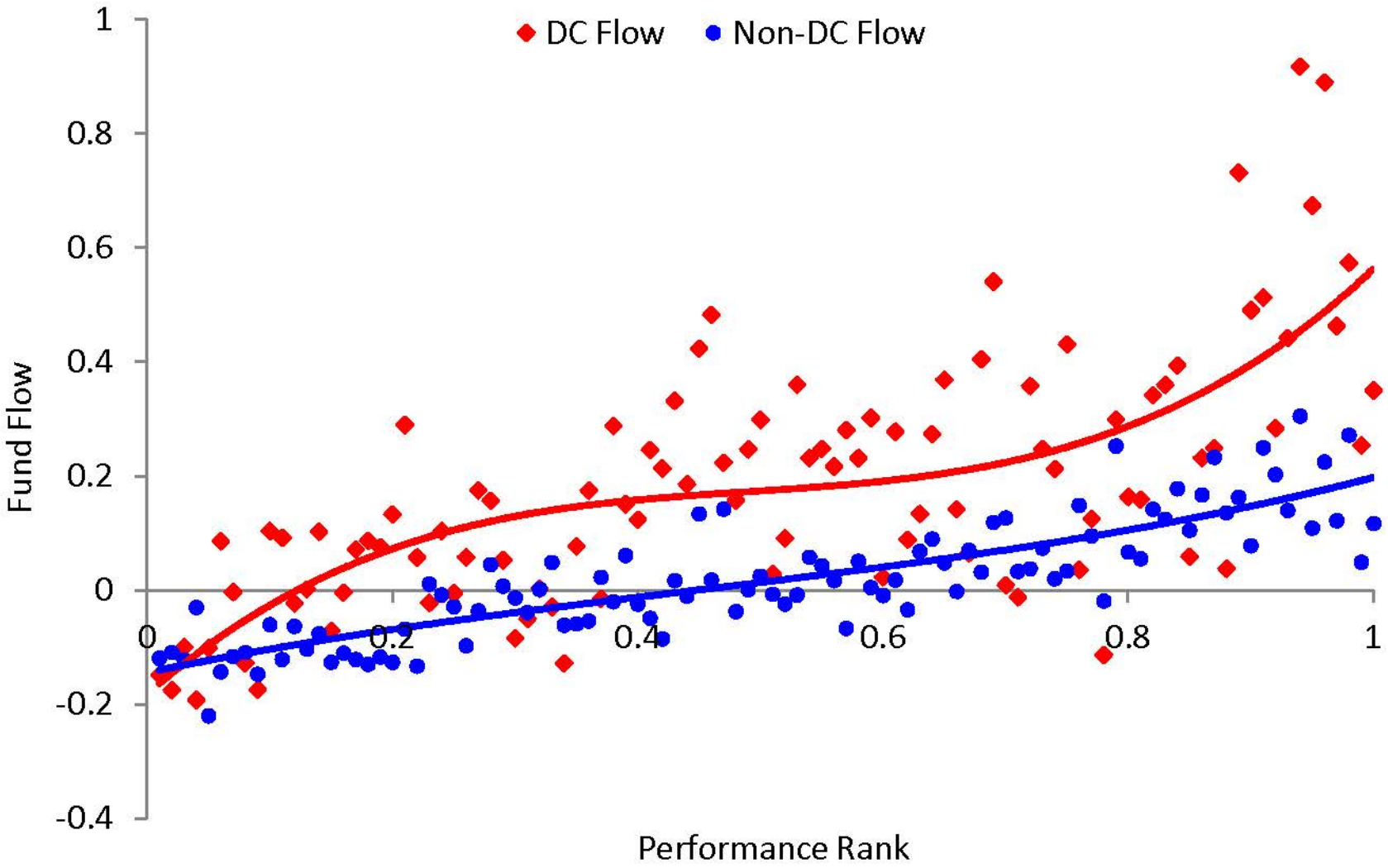

Flow-Performance Sensitivity (Raw Perf; 1-Year)

	DC Flow	Non-DC Flow	Difference
Low Perf	1.194***	0.328**	0.866**
	(0.377)	(0.142)	(0.374)
Mid Perf	0.236***	0.284***	−0.049
	(0.086)	(0.037)	(0.090)
High Perf	1.776***	0.487***	1.289***
	(0.497)	(0.180)	(0.476)
Log DC Size	−0.136***	0.007	−0.143***
	(0.017)	(0.006)	(0.016)
Log Non-DC Size	0.041**	−0.070***	0.111***
	(0.016)	(0.009)	(0.018)
Log Family Size	0.039***	0.039***	0.000
	(0.014)	(0.007)	(0.013)
Log Age	−0.037	0.003	−0.040*
	(0.024)	(0.010)	(0.022)
Expense Ratio	−0.471	−0.223	−0.248
	(0.551)	(0.219)	(0.511)
Turnover	−0.026	−0.018**	−0.007
	(0.019)	(0.008)	(0.016)
Volatility	1.026	0.009	1.017
	(0.870)	(0.317)	(0.857)
Style Flow	0.359	0.282**	0.077
	(0.324)	(0.132)	(0.295)
Observations	3,851	3,851	3,851
R-squared	0.098	0.124	0.064

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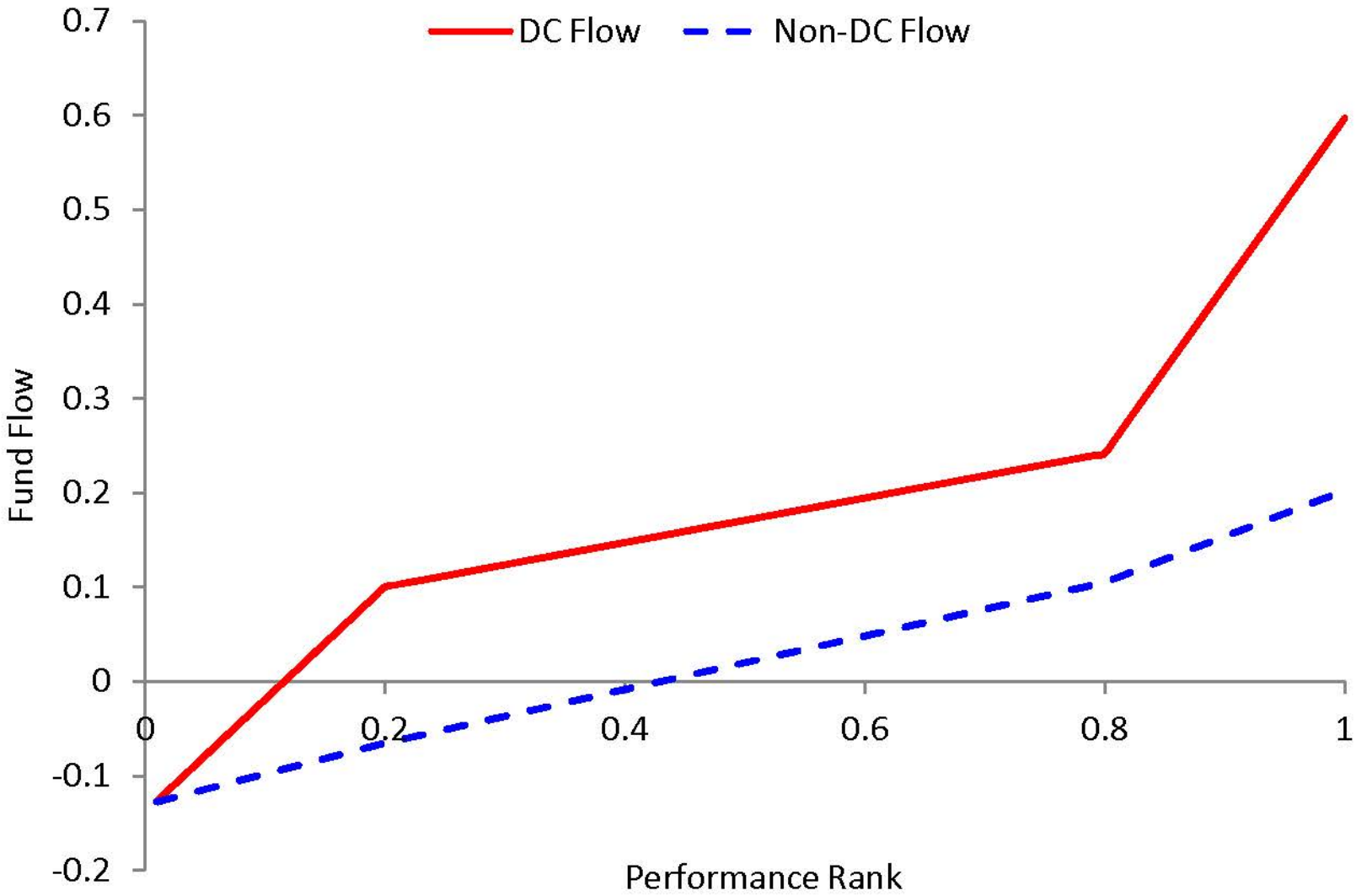

Robustness Tests

The results remain robust using alternative samples or specifications:

- Different Performance Horizons ▸ 5-Year Perf
- Different Performance Measures ▸ Obj-Adj ▸ Style-Adj ▸ Carhart
- Different Performance Functional Forms ▸ Linear ▸ Cubic
- Different Subsample Periods ▸ Subsamples
- Inclusion of Size and Age Interactions ▸ Size ▸ Age
- Analysis of Flow Volatilities and Correlations ▸ Moments

Sample Selection: Entry and Exit Decision

- The survey asks mutual fund families to list the 12 funds with the largest DC assets for each investment category. Thus, DC assets are missing for funds with relatively small DC assets within a family.
- To investigate the impact of this selection problem, we run a multinomial logit regression that compares funds that remain in the sample with funds that exit or enter the sample.

Multinomial Logit for Sample Entry and Exit Decisions

	Exit	Entry
Perf	-0.958^{***}	0.485^{**}
	(0.221)	(0.203)
Log Size	-0.644^{***}	-0.653^{***}
	(0.060)	(0.063)
Log Family Size	0.594^{***}	0.549^{***}
	(0.058)	(0.057)
Log Age	0.071	-0.202^{**}
	(0.107)	(0.099)
Expenses	3.193^{*}	0.953
	(1.828)	(1.607)
Turnover	0.065	-0.020
	(0.058)	(0.055)
Volatility	2.368	1.184
	(2.734)	(2.906)
Style Flow	-3.161^{**}	-1.050
	(1.289)	(1.169)
Observations	5,006	

Decomposition into Sponsor and Participant Flows

Are the flow-performance results driven by plan sponsors or participants?

- Sponsors of 401(k) plans that have employer stock as an investment option need to annually file Form 11-K with the SEC (Pool, Sialm, and Stefanescu, 2013).
- We decompose the DC fund flows into:
  - Flows driven by the addition and the deletion decisions taken by the plan sponsors (i.e., employers).
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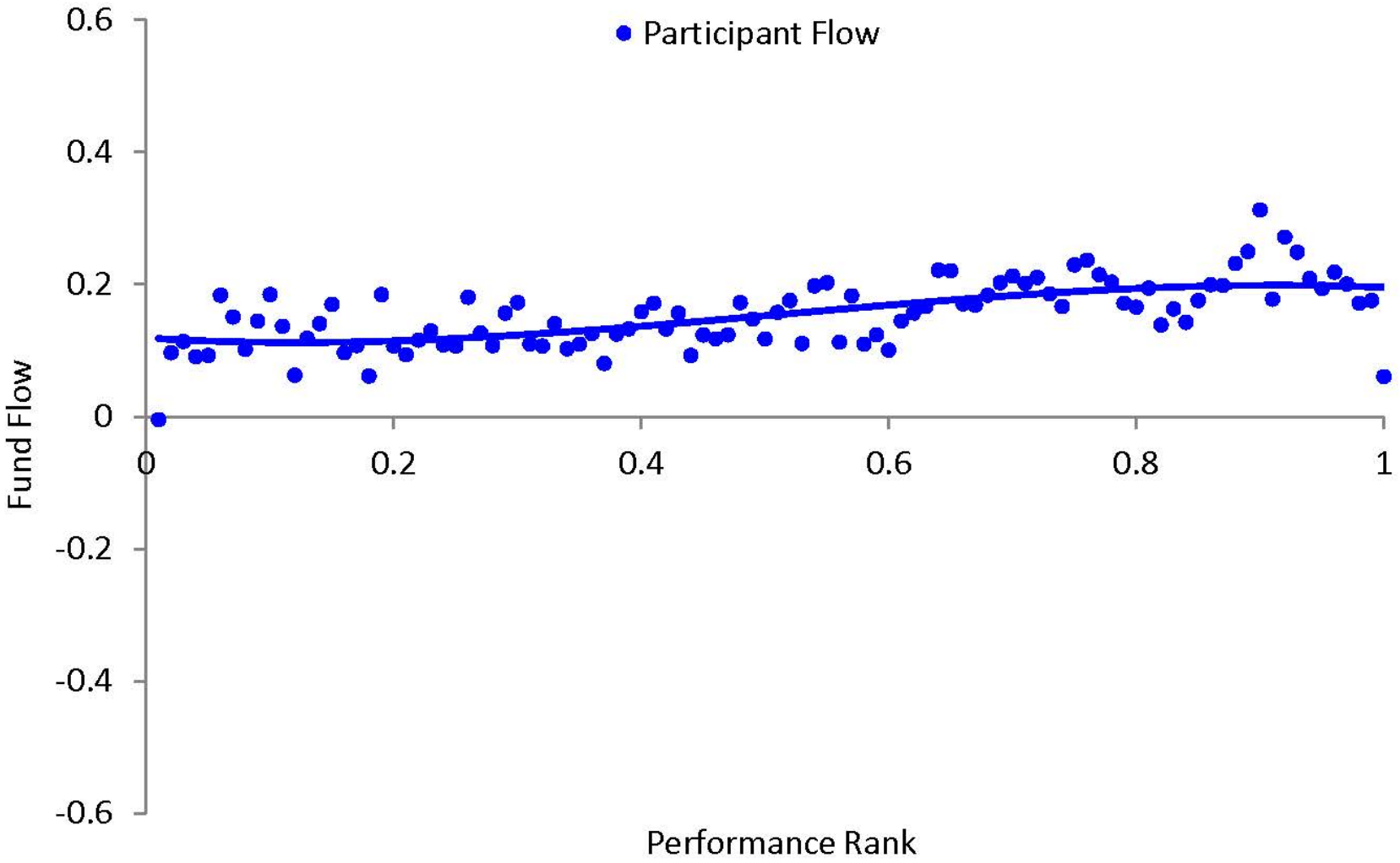

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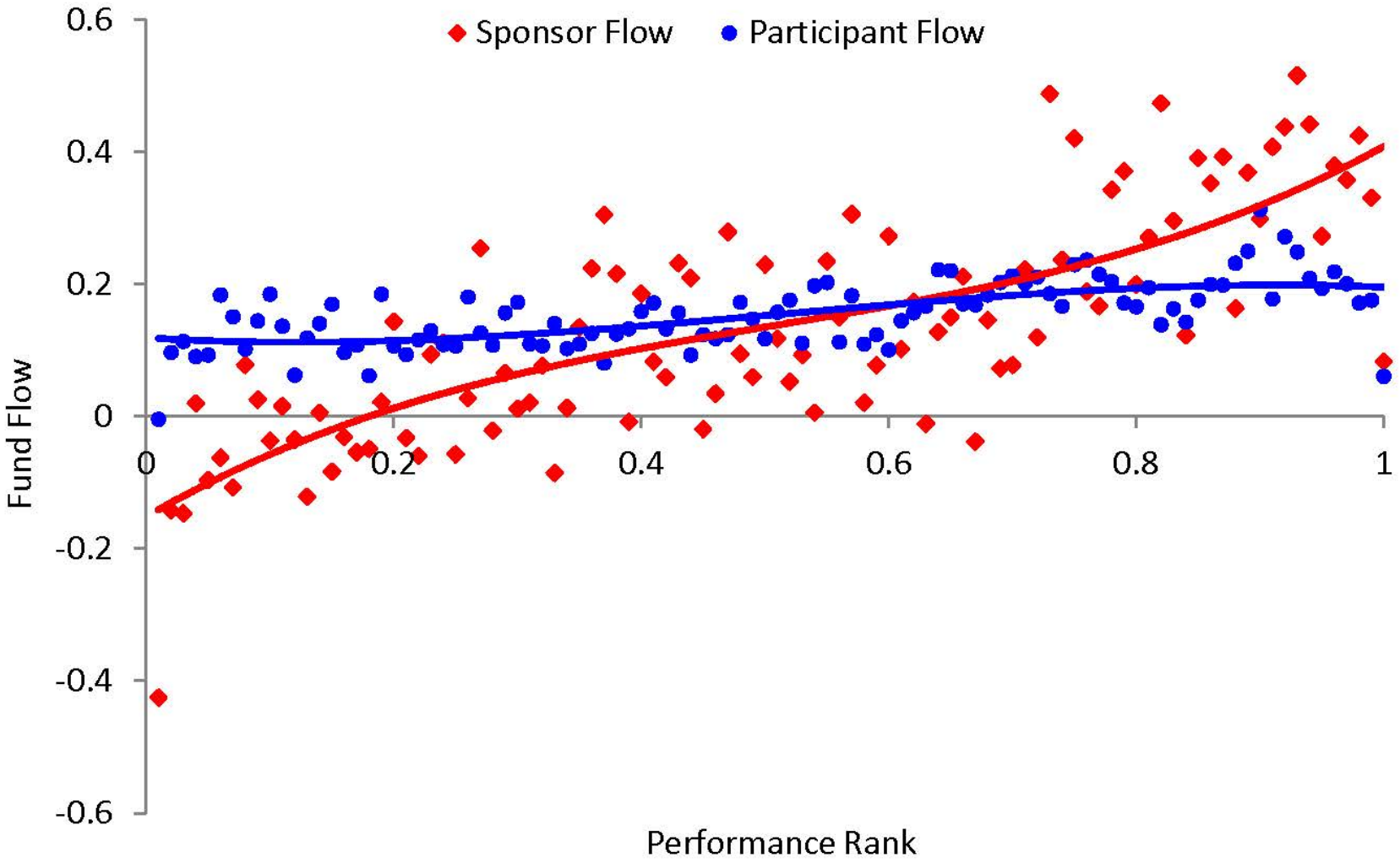

Flow-Performance Sensitivity (11-K Sample)

	Total Flow
Low Perf	0.773***
	(0.299)
Mid Perf	0.516***
	(0.068)
High Perf	0.744**
	(0.324)
Log Plan Size	−0.092***
	(0.006)
Log Fund Size	0.048***
	(0.012)
Log Family Size	0.016**
	(0.007)
Log Age	−0.076***
	(0.023)
Expense Ratio	−0.741*
	(0.420)
Turnover	−0.030*
	(0.018)
Volatility	0.536
	(0.746)
Style Flow	0.873***
	(0.280)
Observations	8,268
R-squared	0.083

Flow-Performance Sensitivity (11-K Sample)

	Total Flow	Sponsor Flow
Low Perf	0.773***	0.786***
	(0.299)	(0.274)
Mid Perf	0.516***	0.380***
	(0.068)	(0.062)
High Perf	0.744**	0.718**
	(0.324)	(0.291)
Log Plan Size	−0.092***	−0.065***
	(0.006)	(0.005)
Log Fund Size	0.048***	0.048***
	(0.012)	(0.011)
Log Family Size	0.016**	0.010*
	(0.007)	(0.006)
Log Age	−0.076***	−0.053***
	(0.023)	(0.021)
Expense Ratio	−0.741*	−0.531
	(0.420)	(0.353)
Turnover	−0.030*	−0.011
	(0.018)	(0.018)
Volatility	0.536	−0.037
	(0.746)	(0.647)
Style Flow	0.873***	0.685***
	(0.280)	(0.254)
Observations	8,268	8,268
R-squared	0.083	0.054

Flow-Performance Sensitivity (11-K Sample)

	Total Flow	Sponsor Flow	Participant Flow
Low Perf	0.773***	0.786***	−0.013
	(0.299)	(0.274)	(0.100)
Mid Perf	0.516***	0.380***	0.135***
	(0.068)	(0.062)	(0.021)
High Perf	0.744**	0.718**	0.026
	(0.324)	(0.291)	(0.101)
Log Plan Size	−0.092***	−0.065***	−0.027***
	(0.006)	(0.005)	(0.002)
Log Fund Size	0.048***	0.048***	−0.001
	(0.012)	(0.011)	(0.004)
Log Family Size	0.016**	0.010*	0.006**
	(0.007)	(0.006)	(0.003)
Log Age	−0.076***	−0.053***	−0.023***
	(0.023)	(0.021)	(0.007)
Expense Ratio	−0.741*	−0.531	−0.210
	(0.420)	(0.353)	(0.142)
Turnover	−0.030*	−0.011	−0.020***
	(0.018)	(0.018)	(0.005)
Volatility	0.536	−0.037	0.573**
	(0.746)	(0.647)	(0.254)
Style Flow	0.873***	0.685***	0.188**
	(0.280)	(0.254)	(0.082)
Observations	8,268	8,268	8,268
R-squared	0.083	0.054	0.079

Flow-Performance Sensitivity (Pensions & Investments)

	Total Flow	Sponsor Flow	Participant Flow
Low Perf	1.046***	1.050***	−0.004
	(0.399)	(0.376)	(0.111)
Mid Perf	0.465***	0.310***	0.156***
	(0.091)	(0.083)	(0.024)
High Perf	1.584***	1.389***	0.194
	(0.482)	(0.427)	(0.136)
Log Plan Size	−0.089***	−0.063***	−0.026***
	(0.010)	(0.009)	(0.003)
Log Fund Size	0.047**	0.036*	0.011*
	(0.021)	(0.019)	(0.006)
Log Family Size	0.006	0.005	0.002
	(0.017)	(0.015)	(0.005)
Log Age	−0.056*	−0.040	−0.016*
	(0.033)	(0.029)	(0.009)
Expense Ratio	−1.473***	−1.136**	−0.336**
	(0.528)	(0.478)	(0.165)
Turnover	0.032	0.038	−0.006
	(0.025)	(0.025)	(0.007)
Volatility	1.061	0.277	0.783**
	(1.056)	(0.919)	(0.354)
Style Flow	0.811**	0.461	0.350***
	(0.341)	(0.303)	(0.087)
Observations	2,815	2,815	2,815
R-squared	0.120	0.081	0.115

Performance Predictability

Do fund flows predict fund performance?

- Berk and Green (2004) derive in a rational model that flows should not predict future abnormal performance.
- The empirical evidence suggests that flows are smart in the short term (Gruber (1996) and Zheng (1999)) but dumb at longer horizons (Frazzini and Lamont (2008)).

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Performance Predictability

To investigate whether DC and Non-DC flows have differential predictability of fund returns, we run the following regression:

$$\begin{aligned} Perf_{f,t} &= \beta_t + \beta_1 DCFlow_{f,t-1} + \beta_2 NonDCFlow_{f,t-1} + \beta_3 Perf_{f,t-1} \\ &+ \beta_4 Size_{f,t-1} + \beta_5 FamSize_{f,t-1} + \beta_6 Age_{f,t-1} + \beta_7 Exp_{f,t-1} \\ &+ \beta_8 Turn_{f,t-1} + \beta_9 DCRatio_{f,t-1} + \epsilon_{f,t} \end{aligned}$$

- We use various performance measures (raw returns, objective-code adjusted performance, style-adjusted performance, CAPM alpha, Fama-French alpha, Carhart alpha).
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Performance Predictability

	Performance Measures					
	Raw Return	Obj-Adj Ret	Style-Adj Ret	CAPM Alpha	FF Alpha	Carhart Alpha
DC Flow	−0.262	−0.260	−0.091	−0.176	0.114	−0.011
	(0.163)	(0.160)	(0.133)	(0.144)	(0.128)	(0.121)
Non-DC Flow	−1.567***	−1.102**	−0.815**	−1.261***	−0.657**	−0.948***
	(0.455)	(0.436)	(0.351)	(0.405)	(0.286)	(0.276)
Past Year Return	0.089***	0.089***	0.021	0.132***	0.189***	0.162***
	(0.021)	(0.022)	(0.023)	(0.019)	(0.019)	(0.018)
Log Size	−1.006***	−0.877***	−0.550***	−0.967***	−0.257**	−0.352***
	(0.183)	(0.179)	(0.145)	(0.169)	(0.118)	(0.115)
Log Family Size	0.642***	0.553***	0.414***	0.598***	0.257**	0.280***
	(0.168)	(0.162)	(0.134)	(0.153)	(0.106)	(0.103)
Log Age	−0.143	−0.038	0.109	−0.094	0.193	0.114
	(0.295)	(0.292)	(0.228)	(0.261)	(0.196)	(0.184)
Expense Ratio	0.089	−0.213	−0.969***	−0.352	−0.788***	−0.613**
	(0.408)	(0.405)	(0.327)	(0.388)	(0.253)	(0.247)
Turnover	−0.444*	−0.604***	−0.615***	−0.379*	−0.568***	−0.531***
	(0.231)	(0.231)	(0.205)	(0.205)	(0.162)	(0.145)
DC Ratio	0.848	0.427	0.118	0.014	−0.275	−0.097
	(0.818)	(0.786)	(0.633)	(0.777)	(0.516)	(0.517)
Observations	4,116	4,075	3,999	4,009	4,009	4,009
R-squared	0.025	0.021	0.010	0.039	0.080	0.068

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Conclusions

Our paper documents important differences across DC and non-DC flows:

- Is DC money sticky?
  - DC fund flows have a more sensitive flow-performance relation than non-DC flows.
  - Most of the sensitivity of DC money is driven by plan sponsors and not by plan participants.
- Is DC pension plan money discerning?
  - DC fund flows do not have significant predictability for future performance, whereas non-DC flows predict future performance negatively.

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Flow-Performance Relation (Raw Perf; 5-Years)

	DC Flow	Non-DC Flow	Difference
Low Perf	0.845**	0.096	0.749**
	(0.334)	(0.166)	(0.330)
Mid Perf	0.421***	0.281***	0.140*
	(0.082)	(0.036)	(0.083)
High Perf	0.619*	0.102	0.517
	(0.329)	(0.154)	(0.334)
Log DC Size	−0.125***	0.006	−0.132***
	(0.018)	(0.006)	(0.016)
Log Non-DC Size	0.020	−0.069***	0.089***
	(0.014)	(0.010)	(0.016)
Log Family Size	0.042***	0.032***	0.010
	(0.014)	(0.007)	(0.013)
Log Age	−0.005	0.020*	−0.025
	(0.024)	(0.011)	(0.024)
Expense Ratio	−0.152	−0.380*	0.229
	(0.509)	(0.227)	(0.481)
Turnover	−0.042**	−0.019*	−0.023
	(0.018)	(0.011)	(0.018)
Volatility	0.499	−0.567	1.066
	(0.963)	(0.477)	(0.951)
Style Flow	0.051	0.248*	−0.197
	(0.319)	(0.138)	(0.300)
Observations	3,249	3,249	3,249
R-squared	0.081	0.089	0.054

Back

Flow-Performance Relation (Obj-Adj Perf; 1-Year)

	DC Flow	Non-DC Flow	Difference
Low Perf	1.040***	0.379**	0.661*
	(0.389)	(0.150)	(0.394)
Mid Perf	0.237***	0.273***	−0.036
	(0.090)	(0.036)	(0.095)
High Perf	1.736***	0.504***	1.232***
	(0.473)	(0.181)	(0.455)
Log DC Size	−0.136***	0.006	−0.142***
	(0.017)	(0.006)	(0.016)
Log Non-DC Size	0.041**	−0.070***	0.111***
	(0.017)	(0.009)	(0.018)
Log Family Size	0.039***	0.039***	0.000
	(0.014)	(0.007)	(0.013)
Log Age	−0.037	0.004	−0.041*
	(0.024)	(0.010)	(0.023)
Expense Ratio	−0.401	−0.191	−0.210
	(0.547)	(0.218)	(0.506)
Turnover	−0.024	−0.018**	−0.006
	(0.019)	(0.008)	(0.016)
Volatility	−0.099	−0.506	0.408
	(1.304)	(0.468)	(1.284)
Style Flow	0.499	0.389***	0.111
	(0.322)	(0.132)	(0.293)
Observations	3,851	3,851	3,851
R-squared	0.097	0.125	0.063

Back

Flow-Performance Relation (Style-Adj Perf; 1-Year)

	DC Flow	Non-DC Flow	Difference
Low Perf	1.219***	0.088	1.130**
	(0.420)	(0.161)	(0.448)
Mid Perf	0.189*	0.275***	−0.086
	(0.097)	(0.035)	(0.100)
High Perf	1.390***	0.415**	0.975**
	(0.470)	(0.180)	(0.475)
Log DC Size	−0.144***	0.004	−0.148***
	(0.018)	(0.006)	(0.017)
Log Non-DC Size	0.037**	−0.074***	0.111***
	(0.018)	(0.009)	(0.019)
Log Family Size	0.045***	0.044***	0.002
	(0.015)	(0.007)	(0.013)
Log Age	−0.047*	−0.006	−0.041*
	(0.024)	(0.010)	(0.022)
Expense Ratio	−0.416	−0.171	−0.245
	(0.556)	(0.221)	(0.513)
Turnover	−0.030	−0.022***	−0.008
	(0.019)	(0.008)	(0.017)
Volatility	0.096	−0.857*	0.953
	(1.914)	(0.506)	(1.881)
Style Flow	0.788***	0.661***	0.127
	(0.229)	(0.089)	(0.214)
Observations	3,780	3,780	3,780
R-squared	0.098	0.128	0.064

Back

Flow-Performance Relation (Carhart-Adj Perf; 1-Year)

	DC Flow	Non-DC Flow	Difference
Low Perf	0.927**	0.073	0.854**
	(0.406)	(0.168)	(0.426)
Mid Perf	0.138	0.281***	−0.143
	(0.100)	(0.037)	(0.106)
High Perf	1.625***	0.290	1.336***
	(0.504)	(0.188)	(0.474)
Log DC Size	−0.130***	0.011*	−0.142***
	(0.018)	(0.006)	(0.017)
Log Non-DC Size	0.030*	−0.073***	0.103***
	(0.017)	(0.009)	(0.019)
Log Family Size	0.040***	0.037***	0.003
	(0.015)	(0.007)	(0.014)
Log Age	−0.036	−0.001	−0.035
	(0.027)	(0.010)	(0.026)
Expense Ratio	−0.108	0.076	−0.185
	(0.579)	(0.226)	(0.536)
Turnover	−0.029	−0.016*	−0.014
	(0.020)	(0.008)	(0.018)
Volatility	−0.017*	−0.016***	−0.001
	(0.008)	(0.003)	(0.008)
Style Flow	0.439	0.332**	0.107
	(0.331)	(0.131)	(0.301)
Observations	3,408	3,408	3,408
R-squared	0.089	0.110	0.063

Back

Linear Flow-Performance Relation (Raw Perf; 1-Year)

	DC Flow	Non-DC Flow	Difference
Perf	0.494***	0.311***	0.183***
	(0.059)	(0.023)	(0.058)
Log DC Size	−0.137***	0.007	−0.144***
	(0.017)	(0.006)	(0.016)
Log Non-DC Size	0.041**	−0.070***	0.111***
	(0.017)	(0.009)	(0.018)
Log Family Size	0.040***	0.039***	0.001
	(0.014)	(0.007)	(0.013)
Log Age	−0.041*	0.002	−0.043*
	(0.024)	(0.010)	(0.022)
Expense Ratio	−0.387	−0.202	−0.185
	(0.543)	(0.216)	(0.499)
Turnover	−0.026	−0.018**	−0.008
	(0.019)	(0.008)	(0.016)
Volatility	1.067	0.052	1.015
	(0.815)	(0.314)	(0.813)
Style Flow	0.362	0.283**	0.079
	(0.326)	(0.132)	(0.297)
Constant	0.346***	0.098*	0.248**
	(0.130)	(0.058)	(0.122)
Observations	3,851	3,851	3,851
R-squared	0.095	0.124	0.061

Back

Cubic Flow-Performance Relation (Raw Perf; 1-Year)

	DC Flow	Non-DC Flow	Difference
$(Perf - 0.5)$	0.131	0.260^{***}	-0.129
	(0.126)	(0.053)	(0.129)
$(Perf - 0.5)^2$	0.064	0.057	0.007
	(0.243)	(0.084)	(0.235)
$(Perf - 0.5)^3$	2.454^{***}	0.335	2.118^{**}
	(0.855)	(0.331)	(0.849)
Log DC Size	-0.136^{***}	0.007	-0.143^{***}
	(0.017)	(0.006)	(0.016)
Log Non-DC Size	0.041^{**}	-0.070^{***}	0.111^{***}
	(0.016)	(0.009)	(0.018)
Log Family Size	0.040^{***}	0.039^{***}	0.001
	(0.014)	(0.007)	(0.013)
Log Age	-0.038	0.003	-0.041^{*}
	(0.024)	(0.010)	(0.022)
Expense Ratio	-0.411	-0.222	-0.189
	(0.556)	(0.220)	(0.515)
Turnover	-0.026	-0.018^{**}	-0.008
	(0.019)	(0.008)	(0.016)
Volatility	1.174	0.023	1.151
	(0.871)	(0.317)	(0.863)
Style Flow	0.362	0.282^{**}	0.080
	(0.324)	(0.132)	(0.295)
Observations	3,851	3,851	3,851
R-squared	0.097	0.124	0.063

Back

Flow-Performance Relation (Raw Perf; 1-Year)

	1996-2002			2003-2009		
	DC Flow	Non-DC Flow	Difference	DC Flow	Non-DC Flow	Difference
Low Perf	0.660	0.318	0.343	1.546***	0.410**	1.136**
	(0.630)	(0.223)	(0.649)	(0.473)	(0.196)	(0.462)
Mid Perf	0.416***	0.333***	0.083	0.120	0.259***	−0.140
	(0.141)	(0.051)	(0.148)	(0.111)	(0.053)	(0.113)
High Perf	2.484***	1.234***	1.250*	1.296**	−0.031	1.327**
	(0.733)	(0.297)	(0.717)	(0.650)	(0.208)	(0.625)
Log DC Size	−0.163***	0.008	−0.171***	−0.114***	0.010	−0.123***
	(0.028)	(0.008)	(0.028)	(0.017)	(0.008)	(0.016)
Log Non-DC Size	0.046	−0.077***	0.122***	0.036**	−0.066***	0.103***
	(0.029)	(0.013)	(0.032)	(0.015)	(0.011)	(0.017)
Log Family Size	0.039*	0.049***	−0.010	0.034**	0.028***	0.006
	(0.023)	(0.010)	(0.022)	(0.015)	(0.008)	(0.014)
Log Age	0.015	−0.001	0.016	−0.078**	0.012	−0.090***
	(0.034)	(0.013)	(0.034)	(0.032)	(0.015)	(0.031)
Expense Ratio	0.362	0.125	0.238	−0.435	−0.208	−0.227
	(0.815)	(0.331)	(0.772)	(0.673)	(0.284)	(0.619)
Turnover	0.000	−0.016*	0.017	−0.065***	−0.023*	−0.042*
	(0.027)	(0.009)	(0.024)	(0.023)	(0.013)	(0.025)
Volatility	1.423	0.540	0.883	−1.865	−1.845**	−0.020
	(1.104)	(0.354)	(1.110)	(1.803)	(0.726)	(1.756)
Style Flow	−0.118	0.061	−0.179	0.400	0.417**	−0.017
	(0.596)	(0.186)	(0.612)	(0.375)	(0.171)	(0.345)
Observations	1,759	1,759	1,759	2,092	2,092	2,092
R-squared	0.128	0.203	0.079	0.087	0.092	0.058

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Flow-Performance Relation with Size Interactions (Raw Perf; 1-Year)

	DC Flow	Non-DC Flow	Difference
Low Perf	0.970***	0.252*	0.718*
	(0.370)	(0.151)	(0.372)
Mid Perf	0.258***	0.294***	−0.036
	(0.089)	(0.038)	(0.092)
High Perf	1.492***	0.365**	1.128***
	(0.418)	(0.159)	(0.414)
Low Perf x Log DC Size	−0.317	−0.154*	−0.163
	(0.218)	(0.091)	(0.223)
Mid Perf x Log DC Size	−0.065	−0.002	−0.063
	(0.083)	(0.034)	(0.081)
High Perf x Log DC Size	−0.271	0.071	−0.342
	(0.389)	(0.138)	(0.379)
Low Perf x Log Non-DC Size	0.162	0.251	−0.089
	(0.307)	(0.165)	(0.313)
Mid Perf x Log Non-DC Size	0.033	−0.034	0.067
	(0.074)	(0.047)	(0.085)
High Perf x Log Non-DC Size	0.149	−0.311	0.460
	(0.451)	(0.221)	(0.481)
(...)			
Observations	3,851	3,851	3,851
R-squared	0.103	0.130	0.067

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Flow-Performance Relation with Age Interactions (Raw Perf; 1-Year)

	DC Flow	Non-DC Flow	Difference
Low Perf	1.147***	0.287**	0.860**
	(0.381)	(0.141)	(0.379)
Mid Perf	0.252***	0.302***	−0.050
	(0.092)	(0.039)	(0.095)
High Perf	1.639***	0.373**	1.266***
	(0.489)	(0.171)	(0.476)
Low Perf x Log Age	−0.023	−0.034	0.011
	(0.445)	(0.146)	(0.458)
Mid Perf x Log Age	−0.055	−0.078*	0.023
	(0.135)	(0.046)	(0.141)
High Perf x Log Age	−0.702	−0.446	−0.256
	(0.686)	(0.279)	(0.641)
(...)			
Observations	3,851	3,851	3,851
R-squared	0.100	0.129	0.064

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Fund Flow Variability and Autocorrelation

	Standard Deviation of Flows		Autocorrelation of Flows	
Constant	0.332***	0.549***	0.093***	0.080***
	(0.012)	(0.023)	(0.023)	(0.029)
DC Indicator	0.522***	0.212***	−0.138***	−0.127***
	(0.033)	(0.031)	(0.026)	(0.034)
Log Size		−0.163***		0.005
		(0.014)		(0.011)
Log Family Size		0.035***		0.027*
		(0.012)		(0.014)
Log Age		0.033		−0.026
		(0.026)		(0.022)
Expense Ratio		1.071**		−0.471
		(0.460)		(0.501)
Turnover		−0.006		0.029***
		(0.014)		(0.011)
Observations	1,032	987	1,032	987
R-Squared	0.162	0.390	0.018	0.030

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