Mutual Fund

Prepared for Empirical Asset Pricing Class at SAIF

Claire Yurong Hong

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Outline

- Mutual Fund Market
- Literature by Market
  - Open-end Mutual Funds
    - Equity Mutual Funds:
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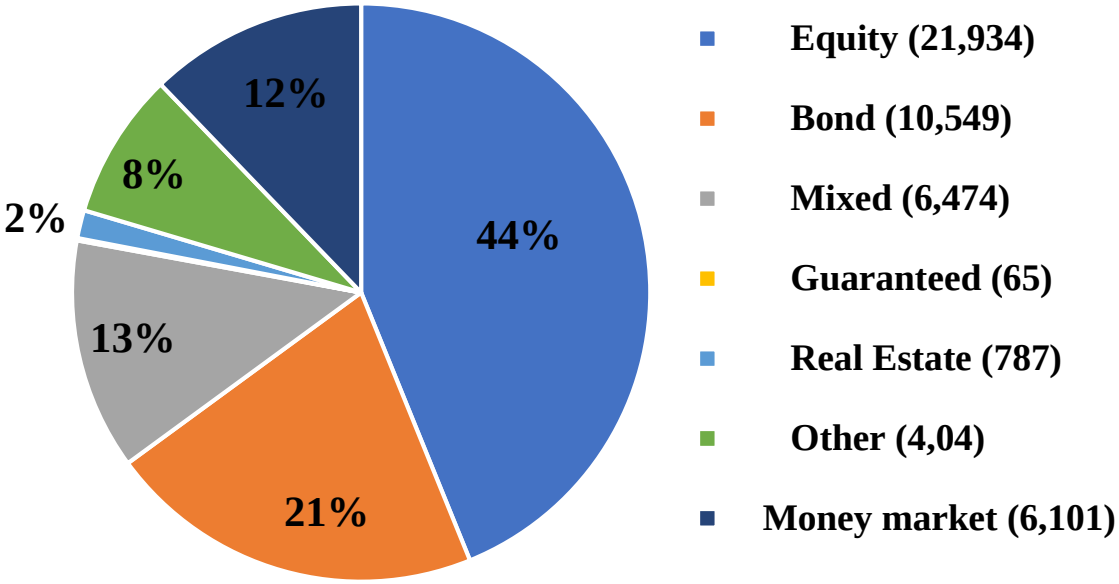
      - Flow and Performance
    - Bond Mutual funds
    - Flow Across Asset Classes
  - Other Related Topics: Closed-end Mutual Funds, ETF, Pension funds
- China Mutual Fund Market: Hong, Lu and Pan (2019)
- Useful Research Source

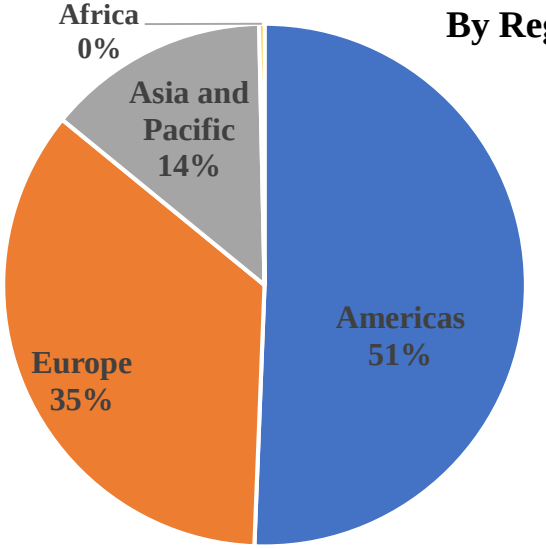
Mutual Fund Background

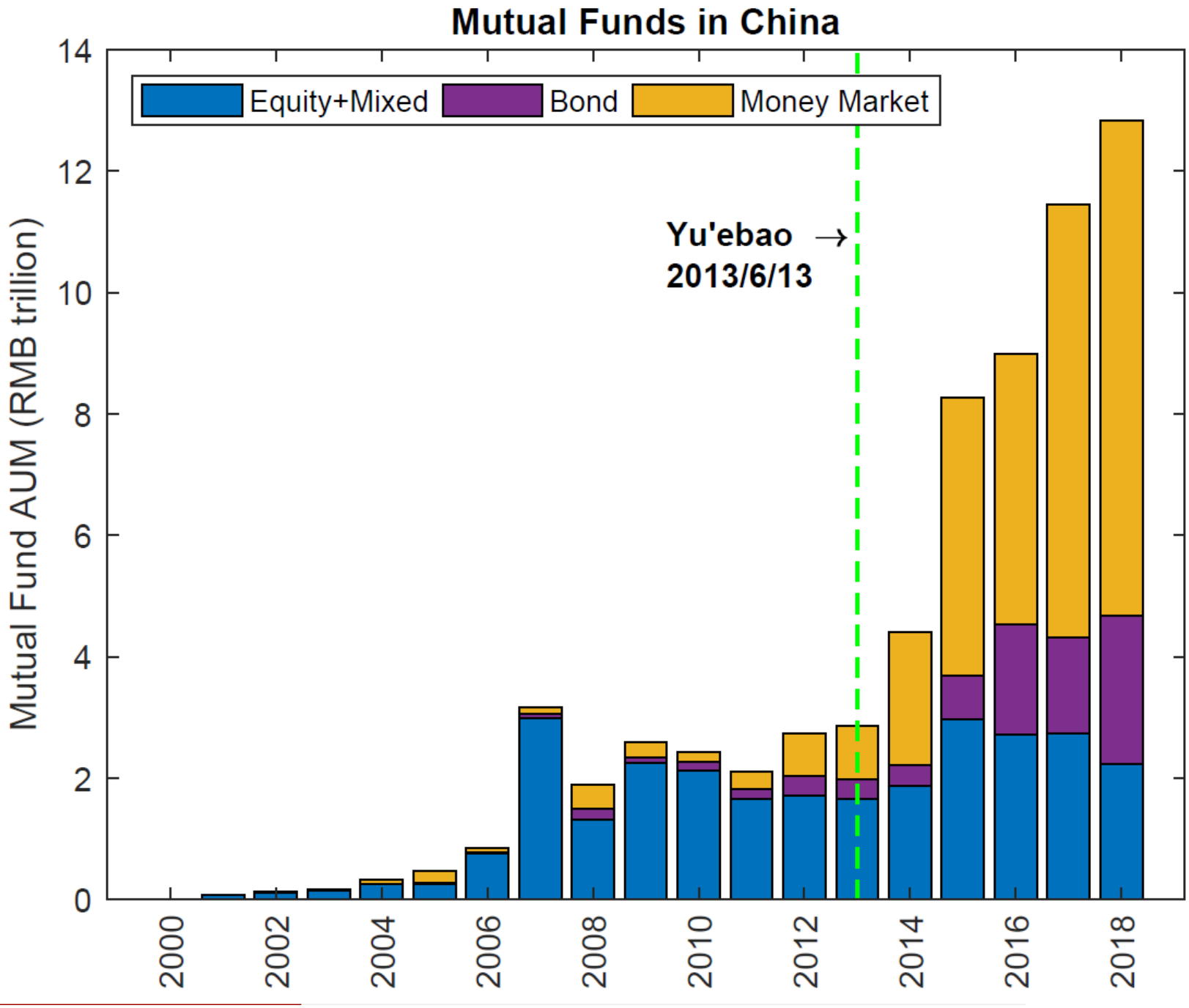
Net Assets of World Mutual Funds, 2019Q2



43.9 Percent of US Households Owned Mutual Funds in 2018. Households hold 90% of mutual fund assets in US. (ICI 2018 Report)

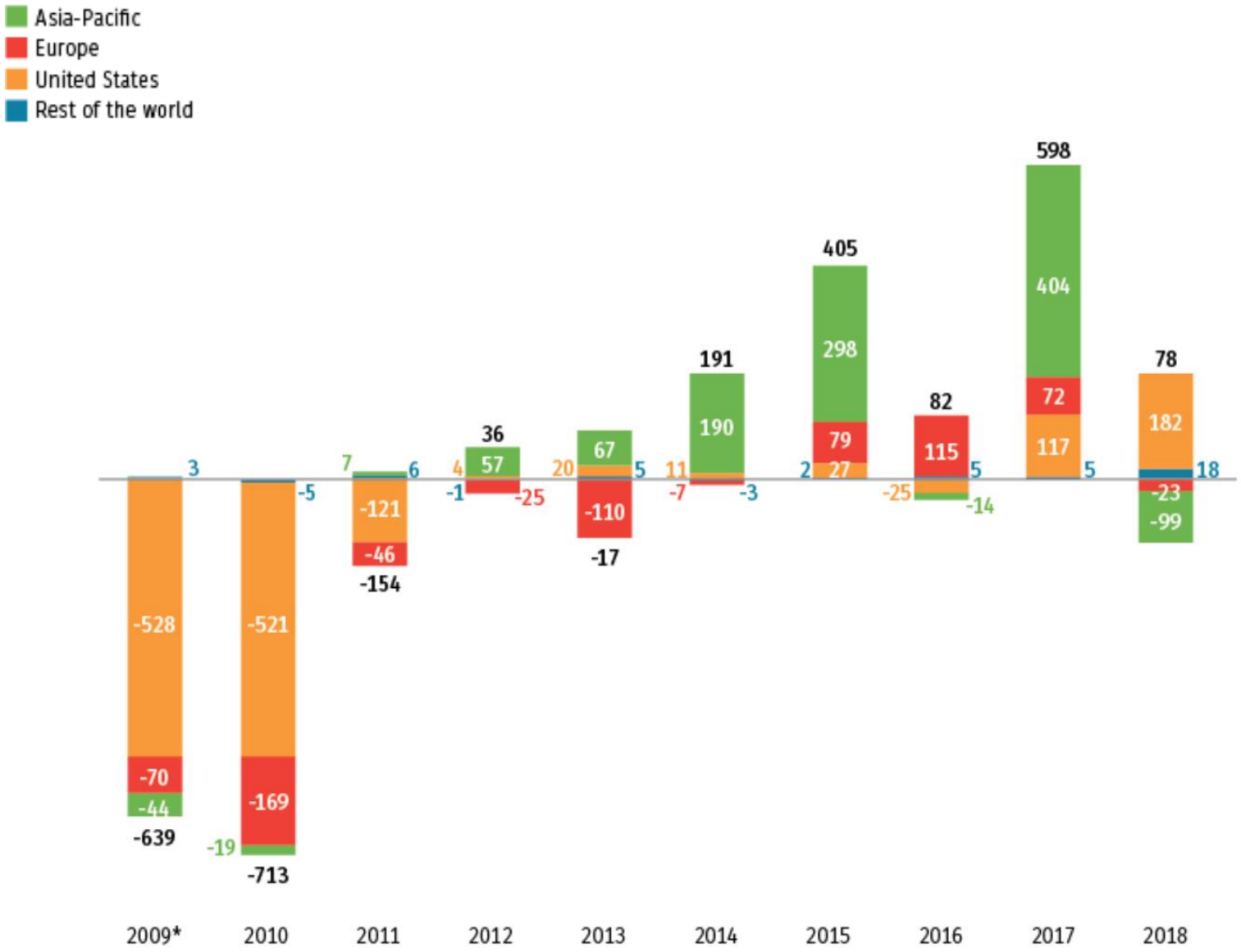
By Region

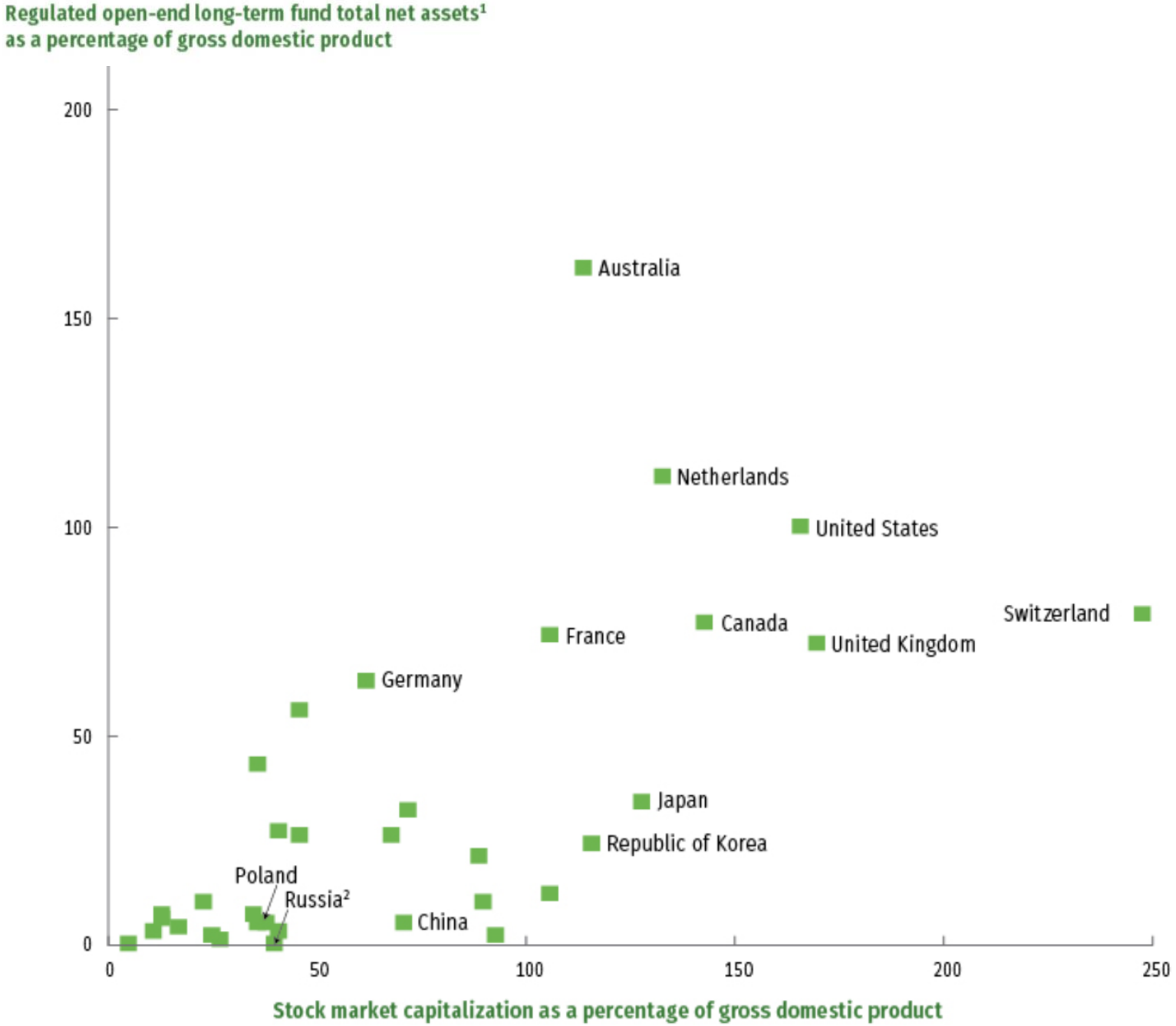



Mutual Funds in China
Equity+Mixed
Bond
Money Market
Yu'ebao →
2013/6/13
Mutual Fund AUM (RMB trillion)
0
2
4
6
8
10
12
14
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

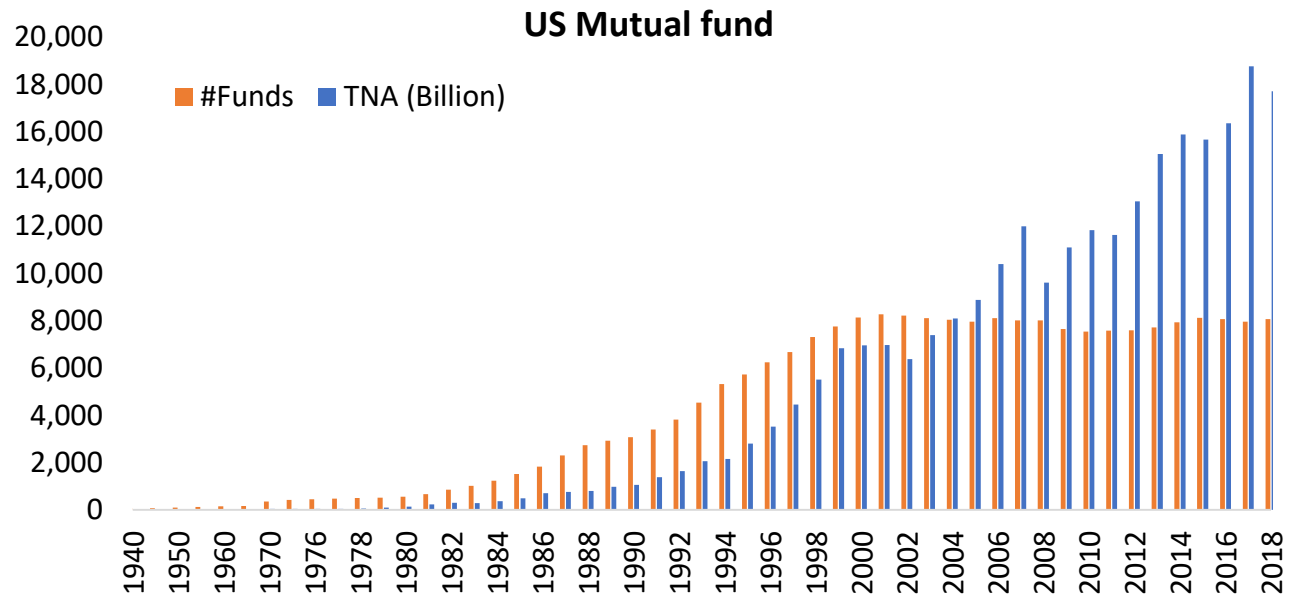
Worldwide Net Sales of Money Market Funds

Billions of US dollars by region, annual

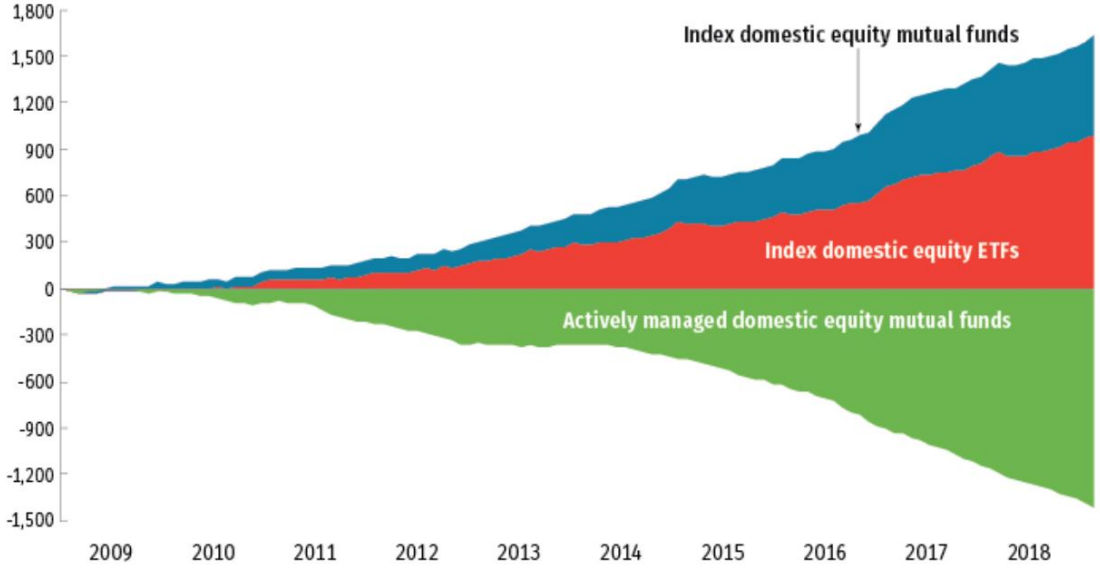


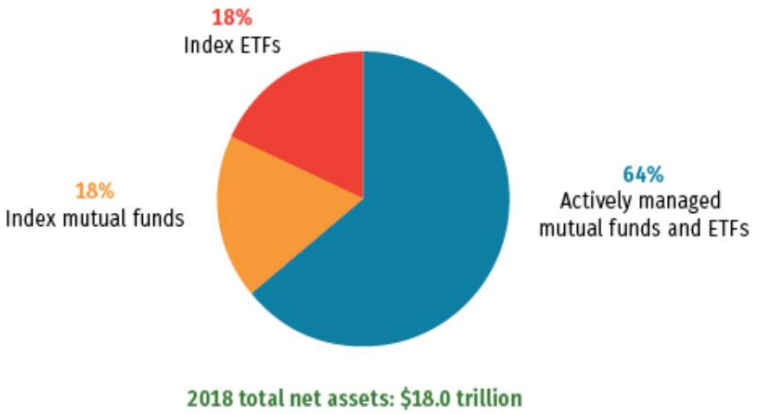

Regulated open-end long-term fund total net assets[1]
as a percentage of gross domestic product
200
150
100
50
0
0
50
100
150
200
250
Australia
Netherlands
United States
Switzerland
Canada
France
United Kingdom
Germany
Japan
Republic of Korea
Poland
Russia[2]
China
Stock market capitalization as a percentage of gross domestic product

Mutual Fund Background



Cumulative Outflows from Actively Managed Domestic Equity Mutual Funds





Fees and Flow

- Load fees, expense ratios, 12b-1 fees, https://www.icifactbook.org/ch6/19_fb_ch6
- Barber, Odean, and Zheng (2005)

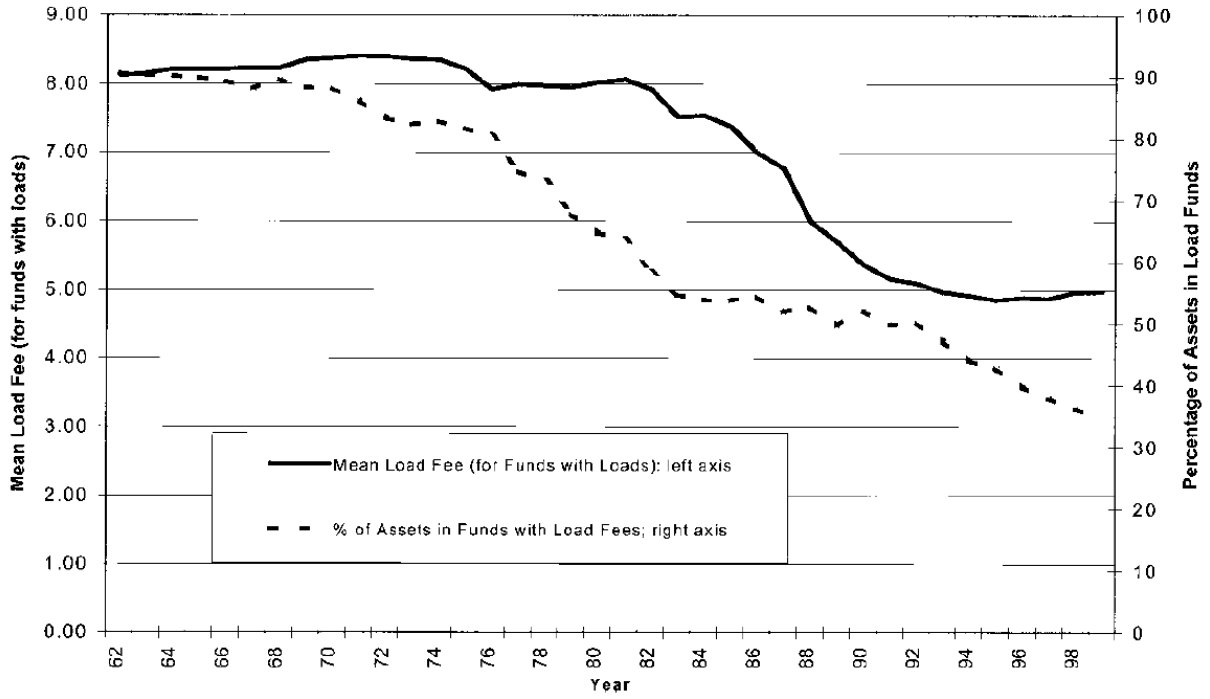


FIG. 1.—Mean Front-End load fee and percentage of assets invested in funds with front-end loads for U.S. diversified equity mutual funds, 1962–99. Front-end load fees are from the CRSP mutual fund database. The mean load fee is based only on funds charging a front-end load and is weighted by fund size.

Fees and Flow

- Barber, Odean, and Zheng (2005)

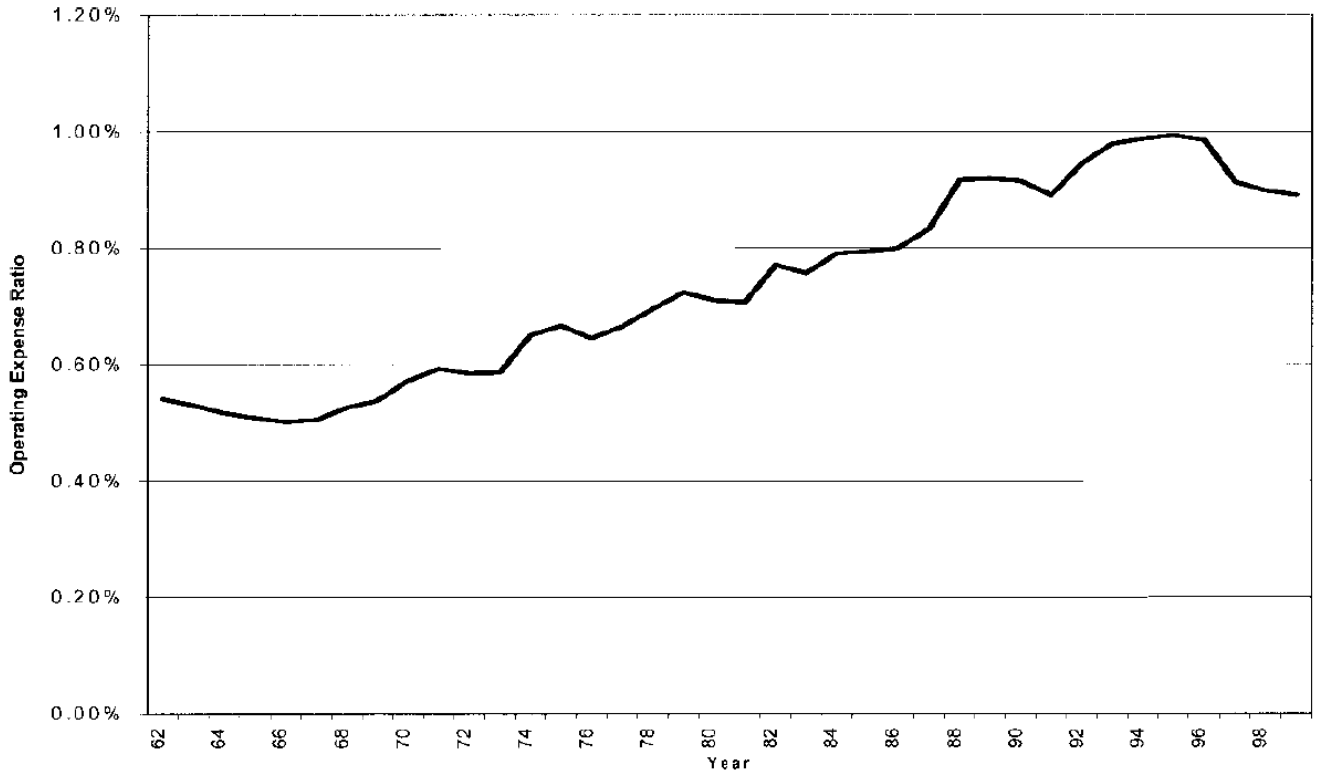


FIG. 2.—Mean operating expense ratio for U.S. diversified equity mutual funds, 1962–99. The mean operating expense ratio is calculated based on expense ratios reported in the CRSP mutual fund database for U.S. diversified equity mutual funds and is weighted by fund size. Funds with zero expense ratios are excluded from the calculation of the mean. On average, 97% of assets are held in funds with nonzero expense ratios, ranging from 92% in 1987 to 100% in 1999.

Fee and Flow

- Barber, Odean, and Zheng (2005)

TABLE 1 Descriptive Statistics for Mutual Funds Sorted by Expense Ratio Deciles and Front-End-Load versus No-Load Funds, 1970–99

Decile	Mean Expense Ratio (%)	Mean Load Fee (%)	Mean TNA ($mil.)	Mean New Money (% of TNA)	Mean Monthly Return (%)	CAPM Alpha (%)	Fama-French Alpha (%)
Panel A. Operating Expense Partition							
1 (low)	.47	3.77	844.821	−1.33	1.056	−.059	−.004
2	.72	4.19	456.255	−.89	1.038	−.068	−.006
3	.85	3.84	301.311	1.57	1.066	−.057	.006
4	.96	4.36	232.351	2.76	1.010	−.102	−.035
5	1.07	4.23	151.334	6.76	1.079	−.037	.055
6	1.18	4.19	112.470	9.79	1.010	−.149	−.052
7	1.34	3.90	93.703	9.37	1.027	−.119	−.040
8	1.53	3.10	77.198	17.37	1.055	−.057	.026
9	1.76	2.68	46.936	20.82	1.096	−.029	.030
10 (high)	3.18	1.67	25.037	20.77	.816	−.366**	−.256*
Panel B. Front-End-Load vs. No-Front-End-Load Funds							
No load	1.07	0	158.479	6.61	1.079	−.059	.012
Load	1.13	6.77	296.890	.04	1.026	−.098	−.017

NOTE.—In panel A, funds are sorted into deciles on the basis of operating expense ratios in year $t - 1$ from 1969–1998. In panel B, funds are sorted into deciles on the basis of front-end-load fees in year $t - 1$ from 1969 to 1998. The table presents the number of funds, mean expense ratio, front-end-load fee, and mean TNA in sorting year $(t - 1)$. New money as a percentage of TNA and the equally weighted mean monthly return for each performance decile are for the subsequent year (t). The CAPM alpha is the intercept from a monthly time-series regression of the mean monthly excess return for each sample partition on the market excess return. The Fama-French alpha is the intercept from a monthly time-series regression of the mean monthly excess return for each sample partition on the market excess return, a zero-investment portfolio formed on the basis of firm size, and a zero-investment portfolio formed on the basis of book-to-market ratios.

**, * Significant at the 5% or 10% level, two -tailed test.

Fee and Flow

- Hortacsu and Syverson (2004)

PRICE DISPERSION WITHIN FUND SECTORS

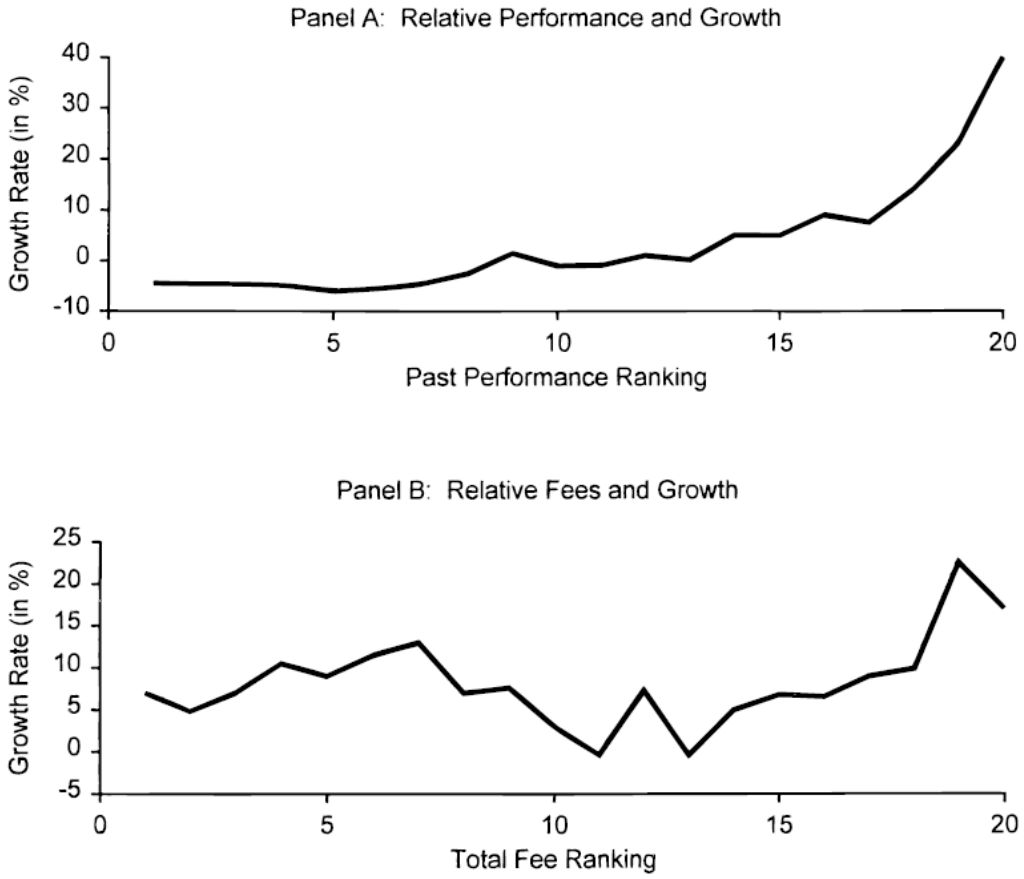
Sector	N	Mean price	Coefficient of variation	75th to 25th Percentile ratio	90th to 10th Percentile ratio
Aggressive growth	1278	191.0	0.485	2.0	3.1
Balanced growth	472	164.2	0.439	2.2	3.7
High-quality bonds	862	118.1	0.566	2.5	4.9
High-yield bonds	337	167.3	0.387	2.1	3.2
Global bonds	358	182.3	0.402	2.0	3.5
Global equities	452	228.3	0.374	1.6	2.8
Growth and income	978	158.4	0.830	2.5	5.5
Ginnie Mae	182	144.0	0.460	2.4	4.0
Gov't securities	450	131.9	0.549	2.5	4.7
International equities	1267	225.5	0.432	1.9	3.2
Income	218	170.8	0.415	2.2	3.4
Long-term growth	1812	179.4	0.421	2.0	3.1
Tax-free money market	455	62.7	0.440	1.6	3.2
Gov't securities money market	437	59.5	0.611	1.8	4.8
High-quality muni bond	541	137.2	0.624	2.4	4.1
Single-state muni bond	1326	150.3	0.384	1.7	3.6
Taxable money market	541	79.2	0.726	2.0	7.1
High-yield money market	62	160.4	0.408	1.7	3.3
Precious metals	35	256.1	0.399	1.6	3.3
Sector funds	511	200.8	0.364	1.8	2.9
Total return	323	178.2	0.415	1.9	3.3
Utilities	94	182.8	0.359	1.7	3.2
Retail S&P 500 index funds	**82**	**97.1**	**0.677**	**3.1**	**8.2**

https://www.icifactbook.org/ch6/19_fb_ch6

Performance and Flow

- Chevalier and Ellison (1997), Sirri and Tufano (1998), Brown, Harlow, Starks (1996)
- Convex flow-performance relation

Figure 1, Sirri and Tufano (1998)



Performance and Flow

- Sirri and Tufano (1998); Chevalier and Ellison (1997), Brown, Harlow, Starks (1996)
- Convex flow-performance relation and risk taking

Table 3, Brown, Harlow, Starks (1996)

		Sample Frequency (% of Observations)					
		Low *RTN* ("Losers")		High *RTN* ("Winners")			
Sample Period	Observations	"Low" *RAR*	"High" *RAR*	"Low" *RAR*	"High" *RAR*	χ^2	*p*-value[b]
Panel A: Whole Sample							
1980–1991	2484	22.22	27.70	27.66	22.42	28.49	0.000
Panel B: Six-Year Periods							
1980–1985	851	26.09	23.85	23.74	26.32	1.98	0.160
1986–1991	1633	20.21	29.70	29.70	20.39	57.72	0.000

Bond Mutual Funds

- Flow-performance relationship (Goldstein, Jiang, Ng, 2017)

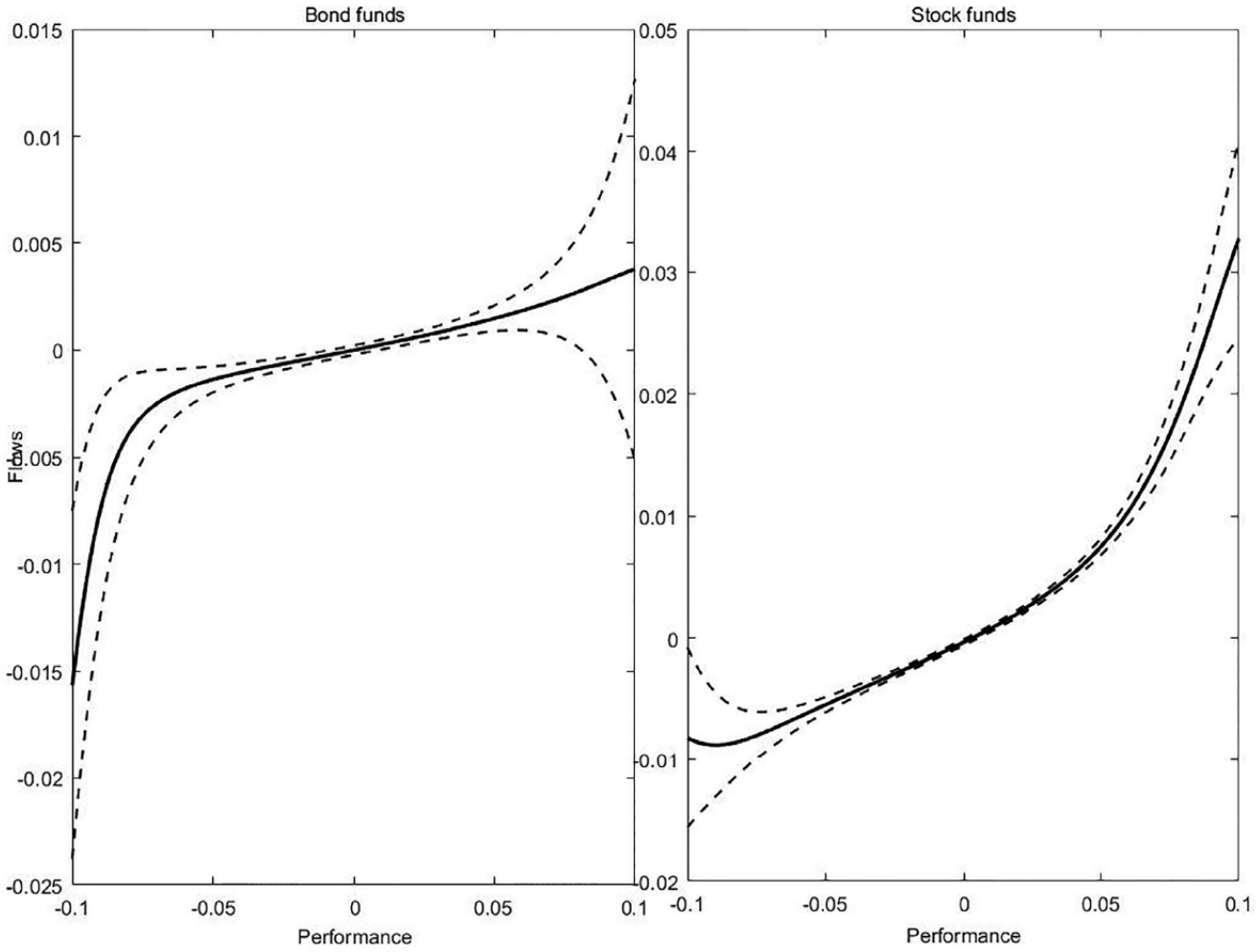


Fig. 3. Flow-performance relations for individual corporate bond funds. This figure shows the flow-performance relation for corporate bond funds and stock funds using a semi-parametric regressing of monthly fund flows on past fund alpha and fund characteristics including fund size, fund age, expenses, back-end loads, and lagged flows. The estimation uses the method developed by Robinson (1988) and applied in Chevalier and Ellison (1997). The dotted lines represent the 90% confidence intervals.

Bond Mutual Funds

- Financial fragility, risk of fund runs
- Illiquid fund holdings and stale NAV price

Table 1, Choi, Kronlund, and Oh (2019)

Panel B. Zero return day ratio by asset category and year

Year	Bond Funds					Domestic Equity Funds
	Govt.	HY	IG	Muni	Total	
2008	13.50	19.49	16.03	22.42	18.91	1.53
2009	19.96	21.23	20.69	28.88	24.18	3.18
2010	23.85	27.19	25.90	45.99	34.36	4.40
2011	23.50	29.61	26.65	37.44	31.22	3.05
2012	29.96	31.01	34.27	39.84	35.30	4.66
2013	28.58	33.63	35.97	37.70	35.29	4.18
2014	28.23	38.55	38.11	41.62	38.35	4.08
2015	23.57	28.27	32.14	39.42	32.92	3.55
2016	26.94	24.58	34.71	44.46	34.94	4.20
2017	27.23	37.92	36.17	39.81	36.77	5.73
Total	25.22	30.35	31.31	38.67	33.21	3.98

Bond Mutual Funds

- Financial Fragility, risk of fund runs
- Illiquid fund holdings and stale NAV price

Table 1, Choi, Kronlund, and Oh (2019)

Panel C. Holding-level zero trading day (ZTD) ratio (%)

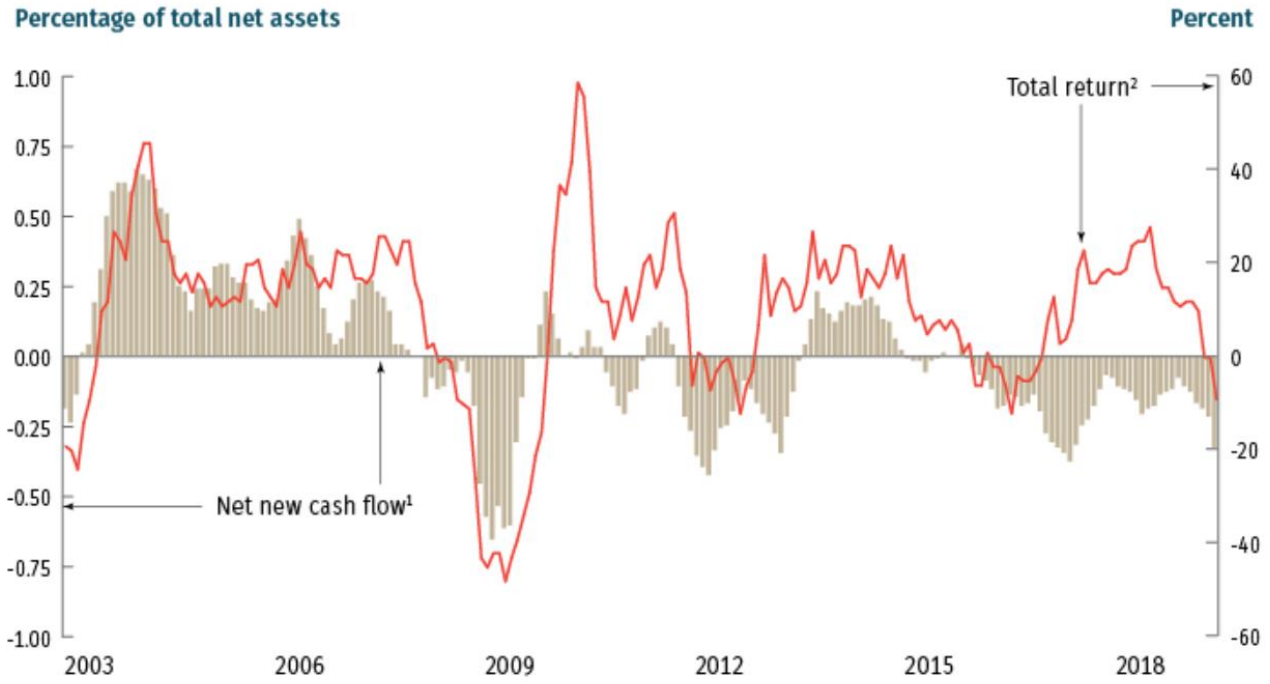
Year	Govt. Bond Funds	HY Bond Funds	IG Bond Funds	Muni Bond Funds	Total
2008	2.68	33.09	16.76	88.46	49.20
2009	2.74	28.15	13.37	86.49	46.57
2010	5.69	25.92	16.53	85.51	46.69
2011	11.40	30.10	19.95	84.71	47.69
2012	15.60	29.93	22.20	85.26	48.07
2013	15.61	26.64	22.32	84.05	46.42
2014	16.96	25.12	24.05	85.30	46.18
2015	17.97	22.22	24.84	86.17	43.96
Total	11.19	27.35	19.90	85.54	46.89

Across Asset Class

FIGURE 3.5

Net New Cash Flow to Equity Mutual Funds Typically Is Related to World Equity Returns

Monthly



[1] Net new cash flow is the percentage of previous month-end equity mutual fund total net assets, plotted as a six-month moving average.

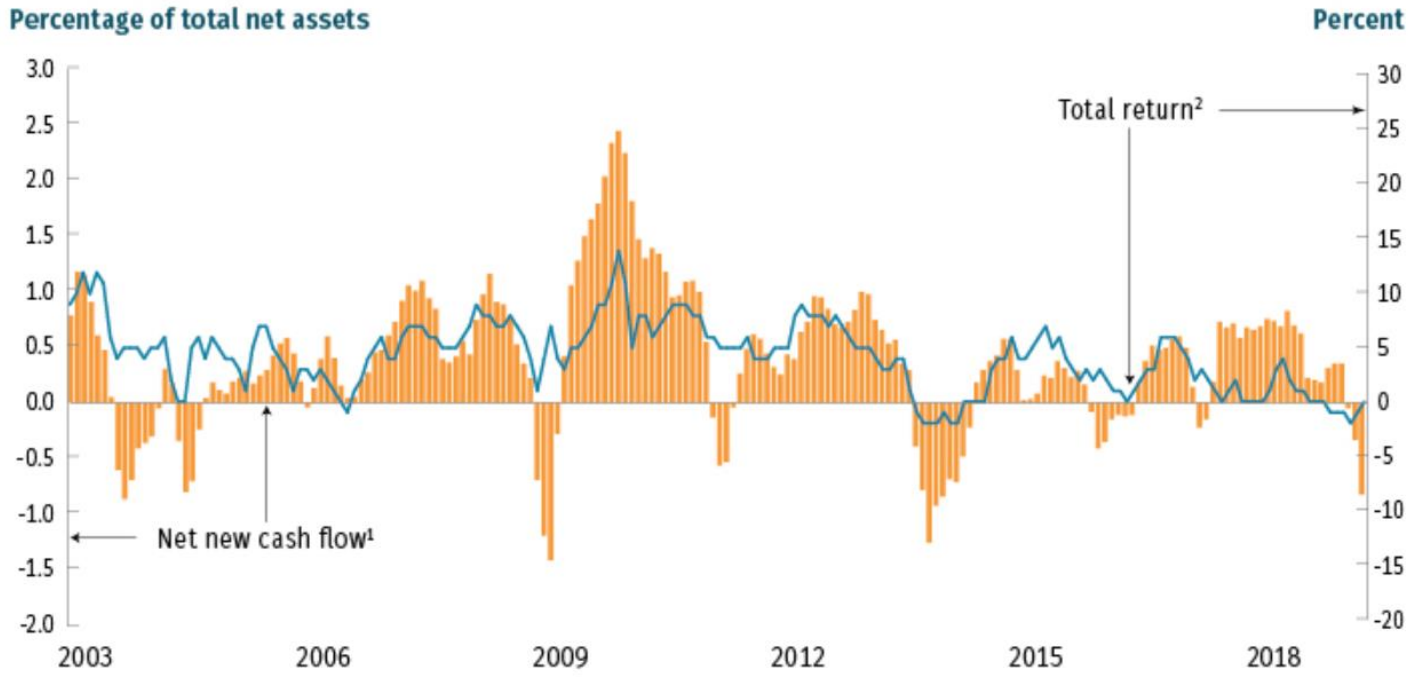
[2] The total return on equities is measured as the year-over-year percent change in the MSCI All Country World Daily Gross Total Return Index.

Sources: Investment Company Institute, MSCI, and Bloomberg

FIGURE 3.8

Net New Cash Flow to Bond Mutual Funds Typically Is Related to Bond Returns

Monthly

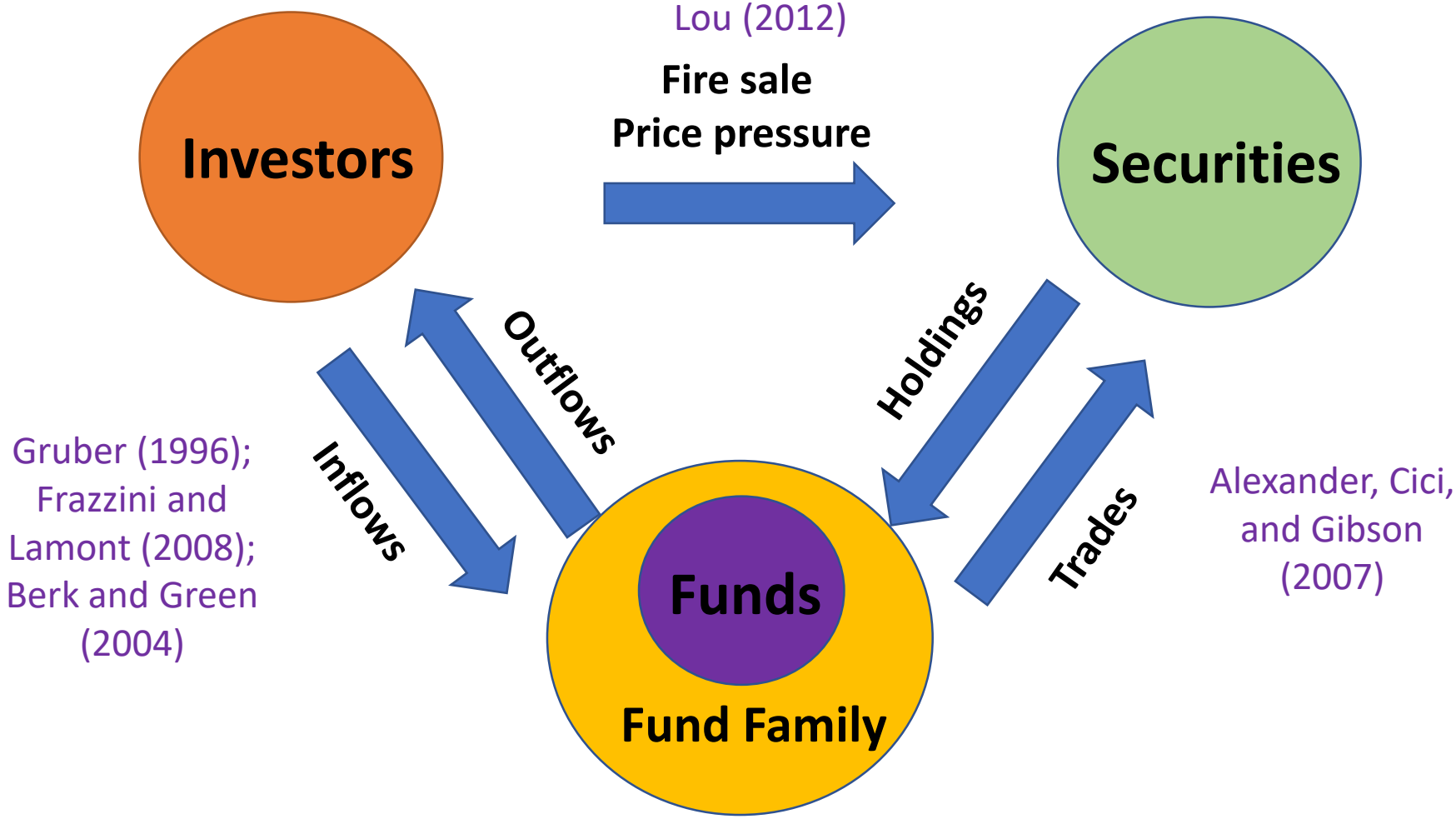


[1]Net new cash flow is the percentage of previous month-end bond mutual fund total net assets, plotted as a three-month moving average. Data exclude high-yield bond mutual funds.

[2] The total return on bonds is measured as the year-over-year percent change in the FTSE US Broad Investment Grade Bond Index.

Sources: Investment Company Institute, FTSE Russell, and Bloomberg

See more from Ben-Rephael, Kandel, and Wohl (2012), Ben-Rephael, Choi, and Goldstein (2019)



Skills (Busse, Tong, Tong, and Zhang, 2018)
Organization Structure (Masssa, 2003)
Conflict of interests (Cohen and Schmidt, 2009)
Compensation (Ma, Tang, and Gomez, 2019)
Disclosure (Kronlund, Pool, Sialm, Stefanescu, 2019) …..

Other Related Topic

- Pension Funds: Sialm, Starks, and Zhang (2014)
- ETF: Ben-David, Franzoni, Moussawi (2017)
- Closed End Funds (250 billion in 2018): Cherkes (2012)

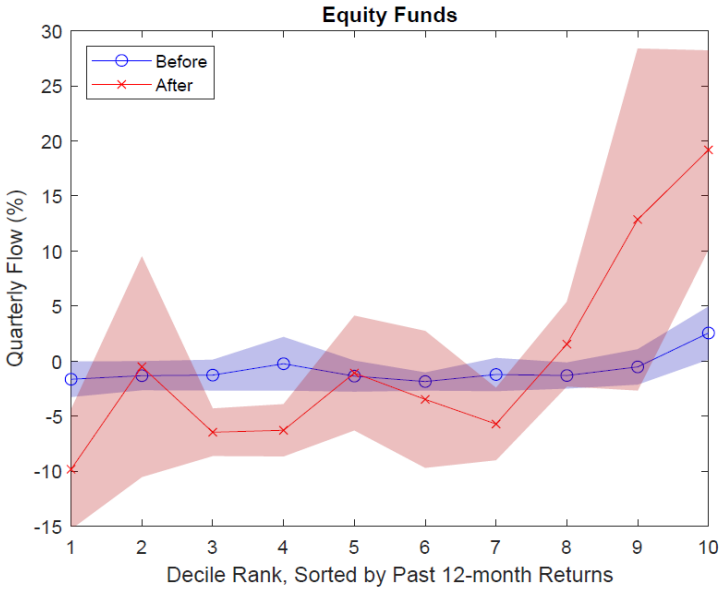
Hong, Lu, and Pan (2019)

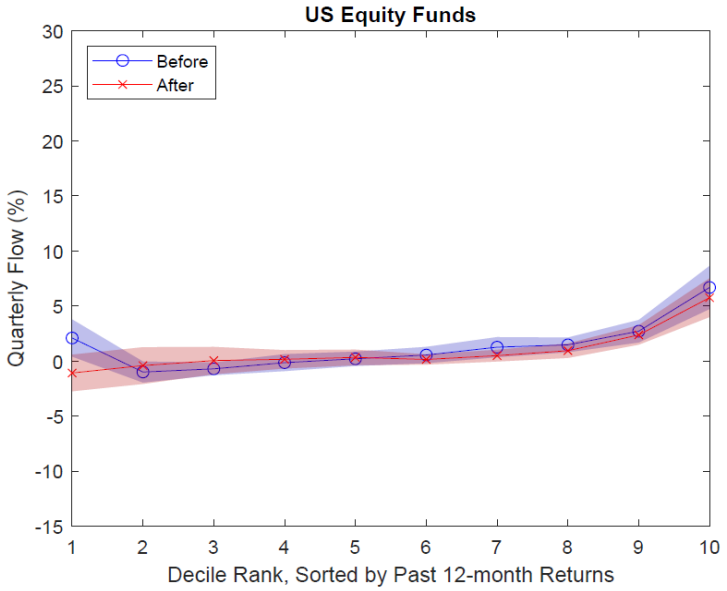
Data source: CSMAR, WIND

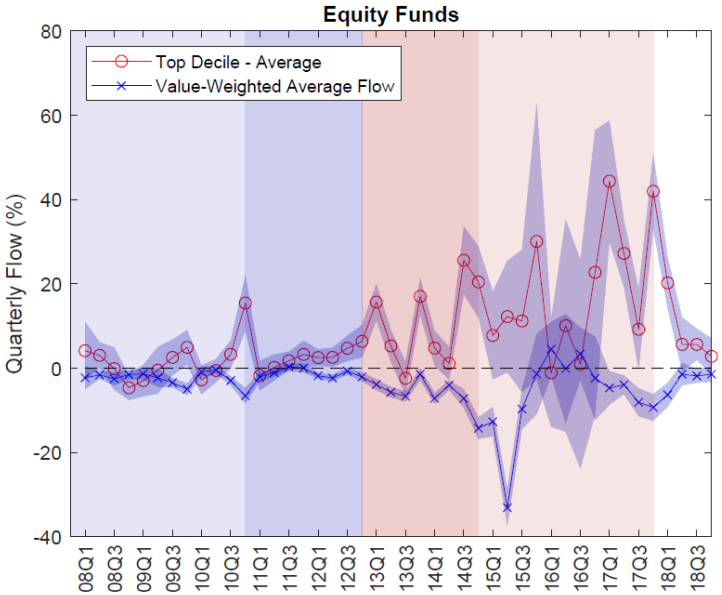
Panel A. Size of Mutual Funds, by Year

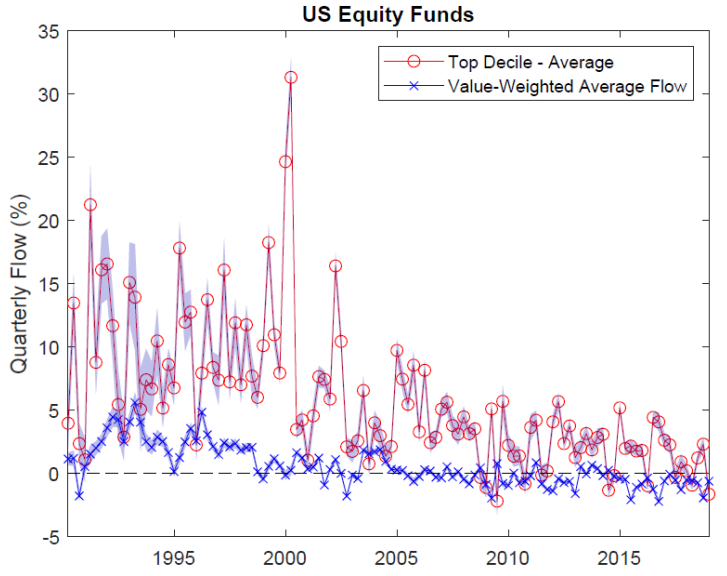
	Equity				Mixed				Bond			
Year	#Funds	TNA(B)	Ret(%)	StdRet(%)	#Funds	TNA(B)	Ret(%)	StdRet(%)	#Funds	TNA(B)	Ret(%)	StdRet(%)
2007	55	323.9	12.60	18.01	80	468.1	4.95	25.08	10	23.1	1.83	3.98
2008	72	376.5	-20.86	10.38	97	488.0	-15.88	8.29	16	50.7	0.44	2.45
2009	111	723.3	13.29	6.52	121	692.7	11.72	6.15	20	32.1	-0.06	2.12
2010	143	810.4	-0.23	5.63	134	690.8	0.07	6.37	40	59.0	-0.08	2.55
2011	184	729.1	-7.64	4.39	156	601.4	-6.53	4.51	72	68.4	-1.49	2.42
2012	220	636.3	1.26	3.90	167	529.6	0.78	3.44	85	91.0	1.19	1.82
2013	270	668.6	3.57	5.98	187	531.4	2.77	5.01	125	132.5	-0.59	2.40
2014	326	616.6	5.62	7.05	210	477.0	4.38	6.37	187	135.3	4.37	5.71
2015	186	357.2	12.40	11.32	431	760.2	8.42	11.39	304	320.6	1.29	5.02
2016	42	35.8	-3.06	6.19	712	905.7	-4.78	8.07	397	632.4	-1.20	3.92
2017	123	159.5	3.21	5.94	1,020	1,300.8	2.24	5.50	456	518.2	-0.11	2.54
2018	177	171.9	-7.24	5.09	1,414	1,237.6	-4.93	5.33	639	715.1	0.28	2.70

Hong, Lu, and Pan (2019)



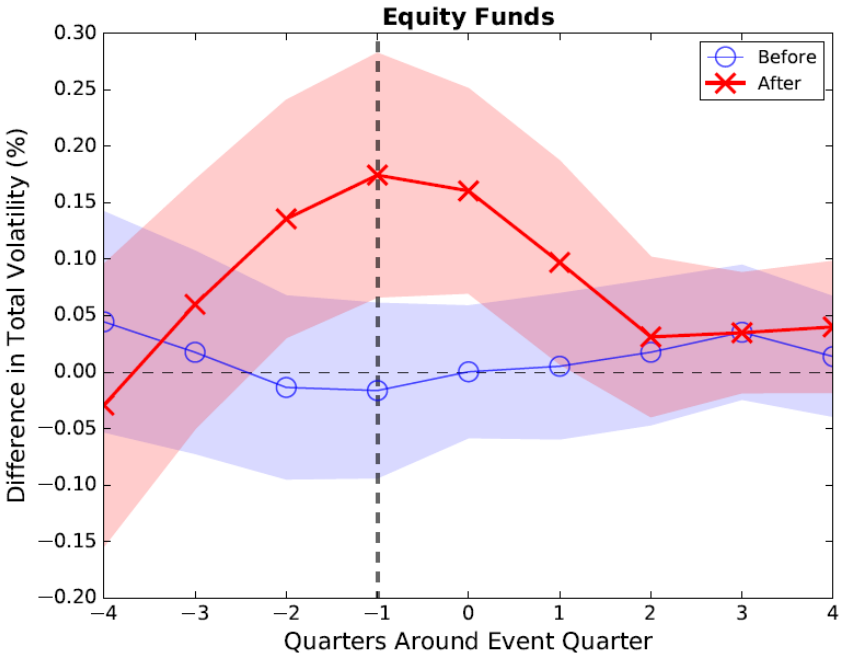


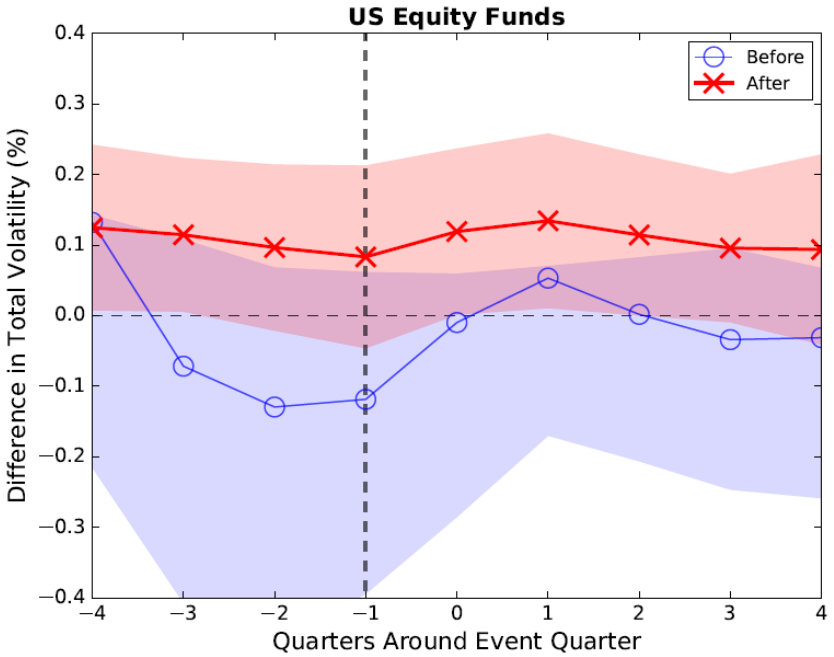




Hong, Lu, and Pan (2019)

- How does changed flow-performance affect managerial incentives?





Useful Research Resources

- https://www.ici.org/research/stats/
- SAS code for Kacperzczyk, Sialm and Zheng (RFS, 2008): https://wrds-www.wharton.upenn.edu/pages/support/applications/institutional-ownership-research/using-thomson-reuters-fund-holdings-and-crsp-mutual-funds-data-wrds-example-return-gap/
- WRDS Macro: https://wrds-www.wharton.upenn.edu/pages/support/research-wrds/macros/
- https://sites.google.com/site/jiejaycao/home/tools

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