Doing Good and Doing It With (Investment) Style

Matteo Binfarè   Kyle Zimmerschied [1]

[1]University of Missouri

January 2023

"Suppose that our foundation hadn't invested in Gavi, the Global Fund and GPEI and had instead put that $10 billion into the S&P 500, promising to give the balance to developing countries 18 years later. As of last week, those countries would have received about $12 billion, adjusted for inflation, or $17 billion if we factor in reinvested dividends. By investing in global health institutions, however, we exceeded all of those returns: The $10 billion that we gave to help provide vaccines, drugs, bed nets and other supplies in developing countries created an estimated $200 billion in social and economic benefits."

— Bill Gates (2019)

Motivation

1. **Importance of Private Foundations**
   - In 2016, private foundations had close to $900 billion in total assets and distributed about $65 billion to charitable efforts
     - ▶ Private foundations increase the efficiency and flexibility of charitable giving through grant-making processes and increased donor control (Allen & McAllister (2019))

2. **Novelty of Investment Setting** `Example`
   - Following their creation, private foundations rely almost completely on investment returns to fund their philanthropic efforts
     - ▶ Little to no fund-raising activities, government grants, tuition and fees, etc.
   - Private foundations are subject to a five percent rate of mandated distributions of their net investment assets

3. **Learning from Private Foundations**
   - Data on the investment performance, asset allocation, and fees paid by private foundations enables an examination of theoretical results and empirical results within a new investment vehicle
     - ▶ Reach for yield, performance persistence, association between investment fees and investment performance, long-term sustainment of private foundations?

Research Questions

1. ## Asset Allocation Decisions

   - Private foundations typically begin with a donor's gift of stock in one corporation
   - Campbell & Sigalov (2021) theoretically show that reaching for yield results from imposing a sustainable spending constraint on an infinitely-lived investor
     - ▶ How do private foundations' asset allocations change in response to the investment environment and a foundation's characteristics (i.e age, size, sophistication)?

2. ## Investment Performance of Private Foundations

   - Dahiya & Yermack (2020) and Lo *et al.* (2020) both show negative risk-adjusted performance for non-profits from 2009-2018
   - Barber & Wang (2013) document no positive risk-adjusted performance of university endowments when controlling for asset allocation to alternatives
     - ▶ Do private foundations achieve positive risk-adjusted returns?

Research Questions

3. Relation between Fees and Investment Returns

- Evidence within the current literature is mixed on the relationship between fees and investment performance
- IRS Form 990-PF discloses fees in a more transparent process while analysis on investment management fees has often been limited due to issues of data availability
  - ▶ Are investment fees associated with positive risk-adjusted performance, and what types of fees are most strongly connected to investment performance?

4. Improving the Legislation of Private Foundations?

- Private foundations are subject to a mandated distribution rate of five percent of their net investment assets
- Aase & Bjerksund (2021) and Dybvig & Qin (2019) show that the optimal spending rate for an investor seeking to maintain real principal for perpetuity is strictly less than the expected return minus one half of the variance of return
  - ▶ Can the inflexible five percent distribution rule be modified to increase the expected real aggregate spending of private foundations?

Main Results

1. Private foundations significantly increase their allocation to "risky" assets in response to declines in the real interest rate

2. The largest foundations exhibit positive risk-adjusted returns of about 140 bps per annum
   - Asset allocation not the only factor in explaining returns
   - Significant time variation in alphas
   - Concentration increases returns at the cost of increased risk
   - Weakening performance persistence

3. Investment wages are positively associated with returns

4. Many foundations with conservative asset allocations are in danger of losing real principal moving forward due to the high hurdle rate imposed by the five percent rule

Institutional Background

▶ A private foundation is an independent legal entity that provides a vehicle for charitable giving

- Enables greater donor control of the timing and use of donations

▶ Private foundations are primarily tax-exempt and donor contributions of appreciated stock is fully deductible

▶ Private foundations must pay out five percent of investment assets annually or are subject to a 30 percent excise tax

- Private foundations can give in excess of five percent and receive a "carry-forward" deduction that can be used to offset future deductions within the next five years

Data Sources and Sample

▶ Data collected from annual tax return filings of private foundations on Internal Revenue Service's (IRS) Form 990-PF from 1991-2016

- Contains an asset-weighted sample of all 990-PF filings (foundations with greater than $10 million in investment assets are included with certainty)

- Sample contains less than 20 percent of foundations' filings but covers over 80 percent of the total fair market value

Data Sources and Sample

	N	Mean	SD	p25	Median	p75	AUM^w
	Panel A: Assets, Investment Assets, and Flows ($M)						
Total Assets (BV)	271047	36.41	373.29	0.70	5.42	18.35	3467.13
Total Assets (FV)	271047	41.19	382.15	0.83	7.50	21.62	3586.81
Investment Assets (FV)	271047	36.72	351.56	0.68	5.50	18.80	3273.58
Contributions	271047	1.78	39.84	0.00	0.00	0.01	144.36
Distributions	271047	2.43	26.37	0.04	0.32	1.20	173.17

▶ Average foundation had close to $37 million in total assets while the asset-weighted average is nearly $3.5 billion

▶ Foundations receive minimal contributions from outside donors

Introduction
00000

Data
000●00

Asset Allocation
00

Performance
0000

Fees
00

Spending
0000

Conclusions
0

References

The Largest Private Foundations in the U.S. in 2016

| Foundation | Inv. Assets | Asset Alllocations | | | |
		Gov. Bonds	Corporate Bonds	Equity	Other
Bill & Melinda Gates Foundation	$ 39,910.70	$ 5,352.00	$ 712.50	$ 27,647.40	$ 6,225.90
Ford Foundation	$ 11,950.00	$ 789.20	$ 83.70	$ 214.30	$ 10,862.70
Lilly Endowment	$ 10,241.10	$ -	$ -	$ 9,236.10	$ 1,005.00
Robert Wood Johnson Foundation	$ 9,644.60	$ 267.10	$ -	$ 1,741.00	$ 7,636.40
William and Flora Hewlett Foundation	$ 8,857.10	$ 475.50	$ 413.90	$ 2,916.90	$ 5,050.80
Bloomberg Family Foundation	$ 7,817.70	$ -	$ -	$ -	$ 7,817.70
W. K. Kellogg Foundation	$ 7,663.30	$ 170.60	$ 0.90	$ 4,844.10	$ 2,647.60

Introduction
00000

Data
000000

Asset Allocation
00

Performance
0000

Fees
00

Spending
0000

Conclusions
0

References

Data Sources and Sample

	N	Mean	SD	p25	Median	p75	AUM^w
	Panel A: Asset Allocation						
Cash	271047	8.95	15.04	1.64	3.87	8.67	6.68
Government Bonds	271047	6.91	15.50	0.00	0.00	6.44	7.25
Corporate Bonds	271047	11.02	16.37	0.00	2.52	17.28	7.72
Equity	271047	56.02	31.90	32.78	61.18	82.51	52.39
Alternatives	271047	14.87	27.59	0.00	0.00	15.29	24.05
	Panel B: Investment Returns, Risk, and Fees						
Total Net Return	232472	8.31	13.75	1.36	8.44	14.93	10.09
Dividend Yield	232472	3.28	2.01	2.17	2.86	3.87	2.57
Realized Gains	232472	3.25	6.61	0.00	1.96	5.28	4.29
Unrealized Gains	232472	2.04	13.79	-4.66	2.01	8.66	3.14
Investment Fees	232472	0.81	0.85	0.28	0.63	1.06	0.59
Risk	149706	12.16	7.13	6.96	10.10	16.45	13.29

▶ Larger foundations hold less cash and equity than smaller foundations while
  investing much more in alternatives

▶ Larger foundations significantly outperform equal-weighted return

Investment Performance and Fees

We estimate gross return as (Validity):

$$R_{it}^{Gross} = \frac{\text{Net Assets}_{it} - \text{Net Assets}_{it-1} - \text{Contributions}_{it} + (\text{Distributions}_{it} + \text{Expenses}_{it})}{\text{Investment Assets}_{it-1}} \quad (1)$$

We subtract disclosed investment fees to get a net measure:

$$R_{it}^{Net} = R_{it}^{Gross} - Fees_{it} \quad (2)$$

Where $Fees_{it}$ include consulting, custody, manager fees, LP fund expenses, deductions from Schedule K-1, etc.

Introduction
00000

Data
000000

Asset Allocation
●○

Performance
0000

Fees
00

Spending
0000

Conclusions
○

References

Asset Allocation Decisions

$$Y_{it} = \lambda_t + \nu_i + \gamma X_{it} + \varepsilon_{it} \tag{3}$$

	Gov. Bonds	Corp. Bonds	Equity	Alternatives
	(1)	(2)	(3)	(4)
Log(Assets)	0.24***	-0.31***	0.13	0.55***
	[0.05]	[0.05]	[0.09]	[0.08]
Log(Age)	0.73***	0.61***	-0.58**	-0.96***
	[0.12]	[0.14]	[0.25]	[0.21]
Investment Fees	-0.62***	-0.69***	-2.72***	0.70***
	[0.10]	[0.10]	[0.21]	[0.18]
Distributions (% Expenses)	0.02***	0.00	0.05***	-0.07***
	[0.00]	[0.00]	[0.01]	[0.01]
Contributions (% Income)	-0.02***	-0.05***	-0.10***	0.04***
	[0.00]	[0.00]	[0.01]	[0.01]
Log(Paid)	-0.94***	-0.57***	-2.36***	4.04***
	[0.15]	[0.19]	[0.44]	[0.48]
Log(Unpaid)	-0.19*	-1.79***	-1.36***	1.35***
	[0.11]	[0.12]	[0.21]	[0.19]
Year Fixed Effects	Yes	Yes	Yes	Yes
Adj-R^2	0.12	0.02	0.03	0.03
Observations	232524	232524	232524	232524

Reach-for-Yield

$$Y_{it} = \beta_1 \, Yield_t + \beta_2 \frac{DY_{it}}{Distr_{it}} + \beta_3 \, \underbrace{Yield_t \times \frac{DY_{it}}{Distr_{it}}}_{\text{Reach-for-Yield}} + \gamma X_{it} + \nu_i + \varepsilon_{it} \quad (4)$$

	Equity			Gvt. Bonds		
	(1)	(2)	(3)	(4)	(5)	(6)
$Yield_{t-1}$	-1.90*** [0.08]	-1.02*** [0.08]		3.03*** [0.06]	1.39*** [0.05]	
DY/Distributions		0.03*** [0.00]	-0.01*** [0.00]		-0.01*** [0.00]	0.01*** [0.00]
DY/Distributions $\times$ $Yield_{t-1}$		-0.82*** [0.05]			0.35*** [0.03]	
Post			-0.01*** [0.00]			-0.01*** [0.00]
DY/Distributions $\times$ Post			0.02*** [0.00]			-0.01*** [0.00]
Controls	No	Yes	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	No	No	No
Fund Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.02	0.59	0.59	0.10	0.59	0.58
Observations	232621	228413	228413	232621	228413	228413

▶ A 1 percent $\downarrow$ in $R_f \rightarrow$ 1–2 percent $\uparrow$ in allocation to risky

▶ $\frac{\partial Risky}{\partial Yield} = \beta_1 + \beta_3 \times \frac{DY}{Distr} \sim$ 15 bps more for a σ-increase in $\frac{DY}{Distr}$

Risk-Adjusted Returns and Performance Persistence

1. Literature results mixed on ability of institutional investors to generate positive risk-adjusted returns

   - Dahiya & Yermack (2020) find negative risk-adjusted performance of nonprofits from 2009-2018
   - Kosowski *et al.* (2007) and Fung *et al.* (2008) find top-performing hedge funds generate positive risk-adjusted returns
   - Barber & Wang (2013) and Binfarè *et al.* (2020) document the ability of some university endowments to select high-performing managers and outperform

2. ...as well as on the persistence of outperformance

   - Brown & Goetzmann (1995) and Carhart (1997) document performance persistence within mutual funds but it is not reflective of superior investment skill
   - Busse *et al.* (2010) find modest evidence of persistence in active equity funds
   - Harris *et al.* (2020) on the weakening persistence of private equity returns

Risk-Adjusted Returns

1. Performance attribution analysis shows that the return performance of foundations cannot be explained by asset allocation alone (Attribution)

2. Time series regression of the value-weighted return of private foundations (Carhart (1997) and Fama & French (1993))

$$R_{it}^{Net} - R_{ft} = \alpha_i + \sum_{k=1}^{K} \beta_{ik} f_{kt} + \epsilon_{it} \qquad (5)$$

3. Performance persistence in Fama-MacBeth regressions (Fama & MacBeth (1973))

4. Examine variation in return performance driven by concentration

Risk-Adjusted Performance

	All	Very Large	Large	Medium	Small	Very Small	Tiny
	Panel B: CAPM, 3-, and 4-Factor Model						
α^{CAPM}(%)	1.49***	2.32***	1.24	1.16*	0.52	-0.14	-1.31***
	[0.52]	[0.86]	[0.79]	[0.59]	[0.57]	[0.54]	[0.50]
α^{FF3}(%)	0.98**	2.12***	0.70	0.73	0.14	-0.53	-1.33**
	[0.48]	[0.74]	[0.76]	[0.58]	[0.51]	[0.45]	[0.54]
α^{FF4}(%)	0.71	1.53**	0.68	0.58	0.22	-0.23	-0.80
	[0.48]	[0.75]	[0.83]	[0.63]	[0.55]	[0.52]	[0.62]

▶ On a value-weighted basis, private foundations significantly outperform their estimated factor exposure

▶ Consistent with these findings of investment skill, we find evidence of performance persistence among private foundations until 2008(Transition Matrix)

Concentration Driving Outperformance?

▶ Many private foundations begin with an endowed gift of corporate stock causing them to be highly concentrated at inception.

▶ We examine the stock holdings of a subset of large private foundations and find 12 percent of private foundations hold >30 percent in a single stock holding

	Net Return		Sharpe Ratio	
	(1)	(2)	(3)	(4)
Concentrated	1.64***	-1.47*	-0.12*	-0.25***
	[0.53]	[0.86]	[0.06]	[0.08]
$\text{Return}_{t:t-12}^{Concentrated}$		0.26***		0.01***
		[0.08]		[0.00]
Controls	Yes	Yes	Yes	Yes
Year × Style Fixed Effects	Yes	Yes	Yes	Yes
Adj-R^2	0.43	0.46	0.40	0.41
Observations	9755	9755	8253	8253

▶ Concentration is associated with higher returns, but comes at the cost of increased idiosyncratic risk

A Closer Look at Investment Fees

1. We scrape form 990-PF in their XLM format on AWS, 2010-2019

2. More granular view of (disclosed) investment fees (internal and external)

3. Still unable to observe undisclosed fees

   - Usually subtracted from NAV and/or capital gains suggesting our net return measure is unbiased

| efile Public Visual Render | ObjectId: 201813189349103206 - Submission: 2018-11-14 | | TIN: 43-6064859 |

TY 2017 IRS 990 e-File Render

Name: EWING MARION KAUFFMAN FOUNDATION
EIN: 43-6064859

Category	Amount	Net Investment Income	Adjusted Net Income	Disbursements for Charitable Purposes
GENERAL ATLANTIC PARTNERS	2,432,621	2,432,621		
FIRST EAGLE INVESTMENT MNGT	1,346,396	1,346,396		
DRIEHAUS CAPITAL MNGT, LLC	1,131,027	1,131,027		
HARRIS ASSOCIATES L.P.	951,234	951,234		
SANDS CAPITAL MANAGEMENT, LLC	883,883	883,883		
BRETTON WOODS GROUP INC.	647,574	44,143		603,431
DBAG FUND VII	567,240	567,240		

Performance and Fees

	Panel B: Performance and Internal and External Fees				
	(1)	(2)	(3)	(4)	(5)
Total Inv. Fees	-0.59***				
	[0.05]				
Investment Wages		0.69***			0.49***
		[0.06]			[0.07]
External Fees			-0.63***		-0.51***
			[0.04]		[0.04]
Ancillary Fees				-2.16***	-2.01***
				[0.14]	[0.14]
Log(Assets)	0.46***	0.56***	0.55***	0.41***	0.46***
	[0.02]	[0.02]	[0.02]	[0.02]	[0.03]
Year × Style Fixed Effects	Yes	Yes	Yes	Yes	Yes
Adj.-R^2	0.32	0.32	0.32	0.32	0.33
Observations	149387	149387	149387	149387	149387

▶ Investment wages are positively associated with future net investment
  return performance

  ■ All other fee types reduce future expected returns

Optimal Spending Policy

▶ Foundations are mandated to spend five percent of their average fair market value of investment assets annually

  ■ This rule was passed by Congress in 1976 to provide a sustainable benchmark for foundations' philanthropic support for present and future generations

▶ Dybvig & Qin (2019) show the optimal spending rate for infinite-lived investors is strictly less than

$$s_{it} = \mathbb{E}[R_{it}] - \frac{1}{2}\sigma_{it}^2 \qquad (6)$$

▶ Based on our simulated results, the optimal spending rate for most foundations must be strictly less than five percent for foundations to sustain their real principal

Simulated Portfolios

Asset Class	Benchmark	I	II	III	IV
Corporate Bonds	BB Aggregate Bond	0.50	0.20	0.05	0.05
Government Bonds	CRSP 10 Year Treasury	0.50	0.20	0.05	0.05
Domestic Equity	Russell 3000	-	0.60	0.60	0.30
International Equity	ACWI ex-USA	-	-	0.30	0.10
Hedge Funds	HFRIVW				0.20
Private Equity	PE Cambridge				0.15
Venture Capital	VC Cambridge				0.05
Real Estate	NCREIF				0.05
Commodities	GSCI				0.05
Expected Return (%)		6.17	6.89	6.33	8.12
Standard Deviation (%)		4.69	9.37	15.21	12.86

1. Draw from $\mathcal{N}(\mu, \Sigma)$

2. Unsmooth illiquid returns following Getmansky *et al.* (2004)

3. Risk ↑ with % of equity, but alts add diversification

Spending Rate and Capital Preservation

Wealth dynamics:

$$W_t = W_0 \prod_{t=1}^{T} (1 + r_t - s_t - \iota_t) \tag{7}$$

	Portfolio I		Portfolio II		Portfolio III		Portfolio IV	
	$h = 25$	$h = 100$	$h = 25$	$h = 100$	$h = 25$	$h = 100$	$h = 25$	$h = 100$
	Panel A: Real Wealth at $s^* = 5\%$							
5th	0.48	0.14	0.41	0.13	0.22	0.03	0.43	0.27
25th	0.63	0.24	0.66	0.37	0.46	0.14	0.80	0.99
50th	0.76	0.34	0.91	0.72	0.79	0.40	1.25	2.51
75th	0.92	0.49	1.28	1.38	1.35	1.15	1.96	6.00
95th	1.19	0.84	2.04	3.56	2.88	5.44	3.68	21.69
$\mathbb{E}(W_T)$	0.79	0.40	1.03	1.15	1.08	1.42	1.55	5.91
$\mathbb{P}(W_T < 1)$	0.84	0.97	0.58	0.64	0.61	0.72	0.37	0.25

▶ Only the portfolio with aggressive allocations to alternatives results in a greater than fifty percent chance of a foundation sustaining its real principal over longer time horizons

Simulating Optimal Spending Rate

	Portfolio I		Portfolio II		Portfolio III		Portfolio IV	
	$h = 25$	$h = 100$	$h = 25$	$h = 100$	$h = 25$	$h = 100$	$h = 25$	$h = 100$
Panel B: Optimal Spending Rule (s^* %)								
$\delta = 0.90$	7.60	5.30	7.45	5.05	6.10	3.05	7.40	4.95
$\delta = 0.92$	7.30	4.75	7.15	4.55	5.85	2.60	7.10	4.45
$\delta = 0.94$	7.00	4.25	6.85	4.05	5.70	2.20	6.80	3.95
$\delta = 0.96$	6.75	3.80	6.60	3.55	5.50	2.00	6.55	3.45

▶ Longer time preference, lower discount rate, and higher expected return lead to lower optimal spending rate

▶ Optimal spending rate for most long-lived investment strategies is strictly less than five percent

▶ A reduced spending rate enables greater flexibility to foundations' decision on longevity depending on the urgency of their philanthropic goals

Conclusions and Implications

1. Private foundations are sophisticated investors that are key to sustaining the charitable sector in the United States due to their level and efficiency of giving

2. The asset allocation of private foundations has shifted towards increasingly risky assets in response to accommodating monetary policy

3. Private foundations exhibit positive risk-adjusted returns that is driven by larger foundations and the time period preceding the Great Recession

4. Investment fees are positively associated with returns for larger foundations, especially those related to internal wages

5. A spending rate below five percent creates a more flexible benchmark that maximizes the present value of foundations' charitable distributions

Aase, Knut K., & Bjerksund, Petter. 2021. The Optimal Spending Rate Versus the Expected Real Return of a Sovereign Wealth Fund. *SSRN Electronic Journal*.

Allen, Arthur C, & McAllister, Brian P. 2019. How Private Foundation Sophistication Affects Capital Campaign Grant Decisions. *Journal of Governmental & Nonprofit Accounting*, **8**(1), 1–20.

Barber, Brad M, & Wang, Guojun. 2013. Do (Some) university endowments earn alpha? *Financial Analysts Journal*, **69**(5), 26–44.

Binfarè, Matteo, Brown, Gregory W., Harris, Robert S., & Lundblad, Christian T. 2020. How Do Financial Expertise and Networks Affect Investing? Evidence from the Governance of University Endowments. *SSRN Electronic Journal*.

Brown, Stephen J, & Goetzmann, William N. 1995. Performance persistence. *The Journal of Finance*, **50**(2), 679–698.

Busse, Jeffrey A, Goyal, Amit, & Wahal, Sunil. 2010. Performance and persistence in institutional investment management. *The Journal of Finance*, **65**(2), 765–790.

Campbell, John Y., & Sigalov, Roman. 2021. Portfolio Choice with Sustainable Spending: A Model of Reaching for Yield. *Journal of Financial Economics (Forthcoming)*.

Carhart, Mark M. 1997. On persistence in mutual fund performance. *The Journal of Finance*, **52**(1), 57–82.

Dahiya, Sandeep, & Yermack, David. 2020. Investment Returns and Distribution Policies of Non-Profit Endowment Funds. *Available at SSRN*.

Dybvig, Philip H, & Qin, Zhenjiang. 2019. How to Squander Your Endowment: Pitfalls and Remedies.

Fama, Eugene F., & French, Kenneth R. 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, **33**(1), 3 – 56.

Fama, Eugene F, & MacBeth, James D. 1973. Risk, return, and equilibrium: Empirical tests. *Journal of Political Economy*, **81**(3), 607–636.

Fung, William, Hsieh, David A, Naik, Narayan Y, & Ramadorai, Tarun. 2008. Hedge funds: Performance, risk, and capital formation. *The Journal of Finance*, **63**(4), 1777–1803.

Getmansky, M., Lo, A. W., & Makarov, I. 2004. An econometric model of serial correlation and illiquidity in hedge fund returns. *Journal of Financial Economics*, **74**(3), 529–609.

Harris, Robert S., Jenkinson, Tim, Kaplan, Steven N., & Stucke, Rüdiger. 2020. Has Persistence Persisted in Private Equity? Evidence from Buyout and Venture Capital Funds. *SSRN Electronic Journal*.

Kosowski, Robert, Naik, Narayan Y, & Teo, Melvyn. 2007. Do hedge funds deliver alpha? A Bayesian and bootstrap analysis. *Journal of Financial Economics*, **84**(1), 229–264.

Lo, Andrew W, Matveyev, Egor, & Zeume, Stefan. 2020. The Risk, Reward, and Asset Allocation of Nonprofit Endowment Funds. *Reward, and Asset Allocation of Nonprofit Endowment Funds (November 1, 2019)*.

University of Missouri vs. Kauffman Foundation vs. WashU

FY 2015	MU	Kauffman	WashU
Fiscal Year	June	December	June
Total Assets ($M)	1480	2097	6820
Distributions ($M)	47.51	104.00	271.44
Distributions (%)	3.21%	5%	4%
Investment Return (%)	1.90%	7.00%	4.40%
Contributions ($M)	30	0	263
Contributions (%)	2%	0%	4%

IRS Form 990-PF Return Validity

Private Foundation	Investment Assets ($M)	Audited	990-PF
Lilly Endowment Inc	15094.34	26.27	26.35
Ford Foundation	12652.56	0.20	0.22
Robert Wood Johnson Foundation	10780.67	3.91	3.96
William and Flora Hewitt Foundation	9713.04	4.08	4.09
David and Lucile Packard Foundation	7083.27	-0.32	-0.29
MacArthur Foundation	6824.10	10.56	10.53
Andrew W Mellon Foundation	6518.25	0.83	0.85
John D. and Catherine T. MacArthur Foundation	6440.08	-1.61	-1.69
Gordon and Betty Moore Foundation	6261.88	-0.90	-0.90
Kresge Foundation	3623.40	-1.74	-1.79
Carnegie Foundation	3572.41	7.71	7.72
Duke Foundation	3568.45	2.91	2.96
Mott Foundation	2994.97	2.24	2.22
Margaret A. Cargill Foundation	2874.53	-2.54	-2.51
Casey Foundation	2522.03	-2.25	-2.18
Conrad Hilton Foundation	2366.28	11.66	11.51
Richard King Mellon Foundation	2348.34	-1.69	-1.68
James Irvine Foundation	2241.86	3.49	3.49
McKnight Foundation	2235.38	-3.83	-3.97
Ewing Marion Kauffman Foundation	2143.49	6.96	6.95
John S. and James L. Knight Foundation	2095.41	-4.15	-4.16
Doris Duke Foundation	1757.11	1.79	1.80
Alfred P. Sloan Foundation	1730.05	-2.98	-2.88
Moody Foundation	1688.87	8.87	9.14
The Annenberg Foundation	1559.29	15.00	15.00
Rockefeller Foundation	1134.92	-1.37	-0.99
Bush Foundation	897.45	5.44	5.50
The Henry Luce Foundation	826.52	-0.93	-0.93

Performance Attribution

	V Large (≥ $500 million)				Large(<$500 & ≥$250 million)				Medium(<$250 & ≥$50 million)			
	Panel A: Performance Attribution CPI Adj. Assets > $50 million											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Russell 3000	0.64***	0.50***	0.45***	0.44***	0.66***	0.52***	0.48***	0.49***	0.62***	0.50***	0.46***	0.46***
	[0.01]	[0.02]	[0.02]	[0.02]	[0.01]	[0.02]	[0.02]	[0.02]	[0.00]	[0.01]	[0.01]	[0.01]
BB US Agg.	0.36***	0.35***	0.20***	0.21***	0.34***	0.33***	0.23***	0.22***	0.38***	0.37***	0.26***	0.26***
	[0.01]	[0.01]	[0.02]	[0.02]	[0.01]	[0.02]	[0.02]	[0.02]	[0.00]	[0.00]	[0.01]	[0.01]
MSCI ACWI ex-US		0.16***	0.07***	0.06***		0.16***	0.10***	0.09***		0.13***	0.07***	0.07***
		[0.02]	[0.02]	[0.02]		[0.01]	[0.02]	[0.02]		[0.01]	[0.01]	[0.01]
HFRI Fund-Weighted			0.28***	0.21***			0.18***	0.19***			0.21***	0.20***
			[0.03]	[0.03]			[0.03]	[0.03]			[0.01]	[0.01]
PE/VC Cambridge				0.08***				0.01				0.01
				[0.02]				[0.02]				[0.01]
Alpha (%)	1.38***	1.84***	1.23***	0.86***	0.93***	1.39***	1.02***	0.78***	0.83***	1.17***	0.78***	0.69***
	[0.21]	[0.21]	[0.22]	[0.26]	[0.19]	[0.19]	[0.20]	[0.25]	[0.07]	[0.07]	[0.07]	[0.09]
RMSE	0.114	0.113	0.111	0.110	0.106	0.105	0.104	0.105	0.110	0.109	0.108	0.108
Observations	3389	3389	3389	2943	3463	3463	3463	2960	28866	28866	28866	24464

▶ Large foundations outperform their estimated benchmark exposure with an estimated alpha around one percent

▶ Increasing root-mean squared error(RMSE) of larger foundations suggests increased activeness

Performance Attribution

	M Small(<$50 & ≥$10 million)				Small(<$10 & ≥$1 million)				Tiny(<$1 million)			
	Panel B: Performance Attribution CPI Adj. Assets < $50 million											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Russell 3000	0.61*** [0.00]	0.50*** [0.00]	0.47*** [0.00]	0.48*** [0.00]	0.61*** [0.00]	0.50*** [0.00]	0.48*** [0.00]	0.49*** [0.00]	0.62*** [0.00]	0.45*** [0.00]	0.42*** [0.00]	0.44*** [0.00]
BB US Agg.	0.39*** [0.00]	0.38*** [0.00]	0.30*** [0.00]	0.29*** [0.00]	0.39*** [0.00]	0.38*** [0.00]	0.31*** [0.00]	0.30*** [0.00]	0.38*** [0.00]	0.38*** [0.00]	0.30*** [0.00]	0.31*** [0.00]
MSCI ACWI ex-US		0.12*** [0.00]	0.07*** [0.00]	0.07*** [0.00]		0.12*** [0.00]	0.08*** [0.00]	0.08*** [0.00]		0.17*** [0.00]	0.12*** [0.00]	0.13*** [0.00]
HFRI Fund-Weighted			0.15*** [0.01]	0.17*** [0.01]			0.13*** [0.01]	0.16*** [0.01]			0.16*** [0.01]	0.19*** [0.01]
PE/VC Cambridge				-0.02*** [0.00]				-0.04*** [0.01]				-0.07*** [0.00]
Alpha (%)	-0.07* [0.04]	0.29*** [0.04]	0.11*** [0.04]	0.16*** [0.05]	-0.71*** [0.04]	-0.29*** [0.04]	-0.49*** [0.05]	-0.24*** [0.06]	-2.12*** [0.04]	-1.45*** [0.04]	-1.45*** [0.04]	-0.97*** [0.05]
RMSE	0.103	0.101	0.101	0.101	0.096	0.095	0.095	0.095	0.077	0.075	0.074	0.075
Observations	83812	83812	83812	70745	56916	56916	56916	46695	56026	56026	56026	47135

▶ Smaller foundations underperform their estimated benchmark exposure despite more closely tracking their estimated index exposure

Performance Persistence

Panel A: Performance Persistence Matrix					
Previous	Current Return Decile				
	(1)	(2)	(5)	(9)	(10)
(1)	22.0	11.3	5.3	11.4	19.3
(2)	10.8	14.9	8.8	9.8	8.5
(5)	5.0	8.8	14.6	6.7	4.0
(9)	10.1	9.2	7.2	16.1	12.7
(10)	17.9	8.2	4.6	13.8	26.6
Panel B: Risk-adjusted Persistence					
α^{CAPM} (%)	-0.22	-0.79**	-0.42***	0.68*	1.54***
	[0.47]	[0.39]	[0.13]	[0.37]	[0.48]
α^{FF3} (%)	-0.54	-0.94***	-0.41***	0.80**	1.62***
	[0.44]	[0.33]	[0.13]	[0.35]	[0.42]
α^{FF4} (%)	0.33	-0.11	-0.29*	0.14	0.59
	[0.49]	[0.45]	[0.15]	[0.43]	[0.55]

Back