

Doing Good and Doing It With (Investment) Style

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December 29, 2021

“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

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' returns exhibit performance persistence?

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
 - Weakening performance persistence
3. Investment management fees are positively associated with returns for large foundations
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

Related Literature and Contributions

1. Asset allocation and portfolio choice

- Brown *et al.* (2010); Dimmock (2012); Lerner *et al.* (2008);...
- Andonov *et al.* (2017); Lu *et al.* (2019); Becker & Ivashina (2015); Choi & Kronlund (2018); Di Maggio & Kacperczyk (2017); Jiang & Sun (2020); Campbell & Sigalov (2021);...

2. Performance and persistence

- Andonov *et al.* (2012); Jang & Wu (2020); Kosowski *et al.* (2006, 2007); Dahiya & Yermack (2020); Lo *et al.* (2020);...
- Busse *et al.* (2010); Agarwal & Naik (2000); Fung *et al.* (2008); Harris *et al.* (2020); Kaplan & Schoar (2005);...

3. Non-profit organizations

- Allen & McAllister (2019); Almond & Xia (2017); Andreoni (2006); Andreoni & Payne (2003); Nelson (1967);...
- Brown *et al.* (2014); Merton (1993); Tobin (1974); Campbell (2011); Aase & Bjerksund (2021); Dybvig & Qin (2019); Brown & Scholz (2019); Lindset & Matsen (2018);...

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
 - Contains an asset-weighted sample of all 990-PF filings (foundations with greater than \$10 million in investment assets are included with certainty)
- ▶ Reports the fair market value of investment asset classes enabling the calculation of investment return performance
- ▶ Sample contains less than 20 percent of foundations' filings but covers over 80 percent of the total fair market value
 - In 2016, the largest 50 foundations accounted for over 28 percent of the total asset values out of the more than 95,000 reporting foundations

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

Foundation	Inv. Assets	Asset Allocations			
		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

- ▶ 990-PF filings include only four main asset classes of government bonds, corporate bonds, equity, and alternatives
 - Includes the book value and fair market values for each asset class at the end of each foundation's fiscal year

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

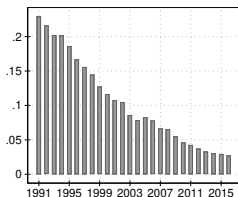
Data Sources and Sample

	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

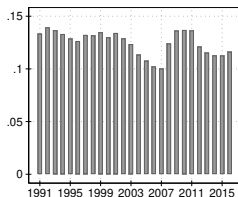
- ▶ Comparison between average and asset-weighted average shows that larger foundations hold less cash and equity than smaller foundations while investing much more in alternatives
- ▶ Larger foundations' returns outperform those of smaller foundations and show greater dependency on unrealized gains

Asset Allocation

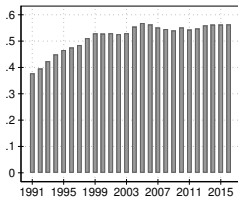
Government Bonds



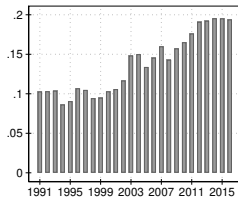
Corporate Bonds



Equity



Alternatives



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:

$$R_{it}^{Net} = R_{it}^{Gross} - \text{Fees}_{it} \quad (2)$$

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

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*** [0.05]	-0.31*** [0.05]	0.13 [0.09]	0.55*** [0.08]
Log(Age)	0.73*** [0.12]	0.61*** [0.14]	-0.58** [0.25]	-0.96*** [0.21]
Investment Fees	-0.62*** [0.10]	-0.69*** [0.10]	-2.72*** [0.21]	0.70*** [0.18]
Distributions (% Expenses)	0.02*** [0.00]	0.00 [0.00]	0.05*** [0.01]	-0.07*** [0.01]
Contributions (% Income)	-0.02*** [0.00]	-0.05*** [0.00]	-0.10*** [0.01]	0.04*** [0.01]
Log(Paid)	-0.94*** [0.15]	-0.57*** [0.19]	-2.36*** [0.44]	4.04*** [0.48]
Log(Unpaid)	-0.19* [0.11]	-1.79*** [0.12]	-1.36*** [0.21]	1.35*** [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

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

	Equity			Govt. 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 × Yield _{t-1}		-0.82*** [0.05]			0.35*** [0.03]	
Post			-0.01*** [0.00]			-0.01*** [0.00]
DY/Distributions × 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 ↓ in $R_f \rightarrow$ 1–2 percent ↑ 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. Run time series regressions for each foundations (Carhart (1997) and Fama & French (1993))

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

3. Follow the bootstrapping methodology of Kosowski *et al.* (2006)
4. Time series regression of the value-weighted return of private foundations
5. Look at performance persistence in a portfolio setting as well as in Fama-MacBeth regressions (Fama & MacBeth (1973))

Risk-Adjusted Returns

	All	Very Large	Large	Medium	Small	Very Small	Tiny
Panel A: 4-Factor Model - Kosowski <i>et al.</i> (2006)							
Percentile							
1	-13.4 0.00	-7.9 0.72	-9.4 0.43	-15.5 0.00	-15.5 0.00	-13.6 0.00	-11.1 0.00
5	-6.0 0.00	-3.6 0.99	-3.4 0.95	-5.6 0.12	-6.0 0.00	-6.1 0.00	-6.2 0.00
10	-3.6 0.00	-2.4 0.99	-2.2 0.99	-3.2 0.92	-3.4 0.00	-3.5 0.00	-4.1 0.00
25	-1.4 0.00	-1.0 0.98	-0.8 0.99	-1.1 1.00	-1.2 0.92	-1.5 0.00	-1.7 0.00
Median	0.2	0.7	0.7	0.5	0.5	0.1	-0.1
75	2.0 0.00	3.1 0.00	2.8 0.00	2.7 0.00	2.6 0.00	1.8 0.00	1.3 0.00
90	5.0 0.00	7.1 0.00	5.0 0.00	6.7 0.00	6.0 0.00	4.7 0.00	2.9 0.00
95	8.0 0.00	11.3 0.00	6.7 0.01	9.9 0.00	9.2 0.00	8.3 0.00	4.9 0.00
99	17.8 0.00	14.7 0.05	10.5 0.40	18.7 0.00	19.8 0.00	18.7 0.00	11.4 0.00
Panel B: CAPM, 3-, and 4-Factor Model							
$\alpha^{CAPM}(\%)$	1.49*** [0.52]	2.32*** [0.86]	1.24 [0.79]	1.16* [0.59]	0.52 [0.57]	-0.14 [0.54]	-1.31*** [0.50]
$\alpha^{FF3}(\%)$	0.98** [0.48]	2.12*** [0.74]	0.70 [0.76]	0.73 [0.58]	0.14 [0.51]	-0.53 [0.45]	-1.33** [0.54]
$\alpha^{FF4}(\%)$	0.71 [0.48]	1.53** [0.75]	0.68 [0.83]	0.58 [0.63]	0.22 [0.55]	-0.23 [0.52]	-0.80 [0.62]

Performance Persistence

- ▶ Building decile portfolios on prior performance provides evidence of performance persistence ([Transition Matrix](#))
 - Top decile portfolio creates positive and significant alpha in the three-factor model which disappears when accounting for momentum

Panel C: Fama-MacBeth Persistence Regressions

	Net Returns	Pre 2008	Post 2008	Size-Adjusted	60/40
$R_{t-1:t} \rightarrow R_{t:t+1}$	0.08*** [0.02]	0.11*** [0.03]	0.01 [0.04]	0.08*** [0.02]	0.08*** [0.02]
$R_{t-1:t} \rightarrow R_{t+1:t+2}$	0.16*** [0.05]	0.25*** [0.05]	0.04 [0.07]	0.15*** [0.04]	0.14*** [0.04]
$R_{t-2:t} \rightarrow R_{t:t+1}$	0.05** [0.02]	0.08*** [0.02]	-0.00 [0.03]	0.06*** [0.02]	0.06*** [0.02]
$R_{t-2:t} \rightarrow R_{t+1:t+2}$	0.11*** [0.03]	0.16*** [0.03]	0.05 [0.04]	0.12*** [0.03]	0.12*** [0.03]

- ▶ Returns of private foundations exhibit strong persistence overall, but this persistence is insignificant following the Great Recession

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
 - “Sharing of profits” → No need for disclosure (?)

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		

A Closer Look at Investment Fees

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

Description	Revenue and Expenses per Books	Net Investment Income	Adjusted Net Income	Disbursements for Charitable Purposes
TEMPORARY LABOR SERVICES	160,186			160,186
DUES, SUBSCRIPTIONS & RESOURCE	260,552	147,065		113,487
OFFICE SUPPLIES	69,107			69,107
POSTAGE AND DELIVERIES	75,277			75,277
COMMUNICATIONS-RELATED EXPENSE	246,803			246,803
HARDWARE, SOFTWARE AND WEBSITE	1,209,243	150		1,209,093
RISK MANAGEMENT	181,410			181,410
OTHER MISCELLANEOUS EXPENSES	16,226	100		16,126
EQUIP/FURN REPAIRS AND MAINT	401,427			401,427
PORTFOLIO & OTHER DEDUCT - K1		7,742,044		
CHARITABLE CONTRIB - K1				4,223

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

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

- ▶ 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	P1	P2	P3	P4	P5
Corporate Bonds	BB Aggregate Bond	0.400	0.200	0.100	0.050	0.050
Government Bonds	CRSP 10 Year Treasury	0.500	0.100	0.050	0.050	0.050
HY Corporate Bonds	ICE BofA US High Yield	0.100	0.100	0.050	0.050	0.050
Domestic Equity	Russell 3000	0.000	0.600	0.600	0.300	0.150
International Equity	ACWI	0.000	0.000	0.200	0.200	0.150
Hedge Funds	HFRIVW	0.000	0.000	0.000	0.150	0.200
Private Equity	PE Cambridge	0.000	0.000	0.000	0.100	0.150
Venture Capital	VC Cambridge	0.000	0.000	0.000	0.025	0.075
Real Estate	NCREIF	0.000	0.000	0.000	0.050	0.075
Commodities	GSCI	0.000	0.000	0.000	0.025	0.050
Expected Return		0.059	0.076	0.072	0.076	0.082
Standard Deviation		0.040	0.108	0.141	0.127	0.123

1. Draw from $\mathcal{N}(\mu, \Sigma)$
2. Unsmooth illiquid returns following Getmansky *et al.* (2004)
3. Risk \uparrow with % of equity, but alts add diversification

Spending Rate and Capital Preservation

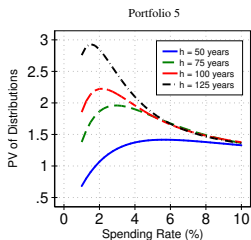
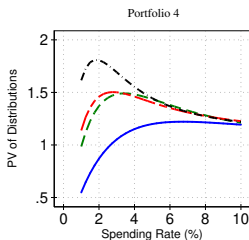
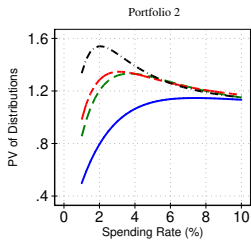
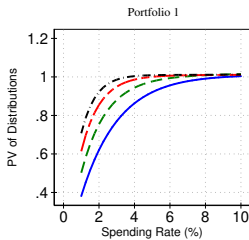
Wealth dynamics:

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

	Portfolio I		Portfolio II		Portfolio III		Portfolio IV		Portfolio V	
	$h = 25$	100	$h = 25$	100	$h = 25$	100	$h = 25$	100	$h = 25$	100
5 th	0.62	0.21	0.32	0.21	0.19	0.05	0.34	0.13	0.40	0.26
25 th	0.74	0.37	0.65	0.49	0.45	0.14	0.61	0.51	0.79	1.18
50 th	0.86	0.49	1.02	0.92	0.82	0.32	1.07	0.97	1.30	2.20
75 th	0.98	0.66	1.56	1.64	1.43	0.69	1.68	1.85	2.00	4.69
95 th	1.17	1.05	2.35	5.08	2.37	2.88	2.85	7.46	3.23	17.93
$\mathbb{E}(W_T)$	0.87	0.54	1.16	1.43	1.00	0.69	1.26	1.83	1.57	4.82
$P(W_T < 1)$	0.80	0.94	0.46	0.54	0.58	0.82	0.45	0.52	0.35	0.21

- ▶ 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



Discussion on Optimal Spending Policy

- ▶ The optimal spending rate to maximize the present value of a foundation's charitable distributions is approximately two percent
 - This reduced spending rate allows foundations to increase their real principal base over time which can be used to sustain higher levels of real giving
- ▶ A reduced spending rate enables greater flexibility to foundations' decision on longevity depending on their philanthropic goals
 - Would not necessarily result in a dramatic decrease in short-term charitable giving as most foundations already give in excess of the current benchmark
- ▶ We assume a constant discount rate in our analysis, but it is rational for foundations to spend more depending on the urgency of their philanthropic mission

Conclusions and Implications

- ▶ 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
- ▶ The asset allocation of private foundations has shifted towards increasingly risky assets in response to accommodating monetary policy
- ▶ Private foundations exhibit positive risk-adjusted returns that is driven by larger foundations and the time period preceding the Great Recession
- ▶ Investment fees are positively associated with returns for larger foundations, especially those related to internal wages
- ▶ A spending rate closer to two percent creates a more flexible benchmark that maximizes the present value of foundations' charitable distributions

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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%

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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				Large				Medium			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CRSP VW	0.65*** [0.01]	0.53*** [0.02]	0.45*** [0.02]	0.45*** [0.03]	0.67*** [0.01]	0.56*** [0.02]	0.52*** [0.02]	0.54*** [0.03]	0.63*** [0.00]	0.55*** [0.01]	0.49*** [0.01]	0.50*** [0.01]
Gvt. Bonds	0.05* [0.03]	0.11*** [0.03]	0.09*** [0.03]	0.09*** [0.03]	0.02 [0.03]	0.08*** [0.03]	0.07** [0.03]	0.05 [0.03]	0.07*** [0.01]	0.12*** [0.01]	0.10*** [0.01]	0.10*** [0.01]
BB Aggregate	0.30*** [0.03]	0.23*** [0.04]	0.10*** [0.04]	0.12*** [0.04]	0.32*** [0.03]	0.24*** [0.03]	0.18*** [0.04]	0.19*** [0.04]	0.29*** [0.01]	0.24*** [0.01]	0.14*** [0.01]	0.13*** [0.01]
ACWI ex-US		0.13*** [0.02]	0.05** [0.02]	0.04* [0.03]		0.13*** [0.02]	0.09*** [0.02]	0.07*** [0.03]		0.09*** [0.01]	0.03*** [0.01]	0.03*** [0.01]
HFRI Fund-Weighted			0.31*** [0.04]	0.22*** [0.05]			0.15*** [0.04]	0.15*** [0.05]			0.23*** [0.01]	0.26*** [0.02]
PE/VC Cambridge				0.08*** [0.02]				-0.01 [0.02]				-0.03*** [0.01]
α (%)	0.77*** [0.22]	1.58*** [0.25]	1.31*** [0.25]	0.86*** [0.32]	0.53** [0.21]	1.32*** [0.25]	1.21*** [0.25]	0.98*** [0.32]	0.35*** [0.07]	0.90*** [0.08]	0.72*** [0.09]	0.88*** [0.11]
RMSE	0.117	0.116	0.115	0.115	0.115	0.114	0.114	0.114	0.116	0.116	0.115	0.114
Observations	3078	3078	3078	2680	3161	3161	3161	2709	26590	26590	26590	22627

Performance Attribution

	M Small				Small				Tiny			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CRSP VW	0.62*** [0.00]	0.55*** [0.00]	0.51*** [0.00]	0.53*** [0.00]	0.63*** [0.00]	0.56*** [0.00]	0.53*** [0.01]	0.55*** [0.01]	0.65*** [0.00]	0.51*** [0.00]	0.48*** [0.00]	0.51*** [0.01]
Gvt. Bonds	0.09*** [0.01]	0.13*** [0.01]	0.11*** [0.01]	0.11*** [0.01]	0.11*** [0.01]	0.15*** [0.01]	0.14*** [0.01]	0.13*** [0.01]	0.15*** [0.00]	0.22*** [0.00]	0.20*** [0.00]	0.22*** [0.01]
BB Aggregate	0.29*** [0.01]	0.24*** [0.01]	0.17*** [0.01]	0.16*** [0.01]	0.26*** [0.01]	0.21*** [0.01]	0.17*** [0.01]	0.16*** [0.01]	0.19*** [0.01]	0.11*** [0.01]	0.06*** [0.01]	0.06*** [0.01]
ACWI ex-US		0.08*** [0.00]	0.03*** [0.00]	0.02*** [0.00]		0.08*** [0.00]	0.05*** [0.01]	0.04*** [0.01]		0.16*** [0.00]	0.12*** [0.00]	0.13*** [0.01]
HFRI Fund-Weighted			0.17*** [0.01]	0.23*** [0.01]			0.11*** [0.01]	0.19*** [0.01]			0.14*** [0.01]	0.18*** [0.01]
PE/VC Cambridge				-0.05*** [0.00]				-0.08*** [0.01]				-0.11*** [0.01]
α (%)	-0.58*** [0.04]	-0.08* [0.05]	-0.17*** [0.05]	0.11* [0.06]	-1.30*** [0.04]	-0.76*** [0.05]	-0.80*** [0.05]	-0.27*** [0.07]	-2.83*** [0.03]	-1.75*** [0.04]	-1.64*** [0.04]	-0.83*** [0.06]
RMSE	0.107	0.106	0.106	0.106	0.098	0.098	0.098	0.098	0.074	0.073	0.073	0.073
Observations	79981	79981	79981	67611	52497	52497	52497	43357	52925	52925	52925	44677

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 [0.47]	-0.79** [0.39]	-0.42*** [0.13]	0.68* [0.37]	1.54*** [0.48]
α^{FF3} (%)	-0.54 [0.44]	-0.94*** [0.33]	-0.41*** [0.13]	0.80** [0.35]	1.62*** [0.42]
α^{FF4} (%)	0.33 [0.49]	-0.11 [0.45]	-0.29* [0.15]	0.14 [0.43]	0.59 [0.55]