Doing Good and Doing It With (Investment) Style

Matteo Binfarè Kyle E. Zimmerschied *

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Abstract

We study the asset allocation, spending behavior, fees, and investment performance of U.S. private foundations. We find that large foundations generate positive risk-adjusted returns of about one percent per year. Larger and more sophisticated foundations perform better and invest more aggressively. Foundations with concentrated stock holdings have higher returns but also take on more risk. Because of the constraints imposed by the five percent minimum spending rule and accommodating monetary policy, private foundations increase their risk-taking and reach for yield. Due to these constraints, a conservative asset allocation will decrease real wealth over time resulting in less charitable giving.

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Private foundations play an increasingly important role in modern society. With total assets of about $900 billion in tax year 2016, private foundations distributed nearly $65 billion to support charitable objectives.[1] While the number of private foundations has steadily increased over the past 20 years, just over 1,000 foundations make up 63 percent of total assets and 50 percent of charitable dollars.[2] To support their operating programs and their charitable spending, private foundations rely heavily on their investment portfolios. As private foundations are required to pay out a minimum of five percent of their average fair market value of net investment assets each year and most do not engage in fund-raising activities, their survival hinges on the investment performance of their endowments. Surprisingly, little is known about private foundations' investment performance, asset allocation decisions, and spending behavior.

This paper provides the first detailed study of the investment performance, fees, and payout policies of U.S. *private* foundations. Do private foundations outperform benchmarks? What factors drive investment performance and asset allocation decisions? What are the implications for spending policy and capital preservation? Unlike other nonprofit organizations, private foundations must pay out five percent of their investment assets each year. This unique feature creates a tight link between investment performance and the ability of foundations to survive and meet their charitable goals. In this paper we seek to answer these questions and provide a framework for improved recommendations in the nonprofit charitable sector.

We draw on data from the Internal Revenue Services (IRS) from 1991 to 2016 and provide evidence that larger foundations have delivered positive risk-adjusted returns. This result is consistent with sophisticated institutional investors being able to identify better investment opportunities and being at the forefront of investments in new asset classes (Barber & Wang, 2013; Binfarè et al., 2022; Heutel & Zeckhauser, 2014; Lo, Matveyev, & Zeume, 2021; Salamon, 1993). We document time variation in alphas and help contextualize recent findings on the underperformance of the nonprofit sector, especially in the aftermath of the Great Recession (Dahiya & Yermack, 2021). As asset allocation decisions are a critical component of an investor's overall risk-taking attitude and future returns, we document a shift towards riskier assets such as public equity and alternative investments (Gilbert & Hrdlicka, 2015; Hooke, Yook, & Chu, 2018; Lerner, Schoar, & Wang, 2008). Consistent with changing preferences towards risk and distortions created by the required minimum

[1] Private foundations comprised 16 percent of the $390 billion donated to U.S. charities in 2016 (Giving USA, 2017).

[2] There are 1,123 private foundations with more than $100 million in total assets. The vast majority of private foundations (87,625, or 87 percent) hold less than $10 million in total assets and account for about 19 percent of total grants paid.

spending rule and accommodating monetary policy, we find that foundations "reach for yield" and increase their allocation to risky assets (see Campbell & Sigalov, 2021; Crook, 2012). Using novel data on investment fees, we document significant heterogeneity in the effect of fees on investment return performance with internal (external) investment fees corresponding to positive (negative) future returns. Finally, we link asset allocation decisions to the ability of foundations to sustain spending and to maintain the real value of their corpus in future periods.

Private foundations are independent legal entities that support charitable giving across the nonprofit sector in the United States. Besides being a solid source of income for nonprofit organizations, private foundations manage substantial assets to generate investment income. They are also relatively unconstrained long-term investors with the desire to spend their corpus in perpetuity.[3] The liability structure of private foundations differs markedly from pension funds, where plan beneficiaries represent liabilities that must be met over time. Moreover, private foundations often receive their original wealth from successful families or individuals in the form of stocks, which makes them less diversified than other institutional investors, such as university endowments. Private foundations also differ from sovereign wealth funds (SWF) which rely on natural resources, trade-surpluses, or state-owned asset sales (Bernstein, Lerner, & Schoar, 2013). Private foundations rely heavily on their endowment investment income to meet the five percent required spending rule each year and to maintain the real value of their corpus because they seldom engage in fund-raising activities or receive government support. In contrast, most colleges and universities in the United States rely on a mix of government grants and contracts, tuition and fees, investment returns, and private gifts and grants to support their operating budgets. Finally, private foundations contribute to the efficient allocation of philanthropic capital between donors and charitable entities (Allen & McAllister, 2019; Andreoni & Payne, 2003), and they provide a credible signal to donors of the potential for charities to achieve their missions (Andreoni, 2006). These unique features speak to the importance of a comprehensive study of private foundations' performance, asset allocation, and payout policies.

There is little research to date on the investment performance of private foundations, mostly due to the lack of high-quality data.[4] In this paper, we provide an estimate of the investment performance of private foundations, which file Form 990-PF with the IRS. We rely on the Statistics

[3] According to Salamon and Voytek (1989), 98.1 percent of private foundations have no scheduled termination date.

[4] Nonprofit organizations filing forms 990 are now required to file Schedule D, which contains data on endowment funds, investment earnings, fees, and market values. This data is only available starting in fiscal year 2009 (is available in XML format starting in 2011), and only covers public charities under Section 501(c).

of Income (SOI) division of the IRS, which compiles balance sheet and income statement information from Form 990-PF since 1985.[5] We collect data on dividends and interests from securities, net capital gains (or losses) from the sale of assets, contributions, distributions, expenses, and a breakdown of investment assets and liabilities for the universe of private foundations in the United States. Because we cannot observe unrealized capital gains (or losses) we estimate total returns using changes in net asset values (NAV) unrelated to charitable inflows and outflows.[6]

We first document that a small number of private foundations comprise a large share of the total assets in the sector. The average (median) foundation has \$37 million (\$5.5 million) in total assets, while total assets are about \$3.5 billion on an asset-weighted basis. The median contribution to a private foundation is zero, which indicates private foundations do not rely on external gifts, but instead are largely dependent on their investment return to meet their spending goals. Distributions to charitable sectors represent on average six percent of assets and about three fourths of total expenses. We also document that private foundations have, on average, strong investment performance. This outperformance comes from different sources, such as investment income, unrealized capital gains, or lower fees. The large heterogeneity we observe in investment performance likely stems from a combination of asset allocation decisions and the ability to select high-performing managers. We document a shift towards riskier assets, in particular alternative investments for large private foundations, and a steady decline in fixed-income investments such as government bonds. For example, foundations with more than \$500 million in total assets more than quadrupled their allocation to alternatives from 1991 to 2016. This is consistent with recent trends in alternative asset investments (Gilbert & Hrdlicka, 2015; Healey & Hardy, 1997; Lerner, Schoar, & Wang, 2008)

The importance of strategic asset allocation on investment performance has been well documented. Ibbotson and Kaplan (2000) show that asset allocation explains about 90 percent of the time series variability of returns but only about 40 percent of their cross-sectional variation. We document that larger foundations are associated with higher allocations to risky assets, such as public equity and alternatives. Interestingly, as private foundations age, their share of capital allocated to public equity decreases. This is consistent with private foundations receiving initial endowments in the form of common stock from wealthy families and later seeking diversification across asset classes.

[5]Our analysis focuses on the period from 1991 to 2016. Data before 1991 is sparse, and we drop those observations from our sample.

[6]We validate our measure of estimated returns against a sample of the audited financial statements of the 29 largest foundations and find our return measure using the 990-PF filings almost perfectly mirrors returns computed using audited financial statements. See Table A.1 for details.

Increased investment sophistication also explains trends in asset allocation: foundations with larger teams of highly paid individuals are associated with larger allocations to alternatives.

We explore one channel for the increased risk-taking behavior of private foundations over time. As most foundations seek to live in perpetuity, the task of spending five percent of their corpus each year while maintaining their real principal value becomes increasingly challenging, especially for those foundations relying on a constant income stream to support their charitable goals. We show that private foundations are more likely to "reach for yield" when conservative asset allocation policies are not sufficient to cover distributions without eroding their principal.

More importantly, our data also allow us to study the investment performance of the universe of private foundations. First, we attribute a large share of return variability to asset allocation to domestic and international equity, fixed income, and hedge funds. However, larger foundations seem to carry out more active investment programs, as their returns cannot be fully explained by these benchmark indices. On a risk-adjusted basis, foundations with more than $500 million in total assets generate alphas ranging from 100 to 180 basis points per year. On the other hand, smaller foundations do not generate alphas, on average. We document time variation in alphas and stress the importance of analyzing longer time periods to capture this variation and provide more precision in estimating factor exposure. Second, we show that investment performance exhibits some persistence over time, and this persistence is likely a feature of each foundation's strategic asset allocation and ability to consistently select better investments. In Fama-MacBeth regressions we show that persistence disappears after the 2008 Great Recession. Finally, we examine how private foundations' asset values are expected to change in future periods by conducting a simulation across a range of various asset allocation strategies. Our results indicate that under the current five percent spending rule and inflation rate, conservative portfolios cannot sustain the real value of foundations' principals over time.

Our paper contributes to the vast literature on the investment performance of institutional investors and the effect of fees on performance. For example, Andonov, Bauer, and Cremers (2012), Jang and Wu (2020), and Kosowski, Naik, and Teo (2007) look at the performance of public pension funds, corporate pension plans, and hedge funds, respectively. Dahiya and Yermack (2021) and Lo, Matveyev, and Zeume (2021) study the investment returns of nonprofit endowment funds in the U.S. over the 2009 to 2018 period. While their studies use novel data on endowment funds and their investment earnings from the IRS, this data was only required since 2009.[7] In contrast, our data

[7]Using a maximum of ten years worth of annual reporting data to estimate risk-adjusted returns is problematic given the large uncertainty in factor exposure estimates at the foundation level.

covers private foundations (which file Form 990-PF) and is available for about 30 years. Similar to Dahiya and Yermack (2021), we find that private foundations underperform between 2009 and 2016, which is consistent with the challenges faced by institutional investors to outperform in the new world of equity bull markets, accommodating monetary policies, and low volatility. We also use novel data on the fees paid by private foundations from 2009 to 2018 and examine the link between fees and performance (Carhart, 1997; Fama & French, 2010; Grossman & Stiglitz, 1980; Jensen, 1968; Servaes & Sigurdsson, 2018). We document a negative association between investment fees and future investment performance overall and find a positive link between internal fees (e.g., investment wages) and investment returns.

With regard to asset allocation decisions, we document the shift in asset allocation towards alternatives, consistent with Barber and Wang (2013), Binfarè et al. (2022), Brown, Garlappi, and Tiu (2010), Brown (1999), Dimmock (2012), Gilbert and Hrdlicka (2015), and Lerner, Schoar, and Wang (2008). Chambers, Dimson, and Kaffe (2020) also document university endowments' large strategic moves into equities and, later, into alternatives. In contrast to the findings of Markowitz (1952) and modern portfolio theory, we find that over 10 percent of the largest private foundations hold more than 30 percent of investment assets in a single stock. Private foundations provide a unique laboratory to study the implications of concentrated holdings on investment returns. We find that foundations with concentrated holdings have higher net returns of 160 basis points; however, concentration results in a significantly lower Sharpe Ratio. This result is consistent with (undiversified) concentrated bets bearing substantial idiosyncratic risk within a portfolio.

Portfolio choices could also arise because of *reaching for yield* behavior by institutional investors or individuals. Campbell and Sigalov (2021) theoretically show that reaching for yield (risk-taking when interest rates decline) results from imposing a sustainable spending constraint on an infinitely-lived investor. Private foundations, which seek to operate in perpetuity and must pay out five percent of their fair market value of net investment assets each year, represent the perfect laboratory to study the reach for yield channel. Our findings suggest that private foundations increase their allocations to risky assets when interest rates decline, especially so when (fixed) income (e.g., dividends and interests) covers a larger share of their distributions. We contribute to the vast literature on reaching for yield in the context of pensions funds (Andonov, Bauer, & Cremers, 2017; Lu et al., 2019), individual investors (Kent, Garlappi, & Xiao, 2021; Lian, Ma, & Wang, 2019), and other financial intermediaries (Becker & Ivashina, 2015; Choi & Kronlund, 2018; Crook, 2012; Di Maggio & Kacperczyk, 2017; Jiang & Sun, 2020).

Finally, we add to the sparse literature on nonprofit organizations, their grantmaking decisions and charitable giving (Allen & McAllister, 2019; Almond & Xia, 2017; Andreoni, 2006; Schmitz, 2021), management of foundation assets (Nelson, 1967; Salamon, 1993; Salamon & Voytek, 1989), their spending behavior (Brown et al., 2014; Halem et al., 2022; Merton, 1993; Tobin, 1974), and compensation of nonprofit executives (Babenko, Bennett, & Sen, 2021; Binfarè & Harris, 2022). Campbell (2011) and the prevailing thought within the endowment community have claimed that it is sustainable for infinitely-lived investors to spend the average return on invested principal. We emphasize the importance of private foundations seeking to live in perpetuity to spend strictly less than their average return on invested principal in accordance with the findings of Aase and Bjerksund (2021) and Dybvig and Qin (2019). Connected to this finding, we examine alternatives to the mandated five percent distribution rule which would allow private foundations to maximize the present value of their charitable distributions(Brown & Scholz, 2019; Lindset & Matsen, 2018). Since private foundations directly support public charities, their spending plays a crucial role in promoting social welfare (e.g., increased access to education, healthcare, and poverty eradication). Our work adds to the growing literature on Environmental, Social, and Governance (ESG) and the non-pecuniary benefits investors derive from investing for the greater good (Aragon et al., 2020; Barber, Morse, & Yasuda, 2021; Bauer, Koedijk, & Otten, 2005; Hartzmark & Sussman, 2019; Riedl & Smeets, 2017).

1 Institutional Background

1.1 Definition and Objectives

A private foundation is an independent legal entity that provides a vehicle for charitable giving. Private foundations begin with a gift from an individual donor, family, or corporation. After their founding, foundations rely primarily upon investment returns of principal to provide support in the form of grants to public charities. The structure of private foundations is an appealing means for families or corporations to conduct their altruistic efforts by allowing greater control of the timing and use of donations while creating a perpetual giving vehicle to advocate for specific causes. Private foundations are often designated to provide inter-generational support to their charitable efforts. Similar to public corporations, private foundations feature a board of directors and trustees to provide oversight to the organization and a mission statement to provide clarity and focus to a foundation's objectives.[8]

1.2 Tax Status

Private foundations are classified as 501(c)(3) organizations by the IRS and are primarily tax-exempt. Contributions to private foundations are tax-deductible up to 30 percent of adjusted gross income for cash contributions, 20 percent of adjusted gross income for non-cash, while donated appreciated stock (publicly traded stock held for more than one year and not subject to any resale restrictions) receives a deduction equal to the stock's fair market value.[9] Private foundations are required to file the IRS Form 990-PF, a publicly disclosed document used for tax filing purposes, which is intended to improve the transparency of the financial structure and investment performance of private foundations. There is a significant possibility of excise tax penalties for private foundations that invest alongside donors, related foundation entities, or "self-deal".[10] These restrictions along with the restriction on speculative and unsuitable investments seek to promote the integrity of foundations' business dealings.

1.3 Investment Objectives and Asset Allocation

1.3.1 Returns and Payout Policies

In general, smaller foundations are more dependent on gifts and contributions from outside donors than larger foundations. Many larger foundations receive minimal contributions from outside donors making them almost completely dependent on their investment performance to sustain their principal of invested assets over time. Private foundations operate under the constraint that they must pay out five percent of their average fair market value of net investment assets annually or are subject to a 30 percent excise tax on the unpaid amount. Foundations can distribute in excess of five percent of the average fair market value of net investment assets, in a given year, and carry forward

[8]For example, the Bill and Melinda Gates Foundation's mission statement specifies its focus to help all people lead healthy, productive lives through the advancement of health systems, poverty alleviation, and educational opportunities (www.gatesfoundation.org).

[9]For tax years beginning on or before December 20, 2019, private foundations were subject to a one to two percent excise tax on net investment income (the amount by which the sum of gross investment income and capital gain net income exceeds the allowable deductions for an organization) which has since been lowered to 1.39 percent(www.irs.gov/charities-non-profits/private-foundations/).

[10]The Tax Reform Act of 1969 was passed to limit the use of private foundations for personal gain rather than philanthropic purposes (Worthy, 1975).

this excess distribution for up to five years. But this five percent rate of mandated distributions places a lower bound on the necessary investment return rate of foundations to retain their nominal principal balance without other donor contributions.[11]

1.3.2 Asset Classes and Allocation

The high investment return rate of eight percent necessary for foundations to maintain their real principal along with their desire to minimize overall portfolio risk has led many private foundations to invest an increasing amount in private and alternative assets. This shift in asset allocation has resulted in many larger foundations reducing their allocation to U.S. public equity, non-U.S. equity, and fixed income. The Rockefeller Foundation, which was incorporated in 1913, is just one example of a private foundation exploiting its indefinite investment horizon to take advantage of the illiquidity premium obtained through investing in private and alternative asset classes.[12]

Another important feature constraining optimal asset allocation is that private foundations might make asset allocation decisions for personal and charitable reasons instead of seeking to maximize their risk-adjusted return. These investment decisions driven by goodwill and philanthropy rather than analytical due diligence provide a greater danger of foundations failing to sustain and grow their invested principal over time. The McKnight Foundation, founded in 1953 by 3M executive William L. McKnight and his wife Maude L. McKnight, specified a five percent asset allocation to 3M stock in 2016 due to the company's origins in helping create the foundation. Additionally, the McKnight Foundation included a ten percent "Carve Out" of investment principal for its Impact Investing Program to use its assets to "support its mission, enhance its credible influence, drive programmatic learning, and impact key philanthropic priorities."

[11] Mark Anson, President and CEO of Commonfund, an institutional asset management company for private foundations, estimates the necessary rate of return to retain a foundation's real endowment assets might lie closer to eight percent after accounting for distributions, inflation, and investment management costs (https://www.commonfund.org/hubfs/Research-Center/Press-Releases/2018-CCSF-Press-Release.pdf).

[12] In 2016, the Rockefeller Foundation had a total fair value of investments of $4.02 billion with nearly 60 percent invested in alternative assets.

2 Data and Measurement

2.1 Sample

We download all 990-PF statements filed by private foundations with the Internal Revenue Service (IRS) which are made available through the IRS' Statistics of Income (SOI) division. These include an asset-weighted sample of all private foundation 990-PF filings for a given fiscal year. The SOI 990-PF filings include every reporting foundation with more than $10 million in fair market value of total assets and a sampling of foundations below this threshold that are selected with a sampling rate decreasing in their total asset value.[13] As originally analyzed in Heutel and Zeckhauser (2014), we use this subset of 990-PF filings as it includes the fair market value of investment asset classes allowing us to compute the true investment return of private foundations consisting of both realized and unrealized gains. While this sample comprises less than 20 percent of private foundations, it represents more than 80 percent of the total fair market value. For fiscal year 2016, the largest 50 private foundations accounted for over 28 percent of the total asset values of the more than 95,000 reporting private foundations.

Table 1 provides a general summary of the universe of reporting foundations, total asset values, and distributions over time. The number of reporting foundations has increased at a cumulative average growth rate of nearly six percent from 1991 to 2016. The entry of private foundations into the sample reflects both the creation of new private foundations and an increasing number of private foundations crossing the sampling threshold of $10 million in total assets to now have a certain chance of being included in the sample. Similarly, the exit of private foundations from the sample captures both private foundations that have ceased operations and foundations that have not been selected as part of the SOI's sample of private foundations. The creation of private foundations occurs more frequently during periods of economic growth that followed recessionary periods such as 2003 and 2008 to 2010 while private foundations exit the sample during periods of negative investment returns.

We begin with 276,877 annual foundation filings from fiscal years 1985 to 2016 of private foundations with positive total asset values at the beginning and end of each fiscal year and non-negative fair market asset allocations to government debt, corporate stock, corporate bond, and alternative investments. We restrict our analysis to foundations reporting for fiscal years 1991 to

[13] Conditional on a foundation below this threshold being selected through the stratified random sampling process, it appears to have a greater chance of being selected again. For smaller foundations appearing more than once in the SOI data, we observe close to 80 percent of filings with missingness that appears random.

2016 due to data validity concerns of returns data preceding 1991 which leaves us with a sample of 271,047 observations. To validate the inclusion of returns data of the sample of firms from 1991 to 2016, we compile annual returns data for individual stocks from CRSP over this period. To account for foundations that invest predominantly in only one security due to a gift of corporate stock to create the foundation, (e.g., Lilly Foundation) we include only private foundations reporting returns that fall between the 10th and 90th percentile of all stocks in CRSP each year. This results in a return measure for 233,472 observations.[14] To facilitate the comparison of private foundations' return performance and growth across time and size buckets, we create an inflation-adjusted measure of the fair market value of total assets using CPI data from the Federal Reserve Bank of St. Louis.

Figure 1 displays the growth of the universe of private foundations' total assets, fair value of investment assets, and distributions over time. The growth of private foundations' assets over time reflects both the growth in asset valuations due to their investment performance and donor contributions to existing and newly-created private foundations. The ratio between total assets and investment assets remains relatively constant during the sample reflecting the persistence of foundations' investment policy statements over time and the shift within investment asset classes rather than to cash. The steady growth of distributions outpacing inflation reflects that foundations' real principal growth has increased their required distributions.

Table 2 presents descriptive statistics on consolidated data of the fair and book value of asset valuations, contributions, and distributions. The average (median) foundation has nearly \$37 million (\$5.5 million) in total assets, while total assets stand at about \$3.5 billion on an asset-weighted basis. Many foundations are dependent upon their investment performance alone to sustain themselves, as evidenced by the minimal contributions to the foundations within our sample. Distributions as a percentage of the average fair market value of assets taking values close to five percent reflects that most foundations closely seek to meet their required distributions without use of the carry-forward provision. For comparison, higher education institutions participating in the 2016 NACUBO-Commonfund Study of Endowments (NCSE) reported an average spending rate of 4.3 percent, a median gift of \$2.8 million, and that 9.7 percent of their operating budget is funded by their endowment.

[14] Heutel and Zeckhauser (2014) trim observations that fall outside of plus or minus 50 percent of the return on the S&P500 each year.

2.2 Asset Allocation

The asset allocation of private foundations plays an important role in supporting foundations' charitable giving and their long-term sustainment. Investment assets are classified into four asset groups on the Form 990-PF: government debt, corporate debt, corporate stock, and other investment assets (e.g., alternative investments). From 1991 to 2016, the asset allocation of private foundations has shown significant increases in weighting to higher yielding asset classes of equity and alternatives at the expense of fixed income. Private foundations' allocation to government debt has fallen from 22 percent in 1991 to just 2 percent in 2016 due to the declining yields of U.S. treasury debt over time (see Figure 2). This shift away from fixed income is due to the necessity of foundations to reach a nominal return target of around eight percent to make distributions of five percent and offset inflation and other investment expenses without reducing their real principal.

Another important feature constraining the asset allocation of private foundations from solely investing in equity and alternative investments is their need to maintain enough liquidity to make supporting distributions throughout the year. The McKnight Foundation in its 2019 audited financial statement specified a majority of the endowment assets should be placed in investments having liquidity of less than 30 days, and the foundation targeted a 12 percent allocation to highly liquid fixed income and cash investments. Panel A of Table 3 and Table A.2 provide a breakdown of asset allocation across all private foundations and years conditional on inflation-adjusted size. The results in Table A.2 show the asset allocation to cash and government bonds increases only slightly as foundation size decreases due to foundations' similar liquidity needs. After weighting in a foundation's allocation to cash, government bonds, and corporate bonds, a significant gap emerges between the amount invested by the largest foundations (20 percent) and the smallest foundations (27 percent). The decreased allocation of the largest foundations to "safe" investments enables them to invest more in "risky" assets providing higher yields through greater exposure to equity and alternative investments than smaller foundations. Another interesting trend that arises within asset allocation conditional on size is the largest foundations have lower allocations to equity than smaller foundations. This result stems from foundations above $50 million in total assets having greater exposure to alternatives than foundations below this threshold due to larger foundations' scale, sophistication, and willingness to bear the illiquidity of alternative assets.

2.3 Investment Performance

To study the investment performance of private foundations we estimate total gross returns as:

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

where the gross investment income for a private foundation i at time t is calculated as the change in net assets from period $t-1$ to period t minus contributions made by the foundation in the last fiscal year, plus distributions and operating expenses paid by the foundation in the last fiscal year.[15,16] The net investment income for a private foundation is the gross investment income less any operating and administrative expenses for compensating investment employees, fees, taxes, and other applicable investment expenses. These include investment consulting, custody, and manager fees, as well as fund expenses and portfolio deductions from the Schedule K-1.[17] The gross and net investment return percentage performance are created by dividing the gross and net investment income by a private foundation's fair value of investment assets at the beginning of the fiscal year adjusted for half of contributions and distributions (Dahiya & Yermack, 2021).

To validate our measure of net returns estimated from Equation 1, we sample 29 of the largest private foundations and compute net returns using their audited financial statements. Table A.1 compares the investment returns computed using the audited financial statements versus the 990-PF. Our return methodology using the 990-PF accurately replicates the audited financial statements which allows us to study the comprehensive universe of private foundations.

Panel B of Table 3 provides detailed information of the investment performance of private foundations. We also decompose total returns into dividend yields and capital gains (both realized and unrealized). The average (annual) net investment return is 8.31 percent, while the average asset-weighted return is 10.09 percent. As a comparison, the average net investment return for the

[15]This change in net assets from period $t-1$ to period t is equivalent to the increase in the fair value of investment assets from period $t-1$ to period t less the increase in the book value of liabilities from period $t-1$ to period t.

[16]The main measure of return performance we use is an approximation of the true return for a private foundation as the timing of a foundation's investment cash inflows and outflows are not reported on the IRS Form 990-PF. We assume that contributions and distributions occur mid-year, but our returns analysis is robust to adjusting for contributions occurring in the beginning of the year and distributions occurring at the end of the year which negatively biases our return measure.

[17]Some private foundations do not disclose investment management fees as a separate item, as those are subtracted from net capital gains and/or from the fair value of investment assets at the end of the year. Our measure would capture the net effect of investment fees on returns in either case.

universe of institutions reporting to NACUBO over the same time period is 8.30 percent, while the average asset-weighted return is 10.16 percent. Larger foundations significantly outperform smaller foundations in addition to paying a smaller proportion of investment fees as a fraction of AUM. In fact, the average foundation pays investment management fees of 81 basis points compared to an asset-weighted average of 59 basis points. After accounting for portfolio risk, the largest foundations also significantly outperform the smaller foundations as the average asset-weighted Sharpe ratio of 0.76 surpasses the equal-weighted average of 0.68. The asset-weighted results also confirm that the largest foundations rely less on dividend-paying investments but instead are more dependent on unrealized appreciation. Figures A.1 and A.2 in the Appendix show the evolution of total net returns, dividend yields, realized and unrealized gains, investment fees and Sharpe Ratios over time.

3 Asset Allocation Decisions of Private Foundations

Asset allocation decisions have been a major driver of asset growth and increased investment sophistication for many institutional investors such as private foundations and university endowments. There are four important reasons why asset allocation policies matter in the context of private foundations. First, asset allocation decisions are a key ingredient of portfolio total returns (Brinson, Hood, & Beebower, 1986; Brinson, Singer, & Beebower, 1991). Second, many private foundations receive their initial endowment from a single individual or family in the form of common stock, therefore increasing concentration risk during the first few years of a foundation's life.[18] Third, there is a tight link between a foundation's liquidity needs, fundraising, spending policy, and asset allocation decisions. Fourth, the fact that foundations must spend five percent of their fair market value of investment assets each year induces risk-taking behaviors, more so when interest rates are low.

To investigate the asset allocation choices of private foundations we estimate the following baseline model:

$$Y_{it} = \lambda_t + \gamma \mathbf{X}_{it} + \varepsilon_{it} \tag{2}$$

where Y_{it} represents the allocation to an asset class as a percentage of the book value of investment assets (i.e., the ratio of the book value of corporate bonds to the book value of total investment assets). We use book values to better approximate changes in strategic asset allocations, rather

[18] For instance, the Ford Foundation held 92,697,240 shares of Ford Motor in 1955. These represented 83.4% of the outstanding Ford Motor stock and 100% of the foundation's initial holdings (see Nelson, 1967)).

than changes in fair values which are driven by market conditions. λ_t represents fiscal year fixed effects to control for macroeconomic shocks to all foundations. X_{it} is a vector of controls which includes the natural logarithm of a foundation's assets, the natural logarithm of a foundation's age, fees (as a percentage of investment assets), distributions from the foundations and contributions to the foundation, the natural logarithm of one plus the number of employees whose pay is greater than fifty thousand dollars, and the natural logarithm of one plus the number of unpaid directors and trustees.

Table 4 presents results across the four main investment asset classes. Columns (1) and (2) examine the asset allocation to fixed income securities, namely government bonds and corporate bonds. Results across the two columns are quite similar: As a foundation ages, the share of assets allocated to fixed income increases, perhaps indicating more diversification out of individual equity holdings. Moreover, more investment fees and expenses correlate with lower asset allocations to bonds, while greater investment team sophistication as proxied by the number of highly paid individuals is associated with lower asset allocation to corporate bonds. Looking at risky assets, columns (3) and (4) study the asset allocation to equity and alternative investments. Column (4) finds that larger foundations invest more in alternatives; however, fees increase with the share of assets allocated to alternatives, while the opposite is true for equity, suggesting that investment programs that rely more heavily on alternative assets are more expensive. As distributions as a percentage of total expenses increase, so does the asset allocation to equity, perhaps reflecting the higher need for liquid assets. Finally, staff sophistication seems to go hand in hand with an increased allocation to alternative assets and a decreased allocation to publicly traded equity.

3.1 Reach for Yield by Private Foundations

Portfolio choices could also arise because of reaching for yield behavior by institutional investors or individuals. Campbell and Sigalov (2021) theoretically show that reaching for yield (risk-taking when interest rates decline) results from imposing a sustainable spending constraint on an infinitely-lived investor. Private foundations, which seek to operate in perpetuity and must pay out five percent of their fair market value of investment assets each year, represent the perfect laboratory to study the reach for yield channel.

To estimate the effect of reaching for yield by private foundations we estimate the following:

$$Y_{it} = \nu_i + \beta_1 Yield_{t-1} + \beta_2 \frac{DY_{it}}{Distr_{it}} + \beta_3 \frac{DY_{it}}{Distr_{it}} \times Yield_{t-1} + \gamma \mathbf{X}_{it} + \varepsilon_{it} \tag{3}$$

where Y_{it} is the asset allocation to an asset class, ν_i represents foundation fixed effects to control for time-invariant unobservable characteristics within a foundation, $Yield_{t-1}$ is the 10-Year Treasury Constant Maturity Rate at time $t-1$ (i.e., over the previous fiscal year), and $DY/Distr_{it}$ is the standardized share of distributions covered by investment income (interests and dividends) for foundation i at time t.[19]

The results in Table 5 show that the share of assets allocated to equity increases as the yield on the 10-year Treasury rate decreases. The effect is more pronounced for those foundations where interests and dividends cover a large share of charitable distributions (columns 2 and 3). We also use a dummy variable that takes a value of 1 after 2009, 0 otherwise and find that the effect of reaching for yield is larger in the aftermath of the Great Recession, which was followed by unprecedented monetary policy interventions (column 3). The results in columns (4)-(6) show the increased allocation to equity comes out of government bonds. These results contribute to the vast literature on reach for yield by financial institutions and pension funds (Andonov, Bauer, & Cremers, 2017; Becker & Ivashina, 2015; Kent, Garlappi, & Xiao, 2021; Lu et al., 2019).

To illustrate the magnitudes of the effect, we calculate the implied change in allocation to equity for a 1 percent decrease in the 10-Year Treasury Constant Maturity Rate. We compare a foundation that has an average reliance on interests and dividends to support distributions of 64% ($DY/Distr_{it}$ $= 0$) to a foundation whose interests and dividends cover 102% of distributions ($DY/Distr_{it} =$ 0.5).[20] In response to a 1 percent decline in the real rate, foundations with a high reliance on fixed-income sources to cover their distributions increase their allocations to equity by 1.43 percent compared to 1.02 percent for foundations with an average reliance on interest and dividend income to cover distributions.[21]

Overall, these results suggest that the asset allocation choices of private foundations are a function of their resources (e.g., size), age, sophistication, liquidity management, and spending behavior. Moreover, trends in asset allocation over the last 25 years can be traced back to the reaching for yield behavior of foundations that need to meet the five percent spending hurdle set by the existing law. Whether (some) foundations go above and beyond the returns explained by their

[19] We standardize $DY/Distr_{it}$ to aid in interpretation of the interaction effect as $DY/Distr_{it}$ is strictly positive and to provide coefficient estimates of $Yield_{t-1}$ that are equivalent to the average partial effect.

[20] This increase corresponds to moving from the 68th to 88th percentile or a 0.60 standard deviation increase in the unstandardized $DY/Distr_{it}$.

[21] In untabulated regressions, we observe similar reach for yield behavior towards alternative assets in response to a decline in the 10-year Treasury rate. A one percent decline in the real rate corresponds to a 0.78 percent increase in a foundation's allocation to alternatives.

strategic allocation and prevailing market forces remains an open question which we address in the next section.

4 Investment Performance and Performance Persistence

The alternative investment industry, hedge funds, and private equity in particular, have grown tremendously over the last 30 years. Despite the increase in committed capital across a wide range of strategies and alternative asset classes, the debate on whether some institutional investors generate positive risk-adjusted returns and whether performance persists is still ongoing. Some studies document performance persistence in the context of mutual funds (Brown & Goetzmann, 1995; Carhart, 1997; Grinblatt & Titman, 1992); however this persistence does not reflect superior skill in selecting high-performing investments. Busse, Goyal, and Wahal (2010) find only modest evidence of performance persistence in their sample of 4,617 active domestic equity products. In the context of hedge funds, Agarwal and Naik (2000) find short-term persistence among hedge fund managers. Kosowski, Naik, and Teo (2007) and Fung et al. (2008) find that top-performing hedge funds generate positive risk-adjusted performance not explained by luck and that performance persists. Similarly, private equity performance is persistent but has weakened over the last two decades (Harris et al., 2020; Kaplan & Schoar, 2005), and some institutional investors can select high-performing managers and outperform (Cavagnaro et al., 2019; Sensoy, Wang, & Weisbach, 2014).

We examine whether private foundations exhibit risk-adjusted outperformance, the degree of persistence of private foundations' investment performance, and whether this persistence persists. Persistence in returns when accounting for asset allocation and common risk factor loadings would imply some private foundations are better able to support their philanthropic endeavors over time. In contrast, if the investment returns of private foundations are random or persistence is correlated across investors, foundations should choose a given level of market risk for their portfolio and pursue a passive strategy that minimizes investment management expenses. The extent of return persistence and positive risk-adjusted persistence also has significant implications for donors' contributions to existing foundations. If returns are persistent and some private foundations generate positive alphas, donors should allocate their contributions to foundations with superior investment performance, provided their objectives align.

4.1 Risk-Adjusted Returns

To study the risk-adjusted performance of private foundations we estimate the following time series regression for each foundation:

$$r_{it} - r_{ft} = \alpha_i + \sum_{k=1}^{K} \beta_{ik} f_{kt} + \epsilon_{it} \tag{4}$$

where $r_{it} - r_{ft}$ is the annual net return for private foundation i for year t, minus the risk-free rate. α_i is the abnormal performance computed using the following four factors and f_{kt} is the k^{th} factor return over the same 12 months. Our baseline results use a four-factor model consisting of the excess return of U.S. equity (Russell 3000), U.S. corporate bonds (Bloomberg U.S. Aggregate Bond), international equity (MSCI ACWI ex-U.S.), and hedge funds (HFRI Fund-Weighted Composite).

We select these four factors based on a survey by CommonFund, an institutional asset management company for private foundations, which provides more fine-grained details on the asset allocation of private foundations.[22] Because the average asset allocation of private foundations to equity investments during our sample is only 56 percent, selecting index factors analogous to the true opportunity set of private foundations will allow us to better capture their true risk exposures. While we perform our main asset pricing tests of private foundations on index asset class factors, we also use the Carhart (1997) four-factor model for robustness.

As the estimation of the four-factor model requires five parameter estimates (one for each factor and the intercept) separately for each private foundation, we assure that each private foundation in our estimation has at least seven years of returns. Our full sample of returns data from 1991 to 2016 consists of 232,472 observations for 25,325 reporting foundations, but imposing this restriction results in 199,406 observations (retaining approximately 86 percent of observations) for 14,374 reporting foundations which meet this threshold. To test the statistical significance of the alpha estimates, we use the bootstrap methodology described by Kosowski et al. (2006). In addition to examining the risk-adjusted performance of all private foundations with at least seven reporting years conditional on size, we assure that these alpha and factor loading estimates are robust to other specifications and filtering procedures. Additional robustness specifications include modifying our measure of returns, removing sub-grouping of foundations which might result in a spurious relationship between investment performance and estimated factor exposure, defining alternative

[22]In 2016, CommonFund's survey estimated that the average private foundation in their survey had investments of: 24 percent equity, 8 percent fixed income, 18 percent international equity, 45 percent alternatives, and 4 percent cash. Survey available here.

size groupings, and limiting the effect of cross-sectional dependence. Lastly, to assure the validity of our risk-adjusted performance results to only requiring a reporting foundation to have seven years of reporting data, we provide bootstrapped t-statistics following Kosowski et al. (2006).

The estimates of risk-adjusted returns and bootstrapped p-values for the bootstrapped distribution are displayed in Table 6 at the private foundation level conditional on private foundation size and a foundation reporting at least 7 years from 1991 to 2016.[23] The overall estimates for the four-factor model alpha in Panel A are statistically significant at all percentile values indicating that foundations within our sample have alphas on average that differ from zero. For the very large foundations, their bootstrapped average alphas greater than the median are significantly different from zero indicating they are creating positive risk-adjusted returns. Their distribution of average alphas below the median being statistically insignificant suggests these negative risk-adjusted returns can be explained by random chance. The two smallest foundation size groupings (under $10 million in investment assets) have both statistically significant positive and negative risk-adjusted returns. Foundations within these groups have significant variation with some foundations outperforming and others underperforming their risk-adjusted benchmarks while their estimated negative mean return suggests underperformance in aggregate.

Finally, we examine the time-varying nature of investment performance across the three decades spanning our sample period. Applying the Kosowski et al. (2006) methodology at the foundation level, Table A.3 displays the median and mean estimated equal- and value-weighted alphas for private foundations across the 1991-1999, 2000-2008, and 2009-2016 time periods overall and by size groupings. The value-weighted, risk-adjusted performance of private foundations is positive and statistically significant in the second part of the sample estimated at 171 basis points. This is consistent with existing research on the growth in alternatives and the outperformance of large institutional investors during the decade preceding the Great Recession (Lerner, Schoar, & Wang, 2008; Sensoy, Wang, & Weisbach, 2014).

As documented by Dahiya and Yermack (2021), the nonprofit sector has underperformed between 2009 and 2018. We find similar but smaller underperformance results using our data on U.S. private foundations. We estimate annual, value-weighted alphas of about -40 basis points in the 8 years following the Great Recession. In comparison, Dahiya and Yermack (2021) estimate four-factor alphas of about -183 basis points for nonprofits with more than $100 million in total assets and

[23] Our main specification groups foundations into size buckets based on their average inflation-adjusted fair value of investment assets. Conditional on a foundation appearing in our sample for more than 7 years, 72 percent of foundations never switch size buckets.

alphas of about -149 basis points for nonprofits with more than \$10 million in total assets (but less than \$100 million). Our examination of the time variation in alpha enabled through private foundations returns data spanning 26 years from 1991 to 2016 shows the importance of examining broader time horizons to better understand risk-adjusted returns over time.

4.1.1 Robustness Tests

This subsection reports on a number of robustness tests we conduct. Our finding across a range of tests support our main results.

Alternative measures of return. As private foundations do not disclose their investment returns in their annual filing with the IRS, we have relied on our approximation via Equation 1 throughout the paper. We take a few additional steps to support our main results. First, we add cash and savings to the denominator of Equation 1. Second, we do not adjust for inflows and outflows in Equation 1. The results in Panels A and B of Table A.4 confirm our results using alternative return measures are quantitatively similar to our main specification.

Alternative filtering procedures. First, we drop operating foundations as these foundations might have differences in the timing of inflows and outflows (due to running their own charitable programs) which might cause differences in the return estimation process. Second, we drop foundations for which the ratio of contributions to total assets is greater than twenty percent to ensure the initial founding year or years with large contribution inflows are not causing us to overestimate returns. Third, some foundations hold a high proportion of cash, savings, and other non-investment assets on their balance sheet. To alleviate concerns that our return measure overestimates unrealized capital gains because of changes in cash holdings over time unrelated to investment assets, we drop observations that have more than 20 percent in cash and savings and less than 80 percent of total assets designated as investment assets. This filter assures that the original results are capturing the risk-adjusted performance of private foundations that are actively investing their assets and retains 85 percent of observations. The results in Panels A to C of Table A.5 verify our estimates are quantitatively similar across all filtering procedures.

Alternative size groupings and methods. First, we require foundations to report in every fiscal year in the sample to ensure that foundations with relatively few reporting years and imprecisely estimated factor estimates are not driving our results. Second, we assign foundations into size groupings based on their first reported AUM to mitigate the impact that survivorship bias causes on our estimated alphas. Third, we include only foundations with a December fiscal-year end (retaining

68 percent of observations) to ensure that a failure to account for cross-sectional correlation in foundation reporting timing is not driving our results. The results in Panels A to C of Table A.6 verify our estimates are quantitatively similar across all methodological modifications.[24]

Additionally, to alleviate the cross-sectional dependence among returns of private foundations of similar size, we estimate time series regressions of the average foundation returns within a size group on a number of common risk factors by aggregating foundations of similar size groupings and reporting month into a portfolio. The results in Table A.7 confirm our results are robust to accounting for the cross-sectional dependence of observations.[25]

Alternative bootstrapping methodology. As foundations with fewer reporting observations might have both large estimated alphas and standard errors, following Kosowski et al. (2006) we bootstrap the distribution of foundation alpha t-statistics to mitigate this concern. The results in Table A.8 provide comparable intuition to our risk-adjusted alpha estimates in Table 6. We document statistically significant outperformance and random underperformance for foundations with greater than $50 million, while foundations below this threshold display statistically significant underperformance and random outperformance.

Alternative risk-adjusted estimation. We estimate a standard equity-based asset pricing test using the Carhart (1997) four-factor model. The results in Panels A and B of Table A.9 confirm our estimates are quantitatively similar across risk-adjusted models and do not change any of our conclusions.

4.2 Performance Persistence

The largest foundations generate risk-adjusted performance of about 140 basis points per year over the sample period. An important question is whether performance is persistent over time and

[24]While the very large foundations appear to have statistically insignificant performance in Panel B of Table A.6 on an equal-weighted basis, this underperformance is driven by non-random entry and exit of private foundations. Grouping foundations into size buckets based on their initial AUM results in only 105 foundations which makes this estimated alpha easily susceptible to bias. We observe that very large foundations with relatively few reporting years are biasing this estimate as they are substantially more likely to be present during periods of underperformance for very large foundations(i.e. pre-1999 and post-2008). When conditioning on foundations being present in the sample for 15 years, this estimated, equal-weighted alpha is about 80 basis points while the value-weighted alpha remains greater than 100 basis points across all observation thresholds.

[25]The number of observations differ conditional on foundation size as some size-month combinations lack enough observations to estimate the cross sectional returns due to most foundationsâ returns occurring in June and December.

whether persistence explains the observed patterns in risk-adjusted returns.

First, we group private foundations into the six size buckets described previously and into deciles based on their size-adjusted net investment return in the previous fiscal year. We then compute the proportion of foundations that fall into the same performance decile in the following year within the same size bucket. Panel A of Table 7 shows the probability that top-performing foundations do not transition out of the top-performing decile the following year is about 26.6 percent. If performance was random, about one in ten foundations would fall into the same return decile each year. Similarly, there is also persistence in the worst performing foundations, as about 22 percent of the worst performers (decile 1) remain in this decile in the following year.[26]

To more formally study persistence, we estimate Fama-MacBeth regressions (Fama & MacBeth, 1973) of lagged returns on future returns using various holding periods and horizons. Panel B of Table 7 reports the persistence results for our measure of net returns, size-adjusted net returns, and the net returns in excess of the 60/40 portfolio. We find evidence of performance persistence for both short and long time horizons such as two years. Finally, we split the sample based on the years before and after the Great Recession. The results in Columns (2) and (3) document significant performance persistence preceding the Great Recession while the effect of prior performance disappears following this event. This result relates to recent evidence in the hedge funds and private equity literature that finds weakened persistence in the most recent decades (Harris et al., 2020).

4.3 Characteristics of Private Foundations and Performance

We have documented so far that large private foundations generate positive risk-adjusted returns over the sample period from 1991 to 2016. While the total dollar amount of assets under management (AUM) certainly helps explain cross-sectional variation in returns, other characteristics might translate into higher risk-adjusted performance. Size likely proxies for the opportunity set available to institutional investors. For example, larger foundations are more likely to gain access to alternative investments such as private equity and venture capital funds, and they are better positioned to bear the illiquidity risk that comes with alternative investing.

Table 8 reports results from regressing each foundation's net return and Sharpe Ratio on a foundation's lagged characteristics including investment fees and concentration of a foundation's

[26]Transitioning from the bottom decile to the top decile (17.9 percent) or the top decile to the bottom decile (19.3 percent) are also greater than 10 percent suggesting the impact of volatility in the return generating process.

holdings. Column (1) documents a strong, negative association between a foundation's lagged value of investment fees and its current investment performance. This negative association between investment fees and performance is consistent with results reported for mutual funds, where funds with high expense ratios underperform. This result might also suggest that, even controlling for size, some foundations are able to negotiate lower fees and reap higher future returns. We also document a strong connection between investment staff sophistication (both paid and unpaid) on overall investment performance. This connection is likely related to cross-sectional differences in in-house expertise and sophistication (e.g., the presence of a Chief Investment Officer).

As discussed throughout the paper, private foundations often follow a remarkably different life cycle compared to other institutional investors such as university endowments and pension plans. Many foundations receive their original wealth from successful individuals or families, which make them potentially less diversified than other investors. Given the large degree of idiosyncratic volatility associated with concentrated position, private foundations represent an interesting laboratory to study the effect of equity concentration on performance. To examine the effect of a foundation's concentration of holdings on investment performance, we hand-collect stock holdings data from 990-PF filings which are available online after 2001.[27] To mitigate the effects of survivorship bias on our results, we collect concentration data for all foundations with assets greater than $250 million at any point after 2001.[28] We collect data on a foundation's largest stock holding for a foundation's first reporting year after 2001, median, and final reporting year in our sample and backfill the remaining year observations for a foundation.[29] We define a foundation to be concentrated when it holds more than 30 percent of its equity holdings in a single stock, and we find that about 12 percent of foundation-year observations meet this threshold. For instance, six private foundations hold concentrated positions in Berkshire Hathaway, while three foundations hold concentrated positions

[27]Form 990-PF filings are available from ProPublica.org

[28]We examine the effects of concentration on only a subset of larger private foundations due to their economic importance and to determine whether concentration is driving their positive risk-adjusted performance. Additionally, we expect for larger private foundations to have a much higher likelihood of being concentrated than smaller foundations due to the link between foundation and donating firm control that make a larger foundation more likely to retain a concentrated position in a stock holding (i.e., The Brin Foundation: Google, Paul Allen Family Foundation: Microsoft, WK Kellogg Foundation: Kellogg Company, Annie Casey Foundation: United Parcel Service (UPS) of America.

[29]For most foundations in our sample, we collect data on their holdings from 2001, 2008, and 2016. By backfilling a foundation's concentration status we are able to collect data on a larger sample of private foundations, and it relies on a reasonable assumption that if a foundation was concentrated in 2001 that it was concentrated in 1991. Due to the limited contributions larger foundations receive after their founding, the likelihood of a foundation going from being diversified to concentrated are rather small which further supports our use of back-filling a foundation's concentration status.

in American International Group (AIG). We also link each stock to CRSP and compute individual stock returns (adjusted for delisting) over the foundation's 12-month fiscal year. The average annual return of these individual stocks is about 18 percent, much larger than the 11 percent earned by the CRSP value-weighted return index over the same period. However, concentrated holdings have a standard deviation of about 41 percent, compared to only 17.5 percent for the CRSP value-weighted return index.

The results in column (3) of Table 8 examine the link between investment performance and foundation characteristics for the subset of foundations on which we collect concentration data. Concentrated foundations outperform by about 160 basis points per year. We continue to find a positive link between the number of highly compensated individuals and future performance. Surprisingly, we find a negative relationship between size and performance, implying that the positive coefficient found in column (1) simply reflects differences between large and micro foundations. This negative coefficient estimate is likely driven by the decreasing economies of scale once a sufficient asset base mark is reached. In addition, investment fees are uninformative in explaining returns due to the limited fees paid by concentrated foundations.

Are the concentrated stock holdings driving outperformance or is it the rest of the portfolio? To tease out these two competing explanations, column (4) controls for the 12-month return earned by the concentrated stock while this variable is set to zero for foundations that do not have a concentrated position.[30] Column (4) documents that concentrated foundations underperform non-concentrated foundations by a statistically significant amount of 1.47 percent when the return on their concentrated stock position is zero. This result documents that concentrated stock holdings drive the outperformance of concentrated foundations rather than the remainder of their portfolios.

Columns (5) and (6) examine the connection between a foundation's concentration and its Sharpe Ratio. The results in column (5) show that the expected increase in stock returns for concentrated foundations is offset by their increased idiosyncratic risk. Once we control for the 12-month return earned by the concentrated stock, the results in column (6) confirm that concentrated foundations have Sharpe ratios that are 0.25 lower than non-concentrated foundations when the return on their concentrated holding is zero.

In summary, the concentration results in Table 8 document that concentrated holdings increase expected returns albeit at a cost of an increase in idiosyncratic risk that sufficiently offsets these gains in expected returns. Why then do we observe many concentrated foundations and is this

[30] $\text{Return}_{t:t-12}^{Concentrated}$ can be interpreted as the interactive effect of a foundation's concentration status and return on its concentrated holding.

portfolio concentration efficient? Yermack (2009) motivates a plausible hypothesis that foundations remain concentrated with donated stock to permit CEOs to continue to retain voting control of the donated shares. While retaining control rights of donated shares is beneficial for executives, it exposes concentrated foundations to large idiosyncratic risk and reduces their risk-adjusted returns. Another explanation for the presence of concentration foundations is the idiosyncratic strategies which employ heavy usage of leverage and concentration many individuals relied upon to build wealth(Chhabra, 2015). Among these subset of wealthy individuals that go on to start private foundations many likely believe that focusing on what they know is the least risky strategy making the decision to uncouple a foundation from a founder's source of wealth more difficult. Coupled with the transaction costs and small excise tax income to liquidate a large portion of a company's stock, it is likely that many foundations with links to corporate stocks maintain their large concentration due to a belief that these stocks have positive risk-adjusted returns when our results are counter this notion.

Addressing the efficiency of concentrated holdings, one could argue that foundations are well-equipped to bear the large, idiosyncratic risks caused by concentrated holdings. In aggregate, this concentration will lead to larger expected returns and more overall giving for the universe of private foundations especially if there is a positive selection bias among stocks that foundations hold. While we are unable to empirically test whether this phenomenon of concentrated foundations stems from a founder's desire to retain voting control or a behavioral bias and the ultimate efficiency of private foundations, we urge caution to interpreting concentrated holdings as efficient if the stability of foundations' giving is important or the closing of foundations causes large distortions to the philanthropic sector.[31] Consistent with Chhabra (2015) we emphasize the necessity of foundations to employ differing investment policies to make wealth (concentration and leverage) versus keep wealth (diversification) depending on their size and systematic importance to a broader philanthropic cause.

4.4 Investment Fees and Performance

Any form of delegated investment management relies on fees paid for professional services. Yet, the literature on investment fees and investment returns is scarce. There are many reasons why this

[31] For instance, three foundations holding concentrated positions in AIG experienced heavy losses and declining giving after AIG stock fell more than 97 percent during 2008, and the asset-weighted average decline in assets for the three foundations was 57 percent. Similar examples exist within university endowments such as Rochester University (Kodak stock) and Emory University (Coca Cola stock) which caused large fluctuations in the endowments' ability to support university operations during downturns for both companies.

is the case. First, there is no centralized database for the actual fees paid by institutional investors, as returns data are often reported net of any investment costs. Second, even if fees were disclosed, the bulk of performance fees paid on alternative assets such as hedge funds or private equity would often be embedded into the net asset value of the investments provided to the limited partners at the end of the year. As such, these fees represent the sharing of the profits generated by the investment manager, rather than an actual cost.

While the IRS SOI data we use throughout the paper allows us to compute an overall figure for expenses related to investment management, we are unable to determine the proportion of these fees related to internal processes (such as wages paid to CIOs or investment directors) or external fees (e.g., investment consulting). To circumvent this data limitation, we scrape the Form 990-PF filings via the Registry of Open Data which contains data for fiscal years 2009 to 2018 and is hosted by Amazon Web Services in their original XML format. We retrieve the detailed breakdown of wages paid to internal investment staff, their pension contributions, legal and accounting fees, travel, printing, and occupancy expenses, other professional fees, and other investment expenses. From supporting documentation, we are able to discern that "other professional fees" include investment management fees paid to consultants or outsourced management companies (e.g., Mercer or Cambridge Associates), custody expenses (e.g., Mellon Custody), brokerage commissions, fees paid to managers in public markets (e.g., Blackrock Financial Management), and investment due diligence fees (e.g., Checkfundmanager LLC). "Other investment expenses" often include substantial "partnership investment expenses", "pass through other investment expenses", and "pass through expense from K-1s". We refer to "external fees" as the sum of "other professional fees" and "other investment fees" in the subsequent analysis.

The results in Panel A of Table 9 show that private foundations pay, on average, 90 basis points of their investment assets in disclosed investment fees. This figure is consistent with the 81 basis points paid by private foundations using the IRS SOI data.[32] Part of this difference is likely a result of the slightly different sampling procedure and time period considered by the two data sources. Internal costs account for about a quarter of overall investment expenses while external investment fees account for about 40 percent of total fees.[33]

Panel B of Table 9 analyzes the cross-sectional determinants of net returns as a function of

[32] Lo, Matveyev, and Zeume (2021) report that public charities (i.e., nonprofit organizations) paid about 96 basis points in investments fees over the 2010-2018 period.

[33] We classify the remainder of investment fees as ancillary and miscellaneous fees. Ancillary fees include accounting and legal fees used to generate investment income. Miscellaneous fees include interest, taxes, depreciation, travel, printing, and occupancy costs.

lagged internal and external investment fees, controlling for size. Consistent with the results of Table 8 we find a negative relationship between past investment fees and current performance (column 1). The magnitude of the effect is large. A one percentage point increase in fees is associated with a decline of 0.59 percent in future net returns. However, this negative relationship is driven by external investment fees rather than investment wages (columns 2 and 3). Investment wages are correlated with positive future net returns, which indicates that foundations with in-house investment teams (e.g., a CIO) are better positioned to exploit market inefficiencies, minimize external fees, or both. Finally, ancillary fees related to investment management are a drag to performance. These fees are primarily prevalent across smaller foundations.

Overall, we find that higher investment costs go hand-in-hand with lower future returns. However, we uncover a differential effect of investment fees on performance across internal and external investment costs. We acknowledge the limitations of our data, as we are not able to observe the full amount paid to managers, other than the one disclosed in the Form 990-PF. It is possible that larger foundations overpay for underperforming investment managers in the private equity or hedge fund space. In either case this would be captured even by our measure of net returns, as most of the profit sharing are embedded in fair values at the end of the fiscal year. Unfortunately, we cannot capture the amount of fees paid by different private foundations to the same fund manager as documented by Begenau and Siriwardane (2020) across public pension funds.

5 Spending Rate, Returns, and Capital Preservation

Our results so far indicate some foundations perform well and this is driven in large part by their asset allocation decisions. We document reach for yield among private foundations in declining interest rate environments which is especially pronounced for those foundations whose interests and dividends cover a larger share of required distributions. The current low-yield investment environment coupled with the high level of required distributions has inefficiently led private foundations' spending decisions to drive their investment policy allocations.[34] The minimum five percent rule places private foundations under great strain to achieve a net investment return of five percent to sustain nominal principal or five percent plus inflation to sustain a foundation's real principal. While rules such as a carry-forward have been created to allow private foundations to

[34]Salamon and Voytek (1989) document this effect in their survey of private foundation investment managers, and they explain that the inefficiency of this stems from investment managers being confined to short-term decision making as opposed to the infinite time horizon foundations operate under.

smooth their mandated distributions closer to five percent, few foundations utilize this rule.[35] Ana Marshall, the Chief Investment Officer for the William and Flora Hewlett Foundation's $14 billion portfolio summarizes these issues in a recent interview with Ted Seides: *"In a foundation, I have a mandate of 5 percent payout. So I have to have at least 70 percent of equity risk in this portfolio to be able to achieve, on a long term basis, the objective which is to grow or maintain the real spending power of the institution"* (Seides, 2021).

To make broader recommendations for maximizing the real value of private foundations' giving moving forward, we conduct a simulation study to examine how private foundations' real principal values are expected to change over the next 25- and 100-year periods under varying investment strategies. We sample from a multivariate, normal distribution made up of quarterly benchmark index returns and inflation rates from 1996 to 2016.[36] The simulated data uses the historical covariances among asset classes and their mean returns. We unsmooth the time series of illiquid alternative asset classes following Getmansky, Lo, and Makarov (2004). Table IA.1 in the Internet Appendix presents asset allocation weights for each of the four portfolios and each portfolio's expected nominal return and standard deviation.[37]

We simulate 10,000 paths for each portfolio. The real wealth distribution paths for each portfolio are created based on these simulated nominal returns and inflation. We assume foundations rebalance their portfolios quarterly, spend a constant rate of five percent of their average fair market value of net investment assets, and receive no donor contributions during the simulated period. Foundations also experience a time-varying inflation rate. Therefore, we are interested in the following dynamics of real wealth:

$$W_t = W_0 \prod_{t=1}^{T} (1 + r_t - s_t - \iota_t) \tag{5}$$

where r_t is the total nominal return at time t, s_t is the five percent spending rate, and ι_t is the inflation rate.

Our simulation results displayed in Table 10 confirm the necessity of foundations to employ

[35] In untabulated results we find that foundations utilize the carry forward on average only 31 percent of the time when they have unused excess distributions in the previous 5 years and an investment return rate below 5 percent in the current fiscal year.

[36] Sampling from a period of high realized stock and bond returns in comparison to today's forward looking expectations suggests these results provide an upper bound of foundation growth.

[37] We exclude cash from our analysis due to differences in the treatment of cash across foundations in our sample as these cash holdings could reflect short-term liquidity needs, the recent liquidation of portfolio holdings, or investments in short-term treasuries. The median foundation in our sample holds the equivalent of four percent of investment assets in cash.

increasingly aggressive asset allocation strategies and to increase their reliance on alternative assets for return diversification and growth potential. The first strategy consisting of asset allocation to only fixed income results in a private foundation sustaining its real principal base just 16 (3) percent of the time over a 25-year (100-year) time horizon. The average foundation under this investment strategy retains just 40 percent of its beginning real investment assets over a 100-year horizon due to charitable distributions outpacing real investment returns. Foundations under a 60/40 portfolio strategy do relatively well and finish the simulation period with about 115 percent of the real purchasing power of their initial principal over the longer horizon. Surprisingly, strategy (3) which heavily invests in domestic and international equity finishes the simulation period with higher growth than strategy (2), but also a higher likelihood (72 percent) of diminished principal over the 100-year time horizon versus 64 percent under the 60/40 portfolio. These results are in alignment with a recent finding by Anarkulova, Cederburg, and O'Doherty (2021), who estimate a 12 percent chance that a diversified equity investor with a 30-year investment horizon will experience declines in real principal. The significant improvement in simulated principal balances under portfolio strategy (4) reflects the benefit of investing in alternatives for diversification and growth. The average foundation under this strategy experiences a 491 percent expected increase in real principal over the 100-year time horizon and has a 75 percent chance to sustain its real purchasing power. This portfolio's median growth in real invested principal of 151 percent results in just 25 (37) percent of investment paths experiencing a decline in real principal over the 100-year (25-year) time horizon. These results are consistent with Brown, Hu, and Bert-Klemens (2020) who study the impact of including private investment funds (private equity, venture capital, and real estate) into a diversified portfolio of stocks and bonds.

Many foundations are in danger of losing their real purchasing power of assets without increases in risk-taking and broader exposure to alternatives to overcome the low-yield investment environment. When first passed into law in 1976, the five percent minimum spending rule was created to inhibit private foundations from solely hoarding wealth and to provide a sustainable benchmark that private foundations could meet philanthropic needs and still maintain their real value of invested principal. For many private foundations, the ability to meet the five percent rule and sustain operations in perpetuity is out of reach as all investment strategies except the aggressive growth with alternatives portfolio result in a greater than 50 percent chance of a foundation experiencing a decline in real principal over longer time horizons.

In line with the findings of Brown and Scholz (2019) we recommend a more flexible distribution rate based on the expected real return environment moving forward as this results in a better smoothing of the real distributions of private foundations and their ability to maintain real principal. The mandated policy of foundations spending at least five percent of their fair market value of investment assets annually results in a perpetual decline in real principal as the spending rate for many foundations dominates their expected real return on investment. The findings of Aase and Bjerksund (2021) and Dybvig and Qin (2019) suggest that the spending rate of private foundations that allows for the maintaining of real principal in perpetuity should be strictly less than their real rate of return.[38]

The optimal spending rate for a private foundation likely results from a complex set of interactions between its strategic asset allocation, return (asset) volatility, mission, and time-horizon. The mission and goal of a nonprofit necessarily capture its rate of time preference for future expected consumption (e.g., the real spending on charitable goals). To solve for the optimal spending rate based on different risky portfolios, we choose the spending rate that maximizes the following CRRA utility:

$$\max U(c) = \mathbb{E}\Big[\sum_{t=0}^{\infty} \delta^t \frac{c^{1-\gamma}}{1-\gamma}\Big] \tag{6}$$

where c denotes charitable consumption and depends on the wealth path and spending rate. We use a coefficient of risk aversion $\gamma = 4$. In our simulation analysis we use various discount rates (e.g., δ) when computing the present value of charitable giving (Campbell & Viceira, 1999; Gilbert & Hrdlicka, 2015; Halem et al., 2022). The philanthropic missions supported by private foundations lend themselves to variation in discount rates as some charitable needs are more pressing than others. For example, private foundations seeking to eradicate poverty, hunger, or clean water crises would be rational to spend their current invested principal more aggressively in fighting these needs due to the high-value creation of these projects (lower δ). On the other hand, private foundations seeking to support inter-generational causes such as art and higher education should seek to solely maximize the present value of their distributions by selecting a spending rate near the optimal spending rate that can be supported over long periods (higher δ). It is important to note that many foundations already give in excess of the five percent mandate suggesting this reduced benchmark would not necessarily reduce charitable giving in the short-term. Instead, it would provide greater flexibility to private foundations to select a spending rate based on the urgency of the mission they support and the time horizon they seek to operate.

[38] Dybvig and Qin (2019) suggest that the spending rate should be set equal to $s_{it} = \mathbb{E}[R_{it}] - \frac{1}{2}\sigma_{it}^2$, where $\mathbb{E}[R_{it}]$ is the expected annual real net return for private foundation i at time t and σ_{it}^2 is the variance of real net returns for foundation i at time t.

The expected life of a foundation is another important dimension to consider. Foundations that decide to live in perpetuity are willing to smooth out their spending over time in order to be sustainable. On the other hand, other foundations might decide to deplete their capital over a pre-determined time frame (e.g., The Bill & Melinda Gates Foundation will spend all its assets within 50 years of them both dying). Panel B of Table 10 reports the optimal spending rule across different investment strategies, rate of time preferences (i.e., mission), and horizons. As expected, the lower the time horizon the higher the optimal spending rate. Foundations with less volatile returns spend more, as principal values can be sustained (Portfolios I and II). Notably, over long horizons (i.e., 100 years), the optimal spending rate is almost always strictly less than 5 percent. However, our simulations mask large variations in spending rates depending on the rate of time preference. For a discount rate $\delta = 0.94$, which mirrors the discount rate of the average university endowment (Gilbert & Hrdlicka, 2015), the optimal spending rate for a portfolio with alternative assets is about 4.10 percent which resembles the typical spending rate for colleges and universities (see Binfarè et al., 2022; Binfarè & Harris, 2022; Dahiya & Yermack, 2021; Lo, Matveyev, & Zeume, 2021).

One caveat to these suggestions is that it might be more efficient to maintain the five percent level of mandated minimum distributions if investment returns are truly persistent. Maintaining the five percent rule would force smaller foundations with negative risk-adjusted returns and conservative asset allocation strategies to outsource their investment management or give their assets to a more efficient steward. Another reason to sustain the high benchmark of the mandated five percent benchmark is the possibility of new foundations with better investment management entering the private foundation universe to increase the philanthropic support provided to public charities. This possibility of "creative destruction" as donor contributions flow increasingly to foundations with superior investment return performance contrasts with that of traditional institutional investors like pension plans or endowments which lack an efficient mechanism for competing investment vehicles. The uniqueness of private foundations stems from the fact that the aggregate philanthropic support is the most important measure of the effectiveness of private foundations. No private foundation is inherently irreplaceable, and new foundations appear every year as a function of wealth creation within the economy and a desire to make a difference in the world.

Regardless of the undertaken policy decision, private foundations will continue to serve an important role within our society. Their giving to public charities funds important philanthropic efforts towards societal problems such as poverty, education, and disease in a more efficient manner than government spending. The positive risk-adjusted performance of foundations on average due to the superior performance of the largest-sized grouping of foundations provides a more optimistic view that foundations will continue to grow their real principal balances and giving towards their respective missions despite the high burden of the five percent rule and a continued low-yield investment environment. While many of these foundations run well-respected investment management divisions, it is encouraging to observe the giving levels of foundations do not reflect this same efficiency. The inefficiency of private foundations' giving evidenced by their failure to optimize use of the carry-forward provision and having distributions in excess of the five percent rule reflects that foundations' giving is driven by charitable needs they observe rather than solely seeking to hoard principal.

6 Conclusions

Private foundations are created to provide intergenerational support to public charities and are influential due to both their level and efficiency of giving. The five percent minimum spending rule poses a constraint to private foundations' operations that has significant implications in better understanding how long-lived investors respond to operating constraints, especially in the midst of a low-yield environment.

We document large variation in the asset allocation and investment performance of private foundations over time and across size groupings. Private foundations reach for yield by shifting their asset allocation towards increasingly "risky" assets in response to the declining yield environment and mandated spending rule. We find that foundations with greater than $500 million in assets generate positive risk-adjusted returns. These findings suggest that larger private foundations should be considered sophisticated institutional investors. The time-varying alpha results we document show the importance of measuring investment returns over longer periods to better determine the likelihood of future outperformance.

The infinite life of foundations has been inefficiently shortened as many foundations have let their spending decisions drive their asset allocation. The inflexibility of the five percent minimum spending rule, despite large changes in the investment environment, suggests there is a more efficient way to legislate the giving pattern of private foundations. In simulated results, we show that the optimal spending rate for private foundations to maximize the present value of their charitable distributions is strictly less than five percent. While we are unable to observe the discount rates that foundations place on their grant-making towards philanthropic efforts, many foundations give in excess of five percent annually suggesting their support for more pressing causes. Investigating the utility functions of infinitely-lived investors to optimize their giving to charitable efforts represents an exciting future area of research.

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Figure 1: Total Assets, Investment Assets, and Distributions by Fiscal Year

This figure shows the total assets, investment assets, and distributions for private foundations from 1991 to 2016 as reported to the IRS, Form 990-PF. Investment assets includes government debt, corporate bonds, equity, and alternative investments. Figures are in billions of dollars.

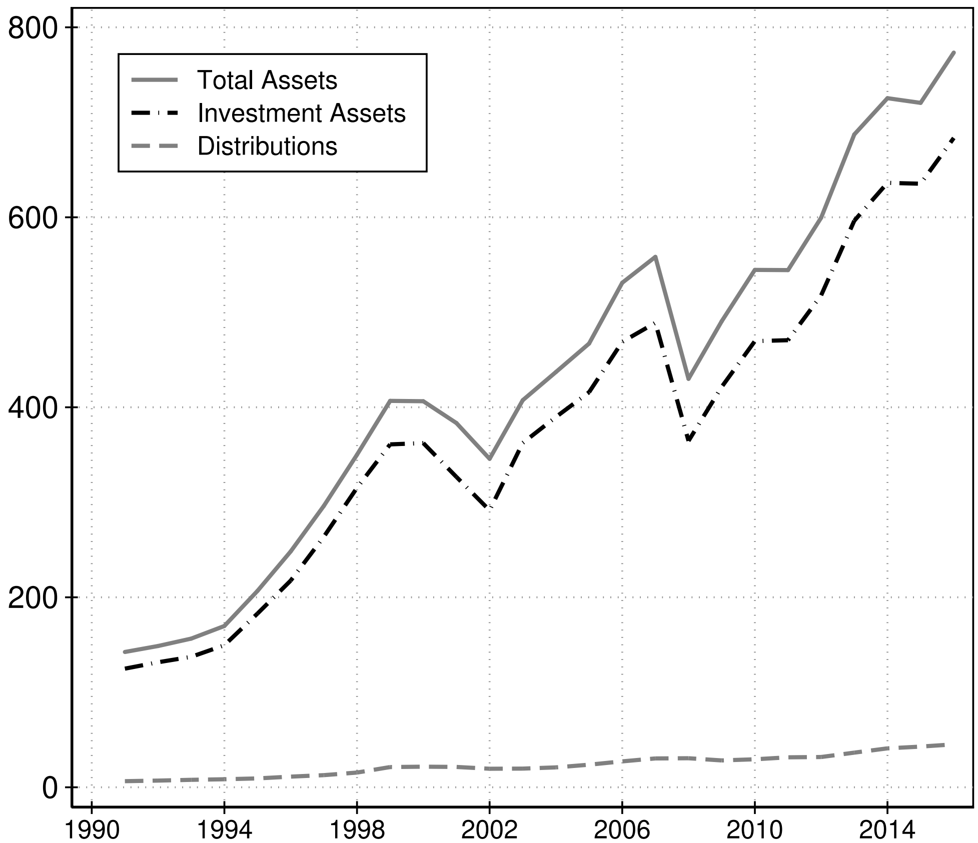

Figure 2: Asset Allocation Breakdown by Fiscal Year

This figure shows the asset allocations of private foundations to government bonds, corporate bonds, equity, and alternative asset classes (includes hedge funds, real estate, and private equity, and other alternative assets) from 1991 to 2016.

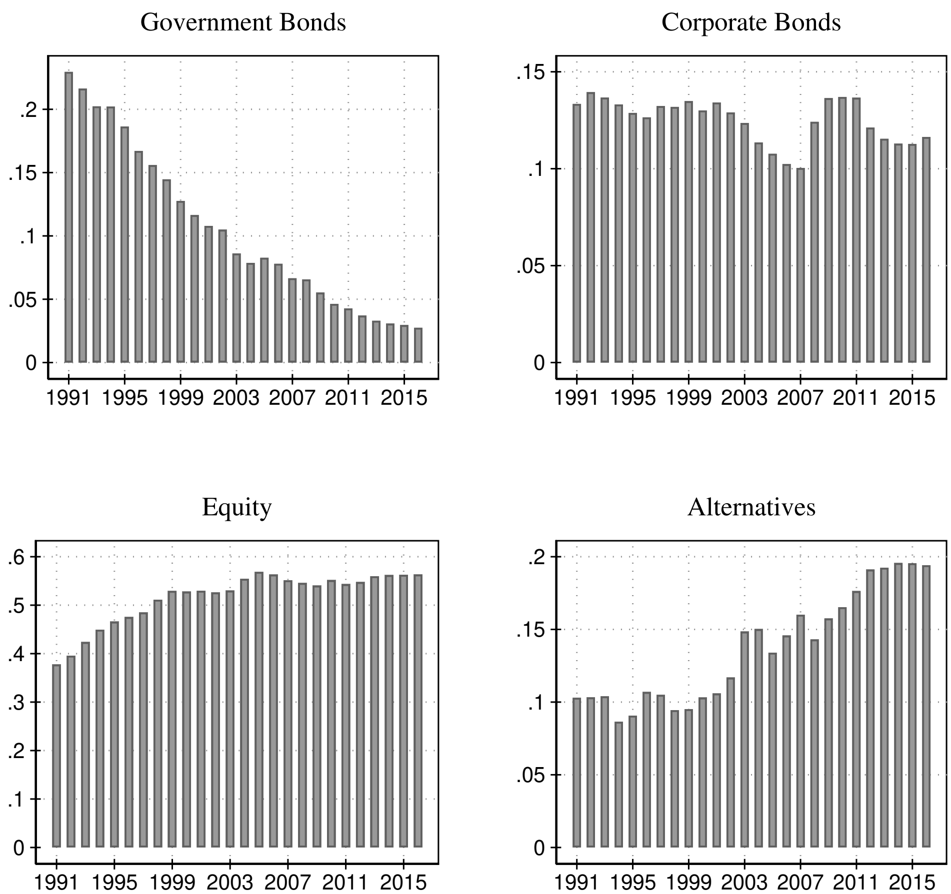

Table 1: Sample and Flows

This table reports the total number of private foundations (Total), the number of foundations entering the sample (Entry), the number of foundations exiting the sample (Exit), the total assets in billion of dollars of the reporting foundations (AUM), and the total distributions in billions of dollars of the reporting foundations (Distr.) from 1991 to 2016. The total number of foundations in the current year equals the total number of foundations in the previous year plus the number that entered the sample in the current year minus the number that exited the sample in the current year.

Year	Total	Entry	Exit	AUM ($B)	Distr. ($B)
1991	4214	-	-	253.5	11.5
1992	4362	534	386	256.7	12.2
1993	4192	582	752	263.5	13.3
1994	4880	1363	675	277.9	13.8
1995	5352	866	394	329.1	14.9
1996	6339	1256	269	384.7	17.4
1997	7049	1181	471	451.9	19.5
1998	7913	1938	1074	524.0	23.2
1999	7326	892	1479	591.4	31.0
2000	7469	756	613	571.9	30.6
2001	5994	468	1943	532.5	29.8
2002	5845	482	631	467.9	26.4
2003	9405	3747	187	539.2	26.0
2004	10232	1246	419	561.3	26.9
2005	10659	924	497	578.3	29.4
2006	11348	1155	466	642.4	33.0
2007	11508	862	702	648.7	35.3
2008	13084	3336	1760	500.4	35.6
2009	14870	2331	545	558.4	32.2
2010	15686	2097	1281	606.9	32.9
2011	15709	1306	1283	590.7	34.3
2012	16348	1666	1027	640.4	34.1
2013	17213	1969	1104	722.6	38.4
2014	17591	1611	1233	763.9	43.2
2015	17346	1284	1529	748.9	44.5
2016	17955	1896	1287	785.3	45.9

Table 2: Characteristics of Private Foundations

This table reports summary statistics for U.S. private foundations from 1991 to 2016. Panel A summarizes figures for the book value and fair value of total assets, fair value of investment assets, contributions, and distributions of private foundations. Panel B summarizes figures for contributions to the foundation as a fraction of total investment assets and distributions from the foundation as a fraction of total investment assets. Entries summarize data points across all private foundations and years, and report the number (N) of data points, mean value, standard deviation, percentile values (25, 50, 75), and the asset-weighted average. All values in Panel A are in millions of dollars. FV denotes fair value while BV denotes book value. The Appendix provides detailed variable descriptions.

	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
	Panel B: Contributions and Distributions						
	N	Mean	SD	p25	Median	p75	AUM^w
Contributions (% FV)	271047	4.05	13.39	0.00	0.00	0.08	4.05
Distributions (% FV)	271047	6.55	7.52	3.94	4.86	6.08	5.60

Table 3: Asset Allocation and Investment Performance of Private Foundations
This table reports summary statistics for U.S. private foundations from 1991 to 2016. Panel A summarizes figures for the share of investment assets allocated to cash (excluded from investment assets), government bonds, corporate bonds, equity, and alternative investments. Panel B summarizes the total net return of private foundations, dividend yields, realized and unrealized gains, investment fees, and standard deviation of returns (four-year rolling window). Entries summarize data points across all private foundations and years, and report the number (N) of data points, mean value, standard deviation, percentile values (25, 50, 75), and the asset-weighted average. All values in Panel A and B are in percentage points. The Appendix provides detailed variable descriptions.

	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

Table 4: Asset Allocation Decision of Private Foundations

This table reports OLS regression coefficients and standard errors for the relationship between asset allocation decisions and private foundation characteristics. The dependent variable is the share of assets allocated to the asset class specified individually within each model. Independent variables include the size of the foundation, age of the foundation, investment fees, distributions from the foundation as a fraction of total expenses, contributions to the foundation as a fraction of total income, the number of employees that earn more than fifty thousand dollars, and the number of unpaid directors/trustees. The Appendix provides detailed variable descriptions. Fiscal year fixed effects are included. Standard errors are adjusted for clustering at the foundation organization level. ***, **, * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

	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

Table 5: Reach for Yield of Private Foundations

This table reports OLS regression coefficients and standard errors for the relationship between the share of assets allocated to equity or government bonds and interest rates. The dependent variable is the share of assets allocated to the asset class specified within each model. The interest rate used is the 10-Year Treasury Constant Maturity Rate at the end of the previous fiscal year. Independent variables include the size of the foundation, age of the foundation, investment fees, distributions from the foundation as a fraction of total expenses and contributions to the foundation as a fraction of total income, the number of employees that earn more than fifty thousand dollars, and the number of unpaid directors/trustees. DY/Distributions is the share of distributions covered by investment income (interests and dividends) and standardized to have a mean of 0 and standard deviation of 1. Post is a dummy variable that takes a value of 1 after 2009 and 0 otherwise. The Appendix provides detailed variable descriptions. Fund fixed effects are included. Standard errors are adjusted for clustering at the foundation organization level. ***, **, * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

	Equity			Gvt. Bonds		
	(1)	(2)	(3)	(4)	(5)	(6)
Yield_{t-1}	-1.90***	-1.02***		3.03***	1.39***	
	[0.08]	[0.08]		[0.06]	[0.05]	
DY/Distributions		0.03***	-0.01***		-0.01***	0.01***
		[0.00]	[0.00]		[0.00]	[0.00]
DY/Distributions × Yield_{t-1}		-0.82***			0.35***	
		[0.05]			[0.03]	
Post			-0.01***			-0.01***
			[0.00]			[0.00]
DY/Distributions × Post			0.02***			-0.01***
			[0.00]			[0.00]
Controls	No	Yes	Yes	No	Yes	Yes
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

Table 6: Risk-adjusted Returns of Private Foundations

This table reports risk-adjusted alpha estimates for foundations within the same size-bucket and across all foundations. The table reports coefficients and bootstrapped p-values of private foundations' risk-adjusted returns at various percentile ranges estimated using a four-factor model for each foundation with a minimum of seven years of valid returns data. Bootstrapped p-values are computed following the methodology of Kosowski et al. (2006). Size groups are formed according to each private foundation's average inflation-adjusted fair value of total assets. Very large foundations have AUM greater than $500 million, large between $250 million and $500 million, medium between $50 million and $250 million, small between $10 million and $50 million, very small between $1 million and $10 million, and tiny less than $1 million. Factors include the excess return of U.S. equity (Russell 3000), U.S. corporate bonds (Bloomberg U.S. Aggregate Bond), international equity (MSCI ACWI ex-U.S.), and hedge funds (HFRI Fund-Weighted Composite).

	All	Very Large	Large	Medium	Small	Very Small	Tiny
	Kosowski et al. (2006) Bootstrap Method						
Percentile							
1	-15.6	-15.1	-12.4	-17.0	-19.1	-14.2	-11.6
	0.00	0.16	0.45	0.00	0.00	0.00	0.00
5	-6.4	-5.7	-4.7	-6.6	-7.5	-6.2	-5.9
	0.00	0.54	0.77	0.02	0.00	0.00	0.00
10	-4.7	-2.9	-2.6	-4.3	-4.7	-4.7	-4.8
	0.00	0.96	0.98	0.00	0.00	0.00	0.00
25	-2.6	-1.0	-1.1	-1.8	-2.2	-2.6	-3.1
	0.00	1.00	0.92	0.00	0.00	0.00	0.00
Median	-0.8	0.8	0.5	0.0	-0.3	-0.9	-1.6
	0.00	0.00	0.00	0.61	0.00	0.00	0.00
75	1.1	3.1	3.1	2.7	2.1	1.0	-0.3
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	4.6	6.8	6.3	6.3	6.1	4.6	1.3
	0.00	0.00	0.00	0.00	0.00	0.00	1.00
95	8.2	10.1	8.4	9.8	9.7	8.3	3.7
	0.00	0.00	0.01	0.00	0.00	0.00	0.00
99	18.5	21.9	19.6	17.0	20.9	18.1	12.6
	0.00	0.00	0.09	0.00	0.00	0.00	0.00
Mean^{EW}	-0.4	1.4	1.3	0.6	0.2	-0.4	-1.5
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean^{VW}	1.0	1.7	1.4	0.6	0.2	-0.3	-1.4
	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 7: Performance Persistence of Private Foundations

This table reports the performance persistence of returns and risk-adjusted performance of size-adjusted returns. Panel A reports the performance persistence transition matrix of private foundations based on their previous year size-adjusted performance decile from 1991 to 2016. Entries report the probability that a foundation in one of the listed deciles of size-adjusted performance in the previous period is in the listed decile of size-adjusted performance in the current period. Panel B reports the results of the Fama-MacBeth regressions (Fama & MacBeth, 1973) of lagged returns on future returns using various holding periods and horizons. The response variable is the net return of each foundation's net return in the period specified in the left-hand time index which is regressed on the foundation's previous period net returns in Columns (1), (2), and (3). Columns (4) and (5) use size-adjusted and 60/40 (equity and fixed-income) benchmark-adjusted returns. We use the Fama and French (1993) model augmented with the momentum factor of Carhart (1997). The brackets report Newey-West standard errors following Newey and West (1994).

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: 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***	0.11***	0.01	0.08***	0.08***
	[0.02]	[0.03]	[0.04]	[0.02]	[0.02]
$R_{t-1:t} \rightarrow R_{t+1:t+2}$	0.16***	0.25***	0.04	0.15***	0.14***
	[0.05]	[0.05]	[0.07]	[0.04]	[0.04]
$R_{t-2:t} \rightarrow R_{t:t+1}$	0.05**	0.08***	-0.00	0.06***	0.06***
	[0.02]	[0.02]	[0.03]	[0.02]	[0.02]
$R_{t-2:t} \rightarrow R_{t+1:t+2}$	0.11***	0.16***	0.05	0.12***	0.12***
	[0.03]	[0.03]	[0.04]	[0.03]	[0.03]

Table 8: Risk-Adjusted Returns and Characteristics of Private Foundations

This table reports OLS regression coefficients and standard errors for the relationship between measures of a private foundation's investment performance and a foundation's characteristics. The dependent variable is either a private foundation's net return or a foundation's Sharpe Ratio calculated over a four-year rolling window. Columns (1) and (2) include all private foundations while columns (3) to (6) include a subset of foundations with investment assets greater than $250 million. Independent variables include the size of the foundation, age of the foundation, investment fees, distributions from the foundation as a fraction of total expenses and contributions to the foundation as a fraction of total income, the number of employees that earn more than fifty thousand dollars, the number of unpaid directors/trustees, and whether a foundation is concentrated (defined as having a single stock that makes up greater than 30 percent of portfolio holdings). $\text{Return}_{t:t-12}^{Concentrated}$ is the total return for the concentrated stock during the current fiscal year. All other independent variables are measured at the end of the previous fiscal year. The Appendix provides detailed variable description. Fiscal year × investment style fixed effects are included. Standard errors are adjusted for clustering at the foundation organization level. ***, **, * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

	Full Sample		Sample > 250M			
	Net Return	SR	Net Return		SR	
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Assets)	0.04***	0.01***	-0.82***	-0.74***	-0.01	-0.01
	[0.01]	[0.00]	[0.16]	[0.16]	[0.01]	[0.01]
Log(Age)	0.08**	0.03***	-0.41	-0.48	0.02	0.02
	[0.04]	[0.01]	[0.32]	[0.31]	[0.04]	[0.04]
Investment Fees	-0.22***	-0.05***	-0.06	-0.05	0.01	0.01
	[0.05]	[0.01]	[0.28]	[0.28]	[0.03]	[0.03]
Distributions (% Expenses)	0.00	-0.00	-0.02*	-0.02*	0.00	0.00
	[0.00]	[0.00]	[0.01]	[0.01]	[0.00]	[0.00]
Contributions (% Income)	0.51***	-0.04***	0.38	0.25	0.03	0.03
	[0.12]	[0.01]	[0.53]	[0.54]	[0.05]	[0.05]
Log(Paid)	0.46***	0.04***	0.49***	0.44***	0.03**	0.03**
	[0.08]	[0.01]	[0.12]	[0.11]	[0.01]	[0.01]
Log(Unpaid)	0.52***	0.01***	0.04	0.08	-0.01	-0.01
	[0.03]	[0.00]	[0.13]	[0.13]	[0.01]	[0.01]
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]
Year × Style Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.45	0.44	0.43	0.46	0.40	0.41
Observations	199588	149496	9755	9755	8253	8253

Table 9: Investment Fees and Future Performance of Private Foundations

This table shows the relationship between investment performance and investment fees. Panel A decomposes total investment fees into internal, external, ancillary, and miscellaneous fees as a percentage of total investment assets. Panel B reports OLS regression coefficients and standard errors for the relationship between private foundations' investment performance and investment fees. The dependent variable is a foundation's total net investment return. Independent variables include total investment fees, internal investment fees paid, external investment fees paid for professional services and other expenses, ancillary, and miscellaneous fees, and the natural logarithm of total investment assets. Ancillary fees include accounting and legal fees used to generate investment income. Miscellaneous fees (omitted to avoid multicollinearity) include interest, taxes, depreciation, travel, printing, and occupancy costs. All independent variables are measured at the end of the previous fiscal year. The Appendix provides detailed variable description. Fiscal year × investment style fixed effects are included. Standard errors are adjusted for clustering at the foundation organization level. ***, **, * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: Summarized Investment Fees				
	Total	Internal	External	Ancillary	Misc.
Fees (% Inv. Assets)	0.90	0.25	0.44	0.14	0.06
	Panel B: Investment Fees and Performance				
	(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

Table 10: Investment Performance and Capital Preservation

This table reports the distribution of real investment paths for the four portfolio scenarios using 10,000 simulations over different horizons h and optimal spending rates under different rate of time preference δ. Panel A summarizes percentiles of real wealth after h years. Each portfolio begins the simulation with one dollar of real principal. Real principal values are computed by subtracting five percent for a portfolio's required distributions and subtracting inflation from a portfolio's nominal return. We bootstrap inflation and returns simultaneously. $\mathbb{E}(W_T)$ represents the average foundation's real asset balance at the end of the horizon period. $\mathbb{P}(W_T < 1)$ represents the proportion of foundations that end the horizon period with a real principal value less than 1. Panel B summarizes the optimal spending rule that maximizes CRRA utility with $\gamma = 4$ and for various δ values, horizons h, and portfolios.

	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 $s^* = 5\%$								
5^{th}	0.48	0.14	0.41	0.13	0.22	0.03	0.43	0.27
25^{th}	0.63	0.24	0.66	0.37	0.46	0.14	0.80	0.99
50^{th}	0.76	0.34	0.91	0.72	0.79	0.40	1.25	2.51
75^{th}	0.92	0.49	1.28	1.38	1.35	1.15	1.96	6.00
95^{th}	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
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

Appendix

Variable Definition

Characteristics of Private Foundations

Total Assets. Total fair market value of assets for a foundation at fiscal year end, including investment assets from IRS Form 990-PF, Part II, Line 16c.

Total Investment Assets. Total fair market value at fiscal year end of a foundation's investments in U.S. government bonds, equity, corporate bonds, physical asset investments (land, buildings, and equipment), mortgage loans,and other (includes alternative assets) from IRS Form 990-PF, Part II, Lines 10a, 10b, 10c, 11, 12, 13. We use the natural logarithm of total investment assets in the main analysis.

Contributions (% Income). Proportion of the total value of contributions, gifts, and grants received by a foundation scaled by a foundation's total income consisting of investment income and contributions received from IRS Form 990-PF, Part I, Lines 1a and 12a.

Distributions (% Expenses). Proportion of the total value of distributions paid by a foundation scaled by a foundation's total expenses consisting of investment- and non investment-related expenses and distributions paid from RS Form 990-PF, Part I, Lines 25a and 26a.

Age. Age of a foundation computed as the date of the current filing year less a foundation's first filing in the IRS SOI 990-PF data. We use the natural logarithm of age in the main analysis.

Paid. Total number of other employees paid over $50,000 from IRS Form 990-PF, Part VIII, Line 2. We use the natural logarithm of one plus the number of paid employees in the main analysis.

Unpaid. Number of uncompensated officers and directors from IRS Form 990-PF, Part VIII. We use the natural logarithm of one plus the number of paid employees in the main analysis.

Asset Allocation of Private Foundations

Cash. Percentage of the foundation's assets allocated to cash. This includes deposits in checking accounts, deposits in transit, change funds, petty cash funds, any other non-interest-bearing account, money market funds, commercial paper, certificates of deposit, and U.S. Treasury bills from IRS Form 990-PF, Part II, Line 1 and 2.

Government Bonds. Percentage of the foundation's assets allocated to government bonds. This includes US and state government obligations that mature in one year or more from RS Form 990-PF, Part II, Line 10a.

Corporate Bonds. Percentage of the foundation's assets allocated to corporate bonds. This includes domestic and international corporate bonds, active and passive bond funds, mortgage-backed securities and asset-backed securities from IRS Form 990-PF, Part II, Line 10c.

Equity. Percentage of the foundation's assets allocated to equity. This includes domestic and international corporate stocks, and active and passive equity funds from IRS Form 990-PF, Part II, Line 10b.

Alternatives. Percentage of the foundation's assets allocated to alternative investments. This includes private equity funds, venture capital funds, hedge funds, real estate funds, other limited partnerships, natural resources and infrastructure funds, derivatives, distressed funds from from IRS Form 990-PF, Part II, Line 13. This does not include program-related investments (PRI).

Investment Style. Segments private foundations into eight groups based on their asset allocation to fixed income, equity, and alternatives.

Investment Performance and Fees of Private Foundations

Total Net Return. Net return includes investment earnings, gains, and losses, including both realized and unrealized amounts for the fiscal year less a foundationâs investment fees. Representative equation form shown in Equation 1 in the main text.

Dividend Yield. Total interest on savings and temporary cash investments, dividends and interests from securities, and other income from IRS Form 990-PF, Part I, Lines 3a, 4a, and 11a.

Realized Gains. Total net gain (or loss) from sale of assets from IRS Form 990-PF, Part I, Line 6a.

Risk. Standard deviation of returns compiled using a four-year rolling window of a foundation's total net returns.

Investment Fees. Total operating and administrative investment expenses deducted from gross investment income. Source: IRS Form 990-PF, Part I, Line 26b.

Figure A.1: Investment Return, Dividend Yield, and Realized Gains

This figure shows the total net investment return, dividend yield, and realized gains for private foundations from 1991 to 2016 (displayed as decimals). Data to compute return measures come from the IRS, Form 990-PF.

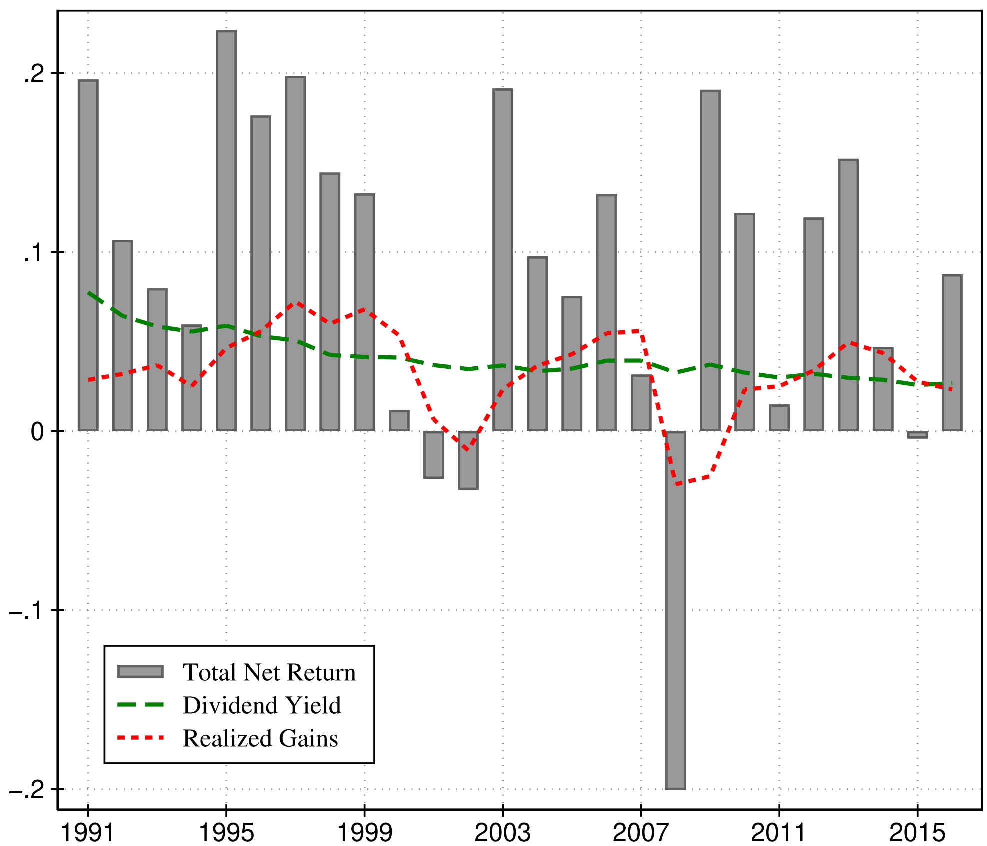

Figure A.2: Investment Return Decomposition and Fees

This figure shows total unrealized gains and losses on investment (top-left panel), investment management fees (top-right panel), standard deviation of total net return (bottom-left panel), and Sharpe ratio (bottom-right panel) for private foundations from 1991 to 2016. The bottom panels are based on a four-year rolling window to compute standard deviation of returns. We use the annualized 3-month Treasury Bill as the risk-free rate.

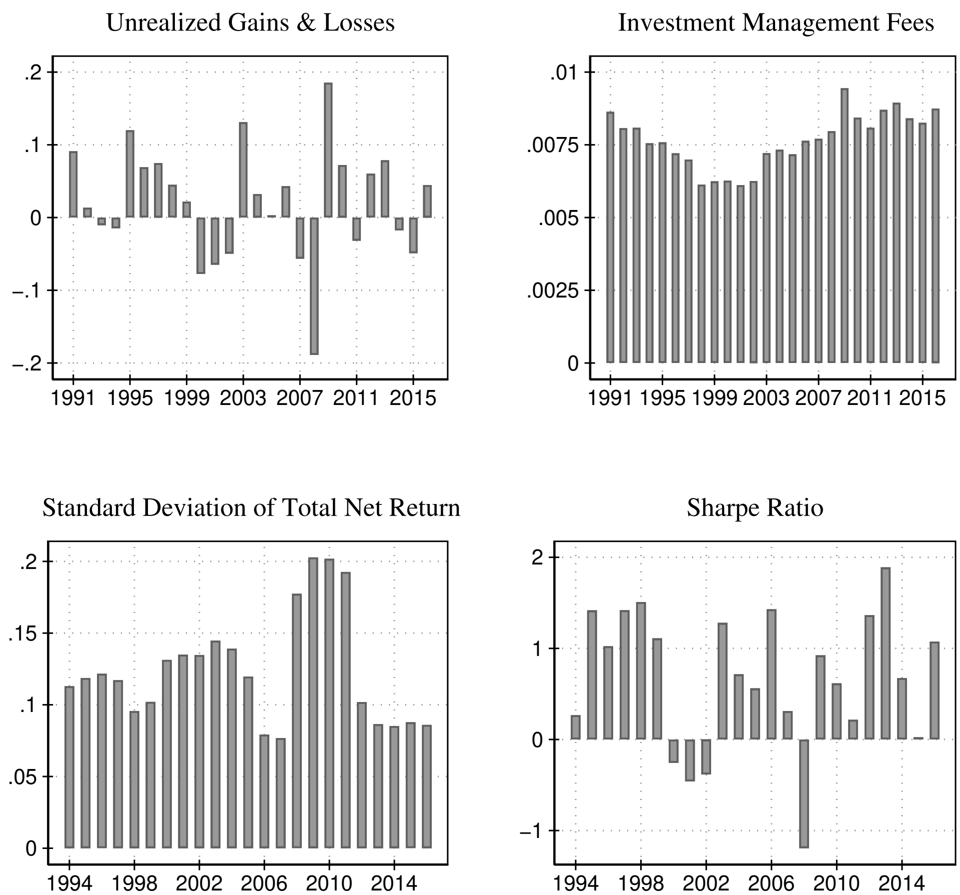

Table A.1: Audited Statement vs Form 990-PF Returns for Top Foundations

This table reports the reconciliation process of comparing the investment return performance of private foundations' returns from their audited financial statements and the returns computed using the 990-PF. The list includes 29 of the largest private foundations measured by total fair value of investment assets with publicly released audited financial statements within the last ten years. Investment assets are measured in millions of dollars while the audited and 990-PF columns denote foundations' investment return performance in percentage points.

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

Table A.2: Asset Allocation and Investment Performance of Private Foundations by Size

This table reports summary statistics for private foundations' asset allocation and investment returns from 1991 to 2016 by size buckets. Panel A summarizes asset allocation to cash (excluded from investment assets), government bonds, corporate bonds, equity, and alternative investments scaled by total investment assets plus cash. Panel B summarizes the total net return of private foundations, dividend yields, realized and unrealized gains, investment fees, and standard deviation of returns (four-year rolling window). Size groups are formed according to each private foundation's inflation-adjusted fair value of investment assets at the end of the year. Entries summarize data points across all years and size groupings, and report the number (N) of data points and mean value. All values in Panels A and B are in percentage points. The Appendix provides detailed variable descriptions.

	Very Large		Large		Medium		Small		Very Small		Tiny	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Panel A: Asset Allocation												
Cash	3525	5.48	3647	7.16	30656	8.25	96869	9.53	68188	9.13	68162	8.53
Government Bonds	3525	6.74	3647	6.58	30656	8.12	96869	7.66	68188	7.27	68162	4.98
Corporate Bonds	3525	7.24	3647	8.58	30656	9.12	96869	10.00	68188	11.36	68162	13.30
Equity	3525	53.24	3647	52.33	30656	53.52	96869	55.69	68188	58.29	68162	55.67
Alternatives	3525	25.02	3647	23.14	30656	18.70	96869	14.77	68188	11.44	68162	15.73
Panel B: Investment Returns, Risk, and Fees												
Total Net Return	3389	10.62	3463	10.40	28866	9.74	83812	8.37	56916	8.57	56026	6.96
Dividend Yield	3389	2.42	3463	2.78	28866	3.05	83812	3.19	56916	3.58	56026	3.32
Realized Gains	3389	4.70	3463	4.57	28866	3.98	83812	3.52	56916	3.17	56026	2.36
Unrealized Gains	3389	3.38	3463	2.90	28866	2.54	83812	1.66	56916	2.15	56026	2.11
Investment Fees	3389	0.58	3463	0.62	28866	0.64	83812	0.72	56916	0.83	56026	1.06
Risk	2809	13.54	2789	13.26	22356	12.91	54573	12.50	34565	11.96	32614	11.06

Table A.3: Risk-Adjusted Returns of Private Foundations by Sub-period

This table reports the risk-adjusted alpha estimates at the foundation level in the same size-bucket and overall across the 1991-1999, 2000-2008, and 2009-2016 sub-periods. The table reports the median and mean equal- and value-weighted alpha and bootstrapped p-values of private foundations' risk-adjusted returns using a four-factor model for each foundation with a minimum of seven years of valid returns data within a sub-period. Bootstrapped p-values are computed following the methodology of Kosowski et al. (2006). Size groups and value-weighted alpha are formed according to each private foundation's average inflation-adjusted fair value of total assets within each sub-period. Very large foundations have AUM greater than \$500 million, large between \$250 million and \$500 million, medium between \$50 million and \$250 million, small between \$10 million and \$50 million, very small between \$1 million and \$10 million, and tiny less than \$1 million. Factors include the excess return of U.S. equity (Russell 3000), U.S. corporate bonds (Bloomberg U.S. Aggregate Bond), international equity (MSCI ACWI ex-U.S.), and hedge funds (HFRI Fund-Weighted Composite).

Time Period	Method	All	Very Large	Large	Medium	Small	Very Small	Tiny
1991-1999	Median	0.73	-0.93	0.00	0.79	0.90	0.91	-0.07
		0.00	0.02	0.60	0.00	0.00	0.00	0.60
	Mean (EW)	0.94	-0.98	0.43	0.85	1.16	1.56	-0.28
		0.00	0.06	0.31	0.00	0.00	0.00	0.35
	Mean (VW)	0.60	0.43	0.56	0.82	1.04	1.75	0.11
		0.62	0.73	0.20	0.01	0.00	0.00	0.21
2000-2008	Median	-0.13	1.34	1.61	0.30	0.14	-1.02	-0.96
		0.16	0.02	0.00	0.01	0.00	0.00	0.01
	Mean (EW)	0.81	1.11	3.28	0.72	0.98	0.16	1.09
		0.00	0.17	0.00	0.03	0.00	0.01	0.00
	Mean (VW)	1.71	2.00	3.68	0.64	1.13	0.48	1.33
		0.02	0.08	0.00	0.21	0.00	0.00	0.00
2009-2016	Median	-0.88	-0.36	-0.21	-0.66	-0.68	-1.01	-0.98
		0.00	0.00	0.42	0.00	0.00	0.00	0.00
	Mean (EW)	-0.87	-0.41	0.49	-0.81	-0.55	-0.98	-1.22
		0.00	0.01	0.49	0.00	0.00	0.00	0.00
	Mean (VW)	-0.37	-0.20	0.51	-0.89	-0.58	-0.80	-1.28
		0.06	0.18	0.41	0.00	0.00	0.00	0.00

Table A.4: Risk-adjusted Returns of Private Foundations: Alternative Returns

This table reports the risk-adjusted alpha estimates at the foundation level in the same size-bucket and overall using alternative measures of return performance. The table reports the median and mean equal- and value-weighted alpha and bootstrapped *p*-values of private foundations' risk-adjusted returns using a four-factor model for each foundation with a minimum of seven years of valid returns data. Panel A includes cash and savings in the denominator of the net return measure while Panel B excludes inflows and outflows from the net return measure. Bootstrapped *p*-values are computed following the methodology of Kosowski et al. (2006). Size groups and value-weighted alpha are formed according to each private foundation's average inflation-adjusted fair value of total assets. Very large foundations have AUM greater than \$500 million, large between \$250 million and \$500 million, medium between \$50 million and \$250 million, small between \$10 million and \$50 million, very small between \$1 million and \$10 million, and tiny less than \$1 million. Factors include the excess return of U.S. equity (Russell 3000), U.S. corporate bonds (Bloomberg U.S. Aggregate Bond), international equity (MSCI ACWI ex-U.S.), and hedge funds (HFRI Fund-Weighted Composite).

Method	All	Very Large	Large	Medium	Small	Very Small	Tiny
			Panel A: Add Cash and Savings				
Median	-0.82	0.62	0.40	-0.10	-0.34	-0.89	-1.55
	0.00	0.00	0.01	0.05	0.00	0.00	0.00
Mean (EW)	-0.45	1.50	1.09	0.32	0.08	-0.47	-1.48
	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Mean (VW)	0.84	1.39	1.04	0.39	0.13	-0.29	-1.34
	0.00	0.00	0.00	0.00	0.01	0.00	0.00
			Panel B: No Cash Flow Adjustment				
Median	-0.96	0.28	0.22	-0.28	-0.58	-0.99	-1.63
	0.00	0.09	0.12	0.00	0.00	0.00	0.00
Mean (EW)	-0.73	0.86	0.86	0.01	-0.40	-0.69	-1.55
	0.00	0.00	0.00	0.49	0.00	0.00	0.00
Mean (VW)	0.48	1.05	0.72	0.08	-0.38	-0.53	-1.48
	0.01	0.01	0.01	0.26	0.00	0.00	0.00

Table A.5: Risk-adjusted Returns of Private Foundations: Alternative Filters

This table reports the risk-adjusted alpha estimates at the foundation level in the same size-bucket and overall using alternative filtering procedures. The table reports the median and mean equal- and value-weighted alpha and bootstrapped p-values of private foundations' risk-adjusted returns using a four-factor model for each foundation with a minimum of seven years of valid returns data. Panel A drops operating foundations, Panel B removes foundation observations that have contribution/assets > 0.2, and Panel C excludes observations that have investment assets/total assets < 0.8. Bootstrapped p-values are computed following the methodology of Kosowski et al. (2006). Size groups and value-weighted alpha are formed according to each private foundation's average inflation-adjusted fair value of total assets. Very large foundations have AUM greater than \$500 million, large between \$250 million and \$500 million, medium between \$50 million and \$250 million, small between \$10 million and \$50 million, very small between \$1 million and \$10 million, and tiny less than \$1 million. Factors include the excess return of U.S. equity (Russell 3000), U.S. corporate bonds (Bloomberg U.S. Aggregate Bond), international equity (MSCI ACWI ex-U.S.), and hedge funds (HFRI Fund-Weighted Composite).

Method	All	Very Large	Large	Medium	Small	Very Small	Tiny
			Panel A: Drop Operating Foundations				
Median	-0.84	0.78	0.57	-0.07	-0.35	-0.92	-1.60
	0.00	0.00	0.00	0.22	0.00	0.00	0.00
Mean (EW)	-0.51	1.10	1.42	0.31	0.06	-0.57	-1.53
	0.00	0.00	0.00	0.00	0.16	0.00	0.00
Mean (VW)	0.97	1.65	1.45	0.35	0.10	-0.42	-1.42
	0.00	0.00	0.00	0.00	0.07	0.00	0.00
			Panel B: Drop if Contributions/Assets > 0.2				
Median	-0.83	0.78	0.51	-0.01	-0.30	-0.93	-1.61
	0.00	0.00	0.00	0.44	0.00	0.00	0.00
Mean (EW)	-0.41	1.25	0.83	0.65	0.22	-0.46	-1.57
	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Mean (VW)	1.05	1.62	1.00	0.64	0.29	-0.30	-1.48
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Panel C: Drop if Cash > 0.2 and Inv. Assets < 0.8				
Median	-0.92	1.09	0.52	-0.05	-0.44	-1.04	-1.67
	0.00	0.02	0.01	0.34	0.00	0.00	0.00
Mean (EW)	-0.72	1.56	0.88	0.35	-0.20	-0.90	-1.66
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean (VW)	1.03	1.88	0.93	0.36	-0.15	-0.72	-1.53
	0.00	0.00	0.00	0.00	0.01	0.00	0.00

Table A.6: Risk-adjusted Returns of Private Foundations: Alternative Methods

This table reports the risk-adjusted alpha estimates at the foundation level in the same size-bucket and overall using alternative methods. The table reports the median and mean equal- and value-weighted alpha and bootstrapped p-values of private foundations' risk-adjusted returns using a four-factor model for each foundation with a minimum of seven years of valid returns data. Panel A requires foundations to report in every period, Panel B groups foundations into size buckets based on their first reported AUM, and Panel C includes only observations with December fiscal year ends. Bootstrapped p-values are computed following the methodology of Kosowski et al. (2006). Size groups and value-weighted alpha are formed according to the average AUM in Panel A, first AUM in Panel B, and average AUM in Panel C. Very large foundations have AUM greater than $500 million, large between $250 million and $500 million, medium between $50 million and $250 million, small between $10 million and $50 million, very small between $1 million and $10 million, and tiny less than $1 million. Factors include the excess return of U.S. equity (Russell 3000), U.S. corporate bonds (Bloomberg U.S. Aggregate Bond), international equity (MSCI ACWI ex-U.S.), and hedge funds (HFRI Fund-Weighted Composite).

Method	All	Very Large	Large	Medium	Small	Very Small	Tiny
Panel A: Require 26 Reporting Years							
Median	-0.41	0.43	0.34	-0.27	-0.41	-0.85	-1.03
	0.00	0.10	0.08	0.00	0.00	0.00	0.00
Mean (EW)	-0.12	0.65	0.70	0.08	-0.21	-0.55	-0.40
	0.00	0.04	0.00	0.23	0.00	0.00	0.00
Mean (VW)	0.94	1.41	0.88	0.05	-0.19	-0.53	-0.71
	0.00	0.03	0.00	0.36	0.02	0.00	0.00
Panel B: Assign into Size Buckets by First AUM							
Median	-0.81	0.35	0.33	-0.12	-0.27	-0.92	-1.49
	0.00	0.08	0.05	0.03	0.00	0.00	0.00
Mean (EW)	-0.39	0.07	0.68	0.40	0.23	-0.42	-1.37
	0.00	0.43	0.01	0.00	0.00	0.00	0.00
Mean (VW)	0.59	1.04	0.82	0.30	0.17	-0.28	-1.34
	0.01	0.03	0.01	0.10	0.00	0.00	0.00
Panel C: Require December Fiscal Year-End							
Median	-0.71	1.12	0.23	0.03	-0.35	-0.75	-1.26
	0.00	0.00	0.14	0.27	0.00	0.00	0.00
Mean (EW)	-0.34	1.63	1.10	0.47	0.11	-0.25	-1.36
	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Mean (VW)	1.11	1.84	1.11	0.51	0.18	-0.10	-1.21
	0.00	0.00	0.00	0.00	0.02	0.16	0.00

Table A.7: Risk-adjusted Returns of Private Foundations: Portfolio Approach
This table reports risk-adjusted alpha estimates within a portfolio of foundations in the same size-bucket and overall by grouping foundations into portfolios based on size and reporting month. The table reports the results of time-series regressions of the equal- and value-weighted return of private foundations on a number of risk factors. Size groups are formed based on the current fiscal year value of inflation-adjusted assets. Very large foundations have AUM greater than \$500 million, large between \$250 million and \$500 million, medium between \$50 million and \$250 million, small between \$10 million and \$50 million, very small between \$1 million and \$10 million, and tiny less than \$1 million. Parameter estimates are obtained by regressing annual excess returns on annual risk factors. These factors include the excess return of U.S. equity (Russell 3000), U.S. corporate bonds (Bloomberg U.S. Aggregate Bond), international equity (MSCI ACWI ex-U.S.), and hedge funds (HFRI Fund-Weighted Composite). Regressions are weighted by the number of foundations reporting in each fiscal year-month combinations. The observation level is monthly. The brackets report Newey-West standard errors following Newey and West (1994)).

Method	All	Very Large	Large	Medium	Small	Very Small	Tiny
	Equal- and Value-Weighted Portfolio Approach						
α^{EW} (%)	-0.00	1.76***	1.19**	1.05***	0.15	-0.64*	-2.04***
	[0.35]	[0.58]	[0.52]	[0.39]	[0.35]	[0.35]	[0.22]
α^{VW} (%)	0.69	1.42**	0.34	0.23	-0.48	-1.18***	-2.30***
	[0.46]	[0.67]	[0.57]	[0.39]	[0.38]	[0.34]	[0.23]
Observations	313	267	257	312	313	312	312

Table A.8: Risk-adjusted t-Statistics of Private Foundations

This table reports risk-adjusted alpha t-statistic estimates within a portfolio of foundations in the same size-bucket and overall. The table reports coefficients and bootstrapped p-values of private foundations' t-statistics at various percentile ranges estimated using a four-factor model for each foundation with a minimum of seven years of valid returns data. Bootstrapped p-values are computed following the methodology of Kosowski et al. (2006). Size groups are formed according to each private foundation's average inflation-adjusted fair value of investment assets. Very large foundations have AUM greater than \$500 million, large between \$250 million and \$500 million, medium between \$50 million and \$250 million, small between \$10 million and \$50 million, very small between \$1 million and \$10 million, and tiny less than \$1 million. Parameter estimates are obtained by regressing annual excess returns on annual risk factors and scaling this estimated alpha coefficient by the estimated standard error. These factors include the excess return of U.S. equity (Russell 3000), U.S. corporate bonds (Bloomberg U.S. Aggregate Bond), international equity (MSCI ACWI ex-U.S.), and hedge funds (HFRI Fund-Weighted Composite).

	All	Very Large	Large	Medium	Small	Very Small	Tiny
	Kosowski et al. (2006) Bootstrap Method						
Percentile							
1	-6.3	-1.9	-2.7	-3.2	-4.1	-5.9	-8.0
	0.00	0.99	0.67	0.21	0.00	0.00	0.00
5	-3.6	-1.1	-1.7	-1.9	-2.2	-3.2	-5.3
	0.00	1.00	0.83	0.28	0.00	0.00	0.00
10	-2.5	-0.9	-1.2	-1.5	-1.6	-2.3	-4.0
	0.00	1.00	0.94	0.11	0.00	0.00	0.00
25	-1.3	-0.3	-0.5	-0.8	-0.9	-1.3	-2.2
	0.00	1.00	0.95	0.00	0.00	0.00	0.00
Median	-0.4	0.3	0.2	0.0	-0.1	-0.4	-0.8
	0.00	0.00	0.01	0.61	0.00	0.00	0.00
75	0.4	1.0	0.9	0.8	0.7	0.3	-0.1
	0.00	0.00	0.06	0.03	1.00	1.00	0.00
90	1.2	1.7	1.5	1.6	1.5	1.1	0.5
	0.00	0.01	0.23	0.00	0.08	1.00	1.00
95	1.8	2.6	2.2	2.1	2.1	1.7	1.0
	0.00	0.00	0.05	0.00	0.00	1.00	1.00
99	3.4	4.4	3.4	3.8	4.1	3.2	2.6
	0.00	0.01	0.21	0.00	0.00	0.99	1.00
Mean^{EW}	-0.5	0.5	0.2	0.0	-0.1	-0.5	-1.3
	0.01	0.00	0.01	0.04	0.00	0.00	0.00
Mean^{VW}	0.3	0.6	0.3	0.1	-0.1	-0.4	-1.3
	0.01	0.00	0.00	0.01	0.01	0.00	0.01

Table A.9: Risk-adjusted Returns of Private Foundations

This table reports risk-adjusted alpha estimates for foundations within the same size-bucket and across all foundations. The table reports coefficients and bootstrapped p-values of private foundations' risk-adjusted returns at various percentile ranges estimated using the Carhart (1997) four-factor model for each foundation with a minimum of seven years of valid returns data. Bootstrapped p-values are computed following the methodology of Kosowski et al. (2006). Size groups are formed according to each private foundation's average inflation-adjusted fair value of total assets. Very large foundations have AUM greater than \$500 million, large between \$250 million and \$500 million, medium between \$50 million and \$250 million, small between \$10 million and \$50 million, very small between \$1 million and \$10 million, and tiny less than \$1 million.

	All	Very Large	Large	Medium	Small	Very Small	Tiny
	Carhart (1997) Four Factor Model: Kosowski et al. (2006)						
Percentile							
1	-13.4	-7.9	-9.4	-15.5	-15.5	-13.6	-11.1
	0.00	0.72	0.43	0.00	0.00	0.00	0.00
5	-6.0	-3.6	-3.4	-5.6	-6.0	-6.1	-6.2
	0.00	0.99	0.95	0.12	0.00	0.00	0.00
10	-3.6	-2.4	-2.2	-3.2	-3.4	-3.5	-4.1
	0.00	0.99	0.99	0.92	0.00	0.00	0.00
25	-1.4	-1.0	-0.8	-1.1	-1.2	-1.5	-1.7
	0.00	0.98	0.99	1.00	0.92	0.00	0.00
Median	0.2	0.7	0.7	0.5	0.5	0.1	-0.1
75	2.0	3.1	2.8	2.7	2.6	1.8	1.3
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	5.0	7.1	5.0	6.7	6.0	4.7	2.9
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	8.0	11.3	6.7	9.9	9.2	8.3	4.9
	0.00	0.00	0.01	0.00	0.00	0.00	0.00
99	17.8	14.7	10.5	18.7	19.8	18.7	11.4
	0.00	0.05	0.40	0.00	0.00	0.00	0.00
Mean^{EW}	-0.4	1.5	1.1	1.2	0.9	0.4	-0.3
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean^{VW}	1.0	1.6	1.0	1.1	0.8	0.5	-0.3
	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Internet Appendix

Table IA.1: Risk, Return, and Allocation Weights of Simulated Portfolios

This table reports the asset allocation weights, expected return, and standard deviation of returns for the 4 simulated portfolios compiled using realized returns of the benchmark indices over the 1996 to 2016 period. The illiquid time series of alternative asset classes are unsmoothed using the methodology of Getmansky, Lo, and Makarov (2004).

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