

Investment Returns and Distribution Policies of Non-Profit Endowment Funds

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Abstract

We present the first estimates of the investment returns and distribution rates for U.S. non-profit endowment funds, based on a comprehensive sample of more than 24,000 organizations drawn from Internal Revenue Service (IRS) filings between 2010-15. Very small endowments earn risk-adjusted returns above market benchmarks, but larger ones significantly underperform, with an inverse relation between fund size and abnormal returns. Higher education endowments, the majority of the \$0.5 trillion asset class, do significantly worse than funds in other sectors. Endowments earn better returns when their parent organizations are located near financial centers. Distribution ratios are conservative, well below the funds' long-run actual and expected returns. Donors increase their contributions when endowment returns exceed market benchmarks, with an elasticity of about 0.129 between investment returns and new donations.

Keywords: non-profit endowments, institutional investors

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I. Introduction

Endowment funds are repositories for gifts and operating surpluses generated by non-profit organizations. Often treated by their parent organizations as “nest eggs” or “rainy day funds,” endowments are invested in stocks, bonds, and alternative assets such as hedge funds and private equity, and they pay income to their parents to subsidize operating costs and capital projects. In recent decades, many endowments have grown rapidly due to an influx of gifts as well as riskier investment policies that have increased their returns. Probably the best-known example is Yale University, which in 2017 reported having grown to \$27.2 billion with an annualized return of 12.1% per year over the prior 20 years.¹ The exponential growth of Yale’s and other high-profile universities’ endowments has led to political scrutiny of the objective functions of their parent organizations² and, as of 2018, a new 1.4% federal income tax on their profits.

Yet little is known about the overall size, performance, and use of endowments in the non-profit sector. The small number of papers on endowment returns have typically focused

¹ <https://news.yale.edu/2017/10/10/investment-return-113-brings-yale-endowment-value-272-billion>.

² “There is an old joke that describes Harvard as a \$37 billion hedge fund with a university attached.” Barry Ritholtz, “The Day Harvard Stopped Being a Hedge Fund,” Bloomberg View, January 26, 2017.

only on universities. These studies all rely on self-reported information from voluntary opt-in samples that take no account of selection bias or survivorship bias. The best known study, Lerner, Schoar and Wang (2008), uses annual data from the National Association of College and University Business Officers (NACUBO) and studies an opt-in sample that increased from 533 schools in 1993 to 726 in 2005 (the NACUBO sample had grown to 809 schools by 2017, the latest edition available today). The same source is used by Brown, Garlappi and Tiu (2007). Cejnek, Franz, Randl and Stoughton (2014) provide a literature review of the extensive academic and trade research into the university endowment sector, which seems to have crowded all other non-profit endowment research to the sidelines. Among the results we report below, one of the most striking is that endowments of colleges and universities perform significantly worse than the universe of funds in all other non-profit sectors.

This paper presents a comprehensive survey of non-profit endowment returns for the period 2010-2015. We use data provided by all U.S. non-profits in annual Form 990 filings with the Internal Revenue Service, and our download of these filings yields a sample of 79,224 annual endowment observations reported by 24,317 organizations in all non-profit sectors. To our knowledge, the only other paper to use this data up to now is Yermack's (2017) study of 120 major art museums. Within the universe of non-profits, colleges and universities represent 18% of the observations 59% of the assets, and one of our immediate observations is they are not particularly representative. In our study, the subclass of higher education institutions significantly under-performs the community of other non-profit endowments that support organizations in diverse areas such as the arts, human services, health care, and religion, among others, and the disappointing returns reported by educational institutions to the IRS appear to

believe those touted in commercial surveys that have made their way into the press and academic papers.

Overall the funds in our study earn negative abnormal returns except in the case of very small endowments, those with assets of less than \$1 million. These results are largely in agreement with those for other investor classes, which typically exhibit zero or negative alphas. See, e.g., the well known research into mutual funds by Fama and French (2010), individual investors by Barber and Odean (2000), hedge funds by Brown, Goetzmann, and Ibbotson (1999), and private equity by Franzoni, Nowak, and Phalippou (2012), among many other performance measurement studies.

We study the distribution policies of non-profit endowments to their parent organizations, which resemble the dividend policies that are an important research topic in corporate finance. We find that most endowments have conservative distribution policies that imply payouts below their long-run expected returns, and well below the actual returns realized during the sample period for our study. These cautious distribution policies would tend to cause endowments to grow without limit over time. The smallest endowment funds make no payouts at all in most cases, implying that organizations seek to grow them to a critical mass before using them as a permanent funding source.

The remainder of this paper is organized as follows. Section II presents a description of the dataset. Section III analyzes endowment funds' investment returns, and Section IV analyzes their distribution policies. Section V studies whether donations to the parent organization respond positively to good investment returns in the endowment. Section VI concludes the paper.

II. Data description

Our data comes from Form 990, a document filed annually with the IRS by most non-profit firms in the U.S. Since 2008, Part V of Schedule D for Form 990 has required those organizations with endowment funds to provide annual data including the fund balance at the beginning of the year, contributions, distributions, administrative expenses, and net investment earnings. These data are a matter of public record, but obtaining them for a large sample of organizations has been impractical up to now, because online databases of information from Form 990 filings have all omitted coverage of this schedule.

We use Form 990 data that has been posted by the IRS since 2016 on Amazon Web Services (AWS) as a result of a lawsuit filed by Carl Malamud, an advocate for transparency in the nonprofit sector.³ The website hosts annual schema of all electronic Form 990 filings beginning in 2011. The electronic filing requirements, which have been phased in gradually since 2006, today cover all but the smallest public charities. We believe our sample, especially in the most recent years, covers substantially all of the endowment assets in the United States, since smaller organizations are far less likely than large ones to maintain endowments.

Table 1 presents a tabulation of the observations in our sample. The available data on the AWS website has well over 1 million organization-year observations beginning in 2010, but most of these charities are too small to have permanent endowments. For purposes of reporting our results in calendar time, we assign each filing to the calendar year that includes the final

³ The data are downloadable by the public from <https://aws.amazon.com/public-datasets/irs-990/>, although we found that considerable effort is required to parse the files, extract the relevant variables, and clean the data before it is suitable for large-sample research. A description of Malamud's successful federal lawsuit to compel the IRS to disclose the data in this way can be found at <https://sunlightfoundation.com/2016/06/16/irs-opens-up-form-990-data-ushering-nonprofit-sector-into-the-age-of-transparency/>.

month of its chosen fiscal year.⁴ We retain observations for a subsample of 79,224 Form 990 filings that include non-missing data for start-of-year and end-of-year endowment balances as well as investment earnings during the year. We exclude a small number of observations that exhibit data inconsistencies or have irregular tax years of fewer than 360 or more than 370 days. Table 1 shows that the sample sizes gradually increase up to 2013 and then drop off. The growth in annual observations likely occurs due to the gradual adoption of electronic filing by organizations during the sample period, and the shortfall in 2014 compared to 2013 is due to the long filing deadlines permitted for some organizations and follow-on delays for the IRS to digitize and post individual returns. In all, we have data for 24,317 unique filing organizations, and the annual sample size peaks at 18,484 in 2013. Colleges and universities, despite representing only a small minority of the observations, account for well over half of all non-profit endowment assets.

Our analysis focuses on the rates of return earned by endowment funds. As reported to the IRS, investment returns are based on dividends, interest, and capital appreciation of the fund's assets rather than only realized gains. An organization can either include its expenses as part of a report of "net investment earnings" on Line 1c of this schedule, or it can report gross investment earnings on Line 1c while listing administrative expenses separately on Line 1f. For the minority of organizations that follow the latter practice, we calculate net investment earnings by subtracting any value reported on Line 1f from Line 1c. We then calculate the annual investment return by taking the ratio of net investment earnings over the sum of start-of-year assets plus one-half of contributions. Contributions are generally bequests, gifts, and other funds

⁴ Unlike for-profit companies that tend to have fiscal years coinciding with the calendar and ending in December, the most common fiscal year-end for non-profits is June 30, which is used by 43% of all observations in the sample. An additional 37% have December fiscal years, and the other 20% are scattered among the remaining 10 calendar months.

deposited into endowments, and our calculation implicitly assumes that the typical contribution is received halfway through the fiscal year and that any distributions from the fund do not occur until year-end.⁵

Table 2 presents descriptive statistics for the sample. The typical endowment size is quite small, with a mean of \$30.3 million and median of \$1.5 million, but the largest funds run into the tens of billions, with a maximum value of \$31.6 billion (Harvard University, 2014). Outside education, the largest fund is the \$7.3 billion endowment of the Shriners Hospitals for Children (as of 2014). The median annual investment return, calculated according to our method, is 7.21%, and the median distribution ratio is much lower, 2.42%.

III. Investment returns

A. Full-sample results, and size-based sub-samples

The main results of our study appear in Table 3, which presents regression estimates for abnormal net investment returns using the standard four-factor model, with the benchmark risk factors aligned in calendar time with each observation. We show estimates for the entire sample in the first column, and for four subsamples partitioned according to the endowments' start-of-year asset values. All standard errors are clustered at the organization level.

In the first column of the table, the estimates for the intercept or alpha show a positive abnormal return of 9 basis points per year that is not statistically significant, implying that, on average, endowments' earnings approximately equal their four-factor expected returns. The

⁵ This assumption probably makes our estimate of returns slightly conservative. Distributions from endowments can occur at any time during the year. Inflows to endowments typically happen when an organization receives bequests or has a capital campaign to solicit donations from its constituents. Donations tend to cluster in the month of December for tax-timing reasons, and since many organizations have a June 30 fiscal year-end, our assumption would seem neutral. For the sizeable cohort of organizations with fiscal years ending December 31, the assumption is conservative. Bequests occur stochastically, so assuming they arrive halfway through a fiscal year is probably neutral for our estimates.

table shows two clear patterns across the size cohorts. First, larger endowments (those with more than \$100 million in assets) significantly underperform their benchmarks, and performance tends to improve as size becomes smaller. The group of tiny endowments, with size below \$1 million, earn positive and significant abnormal returns. Second, systematic risk decreases with endowment size, as shown by the estimates for the market return factor in the top row of the table. This is consistent with a wealth effect that leads to decreasing absolute risk aversion as the size of an endowment grows (Merton, 1993).

Although the estimates for the overall sample imply that endowment returns generally match the market, this interpretation is misleading because it relies on data from a very large number of observations for tiny endowments that represent only a minor part of the overall asset category. This is evident from data tabulated at the bottom of Table 3. The very smallest endowments, those with asset values below \$1 million which we label as “tiny,” comprise 43.1% of the observations in the sample but account for only 0.4% of the assets invested. At the other extreme, the “large” cohort of endowments, those worth more than \$100 million, account for 3.9% of the observations and 77.8% of the assets. As shown by the intercepts in each column, the large endowments significantly underperform their benchmarks while the tiny endowments are the only category to outperform.

The inverse relation we find between endowment size and performance echoes the pattern found for mutual funds in several studies. This pattern is regarded as something of a puzzle, since larger funds should enjoy advantages in trading costs and access to research and other information. Chen et al (2004) proposes a range of explanations for the pattern, including the costs of investing in illiquid securities, which are more commonly held by larger funds, and the administrative costs of team management that is often used by larger funds. Pollet and

Wilson (2008) discuss the costs of diversification and fund family membership as possible explanations, but neither of these issues would seem relevant for endowments, which are typically the only funds overseen by their parent organizations. The liquidity explanation is possibly the most sensible, as some non-profit endowments are known to be over-weighted in individual securities donated by university alumni or other benefactors who found their own companies and contribute a slice of the equity to their favorite charities.⁶ The costs of hedging and eventually unwinding these block ownership positions may create a drag on the overall returns for the fund.

B. Returns and proximity to financial centers

We study the access to investment advice in analysis presented in Table 4. The first column reproduces the baseline four-factor estimates for the entire sample from Table 3. Based on a hypothesis that firms obtain better investment advice if they are close to financial experts, we use STATA's *geodist* function to calculate the distance between the office address of each non-profit organization and Wall Street, for which we use the address of Goldman, Sachs headquarters in New York. The results in the second column show a striking and significant pattern: non-profits located further from the world's financial center earn lower investment returns, all else equal. A more refined analysis in the third column replaces the distance from Wall Street variable with the minimum distance of each organization from one of four financial centers where many asset management firms are located: New York, Boston, Chicago, or San Francisco. For the latter three, we use the headquarters addresses of Fidelity Investments,

⁶ There are numerous examples, but perhaps the best known is the connection between Emory University and the founders of The Coca Cola Co.

Northern Trust, and Charles Schwab, respectively. A similar pattern emerges with a negative and significant estimate.

We are not aware of any result in the investments literature consistent with the idea that access to professional investment advice leads to superior performance; indeed, much of the research on the underperformance of professional managers and the virtues of passive indexed investing suggests quite the opposite.⁷ Our results may be consistent with a number of potential explanations other than access to professional investment advice. For instance, non-profits near financial centers are probably much more likely to have better-informed board members, and they may establish superior investment policies for these organizations' endowments.

C. College and university endowments

Because colleges and universities represent such an important subgroup of the universe of non-profit endowments, we analyze their returns separately and display the results in Table 5. The estimates are striking: higher education institutions, whose endowments account for more than half of all assets in the sample despite representing just 6% of the observations, significantly underperform market benchmarks, with abnormal investment returns of minus 140 basis points per year. All other endowment funds earn positive alphas, with a statistically significant estimate of 16 basis points per year. We confirm that this result is not size-driven by looking separately at the four size-based subsamples from Table 3; we find that colleges and universities underperform other sectors in all four size cohorts, although the difference is statistically significant only in the large and medium sized sectors. These two size cohorts, however, account

⁷ Many papers have been published in recent years on loosely related topics such as the importance of geography in investment research (Coval and Moskowitz, 2001) and the tendency of individuals to invest in local stocks (Seasholes and Zhu, 2010).

for virtually all the capital invested in endowment funds by colleges and universities, with 92.5% and 7.1% of the overall assets in that sector, respectively.

Prior research such as Lerner, Schoar and Wang (2008) has found that the self-reported returns for universities in the NACUBO sample tend to track the academic quality of the institutions, with more selective schools earning higher investment returns. We find some evidence consistent with this in the right column of Table 5, which looks at the abnormal returns earned by endowments of the top 20 national universities (the Ivy League schools and others such as MIT, Stanford, and Georgetown) as ranked by *U.S. News and World Report*. These schools do earn mildly positive but not statistically significant abnormal returns. While these results are not in line with earlier studies and copious media coverage about the out-performance of elite schools, they suggest that these schools do better than others within their sector and basically earn returns that are no worse than average. However, they also support the conclusion that the investment wisdom of top universities is largely a myth, as one would expect to earn these types of returns simply by chance. Frequent mentions in the media of the out-performance of top schools seems likely due to the outsized success of just one university, Yale.

IV. Distribution policy

Endowments exist to distribute funds to their parent organizations. In principle, these distributions could fund part of an organization's operating budget, or be used for non-recurring capital expenditures, or could occur as needed to close deficits when an organization cannot otherwise balance its budget. Little is known about the distribution policies for non-profit endowments other than two recent small-sample studies by Brown *et. al* (2014) and Yermack (2017) which appear to reach opposite conclusions. Brown *et. al* study approximately 200 large

research universities and find a surprisingly pro-cyclical distribution pattern, in which universities experiencing negative financial shocks reduce their endowment payouts. Yermack (2017) studies 120 large art museums and finds that endowment withdrawals increase when the museums' operating surpluses decline.

Numerous papers beginning with Tobin (2014) have proposed spending rules for endowments, and Brown *et. al* (2014) provide an excellent review of this literature. Many of these rules resemble the consumption-smoothing prediction of Tobin's permanent income hypothesis or the dividend-smoothing payout rules followed by corporations as first documented by Lintner (1956). The tenor of these policies implies that non-profits aim for a stable distribution rate from their endowments, with the rate equal to the long-run expected return of the fund. However, other papers have taken issue with this type of distribution policy, such as Hansmann (1990) and Merton (1993). Hansmann focuses on issues of intergenerational equity and concludes that an overly conservative distribution policy may give undue benefit to affluent future generations. Merton notes that an endowment fund can be invested, and can follow distribution policies, that hedge an organization's cash flows from other assets, such as a university's streams of tuition revenue and donations.

Table 6 shows descriptive statistics about the distribution policies for the endowment funds in our sample. We calculate the distribution rate based on information in Part V, Schedule D of Form 990. The distribution rate is calculated as the ratio of distributions for grants and scholarships (Line 1d) plus distributions for facilities and programs (Line 1e) over the sum of beginning-of-year assets (Line 1a) plus 50% of new contributions and transfers during the year (Line 1b). It should be thought of as similar to the dividend policy for a company deciding what fraction of its equity to pay out to shareholders each year. We present data for the sample overall

in the left column of Table 6 and for each of the four size cohorts in the next four columns.

The data indicate that endowments have a mean distribution rate of 5.74% and a median rate of 2.42%, with more than one-third of funds not making any distribution at all. However, these statistics obscure a clear connection between endowment size and payout policies. In the second column of Table 6, data indicate that most large endowment funds have very stable distribution policies, with mean and median distribution ratios of 4.61% and 4.43%, respectively, and more than 98% of all funds making a distribution in a given year.⁸ In the right column of Table 6, the data indicate that the majority of tiny endowment funds make no distribution at all, but the mean distribution is higher than for large funds, at 6.42%. The other two size cohorts see the data trend monotonically between these two extremes.

The data suggest a number of high-level conclusions about the distribution policies of endowments. First, smaller endowments appear to follow an accumulation strategy, with a predisposition to make no distributions at all to their parent organizations and instead attempt to grow to a critical mass. However, the larger mean size of their distributions – especially with the high number of zero values – implies that these endowments are more vulnerable to large, extraordinary withdrawals to cover deficits or capital projects. Once endowments grown large, they follow very different distribution strategies. The mean and median distribution rates are almost identical, in the neighborhood of 4.5%. Extraordinary distributions from larger endowments seem to be rare, since the mean and median withdrawal rates are almost equal, and virtually all large funds make at least some distribution.

The 4.5% distribution rate appears to be a focal point that is commonly used by many

⁸ For comparison, Brown *et. al's* (2014) survey of about 200 large universities drawn from the NACUBO sample between 1986-2009 shows mean and median payout rates of 5.2%, calculated with slightly different methodology than ours. Yermack's (2017) study of 120 art museums between 2008-2013 shows mean and median spending rates of 5.8% and 4.7%, respectively.

large, established funds. This figure approximates the real return that one might expect from a fund invested 60% in equities and 40% in risk-free debt, but if inflation is greater than zero, the 4.5% nominal distribution rate is likely to be less than the return of a typical fund, meaning that endowments will tend to grow over time.⁹ This conservative distribution policy has been the focus of much of the external criticism that has focused especially on the growth of elite universities' endowments and contributed to Congress's decision to enact a 1.4% tax on large university endowment profits beginning in 2018. By comparison, private foundations are generally required to distribute at least 5.0% of their assets in order to maintain their non-profit status, and that number also has drawn criticism for being below the likely investment returns for funds held in these entities.

Table 7 presents a regression analysis of annual endowment distributions as a function of six potential sources of cash for the organization: operating income, cash on the balance sheet at the start of the year, new donations, new government grants, an increase in debt, and investment earnings on the endowment itself. As above, standard errors are clustered at the organization level, and we show estimates for the overall sample and for each of the four size cohorts.

In the left column of Table 7, estimates indicate that the dollar value of endowment distributions exhibits positive associations with two variables: operating deficits and endowments earnings. Results for the four size-based subsamples shows that the entire effect can be attributed to the payout behavior of very large endowments. Medium, small, and tiny sized endowments generally see no associations between the amounts they pay to their parents and any of the six potential alternative sources for cash.

The point estimates in the second column of Table 7 show that when endowments run

⁹ Hansmann (1990, pp 9-10) writes, "nearly all discussions of spending rules simply take it for granted that the rate of spending out of endowment should not, over time, exceed the real rate of return on the investments constituting the endowment."

operating deficits, about 17 percent of the deficit is covered by increased distributions from the endowment, a result quite close to Yermack's (2017) estimate of 13 percent for a much smaller sample of prominent art museums. This result seems to contradict Brown et. al's finding that endowment payouts are reduced when an organization experiences negative financial shocks. However, that paper takes a different empirical approach, defining a "shock" not in terms of operating losses, but instead as a deterioration in the ratio of endowment assets over total expenses.

The other strong result in the second column of Table 7 shows that when an endowment's earnings rise or fall, the annual payout from the endowment to its parent can be expected to rise or fall by about 80% of the change in endowment earnings. This surprisingly high partial correlation is probably an artifact of some institutions following a primitive distribution policy of simply distributing all of the annual realized income of the fund to the parent (Hansmann, 1990).

V. Endowment performance and its impact on fundraising

Given the high public interest in the investment performance of endowment funds, a natural hypothesis to examine is whether donors respond to successful years in which funds earn positive alphas. We test this hypothesis in regressions analysis shown in Table 8. The dependent variable in this table is based on total donations during the fiscal year. We calculate this from Part VIII of Form 990 as the sum of federated campaigns (Line 1a) plus fundraising events (Line 1c) plus all other contributions, gifts, and grants (Line 1f). We do not include membership dues (Line 1b), income from related organizations (Line 1d) or government grants (Line 1e). Our dependent variable in Table 8 is then $\ln(\text{donations}_t / \text{donations}_{t-1})$, and we regress this against the residual for the prior year from the four-factor abnormal return model, with the

intercept constrained to equal zero.

Results in Table 8 indicate a positive and significant intercept of 0.0288, implying a secular growth rate in donations of close to 3% per year, and an estimate of 0.1288, significant at the 10% level, for the residual from the abnormal return model. This coefficient indicates a modest but significant elasticity between investment performance and the willingness of donors to contribute in future periods. If a fund out-performs the market benchmark by 10 percentage points, for instance, donations would grow by about 1.29% in the following year, all else equal.

VI. Discussion and conclusions

We study the investment returns and distribution policies of non-profit endowment funds, which have grown into a \$0.5 trillion institutional investor class in the U.S. economy. Up to now, nearly all research on endowments has focused on a small, self-selected sample of large research universities, using self-reported survey data from these organizations. Although higher education endowments represent somewhat more than half of the total asset class, our results suggest that the research focus on them may be somewhat misleading, as they have inferior investment performance on an absolute basis and also when compared to endowments with parent organizations in other sectors.

In a sample of more than 24,000 endowment funds drawn from Internal Revenue Service filings, our regression analysis indicates that on average, endowment funds match their market benchmarks, but that this pattern is heavily influenced by an endowment's size. Larger endowments tend to underperform significantly, while tiny endowments earn better investment returns than expected. Endowments' returns also appear to be connected to the quality of

investment advice they receive, since organizations close to cities that are major financial centers earn significantly higher investment returns.

Most endowments appear to follow distribution policies that are quite conservative, with a median payout ratio below 2.5% of their assets. Again, size plays a big role, as most tiny endowments make no distributions at all, and larger endowments tend to cluster around a distribution rate of about 4.5%. This number would appear to resemble the expected long-run real return on a fund that is invested 60% in equities and 40% in debt.

Finally, we find an interesting connection between the endowment's investment performance and the willingness of donors to change their contributions in future years. We estimate an elasticity between investment returns and the growth of donations of approximately 0.13. This implies that the constituent donors of a non-profit, such as the alumni of a university, are aware of how well the organization performs as an investor and adjust their donations in a pattern that rewards stock market profits with the supply of new capital, much as one sees the inflows to a mutual fund increase when the fund outperforms the market.

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Table 1
Sample of Form 990 filings

The table shows the sample of Internal Revenue Service Form 990 filings that we retrieve from Amazon Web Services. We retain all observations that have non-missing values for endowment assets at the start and end of the year and exhibit no contradictions or inconsistencies in Table V, Schedule D, where the endowment data is reported. Observations are classified according to each organization's National Taxonomy of Exempt Entities (NTEE) code.

Panel A: Number of unique Form 990 filers by year and NTEE code

Year	Arts, culture, and humanities	Higher education	Education (other)	Hospitals	Environment	Health (other)	Human services	International	Mutual benefit	Public and societal benefit	Religion	Unknown or missing	Total
2010	1,188	964	1,608	694	493	1,512	2,768	149	132	1,145	206	279	11,138
2011	1,651	1,112	2,470	744	643	1,891	3,539	178	207	1,605	303	267	14,610
2012	2,068	1,141	3,173	789	829	2,182	4,375	213	258	1,991	368	215	17,602
2013	2,273	1,159	3,539	772	876	2,294	4,679	239	265	2,090	392	132	18,710
2014	2,161	1,142	3,510	521	743	1,882	4,199	202	203	1,806	339	75	16,783
2015	53	4	71	0	27	33	82	6	21	73	10	1	381
Total	9,394	5,522	14,371	3,520	3,611	9,794	19,642	987	1,086	8,710	1,618	969	79,224

Panel B: Beginning-of-year endowment assets (\$millions) by year and NTEE code

Year	Arts, culture, and humanities	Higher education	Education (other)	Hospitals	Environment	Health (other)	Human services	International	Mutual benefit	Public and societal benefit	Religion	Unknown or missing	Total
2010	\$23,367	\$229,358	\$38,418	\$19,510	\$4,794	\$13,774	\$13,313	\$2,089	\$1,626	\$20,251	\$1,052	\$1,549	\$369,101
2011	\$29,879	\$255,572	\$60,651	\$31,205	\$5,373	\$17,639	\$16,363	\$2,848	\$2,160	\$24,695	\$1,195	\$1,868	\$449,448
2012	\$34,398	\$297,655	\$74,563	\$28,756	\$7,092	\$19,456	\$19,395	\$3,425	\$2,442	\$29,025	\$2,354	\$1,691	\$520,251
2013	\$35,670	\$293,630	\$79,239	\$30,400	\$6,705	\$21,795	\$20,111	\$3,628	\$2,548	\$28,953	\$1,551	\$915	\$525,146
2014	\$34,498	\$320,931	\$84,965	\$20,215	\$6,107	\$18,827	\$18,505	\$3,312	\$1,380	\$22,960	\$1,319	\$519	\$533,540
2015	\$243	\$126	\$376	\$0	\$119	\$39	\$142	\$11	\$85	\$645	\$17	\$0	\$1,804
Total	\$158,055	\$1,397,273	\$338,211	\$130,085	\$30,190	\$91,530	\$87,831	\$15,313	\$10,242	\$126,529	\$7,488	\$6,543	\$2,399,290

Table 2
Descriptive statistics

The table shows descriptive statistics for a sample of 24,317 non-profit organizations between 2010-2015. Data are obtained from IRS Form 990 filings. All dollar values are in \$millions.

	Observations	Mean	Median	Std. Dev.	Minimum	Maximum
Total revenue	79,224	\$42.1	\$3.0	\$248.9	(\$14.4)	\$11,091.4
Total assets	79,224	\$89.0	\$7.9	\$718.0	(\$6.7)	\$72,763.6
Total liabilities	79,224	\$30.8	\$0.6	\$268.5	(\$31.1)	\$35,024.4
Endowment assets	79,224	\$30.3	\$1.5	\$380.9	(\$3.5)	\$31,627.8
Endowment additions	79,224	\$1.3	\$0.0	\$14.5	(\$25.8)	\$1,415.7
Endowment distribution rate	76,549	5.74%	2.42%	169%	(2,567%)	45732%
Net investment return	79,175	8.89%	7.21%	287%	(627%)	79,747%
Fundraising	71,909	\$4.6	\$0.6	\$26.5	(\$1.2)	\$1,855.4

Table 3**Abnormal net investment returns (four-factor model)**

The table shows regression estimates for annual net investment returns for a sample of non-profit endowment funds between 2010-2015 using the standard four-factor model. Data for investment returns is based on non-profit organizations' Form 990 filings with the U.S. Internal Revenue Service. Standard errors appear in parentheses and are clustered at the firm level. Sub-samples in the right three columns are based on endowment fair market values measured at the start of each year.

	Entire Sample	Large: Assets > \$100 mm	Medium: \$10 mm < Assets < \$100 mm	Small: \$1 mm < Assets < \$10 mm	Tiny: Assets < \$1 mm
$R_m - R_f$	0.4214*** (0.0053)	0.6078*** (0.0152)	0.5225*** (0.0079)	0.4332*** (0.0071)	0.3493*** (0.0100)
Small – Big	0.0712*** (0.0065)	0.1275*** (0.0222)	0.0944*** (0.0107)	0.0648*** (0.0091)	0.0567*** (0.0118)
High – Low	-0.0454*** (0.0073)	-0.1191*** (0.0263)	-0.0572*** (0.0117)	-0.0240** (0.0112)	-0.0241* (0.0133)
Up – Down	-0.0797*** (0.0094)	-0.1757*** (0.0389)	-0.0958*** (0.0175)	-0.0505*** (0.0146)	-0.0494*** (0.0161)
Intercept (alpha)	0.0009 (0.0008)	-0.0093*** (0.0018)	-0.0045*** (0.0011)	0.0004 (0.0011)	0.0037** (0.0016)
Observations	79,169	3,124	13,418	28,495	34,132
Fraction of obs.	1.000	0.039	0.169	0.360	0.431
Fraction of assets	1.000	0.778	0.174	0.044	0.004
Adjusted R^2	0.143	0.504	0.451	0.202	0.069

Significant at 1% (***), 5% (**) and 10% (*) levels.

Table 4**Abnormal net investment returns (four-factor model) and proximity to financial centers**

The table shows regression estimates for annual net investment returns for a sample of non-profit endowment funds between 2010-2015 using the standard four-factor model. Data for investment returns is based on non-profit organizations' Form 990 filings with the U.S. Internal Revenue Service. Standard errors appear in parentheses and are clustered at the firm level. Mileage from Wall Street is measured using STATA's *geodist* function with the New York headquarters address of Goldman, Sachs as the origin. Mileage from Financial Center is the minimum distance of each organization from either New York, Boston, Chicago, or San Francisco, measured in a similar way.

	Estimate	Estimate	Estimate
$R_m - R_f$	0.4214*** (0.0053)	0.4233*** (0.0053)	0.4231*** (0.0053)
Small – Big	0.0712*** (0.0065)	0.0704*** (0.0066)	0.0702*** (0.0066)
High – Low	-0.0454*** (0.0073)	-0.0453*** (0.0073)	-0.0450*** (0.0073)
Up – Down	-0.0797*** (0.0094)	-0.0802*** (0.0094)	-0.0794*** (0.0094)
0.001*Mileage from Wall Street		-0.0023*** (0.0005)	
0.001*Mileage from Financial Center			-0.0071*** (0.0012)
Intercept (alpha)	0.0009 (0.0008)	0.0026*** (0.0009)	0.0031*** (0.0009)
Observations	79,169	78,314	78,314
Adjusted R^2	0.143	0.145	0.145

Significant at 1% (***), 5% (**), and 10% (*) levels.

Table 5**Abnormal net investment returns (four-factor model) for higher education endowments**

The table shows regression estimates for annual net investment returns for a sample of non-profit endowment funds between 2010-2015 using the standard four-factor model. Data for investment returns is based on non-profit organizations' Form 990 filings with the U.S. Internal Revenue Service. Standard errors appear in parentheses and are clustered at the firm level. The subsample of the Top 20 Universities is based on rankings from *U.S. News and World Report*.

	Entire Sample	Colleges and universities	All other organizations	Top 20 universities
$R_m - R_f$	0.4214*** (0.0053)	0.5961*** (0.0137)	0.4077*** (0.0055)	0.6243*** (0.0575)
Small – Big	0.0712*** (0.0065)	0.0427** (0.0203)	0.0694*** (0.0067)	0.0841 (0.0815)
High – Low	-0.0454*** (0.0073)	-0.1475*** (0.0241)	-0.0310*** (0.0076)	-0.2420*** (0.0552)
Up – Down	-0.0797*** (0.0094)	-0.2083*** (0.0341)	-0.0641*** (0.0095)	-0.2307** (0.0983)
Intercept (alpha)	0.0009 (0.0008)	-0.0140*** (0.0019)	0.0018** (0.0009)	0.0047 (0.0089)
Observations	79,169	5,521	73,648	100
Adjusted R^2	0.143	0.319	0.134	0.773

Significant at 1% (***), 5% (**) and 10% (*) levels.

Table 6**Distribution rates for endowments of different sizes**

The table shows descriptive statistics about the annual distribution rates for non-profit endowments, for a sample of 24,216 non-profit organizations between 2010-2015. Data are obtained from IRS Form 990 filings on Schedule D, Part V. The distribution rate is calculated as the ratio of distributions for grants and scholarships (Line 1d) plus distributions for facilities and programs (Line 1e) over the sum of beginning-of-year assets (Line 1a) plus 50% of new contributions and transfers during the year (Line 1b).

	Entire Sample	Large: Assets > \$100 mm	Medium: \$10 mm < Assets < \$100 mm	Small: \$1 mm < Assets < \$10 mm	Tiny: Assets < \$1 mm
Observations	76,549	2,789	12,910	27,478	33,372
Fraction of with zero distribution	0.347	0.017	0.094	0.245	0.520
Median distribution rate	2.42%	4.43%	3.94%	3.12%	0
Mean distribution rate	5.74%	4.61%	5.19%	5.28%	6.42%

Table 7**Distributions by endowments as a function of other sources of cash**

The table shows least squares regression estimates of the amounts of cash distributed from non-profit endowments, as a function of six potential sources of cash for the organization. The operating surplus equals program service revenue minus program service expenses. New debt issued equals the year-over-year difference in bonds, loans, and notes outstanding. Government grants received equal cash from newly awarded grants minus changes in grants receivable. Cash on balance sheet is recorded at the start of the year. Data is based on non-profit organizations' Form 990 filings with the U.S. Internal Revenue Service. Standard errors clustered at the organization level appear in parentheses.

	Entire Sample	Large: Assets > \$100 mm	Medium: \$10 mm < Assets < \$100 mm	Small: \$1 mm < Assets < \$10 mm	Tiny: Assets < \$1 mm
Cash donations	0.0001 (0.0349)	0.0482 (0.0617)	0.0005 (0.0027)	0.0018 (0.0016)	0.0015* (0.0008)
Operating surplus	-0.0849*** (0.0283)	-0.1680*** (0.0595)	-0.0008 (0.0020)	-0.0003 (0.0013)	0.0010* (0.0006)
Endowment earnings	0.9250*** (0.2314)	0.8098*** (0.2162)	0.0301 (0.0253)	-0.0033 (0.0036)	0.0020 (0.0035)
Net change in long term debt	-0.0206 (0.0150)	-0.0176 (0.0281)	0.0040 (0.0039)	0.0033 (0.0032)	-0.0003 (0.0026)
Government grants received	0.0169 (0.0496)	-0.1005 (0.0785)	0.0036 (0.0038)	-0.0017 (0.0013)	0.0009 (0.0006)
Cash on balance sheet	0.0554** (0.0239)	0.0910** (0.0379)	0.0043 (0.0039)	0.0012 (0.0008)	-0.0005* (0.0003)
Intercept	-31627.2 (135412.2)	3436307.5 (2586539.9)	1595798.3*** (77809.1)	211531.3*** (5736.5)	22618.1*** (1538.7)
Observations	69,113	2,485	11,721	24,893	30,014
R^2	0.496	0.531	0.004	0.004	0.002

Table 8

Investment returns and subsequent donations to parent organization

The table shows regression estimates for a model of the growth in donations to the parent organizations of non-profit endowments. The dependent variable is the log of the ratio of current year donations over prior year donations. The main explanatory variable is the residual from a four-factor model of abnormal stock returns in the prior year, with the intercept constrained to equal zero. Data are obtained from IRS Form 990 filings for the period 2010-2015. Standard errors, clustered at the organization level, appear in parentheses below each estimate.

	Estimate
Intercept	0.0288*** (0.0031)
Residual from four-factor model	0.1288* (0.0703)
Observations	42,774
Adjusted R^2	0.000

Significant at 1% (***), 5% (**) and 10% (*) levels.