

NBER WORKING PAPER SERIES

THE RISK, REWARD, AND ASSET ALLOCATION OF NONPROFIT ENDOWMENT
FUNDS

Andrew W. Lo
Egor V. Matveyev
Stefan Zeume

Working Paper 34078
<http://www.nber.org/papers/w34078>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
July 2025

The authors thank Huaizhi Chen, Stephen Dimmock, Diane Del Guercio, Clemens Sialm, and seminar participants at MIT, UIUC, New Economic School, Nomura Securities, MFS Investment Management, Summer Institute of Finance Conference, Wolfe Research Conference, ECGI Finance Workshop, and FSU SunTrust Conference for their valuable comments. Deepali Garg, Kushan Tyagi, and Andrew Lu provided excellent research assistance. The authors gratefully acknowledge the MIT Laboratory for Financial Engineering for research support and the MIT Office of Research Computing and Data for providing the computing and data storage resources that supported this research. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2025 by Andrew W. Lo, Egor V. Matveyev, and Stefan Zeume. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

The Risk, Reward, and Asset Allocation of Nonprofit Endowment Funds
Andrew W. Lo, Egor V. Matveyev, and Stefan Zeume
NBER Working Paper No. 34078
July 2025
JEL No. G11, G2, G20, G23, G29

ABSTRACT

Using tax filings from 374,351 U.S. nonprofit organizations from 2008 to 2020, we provide the first large-scale analysis of endowment prevalence, function, asset allocation, and returns. Endowment use varies systematically across sectors and revenue models. Organizations with endowments scale mission-related spending more effectively and hedge revenue risk through asset allocation. Yet most endowments underperform passive benchmarks, with the weakest performance concentrated among smaller, self-managed funds. Advisory fees are positively correlated with gross returns but negatively with net returns, suggesting overpayment for investment services. Stronger governance, lower discretionary spending, and the use of outsourced CIOs are associated with better performance.

Andrew W. Lo
Massachusetts Institute of Technology
MIT Sloan School of Management
and NBER
alo-admin@mit.edu

Stefan Zeume
University of Illinois Urbana-Champaign
Gies College of Business
zeume@illinois.edu

Egor V. Matveyev
Massachusetts Institute of Technology
MIT Sloan School of Management
matveyev@mit.edu

Public nonprofit organizations (NPOs) play a central role in the U.S. economy, employing over 20 million people with annual wages exceeding \$1 trillion. They operate across a wide range of sectors, including human services, religion, the arts, environmental protection, public and societal benefit, education, and healthcare. These organizations include prominent institutions such as the American Red Cross, the Metropolitan Museum of Art, the Nature Conservancy, Habitat for Humanity, and Harvard College. While most NPOs rely primarily on donations and service revenues, a meaningful share also maintain endowment funds that provide long-term investment income to support their missions.

Despite their role in sustaining long-term operations and supporting mission-driven activities, there is limited systematic evidence on how nonprofit endowments are distributed across the sector, how they are invested, how asset allocation choices relate to organizational characteristics and business models, or what returns they generate. Prior research has focused almost entirely on a small subset of large university endowments, which constitute less than 2% of all endowment funds, leaving unanswered questions about the rest of the sector.¹

This paper provides the first comprehensive analysis of nonprofit endowment funds across the full spectrum of NPOs. We assemble a novel dataset from tax filings submitted to the Internal Revenue Service (IRS), covering fiscal years 2008 through 2020. Among nearly 375,000 organizations in our sample, approximately 40,000 report managing endowment assets. A key feature of the dataset is that it links endowment information to detailed characteristics of the parent organization, including financial statements, governance structures, investment management practices, and executive compensation.

We begin by documenting which types of nonprofits are more likely to maintain endowment funds. Although only 10.6% of organizations in the sample report holding an endowment, prevalence varies widely across sectors. For example, 70.4% of universities maintain endowments, compared to just 7.5% of religious organizations. The share of total assets held in endowments also differs substantially. On average, endowments account for 29.6% of an organization's assets. Among hospitals, the figure is just 6.3%, while for mutual benefit organizations, such as Children's Dyslexia Centers, it approaches 50%.²

Endowment funds are disproportionately held by older and larger nonprofit organizations. The

¹See, for example, Lerner, Schoar and Wang (2008), Brown, Garlappi and Tiu (2010), Barber and Wang (2013), Brown, Dimmock, Kang and Weisbenner (2014), and Cejnek, Franz, Randl and Stoughton (2014) for empirical analyses of investment strategies and returns of university endowments.

²Endowments are isolated pools of funds within nonprofit organizations. An asset can appear on the parent organization's balance sheet without being part of the endowment, but endowment assets are always included in the parent organization's balance sheet.

average total assets of NPOs without endowments is \$9.5 million, compared to \$64.6 million for those with endowments. Similar patterns hold for revenues, expenses, number of employees, and volunteer engagement. Conditional on size, we show that organizations with endowments grow faster, not only in revenues and donations but also in functional expenses related to charitable activities. These results, which are new to the literature, highlight the role of endowments in expanding the scale of service provision.

Over our sample period, nonprofit endowments grew at an average annual rate of 9.4%. This growth is driven by two sources: investment returns and new contributions. The average growth rate is skewed by a small number of newer and smaller endowments receiving large inflows. In comparison, the median endowment grew at just 3.4% per year. For the median fund, investment returns are the dominant source of growth, accounting for 94.2% of total inflows. This suggests that, in the aggregate, endowment growth is driven primarily by capital appreciation rather than new fundraising.

The average net investment return of endowment funds over the sample is 4.3%. Returns vary widely across organizations: the interquartile range is 9.1 percentage points, and the spread between the 90th and 10th percentiles is 16.8 percentage points. For context, a conservative multi-asset benchmark appropriate for endowments earned an average annual return of 6.7% over the same period. As a result, an equal-weighted portfolio of endowment funds underperformed the benchmark by approximately 20 percentage points cumulatively.³

Our analysis of risk-adjusted returns reveals several key findings. First, endowments as a group underperform a passive, conservative benchmark on a risk-adjusted basis. This underperformance is concentrated among smaller funds, which lag larger funds by a factor of two on a risk-adjusted basis. Over the sample period, a value-weighted portfolio of endowment funds outperformed the benchmark by 5 percentage points cumulatively, highlighting substantial performance differences by size. We show that the relationship between size and performance is nearly monotonic and robust across a variety of measurement approaches and risk adjustments.

The weaker performance of smaller endowments can be attributed to three main factors. First, small funds follow more conservative asset allocation strategies, with more than one-third of their portfolios in cash and fixed income, compared to just 4% for the largest funds. Second, they allocate disproportionately to trusts and cooperatives, which earned particularly low returns during our sample period. Third, smaller funds are much more likely to invest in individual

³The S&P 500 returned 8.0% annually during the sample period, although, as discussed below, it is not an appropriate benchmark for most endowment funds.

securities rather than diversified vehicles such as mutual funds or ETFs. We find that this strategy is associated with an average reduction of approximately 1 percentage point in annual returns.

Endowments across different sectors may approach asset allocation and portfolio construction differently, reflecting variation in liquidity needs, investment horizons, and operating models. We show that sectors such as environment and human services maintain high allocations to liquid and safe assets, consistent with a strong preference for liquidity and risk aversion given their exposure to unpredictable funding needs arising from environmental and human disaster events. In contrast, sectors such as higher education and hospitals allocate a larger share to alternative investments, supported by longer investment horizons and, in the case of hospitals, more stable revenue streams. These sectoral patterns underscore the importance of operating models in shaping endowment investment decisions.

In addition to sectoral differences, funding models also play an important role in shaping asset allocation choices. We show that organizations relying on a donations-based funding model, as opposed to an earned revenue model, allocate assets in a manner consistent with theories of using endowments to hedge parent organization operating risk (Merton, 1993). Specifically, donations respond strongly to market returns, falling by approximately 3% for every 1% decline in the market. Using income statement data from parent organizations, we construct a measure of reliance on donations and find that a one standard deviation increase in funding risk is associated with an 11 percentage point decrease in allocations to public equity and a corresponding 10 percentage point increase in allocations to cash and fixed income.

We show that the return spread between the best- and worst-performing sectors reaches 2 percentage points annually. The higher education sector exhibits the highest average return, but this is entirely driven by its larger relative size. After adjusting for size, higher education endowments rank sixth out of eleven sectors. Several sectors, notably arts, human services, and environment, outperform higher education in each endowment size quintile. Our results also reveal a puzzling fact: hospital endowments significantly underperform all other sectors. This underperformance is not explained by asset allocation, as hospital endowments exhibit substantial exposure to risk assets. Moreover, hospitals manage relatively large endowments, yet underperform even without adjusting for size.

As part of our sector-size performance analysis, we construct sector-size annual performance benchmarks. These benchmarks can be used to assess endowment performance by comparing each fund to similarly sized funds within the same nonprofit sector. We later utilize these benchmarks to study the role of fund management and parent organization governance in explaining investment

returns. In essence, the benchmarks allow us to nonparametrically control for variation in returns due to size and sector.

We utilize reporting requirements to study how endowments organize their investment management function. In particular, we identify funds that manage investments internally without hiring external advisors. The data show that approximately 60% of endowments manage investments on their own, while 40% employ investment advisors. Organizations that use advisors are significantly larger, with average AUM of \$55 million compared to \$8 million for organizations that manage funds internally. We also analyze officer job titles to determine whether an organization has a dedicated senior officer overseeing investment management, such as a Chief Investment Officer (CIO) or a related role. In addition, we collect data on their compensation. A relatively small fraction of funds employ a CIO; in most cases, investment management responsibilities fall under the purview of a treasurer, vice president of finance, or a similar officer.

The results show that funds employing external advisors perform better. Funds that manage investments internally earn, on average, 40 basis points lower returns per year. In contrast, funds with a dedicated CIO do not outperform other funds; if anything, their performance is marginally weaker. We find no evidence that higher CIO compensation is associated with better returns. In fact, among funds that employ external advisors, higher CIO pay is negatively correlated with investment performance. Overall, these findings suggest that the outsourced chief investment officer (OCIO) model of endowment management has historically produced better investment outcomes during our sample period.

We also collect data on investment management fees to examine how fees relate to performance. Our sample is large and comprehensive, covering 130,000 fund-year observations across a wide spectrum of fund sizes. We find that the average fee is 65 basis points, with a standard deviation of 60 basis points. At the 90th percentile, fees are 1.13%, and at the 10th percentile, 0.14%. Smaller endowments tend to pay higher fees as a percentage of assets under management. We show that fees are weakly positively correlated with gross returns but strongly negatively correlated with net returns. We establish these results by controlling for size, sector, and year fixed effects, and by using our sector-size performance benchmarks. Overall, the findings suggest that while external advisors may help achieve higher gross returns, endowments that pay higher fees earn lower net investment returns on average.

In the final part of the paper, we link investment performance to organizational governance. Nonprofit governance has received substantial attention in the economics literature due to the unique agency problems arising from the distinctive nature of principals and stakeholders in non-

profit organizations (see, e.g., [Hansmann, 1980](#); [Fama and Jensen, 1983](#); [Glaeser and Shleifer, 2001](#); [Glaeser, 2003](#)). We construct several empirical measures aimed at capturing important facets of nonprofit governance and examine how these variables relate to endowment returns.

We find that excessive spending on non-core activities is associated with lower endowment returns, consistent with prior work showing that such organizations perform worse along other dimensions as well. Organizations in which the CEO captures a larger share of total officer and director compensation tend to have higher endowment returns. While we cannot fully establish the economic mechanism, this finding contrasts with the corporate governance literature, which generally finds that a larger CEO pay share is associated with worse performance. Finally, we show that organizations with fewer independent directors tend to achieve lower returns.

This paper contributes new descriptive data and empirical moments that improve our understanding of the behavior of U.S. endowments. The evidence we provide can be used to calibrate and discipline richer economic models. Our approach builds on prior work assembling foundational datasets on wealth management and investment behavior, including [Piketty and Saez \(2003\)](#), [Fagereng, Guiso, Malacrino and Pistaferri \(2020\)](#), [Bach, Calvet and Sodini \(2020\)](#), and [Smith, Zidar and Zwick \(2023\)](#). Understanding the role of endowments in the nonprofit sector is critical for studying the provision of charitable services, organizational responses to shocks, and the long-term sustainability of key activities such as scientific research, environmental conservation, and a broad range of social services. While some research has addressed these issues for university endowments using comprehensive datasets (e.g., [Brown, Dimmock, Kang and Weisbenner, 2014](#)), much less is known about endowments outside the higher education sector.

Our results add to the literature on the role of endowments in the provision of nonprofit services (e.g., [Tobin, 1974](#); [Hansmann, 1990](#); [Andreoni, 1998](#); [Fisman and Hubbard, 2003](#)). We show that endowments support both the expansion of mission-related activities and the mitigation of funding risk. We also contribute to the broader literature on nonprofit governance and organizational outcomes ([Glaeser, 2003](#); [Fisman and Hubbard, 2005](#); [Core, Guay and Verdi, 2006](#); [Aggarwal, Evans and Nanda, 2012](#); [Desai and Yetman, 2015](#)). We extend this work by documenting a robust association between poor governance and weaker endowment performance, highlighting the importance of governance in investment outcomes.

We also contribute to the literature on the investment behavior of institutional and individual investors by providing a comprehensive analysis of how nonprofit endowments, an important class of institutional investors, allocate capital. Our analysis leverages a hand-classified dataset of detailed endowment portfolio holdings. Several themes that emerge are consistent with findings

in other areas of the asset management literature. For example, we document a steady shift toward alternative investments over the past 15 years, consistent with trends observed among pension funds (e.g., [Ivashina and Lerner, 2018](#); [Begenau, Liang and Siriwardane, 2024](#)). We also find notable parallels between endowment portfolios and those of high-net-worth individuals, as recently reported in [Balloch and Richers \(2023\)](#) and [Gabaix, Koijen, Mainardi, Oh and Yogo \(2023\)](#). A further contribution is our analysis of the relationship between investment fees and performance. We assemble, to our knowledge, the largest dataset of fees for any class of institutional investors, covering the full universe of nonprofit endowment funds. This enables us to evaluate both gross and net investment performance and to document several key empirical patterns.

Finally, we expand the literature on endowment performance, which has traditionally focused on universities, with the exception of [Dahiya and Yermack \(2023\)](#). Our analysis shows that higher education endowments account for just over 3% of all nonprofit endowments and are not the strongest performers. Other sectors, such as the arts, exhibit superior investment performance, suggesting that investment expertise extends beyond the university sector. We contribute to the literature by analyzing how endowment performance varies with nonprofit business models, the structure of the investment management function, and the governance characteristics of the parent organization.

The paper proceeds as follows. [Section 1](#) describes the data and examines which organizations have endowments and how endowments affect outcomes. [Section 2](#) analyzes endowment returns, asset allocations, and how portfolio choices vary with size, sector, and funding risk. [Section 3](#) examines risk-adjusted performance. [Section 4](#) studies how nonprofits structure their investment management function, the fees they incur, and how these affect gross and net returns. [Section 5](#) links governance to performance. [Section 6](#) concludes.

1 Data and Descriptive Statistics

Our dataset covers all active and defunct public nonprofit organizations in the United States from 2008 to 2020. This section outlines the construction of the dataset, compares it to those used in prior literature, and presents descriptive statistics for the main economic variables used in the analysis. The Appendix provides detailed variable definitions and additional information on data collection.

1.1 Data Collection

Each public nonprofit organization in the United States is required by law to file an annual return with the IRS known as the “Return of Organization Exempt From Income Tax,” more commonly referred to as “Form 990.” Until December 16, 2021, the IRS disseminated these filings through Amazon Web Services (AWS), but the repository has since been decommissioned.⁴ The IRS now offers direct access through its “Tax Exempt Organization Search” webpage, although coverage on that platform begins only in 2019.

We obtained individual Form 990 filings in XML format from both AWS and the IRS website. We removed duplicate filings appearing in both sources, retaining only unique forms. In a significant number of cases, organizations submitted amended returns; in such instances, we retained only the most recent amended version, discarding earlier filings. This process yielded a dataset with unique combinations of Employer Identification Number (EIN) and fiscal year, with the EIN serving as the primary identifier of the organization. We excluded organizations with missing or zero end-of-year asset values, as well as all private foundations.⁵ The final dataset spans fiscal years 2008 through 2020.

As we elaborate later in the paper, the majority of nonprofit organizations do not maintain endowment funds. However, those that do are required to disclose detailed financial information about their endowments in Schedule D of Form 990. This schedule reports the beginning- and end-of-year values of assets under management (AUM), contributions to and distributions from the fund, administrative expenses, and investment income, including capital gains and losses. These data are provided for each of the past five fiscal years, enabling us to backfill historical time series for many funds.⁶

A unique feature of our dataset is that it explicitly links endowment funds to their parent organizations. Data on the parent entity are contained in the main body of Form 990 and include balance sheet and income statement information. This linkage allows us to analyze which types of organizations are more likely to establish endowment funds, and whether organizations with endowments differ systematically from those without. The main form also includes information on the organization’s mission, program activities, governance structure, and top officers and directors, including their titles and compensation. Organizations must also disclose payments to third parties

⁴See IRS information release IR-2021-250 dated December 16, 2021.

⁵Private foundations file Form 990-PF, which has a different structure and reporting requirements. They are also subject to spending rules not applicable to public charitable organizations.

⁶In rare cases, organizations restate their endowment data, resulting in inconsistencies across years. When such discrepancies arise, we retain the most recent reported values, assuming them to be the most accurate.

for asset management services. This rich set of disclosures enables us to study how nonprofits manage their endowments (e.g., internal management versus external advisors, presence of a dedicated CIO) and how fund management structures and broader organizational governance relate to endowment performance.

Another unique feature of our dataset is the availability of detailed asset allocation information. If a nonprofit organization invests more than 5% of its assets in non-public securities or alternative investments, it is required to disclose this information in Part VII of Schedule D. This disclosure requirement enables us to reconstruct portfolio allocations and analyze how asset allocation choices are related to endowment performance. Section 2 provides a more detailed discussion and analysis.

Our paper is not the first to examine the financial performance of endowment funds, but prior research has relied on smaller and more narrowly focused datasets. The most widely used source is the dataset compiled by the National Association of College and University Business Officers (NACUBO), which is limited to institutions of higher education.⁷ In contrast, our dataset covers endowment funds across all nonprofit sectors. We identify 39,866 endowments, of which only 1,246 are affiliated with higher education institutions, accounting for just over 3% of the total. Moreover, even within the higher education sector, our dataset includes approximately 50% more endowment observations per year than the NACUBO sample.

The average returns reported in the NACUBO data are consistently higher across most years. Over the full sample period, the average annual return for higher education endowments in our dataset is 4.7%, compared to 6.0% in the NACUBO data. This difference reflects two key factors. First, larger endowment funds tend to earn higher returns, a relationship we examine in detail in Section 3. Second, the NACUBO sample systematically overrepresents larger institutions, as previously documented by Lerner, Schoar and Wang (2008).⁸

Another commonly used source of nonprofit data is the National Center for Charitable Statistics (NCCS). The NCCS dataset offers a longer time series beginning in 1982, but it is restricted to nonprofits with over \$10 million in assets and a random sample of 4,000 smaller organizations.⁹ While the NCCS provides extensive historical coverage, it contains no data on endowment funds, which are the central focus of our study. For this reason, we do not utilize the NCCS dataset.

Overall, the results presented in our paper provide a more comprehensive view of endowment performance in the nonprofit sector, as our dataset spans the full universe of nonprofit organizations

⁷See, for example, Lerner, Schoar and Wang (2008), Brown, Garlappi and Tiu (2010), Dimmock (2012), Barber and Wang (2013), Brown, Dimmock and Weisbenner (2014), and Dimmock, Wang and Yang (2019).

⁸See the Appendix for additional comparisons between our dataset and NACUBO.

⁹See, e.g., Okten and Weisbrod (2000), Andreoni and Payne (2003), Fisman and Hubbard (2005), Core, Guay and Verdi (2006), Aggarwal, Evans and Nanda (2012), among others.

and their associated endowments.

1.2 Descriptive Statistics

Our sample consists of 374,351 unique NPOs with a non-missing book value of assets, covering fiscal years 2008 through 2020. These NPOs represent a significant fraction of the U.S. economy. For example, our dataset indicates that in 2019, the last fiscal year before the COVID-19 pandemic, these nonprofits collectively employed 29.5 million paid workers, with total wages amounting to \$1.53 trillion. Among these employees, 2.4 million received annual wages exceeding \$100,000.

Table 1 reports summary statistics for all nonprofit organizations, comparing those with endowment funds to those without. Detailed variable definitions are provided in the Appendix. All variables are averaged at the organization level; results are similar when computed at the organization-year level. Overall, slightly fewer than one in nine organizations ($10.6\% = 39,866/374,351$) report having an endowment fund.

Panel A documents differences in observable characteristics of NPOs with and without endowment funds. Perhaps unsurprisingly, organizations that have endowment funds are significantly larger, older, employ more people, and have more volunteers. The average book value of assets is \$15.0 million across all organizations, but \$64.6 million among organizations with endowment funds, which is 6.8 times that of organizations without endowment funds. NPOs with endowments spend considerably more on charitable activities (referred to as “functional expenses”): \$27.4 million versus \$4.3 million spent by NPOs without endowment funds.

Next, we compute NPO spending statistics and growth rates. Since differences in spending and growth rates may be driven by differences in size, and considering that NPOs with endowments are substantially larger, we present two statistics: the first is a simple difference in values, while the second accounts for size differences through a regression controlling for the natural logarithm of book assets. We find that NPOs with endowments are more efficient, as they allocate a higher fraction of overall expenses directly to charitable activities (i.e., they spend less on management and other overhead expenses).¹⁰ Specifically, when controlling for size, NPOs with endowments have a program services expense ratio that is 2.7 percentage points larger than that of NPOs without endowments. This higher allocation towards program services is achieved, in part, by spending less on wages (2.1%) and travel (0.3%). We also note that organizations with endowments have a more robust fundraising function. Controlling for size, they spend almost 3% more on fundraising

¹⁰Note that unlike private foundations, public charitable organizations are not required to spend at least 5% of their total asset value annually.

activities.

During our sample period, organizations with an endowment grew faster across all dimensions. Controlling for size, NPOs with endowments grew their assets, revenue, contributions, and expenses on average by 1.6%, 3.0%, 3.4%, and 4.0% faster per year, respectively.¹¹ Interestingly, the average organization experienced a decline in external contribution growth (and overall revenue growth) over our sample period. However, this average decline is primarily driven by organizations without an endowment fund, some of which discontinued their operations during the sample period.

In summary, we find that nonprofits with endowments are larger and grow faster than those without. They spend a larger fraction of their overall expenses on their charitable mission, even after controlling for their larger size. These results are important in light of the literature that studies the purpose of endowment funds (e.g., Hansmann, 1990; Glaeser, 2003; Fisman and Hubbard, 2003).

In Panel B of Table 1, we examine whether the use of endowments and their relative size differs by operational sector of the charitable organization. We use a classification known as the 12 major National Taxonomy of Exempt Entities (NTEE) categories developed by the National Center for Charitable Statistics (NCCS).¹² The table shows that there is a large variation in the proportion of organizations with endowment funds across sectors. In particular, only 7.5% (843 out of 11,299) of all religious organizations have established endowment funds. This stands in sharp contrast to institutions of higher education, of which 70.4% (1,241 out of 1,771) have endowment funds. The average percentage of organizations with endowment funds across all categories is 10.6%, slightly more than one in nine organizations. The table also indicates that endowments of institutions of higher education on average are significantly larger than endowments in other nonprofit sectors.

We also measure the fraction of total assets held in an organization's endowment fund. The average across all NPO categories is 29.6%. However, there is substantial variation across sectors. Mutual benefit organizations, public and societal organizations, and educational organizations (excluding higher education) have more than one-third of their total assets in endowment funds.

¹¹Contributions refer to external donations, including membership dues, fundraising events, and government grants. They constitute a portion of the total revenue for NPOs. Some contributions are made directly to organizations' endowment funds, but the vast majority of contributions are made to the organization itself. In either case, they appear in both contribution and revenue figures on the income statement.

¹²These categories are: 1) arts, culture, and humanities, 2) higher education, 3) education (other), 4) environment, 5) hospitals, 6) health (other), 7) human services, 8) international, 9) public and societal benefit, 10) religion, 11) mutual benefit, and 12) unknown/other. For more details, refer to: <https://nccs.urban.org/project/national-taxonomy-exempt-entities-ntee-codes>. Table 1 Panel B shows examples of organizations within each category.

It's noteworthy that higher education institutions hold, on average, only 25.2% of their total assets in endowments, which is significantly lower than what is typically perceived based on the large established endowments of elite U.S. colleges, where more than 90% of their assets are held in endowments. On the lower end, hospitals are the most notable outlier, with only 6.3% of their assets held in endowments, on average. This is perhaps not surprising, given the asset-intensive nature of hospital operations, as well as the fact that their service expenses are primarily covered by revenue (e.g., [Adelino, Lewellen and McCartney, 2022](#); [Aghamolla, Karaca-Mandic, Li and Thakor, 2024](#)).

2 Endowment Growth, Returns, and Asset Allocation

Since this is the first paper to examine the full universe of nonprofit endowment funds, we begin by documenting basic facts about growth dynamics and the factors that shape them, including investment returns and new contributions to the fund. In [Section 2.2](#), we analyze investment returns. [Section 2.3](#) focuses on asset allocation, highlighting changes over time as well as cross-sectional differences by fund size and sector. We estimate the contribution of major asset classes to overall investment performance and, finally, examine how an organization's funding risk is related to its portfolio choices.

2.1 Endowment Growth

[Table 2](#) shows endowment summary statistics for all NPOs with endowment funds. Our sample contains 39,866 unique endowments over fiscal years 2008 through 2020, totaling 318,757 fund-year observations. The average endowment fund has \$25.6 million in assets under management (AUM), but this figure is skewed by a small number of very large funds. The median AUM is slightly over \$1 million.

Compared to prior literature, which primarily focused on large university endowments, the median nonprofit endowment across all NPOs in the United States is substantially smaller. For instance, according to [Lerner, Schoar and Wang \(2008\)](#), who used NACUBO data covering 726 universities, the median endowment in 2005 was \$72 million in AUM. Our dataset, by contrast, includes 1,246 university endowments with a median AUM of \$30 million in 2020, reflecting the broader inclusion of smaller endowment funds not previously studied.

[Table 2](#) shows that endowment funds experienced an average annual growth rate of 9.4% over our sample period. Like the distribution of AUM, endowment growth rates are highly skewed.

Although the mean growth rate stands at 9.4%, the median growth rate is notably lower at 3.4% annually.

There are three separate components that contribute to endowment growth: contributions to the fund, distributions from the fund, and the accrued market return on invested funds. Table 2 indicates that the average contribution rate is 9.6%, the average distribution rate is 4.4%, and the net investment return is 4.3%.¹³ While this data may suggest that endowment growth is primarily driven by contributions, the distribution of contribution rates is highly skewed. Many funds at their inception exhibit high contribution rates (the 90th percentile of the contribution rate distribution is 22.1%); however, the median contribution rate to funds is just 0.3%.

To better understand the relative importance of contributions versus investment returns, we compute the share of fund inflows attributable to each. On average, returns account for 67.8% of inflows, while contributions account for the remaining 32.2%. For the median fund, returns are even more important than contributions, accounting for 94.2% of all inflows. This reflects the fact that contribution rates are very high for only a small fraction of funds. For most funds, however, investment returns drive a substantially larger share of endowment growth over time.

2.2 Investment Returns

We next turn to a central focus of our analysis: the investment performance of endowments. Each year, organizations with endowment funds are required to report the beginning-of-year balance, contributions to and distributions from the fund, investment earnings (including realized and unrealized gains and losses), and the end-of-year balance. The IRS permits organizations to report investment earnings either gross or net of transaction costs.¹⁴ In our sample of 318,757 fund-year observations, approximately one-third (104,532) report gross returns.

To compute annual investment returns, we account for contributions made during the year by dividing the dollar value of investment earnings by beginning-of-year AUM plus half of that year's contributions. Table 2 shows that the average net investment return over our sample period is 4.3%.¹⁵ Investment returns vary widely across funds: the interquartile range is 9.1 percentage

¹³By construction, the average growth rate of 9.44% equals the average contribution rate (9.57%) minus the distribution rate (4.42%), plus the average return on invested funds (4.30%).

¹⁴See Instructions to Schedule D of Form 990 for details.

¹⁵For robustness, we also compute returns using 0% and 100% of annual contributions. These alternatives assume that all contributions are made either at the end of the fiscal year (producing no returns) or at the beginning (earning returns for the full year). The resulting return estimates are 4.2% and 4.5%, respectively. For the remainder of the paper, we use the return measure that assumes contributions are made evenly throughout the year and includes 50% of contributions in the denominator.

points, and the 90th–10th percentile spread is 16.8 percentage points. Very low returns are rare; the 10th percentile is -2.5% .

Among the one-third of funds that report investment earnings on a gross basis, the average gross return is 6.2% , and the distribution of returns is less skewed than that of the full sample. The average net investment return for these gross-reporting funds is also nearly one percentage point higher than that of net-reporting funds (5.2% versus 4.3%). This discrepancy suggests that either funds with higher costs choose to report returns on a net basis, or net-reporting funds earn lower gross returns. While we cannot directly disentangle these two channels, the large return differential implies that transaction costs alone are unlikely to explain the gap.

To better understand how annual performance translates into long-term outcomes, we compute cumulative returns and compare them to two benchmarks. The first is the S&P 500 index. For most endowment funds, however, the S&P 500 is too aggressive, making it an unrealistic benchmark. As an alternative, we construct a more representative multi-asset benchmark composed of 40% U.S. equities, 20% international equities, 20% investment-grade bonds, 10% real estate, and 10% cash.¹⁶ This benchmark reflects two empirical facts. First, as discussed below, the average allocation to public equities during our sample period is approximately 60%, with about one-third of that in international stocks. Second, the 30% allocation to bonds and cash aligns with the typical fixed-income exposure of small funds. While this portfolio may be too conservative for larger funds, it represents a broadly appropriate and investable asset allocation strategy for the average endowment.

Figure 1 shows cumulative returns for equally weighted and value-weighted portfolios of endowment funds, alongside the S&P 500 and the multi-asset benchmark described above. To compute returns, it is critical to account for each fund's fiscal year-end, as annual returns can vary significantly depending on the timing within the calendar year.¹⁷ While the majority of nonprofit organizations report on a June-to-June basis (41% of our sample) or December-to-December basis (40%), our sample includes funds with fiscal year-ends in every month of the year. Panel A of Figure 1 presents results for June filers, and Panel B shows results for December filers.

First, the S&P 500 and the multi-asset benchmark exhibit sizable differences in returns between Panels A and B, highlighting the importance of aligning return measurement with fiscal year timing. The average annual return on the S&P 500 is 6.8% when computed June-to-June and 9.2%

¹⁶We thank Clemens Sialm for suggesting this benchmark. It is constructed using the following ETFs: VTI (U.S. equities), VEU (international equities), AGG (investment-grade bonds), VNQ (real estate), and BIL (cash).

¹⁷For example, in 2020 at the onset of the COVID-19 pandemic, funds with March, June, and December fiscal year-ends reported markedly different annual returns.

December-to-December. The corresponding benchmark returns are 6.0% and 7.5%, respectively. Second, both panels show that value-weighted (VW) returns exceed equal-weighted (EW) returns by a wide margin. Among June filers, the EW return is 4.7% and the VW return is 7.1%; for December filers, the EW return is 3.8% and the VW return is 6.6%.¹⁸ As a result, cumulative VW returns substantially exceed EW returns for both June and December filers.

The main takeaway from Figure 1 is that the value-weighted return on the endowment portfolio closely tracks the return on both the S&P 500 and the benchmark. It is slightly higher for June filers and slightly lower for December filers. The pronounced gap between value-weighted and equal-weighted returns suggests that larger funds outperform smaller ones. We return to this point in Section 3, where we provide a comprehensive analysis of risk-adjusted endowment performance.

2.3 Asset Allocation

In this section, we study asset allocation decisions of endowment funds. The IRS requires public nonprofit organizations to disclose their investments in publicly traded and other securities as part of their Form 990 filings. Publicly traded securities include bonds, common and preferred stocks that are listed and regularly traded in over-the-counter markets or on established exchanges. The IRS defines other securities as all securities, partnerships, or funds that are not publicly traded.¹⁹

If other securities constitute 5% or more of an organization's total assets, the IRS requires the organization to complete Part VII of Schedule D on Form 990. Aside from requiring separate disclosure of financial derivatives and closely held equity interests, the IRS does not mandate specific reporting categories for asset classes. As a result, organizations report asset holdings in a variety of non-standardized formats. For example, in FY2023, the Metropolitan Museum of Art reported holdings in private equity, real assets, equity funds, hedge funds, and funds of hedge funds. By contrast, the AIDS Healthcare Foundation reported holdings in venture capital, public and private equity, fixed income, and hedge funds.

To enable consistent analysis, we hand-classify all reported investments into a standardized set of eight asset classes: (1) public equity, (2) fixed income, (3) private equity and venture capital, (4) cash and cash equivalents, (5) real assets and real return, (6) real estate, (7) hedge funds and absolute return, and (8) trusts and cooperatives. A detailed description of the holdings included in each category is provided in the Appendix. In some instances, organizations report holdings that

¹⁸As reported in Table 2, the overall EW return across all funds is 4.3%, and the VW return (untabulated) is 6.3%.

¹⁹Definitions for publicly traded and other securities are provided in the Instructions to Form 990 and Schedule D, under the IRS reporting guidelines for nonprofit investments. These categories reflect disclosure requirements under IRC §6033 and the corresponding Treasury regulations.

span multiple categories. For example, the AIDS Healthcare Foundation reports \$3.8 million in “public & private equity,” which we cannot separate into public and private components. In such cases, we exclude these assets from the classification and rely only on those that can be clearly assigned to a single category.²⁰

We further break down public equity holdings into individual stocks and pooled investment vehicles, such as mutual funds and exchange-traded funds. We make this distinction when organizations explicitly report direct holdings of specific stocks.²¹ Similarly, we separate fixed income holdings into individual bonds and pooled funds. Examples of direct bond holdings include FNMA bonds, FHLB bonds, and State of Israel bonds, while pooled fixed income investments are typically labeled as “fixed income funds.” This level of granularity allows us to assess whether funds that invest in individual securities exhibit different behavior or performance compared to those using diversified vehicles.

A somewhat unique feature of endowment portfolios is their allocation to trusts and cooperatives. Trusts typically include common and collective trusts, which pool the assets of multiple investors. These vehicles resemble mutual funds but are not publicly available. Collective trusts have a similar structure but are often used in retirement plans and are regulated by the Office of the Comptroller of the Currency (OCC). Investments in cooperatives and credit unions involve ownership stakes in cooperative enterprises such as cooperative banks, agricultural cooperatives, and housing cooperatives. These assets often provide returns in the form of dividends or patronage refunds and emphasize member benefit over profit maximization.

Figure 2 shows the average asset allocation across all endowments for three sub-periods: 2008 to 2010 (global financial crisis), 2011 to 2015, and 2016 to 2020. Because our sample ends in December 2020, it captures the early phase of the COVID-19 pandemic. A notable trend over this period is the increase in allocations to public equity (61.8% in 2016 to 2020, up from 55% in 2008 to 2010), alongside a decline in allocations to fixed income and cash. Allocations to the remaining asset classes are relatively stable over time.

The share of assets allocated to alternatives, defined as the sum of private equity, venture capital, hedge funds, real assets, and real estate, remained stable at approximately 16% throughout

²⁰Specifically, AIDS Healthcare Foundation reported the following FY2022 holdings: venture capital (\$5.46 million), public & private equity (\$3.81 million), fixed income (\$155.43 million), and hedge funds (\$3.89 million), totaling \$168.59 million. In our analysis, we include only the fixed income (92.2%) and hedge funds and absolute return (2.3%) holdings, and exclude the remaining assets that cannot be cleanly classified. Our asset class definitions are designed to maximize the share of reportable assets while maintaining consistency. For example, we do not distinguish private equity from venture capital because most organizations report them jointly.

²¹Some of the most common individual stock names in our sample include Johnson & Johnson, General Electric, Exxon Mobil, Verizon, AT&T, Apple, and Duke Energy.

the sample period. This figure is slightly higher than the average alternative allocation reported in [Lerner, Schoar and Wang \(2008\)](#) for larger endowments in the NACUBO sample (as of 2005), but substantially lower than the corresponding figure for U.S. public pension funds. [Begenau, Liang and Siriwardane \(2024\)](#) show that public pension systems increased their allocation to alternatives from approximately 20% in 2008 to 30% in 2020. Their sample includes large public pensions with average AUM exceeding \$2 billion, whereas our dataset covers the full universe of nonprofit endowments, with an average AUM of \$26 million. These differences suggest that asset allocation decisions vary systematically with fund size, which we examine in the following section.

2.3.1 Asset allocation by fund size

To analyze how asset allocation varies by endowment size, we group all funds into four quasi-logarithmic AUM categories: above \$100 million, \$10 million to \$100 million, \$1 million to \$10 million, and below \$1 million. [Figure 3](#) shows that public equity is the dominant asset class across all size groups, with allocations ranging from 56.8% to 63.6%. In contrast, allocations to safe assets such as cash instruments and fixed income differ substantially by size. The smallest funds (AUM < \$1 million) allocate 20.2% to cash and 11.3% to fixed income, compared to just 1.8% and 2.2%, respectively, for the largest funds (AUM > \$100 million).

Allocations to alternative assets vary sharply by fund size. Among the largest endowments, private equity, venture capital, hedge funds, and real assets together account for more than one-third of the total portfolio. This share exceeds the 30% allocation to alternatives reported for U.S. public pension systems by [Begenau, Liang and Siriwardane \(2024\)](#). In contrast, for the smallest funds, these asset classes represent just 1% to 2% of total assets on average. This pattern suggests that larger endowments have greater access to alternative investments, while smaller funds may lack the scale or resources to participate meaningfully in these markets. The data also show that allocations to trusts and cooperatives are more common among smaller endowments.

Limited access to alternative investments does not explain why smaller funds allocate such a large share of their portfolios to safe assets. If access were the only constraint, we would expect these funds to substitute alternatives with other risky assets, such as public equities. Instead, they disproportionately allocate to cash and fixed income. This pattern is consistent with models of precautionary saving, in which agents with lower wealth or more limited financial flexibility hold safer portfolios to hedge against income risk and future uncertainty (e.g., [Carroll, 1997](#); [Carroll and Samwick, 1997](#); [Vissing-Jørgensen, 2002](#)). Smaller nonprofits with modest endowments may be especially vulnerable to short-term financial shocks and therefore maintain higher allocations

to liquid, low-risk assets to ensure they can meet operational needs and obligations.

Interestingly, the allocation to alternatives by large endowments closely mirrors that of high-net-worth individuals, as documented in [Gabaix, Kojien, Mainardi, Oh and Yogo \(2023\)](#). For endowments with AUM exceeding \$100 million, the average allocation to alternatives is approximately one-third, similar to the allocation observed among individuals with net worth above \$100 million. At the lower end of the wealth distribution, however, individuals appear to allocate more to alternatives than endowments do. For example, individuals with net worth below \$10 million allocate nearly 15% to alternatives, compared to 8.2% for endowments in the same asset range.

Our data allow us to examine how endowments invest within asset classes, particularly in their use of individual securities. [Figure 3 Panel B](#) shows the share of stock and bond holdings allocated to individual securities rather than pooled investment vehicles such as ETFs or mutual funds. Smaller funds are significantly more likely to invest directly in individual stocks and bonds. On average, nearly one-sixth of their equity and fixed income portfolios is held in single-name securities.

Several factors may help explain this investment behavior. First, smaller endowments are often managed by small committees or individual treasurers, which may lead to a preference for selecting individual securities based on conviction or perceived opportunities for outperformance relative to pooled vehicles. Second, direct security selection may offer greater flexibility to tailor portfolios to the specific constraints or objectives of the organization, aligning with the operational needs of smaller nonprofits. We examine the performance implications of this investment approach in a later section.

[Figure 3 Panel C](#) shows the average allocation to international equity (defined as the sum of developed and emerging markets) as a share of total public equity holdings. The largest funds allocate 35% to international and 65% to domestic equity, consistent with broader diversification strategies. Smaller funds, by contrast, allocate a significantly smaller share to international equities. While we cannot definitively determine the reasons for this pattern, it may reflect greater perceived risk associated with international markets, consistent with the conservative asset mix observed in [Panel A of Figure 3](#). Alternatively, smaller funds may face informational or institutional constraints that limit their use of international equity.

2.3.2 Asset allocation by nonprofit sector

The asset allocation strategies of nonprofits can vary by sector due to several factors, including liquidity preferences, investment horizons, and the operating model typical of each sector. Liq-

liquidity preference is particularly important for organizations that require ready access to cash to meet operational expenses, manage uncertainty, or respond quickly to emerging needs. Investment horizon may also play an important role, influencing the balance between liquid and illiquid assets. Finally, the structure of an organization's operating model, including its mix of revenue sources, can affect risk tolerance and the ability to absorb investment losses, which in turn influences portfolio decisions.

Figure 4 shows average asset allocations by nonprofit sector. Sectors such as environment, religion, and human services exhibit high allocations to safe assets, particularly cash and bonds. This pattern may reflect risk aversion and a strong preference for liquidity. These sectors often face unpredictable demand for services and prioritize maintaining liquidity to respond to emergencies. For example, human services organizations may require immediate funds to address crises, while environmental nonprofits may need to mobilize resources quickly for disaster response or urgent conservation efforts. In contrast, sectors such as higher education and hospitals allocate less to safe assets and more to alternatives. Higher education institutions often operate with longer investment horizons, allowing for greater exposure to illiquid assets. Hospitals, supported by relatively stable revenue from services and insurance reimbursements, may also have greater capacity to invest in alternatives.

Even closely related sectors can exhibit different asset allocation patterns. For instance, the education sector, which includes high schools, allocates a much larger share to safe assets than the higher education sector. This difference likely reflects variation in operating models. High schools typically rely heavily on tuition and annual fundraising, which can be more volatile, increasing the likelihood of needing to draw on endowment funds to cover cash flow shortfalls. In contrast, many higher education institutions receive a significant share of their funding from government sources, which have historically been more stable, allowing them to invest with longer horizons and greater risk tolerance.

2.3.3 Portfolio holdings and investment returns

To measure the contribution of different asset classes to investment performance, we regress net investment returns on portfolio composition. Table 3 presents the results. Regression (1) includes no fixed effects; the intercept reflects the average net return across the sample, while the coefficients capture the average contribution of each asset class. Since endowment returns vary substantially by fiscal year-end (see Figure 1), regression (2) includes fiscal year-end fixed effects to absorb reporting-period variation. To account for sectoral differences in investment strategy, regression

(3) includes sector fixed effects. Regression (4) adds fiscal year-end-by-sector fixed effects to absorb both sources of variation.

Table 3 Panel A shows that allocations to public equity during our sample period contributed positively to investment returns, while allocations to cash and fixed income, unsurprisingly, contributed negatively. Among alternative asset classes, real assets contributed the most to average performance, followed by hedge funds and private equity/venture capital (PE/VC). Regression (4) indicates that real assets added, on average, 1.0 percentage point to net returns, while hedge funds and PE/VC added 0.8 and 0.7 percentage points, respectively. Somewhat unexpectedly, real estate contributed -1.0 percentage point to returns on average, performing even worse than fixed income. However, this estimate is only marginally significant, suggesting substantial heterogeneity in returns within the real estate category. Finally, trusts and cooperatives, which are more commonly held by smaller organizations, also contributed negatively, although these estimates are not statistically significant.

Panel A of Table 3 also sheds light on how much variation in returns is attributable to asset class composition, sectoral affiliation, and reporting period effects. Regressions (1) and (3) suggest that neither asset classes nor sectoral differences account for much of the variation, indicating substantial heterogeneity in returns within sectors and asset categories. In contrast, regression (2) shows that nearly half of the variation is explained by differences in reporting periods, consistent with the evidence in Figure 1 and the discussion in Section 2.2.

To evaluate how individual security selection affects endowment performance, we regress net investment returns on indicators for whether a fund holds individual stocks, individual bonds, or instead uses mutual funds and exchange-traded funds for equity and fixed income exposure. Panel B of Table 3 shows that funds engaging in individual security selection underperform. In particular, regression (4), which includes fiscal year-end-by-sector fixed effects, indicates that funds holding individual stocks earn 0.8 percentage points lower annual returns (0.2% vs. 1.0%). Similarly, funds that invest in individual bonds underperform by 0.9 percentage points per year (-1.9% vs. -1.0%).

As discussed above, individual security selection may, in some cases, be used to hedge specific risks that covary with those securities. However, the fact that such strategies are predominantly employed by smaller funds, combined with an annual underperformance of nearly one percentage point, indicates a substantial erosion of returns and suggests that these are more likely suboptimal investment choices rather than targeted hedging strategies.

2.3.4 Funding risk and asset allocation

Nonprofit organizations typically rely on two primary funding models. First, under an earned revenue model, nonprofits fund their activities by charging for goods or services. For example, a sustainable agriculture nonprofit that offers certification services collects fees from participants; revenues scale with service demand, keeping operating margins relatively stable. Second, under a donation-based model, nonprofits finance service provision through external contributions. For instance, a food pantry dependent on annual fundraising must reduce the quantity of food distributed if donations decline, even if community need remains constant.

In donation-based funding models, the risk of a decline in contributions creates a threat to service continuity. For most nonprofits, the uninterrupted provision of services is critical to their mission (see, e.g., [Tobin, 1974](#); [Hansmann, 1980](#)). Mitigating this risk is one of the key motivations for establishing an endowment. An endowment allows organizations to rely on investment income to supplement funding during periods of donation shortfall. Standard models of endowment management (e.g., [Merton, 1993](#)) suggest that institutions facing volatile revenues should allocate less to risky assets. Consistent with this argument, [Dimmock \(2012\)](#) shows that university endowments take on less investment risk when revenues are more volatile.

We extend this line of work along several dimensions. First, our data covers a broad range of nonprofit sectors beyond higher education, providing substantial cross-sectional variation in funding models and associated revenue risks. Second, our detailed revenue classifications allow us to isolate the fraction of revenue derived from earned sources versus donations, a distinction that is particularly important because, for most universities, annual donations constitute only a small share of total revenues, limiting prior analyses. Third, we directly link nonprofits' asset allocation choices to their funding risk, offering new evidence on the extent to which organizations hedge operational risks through endowment portfolio management.

To distinguish between the two funding models empirically, we measure the instability in an organization's ability to self-finance service provision. In particular, we compute the ratio of program service expenses to program service revenues for each year and calculate the standard deviation of this ratio across all available years. This measure captures fluctuations in the ability to fund operations through earned revenues and serves as a proxy for operational funding risk. Organizations with higher volatility face greater uncertainty in sustaining services without external contributions.

First, we document that donations are strongly correlated with broad market returns, consistent with the idea that charitable giving is procyclical: households and institutions donate more during

periods of strong market performance and cut back during downturns. We measure donations as the total external contributions reported in Part VIII, Line 1h of Form 990. To normalize across nonprofits and account for size effects, we compute the annual log growth rate of donations. Table 4, regression (1), estimates the sensitivity of donation growth to market returns. We find a strong positive relationship between donation growth and market performance: a 1% market return is associated with a 3% increase in donation growth on average. As a result, organizations dependent on donation-based funding models are more exposed to aggregate market risk, facing heightened revenue volatility precisely when economic conditions deteriorate.

We next examine whether nonprofits adjust their endowment portfolio allocations in response to operational funding risk. Specifically, we regress the portfolio weight on public equities on our measure of funding volatility, controlling for sector fixed effects. Table 4, regression (2), shows a negative and statistically significant coefficient of -0.140 , indicating that organizations with more volatile funding models allocate less to public equities. In regression (3), we add endowment size as a control variable to account for size effect in asset allocations discussed above; the coefficient remains negative and statistically significant at -0.109 . Regressions (4) and (5) report analogous results where the dependent variable is the combined portfolio weight on cash and fixed income securities. Consistent with a shift toward safer assets, we find positive and significant coefficients of 0.203 and 0.104 , respectively, with and without controlling for endowment size.

Economically, the magnitudes are meaningful. A one-unit increase in funding volatility is associated with approximately an 11 percentage point decrease in public equity allocations and a corresponding 10 percentage point increase in allocations to cash and fixed income. Given the typical range of portfolio weights documented above, these effects are substantial and consistent with organizations adjusting their investment strategies to hedge operational revenue risk.

3 Risk-Adjusted Performance of Endowment Funds

This section analyzes the risk-adjusted performance of nonprofit endowment funds. We begin by reporting average performance for the sector as a whole, followed by an examination of differences in risk-adjusted returns along two key dimensions: fund size and nonprofit sector. Finally, we disentangle the respective contributions of size and sector to return variation.

To assess risk-adjusted performance, we compute two measures. The first is each fund's Sharpe ratio. As shown in Section 2.2, investment returns vary significantly depending on a fund's fiscal year-end, which affects the measurement of both average returns and volatility. As

a result, comparing Sharpe ratios across funds with different reporting periods complicates cross-fund comparisons. To address this, we also compute the Relative Sharpe Ratio (RSR), defined as the ratio of a fund’s Sharpe ratio to that of a passive benchmark over the same fiscal year.²² An RSR greater than one indicates outperformance relative to the benchmark on a risk-adjusted basis. This measure provides a more consistent basis for comparing performance across funds with different fiscal year-ends.

Table 5 shows that the average Sharpe ratio across all endowment funds is 0.535. The average Relative Sharpe Ratio (RSR) is 0.759, which is statistically significantly below one, indicating that, on average, endowment funds exhibited a 24.1% lower Sharpe ratio than the benchmark over the same reporting period. The benchmark, defined in Section 2.2, consists of 40% U.S. equities, 20% international equities, 20% investment-grade bonds, 10% real estate, and 10% cash. It was selected to approximate the asset allocation of smaller funds, which tend to hold the most conservative portfolios, and is therefore more conservative than the average endowment allocation (see Figure 2). The fact that average performance falls well short of this conservative and easily replicable benchmark highlights the magnitude of underperformance across the nonprofit sector.

We also estimate CAPM alphas for each fund. As discussed in Section 2.3, many endowments follow conservative investment policies shaped by the operational risks and funding models of their parent organizations. In these cases, the market portfolio may not span all relevant sources of risk, making CAPM regressions prone to omitted variable bias. Even so, the average CAPM alpha is -0.39% , statistically significant and broadly consistent with the underperformance implied by the Relative Sharpe Ratio.

3.1 Size Cross-Sections

Investment performance may vary systematically with fund size due to differences in asset allocation across fund sizes (Section 2) and the heterogeneous returns across asset classes over the sample period (Table 3). To explore this relationship, we sort all funds into four size groups: above \$100 million in AUM, \$10–100 million, \$1–10 million, and below \$1 million. Since most funds report returns on a net basis, we use net returns as our primary performance measure.²³ Table 5 shows a clear size gradient in performance. The largest funds earn an average net return of 4.73%, compared to just 3.75% for the smallest.

²²See Calvet, Campbell and Sodini (2009), Dorn and Huberman (2010), and Dimmock, Kouwenberg, Mitchell and Peijnenburg (2021) for similar approaches.

²³All results in this section remain conceptually unchanged when restricting the analysis to the subsample of funds that report gross returns.

Differences in returns by fund size can be driven by several factors. First, as documented in the previous section, nonprofit sectors differ in their asset allocation strategies, and fund size varies systematically across sectors (see Table 1, Panel B). As a result, part of the return variation by fund size may reflect sectoral differences rather than size per se. To account for this, we compute sector-adjusted returns by subtracting the equally weighted average return of all organizations within the same sector. Table 5 shows that this adjustment has little effect on the overall size-performance pattern: large funds earn 0.66% in sector-adjusted returns, while small funds earn -0.75% . Thus, sector affiliation does not fully account for the return differences across fund sizes.

Second, because fund size varies systematically across sectors and fiscal year-end conventions also differ by sector, differences in reporting periods may confound the observed size-performance relationship.²⁴ To address this, we standardize each fund's return by subtracting the average return of all endowments with the same fiscal year-end. For example, for a fund reporting on June 30, we compute its reporting period-adjusted return as the difference between its investment return and the average return of all June filers. Table 5 shows that even after adjusting for fiscal year-end, large funds continue to outperform: those with over \$100 million in AUM earn an average excess return of 0.70%, while those with less than \$1 million earn -0.76% .

The size-performance relationship is close to monotonic. Figure 5 illustrates this by sorting all endowment funds into 25 size bins based on their average AUM over the sample period, with each bin containing 4% of the sample. For each bin, we compute the average (equal-weighted) return, along with the 25th and 75th percentiles of the return distribution. The figure reveals a clear upward trend in performance with size, not only at the mean but also across the distribution. The monotonicity is particularly strong at the 25th percentile, while somewhat less pronounced at the 75th. Among the ten largest size bins, returns at the 75th percentile are relatively similar.

The size-related differences in returns persist when performance is evaluated relative to the benchmark. For each fund, we compute its average annual benchmark-adjusted return by subtracting the return of the benchmark over the same fiscal reporting period. This adjustment accounts for differences in fiscal year-end timing, making the benchmark-adjusted returns comparable across funds. The resulting performance gap between the largest and smallest funds is substantial: -2.34% for the largest funds versus -4.35% for the smallest. This represents an almost two percentage point difference.

Table 5 shows that larger endowments exhibit higher risk-adjusted performance. The average

²⁴For example, educational endowments typically report on a June fiscal year-end, while many human services organizations report in December.

Sharpe ratio for the largest funds is 0.541, compared to 0.448 for the smallest. The gap is even more pronounced when using Relative Sharpe Ratios (RSR), which account for variation in benchmark performance across fiscal year-ends: the largest funds have an average RSR of 0.943, while the smallest report an RSR of 0.491. This sharper gradient in RSR reflects the fact that benchmark Sharpe ratios are, on average, higher for the fiscal year-ends when smaller funds report. As a result, smaller funds underperform large ones by a factor of two on a risk-adjusted basis.

In summary, smaller endowments dramatically underperform larger ones, both in net returns and on a risk-adjusted basis. Their average Relative Sharpe Ratio is nearly 50 percentage points lower than that of the largest funds. Notably, even the largest funds underperform the benchmark on average, with an RSR of 0.943. In the next section, we show that this size-performance relationship is remarkably persistent: it holds not only in the aggregate but also within each nonprofit sector. These findings extend prior evidence from the university endowment literature, which also documents stronger performance among larger funds (e.g., [Lerner, Schoar and Wang, 2008](#); [Barber and Wang, 2013](#); [Cejnek, Franz, Randl and Stoughton, 2014](#)). A contemporaneous study by [Dahiya and Yermack \(2023\)](#) reaches a different conclusion using [Carhart \(1997\)](#) four-factor alphas. We replicate their analysis and confirm their estimates, but note several methodological concerns with the approach.

First, unlike hedge funds and mutual funds, the investment objective of endowments is not to outperform the equity market. Rather, their portfolio choices are shaped by the financial risks faced by their parent organizations, as modeled in frameworks such as [Merton \(1993\)](#). As a result, evaluating performance relative to equity market factors such as value, size, and momentum is conceptually misaligned with endowment objectives. Second, and perhaps more important, estimating four-factor regressions presents statistical challenges due to the limited time series available at the fund level. Returns are reported annually, and most funds have only 13 observations over the 2008 to 2020 sample period. Estimating five coefficients (an intercept and four factor loadings) using such short panels leads to imprecise estimates and weak inference.²⁵ While Sharpe ratios are also affected by small-sample limitations, they require estimating only two parameters and, as shown in [Lo \(2002\)](#), exhibit more favorable statistical properties in short panels.

²⁵In untabulated results, we show that most factor loadings are statistically insignificant, and the estimated alphas for June and December fiscal-year-end funds are highly inconsistent. By contrast, benchmark-adjusted returns, Sharpe ratios, and RSRs display consistent patterns across June and December filers, as documented in the Appendix.

3.2 Sector Cross-Sections

Differences in sectoral characteristics such as liquidity needs, investment horizons, and funding stability may lead to variation in investment strategies and asset allocations (see Section 2.3), which in turn can produce systematic differences in returns across sectors. Table 6 shows substantial variation: the highest-performing sector, higher education, earns an average return of 4.81%, compared to 3.23% for the lowest-performing sector, hospitals, a highly statistically significant difference of 1.58 percentage points. However, this return differential may also reflect mechanical factors such as differences in average fund size or fiscal year-end timing across sectors.

To address this, we make two adjustments. First, we compute reporting period-adjusted returns, following the same approach as in Table 5, by demeaning each fund's return using the average return of all organizations filing for the same fiscal year-end. Table 6 shows that large return differences persist. For example, higher education institutions continue to exhibit the highest returns at 0.87%, while hospital endowments have the lowest at -0.79% . The resulting difference of 1.66 percentage points per year remains highly statistically significant.

Second, we adjust returns for fund size. We do this in two ways: by demeaning each fund's annual return using the equal-weighted (EW) and value-weighted (VW) average returns of all funds in the same size quintile and fiscal year-end. For readability, Table 6 is sorted from highest to lowest by the EW-adjusted returns. Note that VW-adjusted returns are, on average, lower than EW-adjusted returns. This reflects the fact that returns increase monotonically with size within each quintile, as shown in Figure 5. As a result, the VW average exceeds the EW average within each group.

The main result in Table 6 is that large, systematic differences in performance persist across sectors, but sectoral rankings change substantially once returns are adjusted for size.²⁶ EW and VW adjustments yield different rankings, reflecting systematic differences in fund sizes across sectors (see Table 1, Panel B). Most notably, the higher education sector no longer appears to outperform when controlling for fund size. Based on EW-adjusted returns, it ranks 6th out of 11 sectors, with returns close to zero. Under the VW adjustment, it ranks second to last with a return of -0.79% . This finding is particularly notable given that prior literature focused primarily on higher education institutions, whose endowments, once size is taken into account, underperform those in many other sectors.

The best-performing sectors are arts, environment, and human services. Each of these sectors

²⁶There are only 53 endowments in the mutual benefit sector, which explains the lack of statistical significance of the point estimates.

has more endowments than the higher education sector; for example, there are 4,233 arts endowments compared to 1,246 in higher education (see Table 1, Panel B). Although smaller on average, these sectors deliver stronger performance. Arts endowments, in particular, outperform others by 35 basis points per year based on equal-weighted returns and by 16 basis points based on value-weighted returns.

Table 6 also shows that hospital endowments continue to underperform other sectors, even after adjusting for size. Because hospital endowments are the second largest sector by AUM after higher education, size adjustment does little to change their relative ranking. This underperformance is especially puzzling given that their asset allocation closely resembles that of higher education endowments (see Figure 4). Despite this similarity, hospital endowments underperform the next-lowest category, international endowments, by nearly 1 percentage point based on equal-weighted returns and by 1.3 percentage points based on value-weighted returns.

Taken together, nonprofit sectors differ systematically in both investment returns and asset allocations. These patterns suggest that sector-level economic factors and organizational constraints shape investment choices in ways that contribute to the observed variation in performance.

3.3 Sector-by-Size Benchmarks

To isolate the independent effects of sector affiliation and fund size on investment performance, we perform sector-by-size double sorts. This approach helps determine whether return differences are primarily driven by size, sector, or their interaction. In the latter part of the paper, we use these benchmarks to control for size and sector effects when analyzing how fund management structures and organizational governance relate to investment performance.

We implement two sorting approaches: across-sector and within-sector by size. In the across-sector sort, we first assign all funds to size quintiles based on average AUM over the sample period. We then group funds within each quintile by sector, which allows for comparison of returns across sectors among similarly sized funds. This helps assess whether sectoral variation in performance persists after controlling for size.

In the within-sector sort, we first group funds by sector and then assign them to size quintiles within each sector. This approach is useful for two reasons. First, endowment sizes vary across nonprofit sectors in ways that reflect differences in how organizations operate and fund their activities. For instance, human services nonprofits usually maintain smaller endowments because they depend primarily on operating revenue rather than investment income. In such cases, comparing funds within the same sector provides a more coherent basis for analyzing size-related differences.

Second, this method is useful for benchmarking and performance evaluation, because comparing a fund to similar-sized peers within its own sector provides a more meaningful basis for performance assessment.

Table 7 reports the results. Panels A and B present the across-sector and within-sector size sorts, respectively. For each sector, rows report the investment return (first line), the number of funds (second line), and the average AUM (third line).²⁷ Panel C reports Relative Sharpe Ratios. Columns are ordered from largest (Q1) to smallest (Q5) size quintiles.

The results show a strong monotonic relationship between fund size and performance across all sectors. This pattern holds for both net investment returns (Panels A and B) and Relative Sharpe Ratios (Panel C). Differences in returns and relative Sharpe ratios between the largest (Q1) and smallest (Q5) size quintiles are both economically large and statistically significant. The mutual benefit sector has relatively few funds, which limits statistical power, but the economic patterns are consistent with those in other sectors.

Across-sector sorts in Panel A reinforce the findings from the previous section by directly comparing the performance of similarly sized funds across sectors. Arts, human services, and environmental endowments consistently outperform higher education endowments in each size quintile. The weakest results are observed among the smallest higher education funds, which earn just 0.25% annually and exhibit a negative Sharpe ratio.

Hospital endowments also perform poorly relative to other sectors. Panel A shows that they have the lowest returns across most size quintiles, ranking above only higher education in the smallest group. The within-sector sort in Panel B confirms this pattern: hospital endowments are the second largest by AUM after higher education in each quintile, yet their performance remains the weakest.

Panel C shows that, on a risk-adjusted basis, smaller funds underperform larger funds within every nonprofit sector. In most sectors, the largest endowments perform similarly to the passive benchmark (40% U.S. equities, 20% international equities, 20% investment-grade bonds, 10% real estate, 10% cash), with Relative Sharpe Ratios close to one.²⁸ The only sector in which large endowments significantly outperform the benchmark is the arts. As fund size declines, risk-adjusted performance generally worsens. Beginning in size quintile Q3, a majority of sectors underperform the benchmark.

²⁷Note that in the across-sector sort (Panel A), average AUM within each size quintile can differ across sectors, even though the quintile breakpoints are fixed. This mainly occurs in the largest size group (Q1), due to the presence of very large endowments in sectors such as higher education and hospitals.

²⁸Exceptions include public and societal benefit and health organizations, based on both sorts, as well as human services and higher education, based on the within-sector sort.

4 Fund Management, Fees, and Investment Returns

In this section, we examine the role of fund management in endowment investment returns. In particular, we collect data on how the investment management function is structured within each organization. We also collect data on investment management fees, which allows us to determine whether funds use investment advisors, how much they pay them, and how this affects both gross and net returns.

4.1 Investment Management Models and Performance Outcomes

First, we identify whether an organization has a highly paid individual whose primary responsibility is managing investments. Section 6033 of the Internal Revenue Code and the accompanying Treasury Regulations require tax-exempt organizations to disclose the names, titles, and compensation of officers, directors, trustees, and key employees. This allows us to collect these data and process job titles to identify roles related to investment management, such as Chief Investment Officer (CIO), Investment Chair, or Investment Director.²⁹ If such titles are reported, it indicates that the organization has a senior officer whose primary role is to oversee investments. The presence of a dedicated highly compensated investment officer suggests an effort to establish a formalized investment function embedded at a high level of the organizational hierarchy. In contrast, if no such titles are reported, investment oversight typically falls to senior financial officers such as the CFO, VP of Finance, or Treasurer, whose responsibilities encompass broader financial management.

Second, the same regulation requires tax-exempt organizations to report the amounts spent on investment management services. As per Internal Revenue Code instructions, these fees cover “investment counseling and portfolio management.” The fees must be paid to third parties and cannot include salaries of employees responsible for investment management. In addition, the code specifically instructs to exclude transaction costs from these fees. This allows us to determine whether an organization employs external advisors for investment management. If no fees are reported, we infer that the organization manages its investments internally.

Table 8, Panel A, shows that 39.7% of organizations report investment management fees, calculated as 130,060 fund-year observations that report fees, divided by the total number of organization-years, 327,544. Since the remaining 60.3% do not report such fees, we conclude that

²⁹Refer to Treas. Reg. § 1.6033-2(a)(2)(ii)(f) for details. The appendix provides a full list of identified titles related to the investment management function, as well as further details on the classification process and coverage across organization-years.

these organizations rely on internal resources to manage their endowments. Panel A also shows that only a small fraction of nonprofits (3.8%) employ a dedicated investment manager. Although, as noted above, job titles vary, the most common designation is Chief Investment Officer (CIO). For brevity, we refer to organizations with a dedicated and highly compensated investment manager as having a CIO.

To examine how the organization of the investment management function relates to endowment performance, we estimate regressions of investment returns on indicators for whether the fund is managed internally, whether the organization employs a dedicated CIO, and their interaction. We use two measures of returns. The first is net investment return. Because smaller funds are more likely to self-manage and less likely to employ a CIO, and because fund size is strongly correlated with returns (as shown in Section 3), these regressions include controls for fund size and sector-by-year fixed effects to absorb variation in returns due to differences across sectors and time.

The second measure is excess return, benchmarked against the performance of sector-by-size peer funds in a given fiscal year, as constructed in Section 3.3. This specification does not include separate controls for size, sector, or year, since these factors are already accounted for through the benchmarking procedure. Unlike the net return regressions, which impose a log-linear relationship between fund size and returns, the excess return specification captures size-related variation in a fully nonparametric manner.

Table 8, Panel B, shows that organizations that manage their endowments internally earn significantly lower returns: 40 basis points lower in net returns and 35 basis points lower in size- and sector-adjusted returns. These differences are statistically significant and suggest that using external advisory services is associated with better investment performance.

The results further show that endowments of organizations with CIO titles underperform by 20 basis points in net returns and 22 basis points in benchmark-adjusted returns. Although these estimates are statistically weaker, with significance at the 10% and 5% levels respectively, they are directionally surprising. As discussed above, the presence of a highly compensated CIO at the top of the organizational hierarchy implies a more formalized investment function. In contrast, when investment oversight falls to officers such as the CFO, VP of Finance, or Treasurer, it likely reflects a lower organizational emphasis on investment management. Given this distinction, the underperformance of organizations with CIOs is at odds with the presumed benefits of having a dedicated investment function. The underperformance is even more pronounced among funds with CIOs that do not employ external advisors (21.1 bp in net returns and 8.4 bp in benchmark-adjusted returns), although these estimates are not statistically significant, likely due to the small number of

such funds in the sample.

Table 8 also examines the relationship between CIO compensation and investment performance. These regressions are based on a relatively small sample of funds managed by CIOs (3,083 fund-year observations). Panel A shows that average CIO compensation is \$330,000, with substantial dispersion. This suggests that the sample includes not only large endowments with formal investment management structures but also smaller organizations that employ dedicated CIOs. The results in Panel B show a statistically weak but negative relationship between CIO compensation and returns. Notably, this relationship is observed only among endowments that engage external advisors.

Overall, these findings suggest that the investment management model in which the CIO function is outsourced, commonly referred to as the Outsourced Chief Investment Officer (OCIO) model, has historically delivered the strongest performance. Endowments of organizations without an in-house CIO that rely on external advisors outperform those with a dedicated internal CIO and those that manage investments entirely in-house.

4.2 Fees and Performance

Since funds that use external advisors tend to perform better, earning 35 basis points more in size- and sector-adjusted returns (see Table 8, Panel B), we next examine the relationship between investment management fees paid to these advisors and fund performance. Our dataset includes over 130,000 fund-year observations with reported fees, which, to the best of our knowledge, represents the most comprehensive investigation to date of the relationship between fees and returns in delegated asset management.

The Internal Revenue Code requires nonprofits to report investment management fees at the organizational level, rather than specifically for the endowment. As a result, relating these fees to endowment returns may be misleading, since a portion of the reported fees may be associated with managing non-endowment assets.³⁰

To address this limitation, we take two steps. First, we conduct a forensic data analysis to identify a subsample in which investment management fees are fully attributable to endowment asset management. We do so by comparing investment management fees reported in line 11(f) of Part IX of Form 990 with administrative fees for the endowment fund reported in line 1(f) of

³⁰As discussed in Section 1.2 and shown in Table 1, Panel B, in some sectors, the average endowment-to-total-financial-assets ratio is below 25%, with individual organizations reporting values as low as 10%, indicating that a substantial number of nonprofits hold the majority of their financial assets outside of endowments.

Part V of Schedule D. The IRS does not explicitly define administrative expenses, stating only that they may arise from either internal or third-party sources. Therefore, when the amount reported as administrative expenses exactly matches the investment management fees, we infer that the fees were paid exclusively to external parties for managing endowment assets. Because this amount is reported specifically for the endowment, we conclude that all fees in this subsample reflect endowment-related investment management. This matched sample consists of 11,391 fund-year observations, covering 3,401 unique endowment funds.

Second, to extend our analysis of the fee–return relationship to a broader sample, we calculate investment management fees as a fraction of total financial assets rather than endowment assets alone. We then examine the relationship between fees and returns among organizations with a high proportion of endowment assets. Specifically, we use an endowment-to-assets (E/A) threshold of 75%, although our results are robust to alternative thresholds, including a stricter 90% cutoff and a more lenient 50% cutoff. This broader sample consists of 25,884 fund-year observations covering 4,956 unique funds.

Table 8, Panel A, shows that average annual investment management fees amount to 0.63% of assets under management (AUM). The dispersion is wide, with funds at the 90th percentile paying 1.13% and those at the 10th percentile paying 0.14%. The fee distribution is similar across both the matched sample, defined above as the set of funds for which all reported investment management fees are attributable to endowment assets, and the high E/A sample. This similarity suggests that our analysis of the fee–return relationship is not biased by sample selection or reporting inconsistencies.

Regressions (1)–(3) in Table 8, Panel C, confirm that internally managed endowments underperform in terms of gross, net, and size-by-sector benchmark-adjusted returns. In columns (4)–(6), we examine the fee–return relationship within the matched sample, where all fees are attributable to endowment assets. Regression (4) shows a weak positive association between fees and gross returns. However, regressions (5) and (6) reveal a strong negative relationship between fees and both net returns and benchmark-adjusted returns. In columns (7)–(9), we repeat the same analysis in the broader sample of organizations with an endowment-to-assets ratio above 75%. These regressions confirm a strong negative relationship between fees and net returns. Notably, in this subsample, funds that pay higher fees do not earn higher gross returns.

Taken together, these results indicate that external advisors contribute to higher gross returns, net returns, and returns adjusted for sector and size. However, fees have a strong negative effect on net performance, suggesting that funds paying higher fees may receive limited incremental benefit

from investment advice.

5 Organizational Governance and Investment Returns

In the final part of the paper, we examine the relationship between the strength of organizational governance and endowment fund performance. This analysis is made possible by a unique feature of our dataset, which links endowment-level characteristics, including returns, to attributes of the parent organizations that own the endowments.

Nonprofit governance differs from that of for-profit enterprises in part because the principals of nonprofit organizations are not shareholders. Instead, they may include donors, customers, taxpayers, or other stakeholders. In each of these cases, oversight may be less stringent, placing greater importance on the organization's internal governance structures (see, for example, [Fama and Jensen, 1985](#); [Glaeser and Shleifer, 2001](#); [Fisman and Hubbard, 2005](#)).

Following the existing literature on nonprofit and for-profit governance, we construct several measures to assess governance strength. First, given the argument above that nonprofits may lack rigorous oversight from their principals, indicators reflecting prudent management of financial resources become particularly relevant. [Andreoni and Payne \(2003\)](#) argue that donors closely monitor how their contributions are used, typically viewing administrative expenses and excessive compensation as wasteful. Such expenditures have been shown to negatively impact future donations; for example, [Khanna, Posnett and Sandler \(1995\)](#) find that higher administrative costs lead to lower subsequent donations. Moreover, higher administrative expenses generally reduce expenditures on program services, implying that a smaller fraction of donations supports the organization's charitable mission. We use two measures to capture this dimension of governance. Following [Desai and Yetman \(2015\)](#), our first measure is the ratio of administrative expenses to total functional expenses. Our second measure is the proportion of highly paid employees. Specifically, nonprofits must report the number of employees earning more than \$100,000 per year. We scale this number by the organization's total number of employees.

Second, we examine board-level governance measures. Nonprofit organizations are required to disclose, in Part VI of Form 990 ("Governance, Management, and Disclosure"), the number of voting members of the governing body (line 1a) and the number of independent voting members

(line 1b).³¹ Using these disclosures, we construct measures of board size and board independence. We classify boards as small if the number of voting members is fewer than 10, following [Graham, Kim and Leary \(2001\)](#), who document an average board size of approximately 10 members. Our results are robust to alternative cutoff thresholds. Board independence is calculated as the number of independent voting members divided by the total number of voting members.

Finally, to capture CEO power or an organization's reliance on the CEO, we calculate the fraction of total officer and director (O&D) compensation paid to the CEO. By law, nonprofits must report compensation for their key personnel, including trustees, directors, officers, and key employees. To compute total O&D compensation, we sum the compensation of all trustees, directors, and officers, and then calculate the ratio of CEO compensation to total O&D compensation.

Table 9, Panel A, presents summary statistics for these governance measures. Administrative expenses average 15.5%, consistent with estimates reported in [Desai and Yetman \(2015\)](#), but vary substantially across organizations, with a standard deviation of 13.4% and an interquartile range of 11.9%. The median organization reports that only 1% of employees are highly compensated, but this figure rises to 4.7% at the 75th percentile and 13.6% at the 90th percentile, with a standard deviation of 9.7%. This variation suggests significant differences in compensation practices across NPOs. Nonprofit boards are generally highly independent on average, though there is meaningful cross-sectional dispersion, with a standard deviation of 16%. Approximately 25% of boards have 10 or fewer members. Finally, the average CEO-to-O&D pay ratio is 55.9%. This surprisingly high figure indicates that, on average, the CEO alone receives more than half of total officer and director compensation. As with the other governance variables, there is considerable variation across organizations.³²

We examine the relationship between governance characteristics and endowment performance using the same empirical framework described in Section 4. Specifically, we estimate regressions of both net investment returns and size- and sector-benchmark-adjusted excess returns on governance variables. The net return regressions include controls for fund size and sector-by-year fixed effects. In contrast, the excess return regressions omit these controls, as the benchmarking procedure already accounts for differences in size, sector, and fiscal year.

Table 9, Panels B and C, present our main results. Panel B reports regressions using net

³¹The IRS classifies a voting member as independent if all four of the following conditions apply: (1) The member was not compensated as an officer or employee of the organization or related organizations; (2) the member received no more than \$10,000 in total compensation during the organization's tax year; (3) neither the member nor their family members were involved in transactions with the organization; and (4) neither the member nor their family members were involved in transactions with related taxable or tax-exempt organizations.

³²The Appendix provides additional analysis of how these governance measures vary by endowment fund size.

investment returns, while Panel C uses excess returns relative to sector-size benchmarks. The findings are broadly consistent across both sets of regressions. We find a negative relationship between administrative expenses and investment returns, suggesting that organizations with higher administrative costs tend to achieve lower performance. Likewise, a higher proportion of highly compensated employees is associated with weaker returns. As shown in the descriptive statistics in Table 9, Panel A, a subset of organizations reports notably high shares of highly paid employees, and these organizations tend to underperform. These findings corroborate prior evidence from Ribar and Wilhelm (2002) and Andreoni and Payne (2003), which show that increased spending on non-core activities is negatively correlated with overall organizational performance. We extend this literature by showing that such spending is also associated with weaker endowment returns.

Organizations with larger boards and a higher fraction of independent directors tend to generate higher investment returns. This finding is consistent with Aggarwal, Evans and Nanda (2012), who show that nonprofit organizations with larger boards typically perform better and allocate more resources to program-related activities. Notably, this result contrasts with traditional corporate governance findings, such as Yermack (1996), which suggest that larger boards are associated with weaker performance in for-profit firms. However, evidence from other contexts highlights heterogeneity: Adams and Mehran (2012) find that U.S. banks with larger boards perform better, while Kiel and Nicholson (2003) document a positive correlation between board size and performance among Australian firms. These findings contribute to the broader literature on nonprofit governance, including Glaeser (2003), Fremont-Smith (2004), and O'Regan and Oster (2005).

The final result is that higher CEO pay relative to other officers and directors is associated with stronger investment performance. This finding is notable for several reasons. First, the CEO-to-O&D pay ratio exhibits substantially greater dispersion in nonprofits than in public corporations. This suggests that CEOs play a more dominant role in a larger subset of nonprofits, potentially reflecting more centralized decision-making or greater executive control. While such structures may raise concerns about agency problems, our evidence indicates that these organizations tend to achieve better endowment returns. Second, higher CEO-to-O&D pay ratios are most commonly observed in smaller organizations (see Appendix), even though, as shown in Section 3, smaller organizations generally earn lower endowment returns. This suggests that small nonprofits with more concentrated executive authority may, in some cases, be better able to manage their endowments. Finally, this result stands in contrast to evidence from the corporate sector. In particular, Bebchuk, Cremers and Peyer (2011) find that a larger CEO pay slice is associated with weaker performance in public companies. These findings highlight important differences in the structure

and implications of CEO-board dynamics between nonprofit and for-profit organizations.

It is important to emphasize that our results do not establish causality. Rather, they document associations between corporate governance characteristics and endowment returns. Governance structures arise from the interaction of numerous observable and unobservable organizational features, including the attributes of board members, executives, and other internal factors. Many of these underlying factors are unobserved but likely influence the design of governance frameworks, the choice of investment policies, and ultimately, investment performance. Nevertheless, these correlations offer valuable insights and serve as a starting point for future research into their underlying economic mechanisms. Clarifying this relationship could significantly advance our understanding of effective governance and investment management in nonprofit organizations.

6 Conclusion

We build a new dataset constructed directly from tax filings of U.S. public nonprofit organizations to study endowment returns and asset allocation decisions. The dataset spans fiscal years 2008 through 2020 and includes approximately 375,000 organizations.

The dataset has several key features. First, it covers the full universe of active and defunct nonprofit organizations and their endowments, enabling us to establish facts for the entire nonprofit sector. For comparison, it includes roughly 50 times as many endowments as the datasets commonly used to study university endowments. Second, we design the dataset to directly link endowments to their parent organizations, allowing us to relate investment performance and portfolio choices to operating model risk, the structure of the investment management function, and governance characteristics. Third, we take advantage of regulatory disclosure thresholds to hand-classify portfolio holdings when organizations allocate more than 5% of assets to non-public securities, allowing for detailed analysis of endowment portfolio composition.

Using this dataset, we document several novel facts about endowment behavior. On the positive side, endowments appear to enhance both the scale and stability of nonprofit service provision: organizations with endowments are better able to expand charitable activities and seem to use endowments to hedge funding risk during market downturns. At the same time, we find that risk-adjusted returns are generally low, particularly among smaller funds. Over half of endowments are managed internally without external advisors, and these funds tend to underperform. Even among those that do hire advisors, fees are negatively correlated with net investment returns. These patterns suggest that outsourcing investment management, such as through an OCIO model, may

improve outcomes, although excessive fees can erode net performance.

Taken together, the results in this paper portray a nonprofit endowment sector that is, as a group, less sophisticated than commonly perceived. This perception is often shaped by the practices of the largest endowments at elite universities. In contrast, smaller funds frequently engage in suboptimal strategies such as individual stock selection, and poor investment performance is closely associated with weaker governance. While any single small fund may appear inconsequential, collectively they account for more than half of total endowment assets. These findings highlight the critical role of governance in shaping investment outcomes across the nonprofit sector.

References

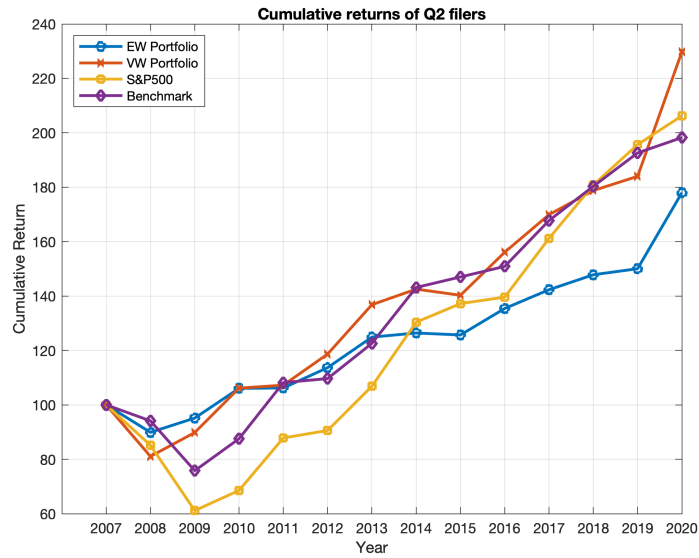
- Adams, Renée, and Hamid Mehran.** 2012. “Bank board structure and performance: Evidence for large bank holding companies.” *Journal of Financial Intermediation*, 21(2): 243–267.
- Adelino, Manuel, Katharina Lewellen, and W. Ben McCartney.** 2022. “Hospital Financial Health and Clinical Choices: Evidence from the Financial Crisis.” *Management Science*, 68(3): 1591–2376.
- Aggarwal, Rajesh, Mark Evans, and Dhananjay Nanda.** 2012. “Nonprofit boards: Size, performance and managerial incentives.” *Journal of Accounting and Economics*, 53(1-2): 466–487.
- Aghamolla, Cyrus, Pinar Karaca-Mandic, Xuelin Li, and Richard Thakor.** 2024. “Merchants of Death: The Effect of Credit Supply Shocks on Hospital Outcomes.” *American Economic Review*, 114(11): 3623–3668.
- Andreoni, James.** 1998. “Toward a Theory of Charitable Fund-Raising.” *Journal of Political Economy*, 106(6): 1186–1213.
- Andreoni, James, and A. Abigail Payne.** 2003. “Do Government Grants to Private Charities Crowd Out Giving or Fund-raising?” *American Economic Review*, 93(3): 792–812.
- Bach, Laurent, Laurent Calvet, and Paolo Sodini.** 2020. “Rich Pickings? Risk, Return, and Skill in Household Wealth.” *American Economic Review*, 110(9): 2703–2747.
- Balloch, Cynthia, and Julian Richers.** 2023. “Asset Allocations and Returns in the Portfolios of the Wealthy.” Working paper.
- Barber, Brad M., and Guojun Wang.** 2013. “Do (Some) University Endowments Earn Alpha?” *Financial Analysts Journal*, 69(5): 26–44.
- Bebchuk, Lucian, K.J. Martijn Cremers, and Urs Peyer.** 2011. “The CEO Pay Slice.” *Journal of Financial Economics*, 102(1): 199–221.
- Begenau, Juliane, Pauline Liang, and Emil Siriwardane.** 2024. “The Rise in Alternatives.” Working paper.
- Brown, Jeffrey R., Stephen G. Dimmock, and Scott Weisbenner.** 2014. “The Supply of and Demand for Charitable Donations to Higher Education.” In *How the Financial Crisis and Great Recession Affected Higher Education*. Chapter 5, 151–174. University of Chicago Press.
- Brown, Jeffrey R., Stephen G. Dimmock, Jun-Koo Kang, and Scott J. Weisbenner.** 2014. “How University Endowments Respond to Financial Market Shocks: Evidence and Implications.” *American Economic Review*, 104(3): 931–962.
- Brown, Keith, Lorenzo Garlappi, and Cristian Tiu.** 2010. “Asset allocation and portfolio performance: Evidence from university endowment funds.” *Journal of Financial Markets*, 13(2): 268–294.

- Calvet, Laurent, John Campbell, and Paolo Sodini.** 2009. "Fight or Flight? Portfolio Rebalancing by Individual Investors." *Quarterly Journal of Economics*, 124(1): 301–348.
- Carhart, Mark.** 1997. "On persistence in mutual fund performance." *Journal of Finance*, 52(1): 57–82.
- Carroll, Christopher.** 1997. "Buffer-Stock Saving and the Life Cycle/Permanent Income Hypothesis." *Quarterly Journal of Economics*, 112(1): 1–55.
- Carroll, Christopher, and Andrew Samwick.** 1997. "The Nature of Precautionary Wealth." *Journal of Monetary Economics*, 40(1): 1–71.
- Cejnek, Georg, Richard Franz, Otto Randl, and Neal Stoughton.** 2014. "A survey of university endowment management research." *Journal of Investment Management*, 12(3).
- Core, John E., Wayne R. Guay, and Rodrigo S. Verdi.** 2006. "Agency problems of excess endowment holdings in not-for-profit firms." *Journal of Accounting and Economics*, 41(3): 307–333.
- Dahiya, Sandeep, and David Yermack.** 2023. "Investment returns and distribution policies of non-profit endowment funds." Working paper.
- Desai, Mihir A., and Robert J. Yetman.** 2015. "Constraining Managers without Owners: Governance of the Not-for-Profit Enterprise." *Journal of Governmental & Nonprofit Accounting*, 4(1): 53–72.
- Dimmock, Stephen G.** 2012. "Background Risk and University Endowment Funds." *The Review of Economics and Statistics*, 94(3): 789–799.
- Dimmock, Stephen, Neng Wang, and Jinqiang Yang.** 2019. "The Endowment Model and Modern Portfolio Theory." Working Paper, Columbia University and Nanyang Technological University.
- Dimmock, Stephen, Roy Kouwenberg, Olivia Mitchell, and Kim Peijnenburg.** 2021. "Household Portfolio Underdiversification and Probability Weighting: Evidence from the Field." *Review of Financial Studies*, 34(9): 4524–4563.
- Dorn, Daniel, and Gur Huberman.** 2010. "Preferred Risk Habitat of Individual Investors." *Journal of Financial Economics*, 97(1): 155–173.
- Fagereng, Andreas, Luigi Guiso, Davide Malacrino, and Luigi Pistaferri.** 2020. "Heterogeneity and Persistence in Returns to Wealth." *Econometrica*, 88(1): 115–170.
- Fama, Eugene, and Michael Jensen.** 1983. "Separation of Ownership and Control." *Journal of Law and Economics*, 26(2): 301–325.
- Fama, Eugene, and Michael Jensen.** 1985. "Organizational Forms and Investment Decisions." *Journal of Financial Economics*, 14(1): 101–119.
- Fisman, Raymond, and R. Glenn Hubbard.** 2003. "The Role of Nonprofit Endowments." In *The Governance of Not-for-Profit Organizations*. Chapter 7, 217–233. University of Chicago Press.
- Fisman, Raymond, and R. Glenn Hubbard.** 2005. "Precautionary savings and the governance of nonprofit organizations." *Journal of Public Economics*, 89(11-12): 2231–2243.
- Fremont-Smith, Marion R.** 2004. *Governing Nonprofit Organizations: Federal and State Law and Regulation*. Cambridge, MA:Harvard University Press.
- Gabaix, Xavier, Ralph Koijen, Federico Mainardi, Sangmin Oh, and Motohiro Yogo.** 2023. "Asset Demand of U.S. Households." Working paper.
- Glaeser, Edward, and Andrei Shleifer.** 2001. "Not-for-profit Entrepreneurs." *Journal of Public Economics*, 81(1): 99–115.
- Glaeser, Edward L.** 2003. *The Governance of Not-for-Profit Organizations*. Chicago, IL:Harvard University Press.
- Graham, John, Hyunseob Kim, and Mark Leary.** 2001. "CEO-board Dynamics." *Journal of Public Economics*, 81(1): 99–115.

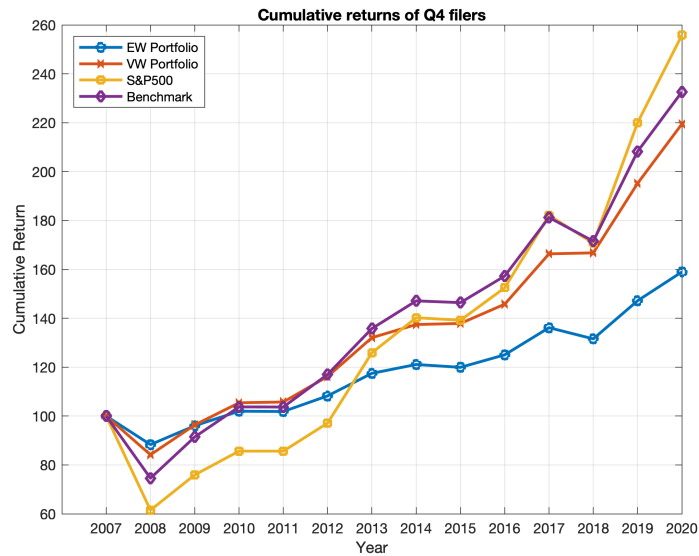
- Hansmann, Henry.** 1980. “The Role of Nonprofit Enterprise.” *The Yale Law Journal*, 89(5): 835–901.
- Hansmann, Henry.** 1990. “Why Do Universities Have Endowments?” *The Journal of Legal Studies*, 19(1): 3–42.
- Ivashina, Victoria, and Josh Lerner.** 2018. “Looking for Alternatives: Pension Investments around the World, 2008 to 2017.” Working paper.
- Khanna, Jyoti, John Posnett, and Todd Sandler.** 1995. “Charity donations in the UK: New evidence based on panel data.” *Journal of Public Economics*, 56(2): 257–272.
- Kiel, Geoffrey, and Gavin Nicholson.** 2003. “Board Composition and Corporate Performance: how the Australian experience informs contrasting theories of corporate governance.” *Corporate Governance: An International Review*, 11(3): 189–205.
- Lerner, Josh, Antoinette Schoar, and Jialan Wang.** 2008. “Secrets of the Academy: The Drivers of University Endowment Success.” *Journal of Economic Perspectives*, 22(3): 207–222.
- Lo, Andrew W.** 2002. “The Statistics of Sharpe Ratios.” *Financial Analysts Journal*, 58(4): 36–52.
- Merton, Robert C.** 1993. “Optimal Investment Strategies for University Endowment Funds.” In *Studies of Supply and Demand in Higher Education*, ed. Charles T. Clotfelter and Michael Rothschild, 211–242. University of Chicago Press.
- Okten, Cagla, and Burton Weisbrod.** 2000. “Determinants of Donations in Private Nonprofit Markets.” *Journal of Public Economics*, 75(2): 255–272.
- O’Regan, Katherine, and Sharon Oster.** 2005. “Does the Structure and Composition of the Board Matter? The Case of Nonprofit Organizations.” *Journal of Law, Economics, and Organization*, 21(1): 205–227.
- Piketty, Thomas, and Emmanuel Saez.** 2003. “Income Inequality in the United States, 1913–1998.” *Quarterly Journal of Economics*, 118(1): 1–39.
- Ribar, David, and Mark Wilhelm.** 2002. “Altruistic and Joy-of-Giving Motivations in Charitable Behavior.” *Journal of Political Economy*, 110(2): 425–457.
- Smith, Matthew, Owen Zidar, and Eric Zwick.** 2023. “Top Wealth in America: New Estimates Under Heterogeneous Returns.” *Quarterly Journal of Economics*, 138(1): 515–573.
- Tobin, James.** 1974. “What Is Permanent Endowment Income?” *The American Economic Review, Papers and Proceedings*, 64(2): 427–432.
- Vissing-Jørgensen, Annette.** 2002. “Limited Asset Market Participation and the Elasticity of Intertemporal Substitution.” *Journal of Political Economy*, 110(4): 1–55.
- Yermack, David.** 1996. “Higher market valuation of companies with a small board of directors.” *Journal of Financial Economics*, 40(2): 185–211.

Figure 1: Cumulative Investment Returns of Nonprofit Endowment Funds

The figure shows cumulative returns for nonprofit endowment funds filing their returns for fiscal year ending in June (second quarter filers, labeled “Q2”) and December (fourth quarter filers, labeled “Q4”). The returns series are normalized to 100 in 2007. The figures show return on the equal weighted portfolio (EW) and value weighted (VW) of endowment funds. The figures also plot cumulative returns for S&P500 index as well as annually rebalanced portfolio comprising of 40% U.S. equities, 20% international equities, 20% investment-grade bonds, 10% real estate, and 10% cash (labeled “Benchmark”).



Panel A: Cumulative returns of organizations filing for fiscal year ending in June (Q2 filers)



Panel B: Cumulative returns of organizations filing for fiscal year ending in December (Q4 filers)

Figure 2: Asset Allocation of Nonprofit Endowments

This figure shows the average asset allocation of public nonprofit endowments during three periods: 2008–2010, 2011–2015, and 2016–2020. The sample includes 39,866 unique endowment funds. We categorize assets into eight major classes: public equity, cash instruments, fixed income, private equity and venture capital, trusts and cooperatives, hedge funds, real assets, and real estate. The detailed composition of these asset classes is provided in the Appendix and discussed in Section 2.

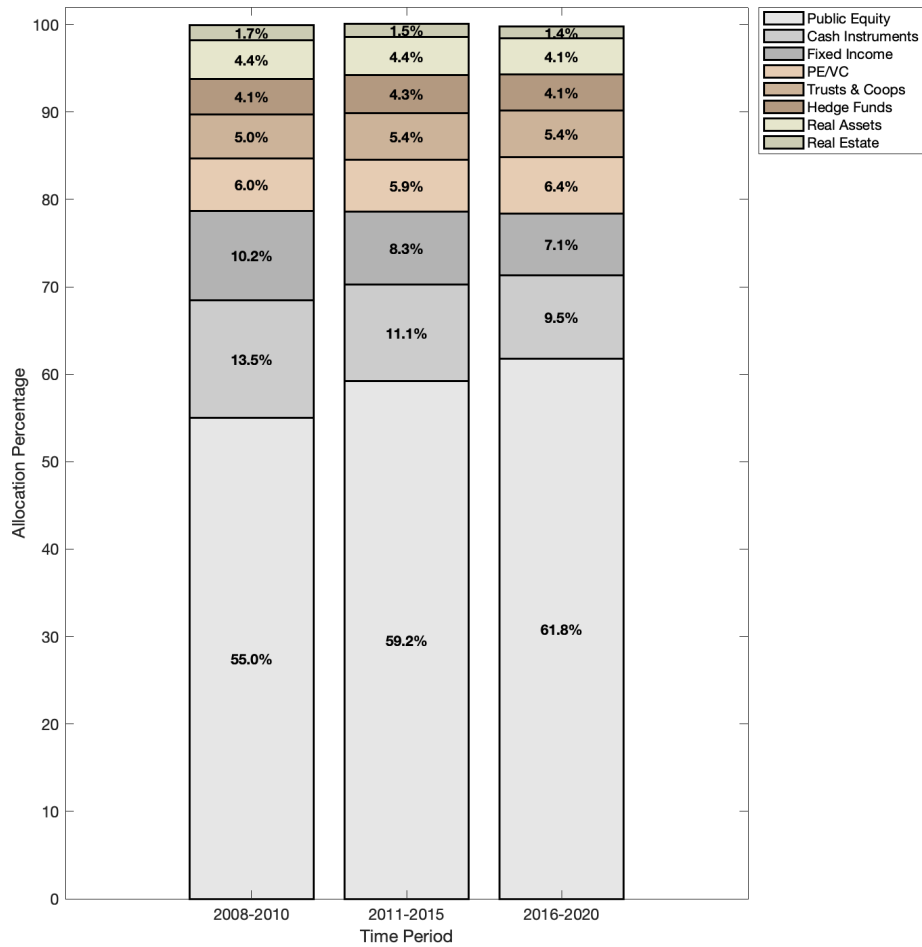


Figure 3: Asset Allocation by Endowment Size

This figure shows average asset allocation by endowment fund size. All funds are grouped into four bins based on their average AUM over the sample period: (1) above \$100 million, (2) \$10 million to \$100 million, (3) \$1 million to \$10 million, and (4) below \$1 million. Panel A reports the average percentage of AUM allocated to each major asset class. Panel B shows the share of individual securities (stocks and bonds) within the total allocation to their respective asset classes. Panel C presents the average share of international equity, defined as the sum of developed and emerging markets, within total public equity allocation. The detailed composition of asset classes is provided in the Appendix and discussed in Section 2.

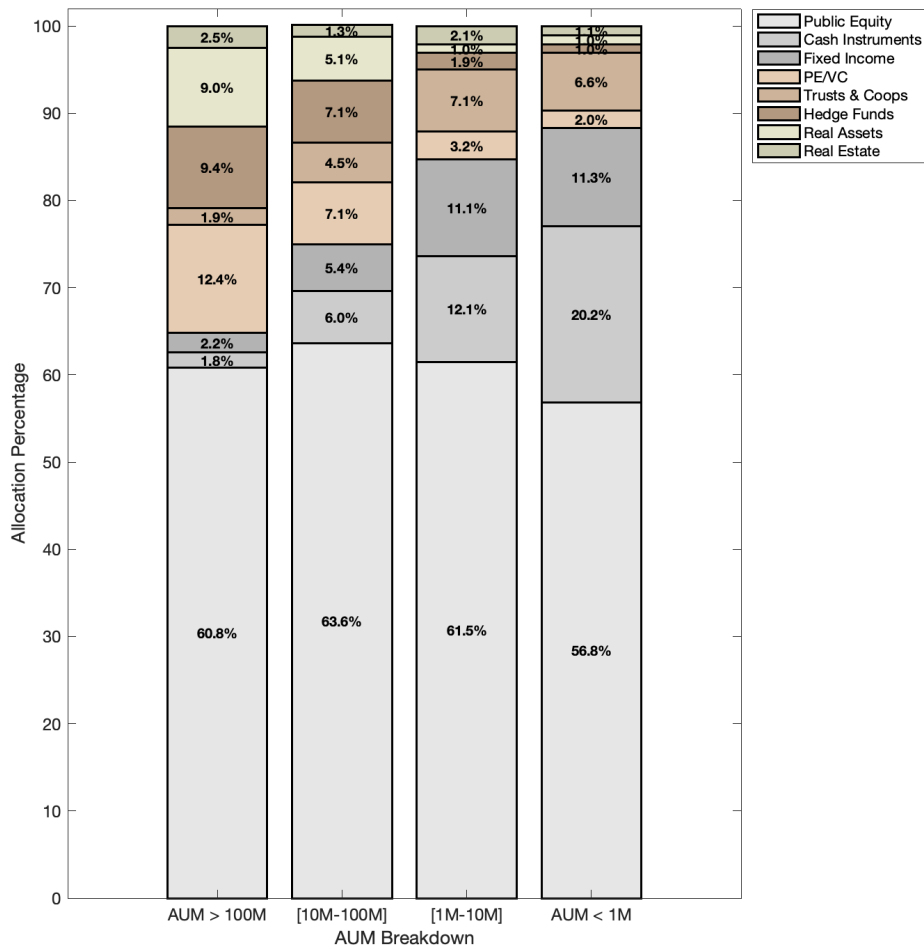
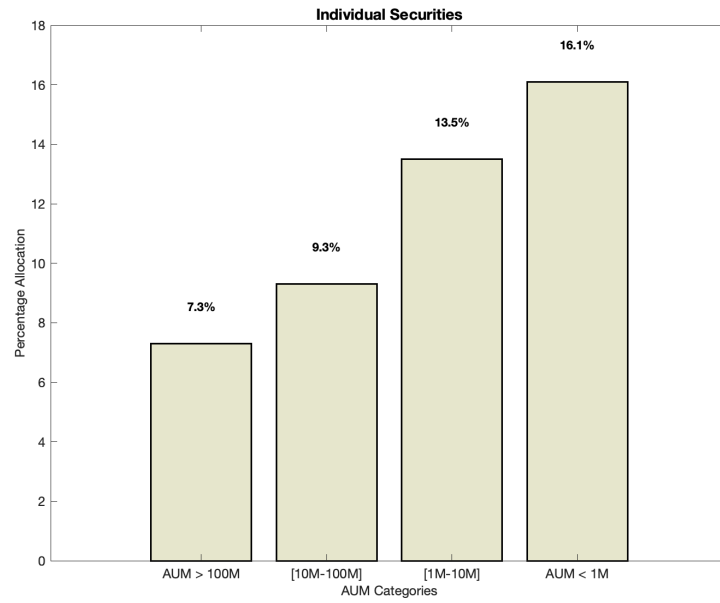
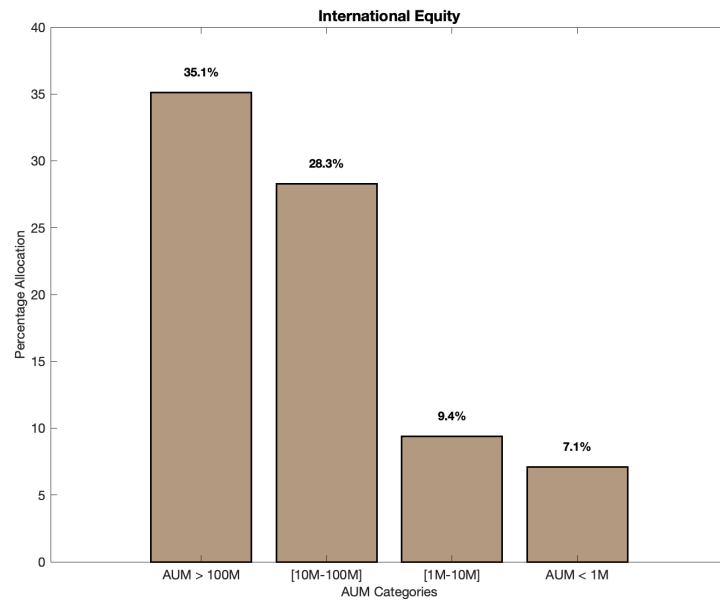


Figure 3 Continued: Asset Allocation by Endowment Size



Panel B: Allocation to individual securities



Panel C: Allocation to international equity

Figure 4: Asset Allocation by Nonprofit Sector

This figure shows the average asset allocation of endowments across nonprofit sectors. Sectors are defined based on the National Taxonomy of Exempt Entities (NTEE) categories. Assets are grouped into eight major classes. The detailed composition of these asset classes is provided in the Appendix and discussed in Section 2.

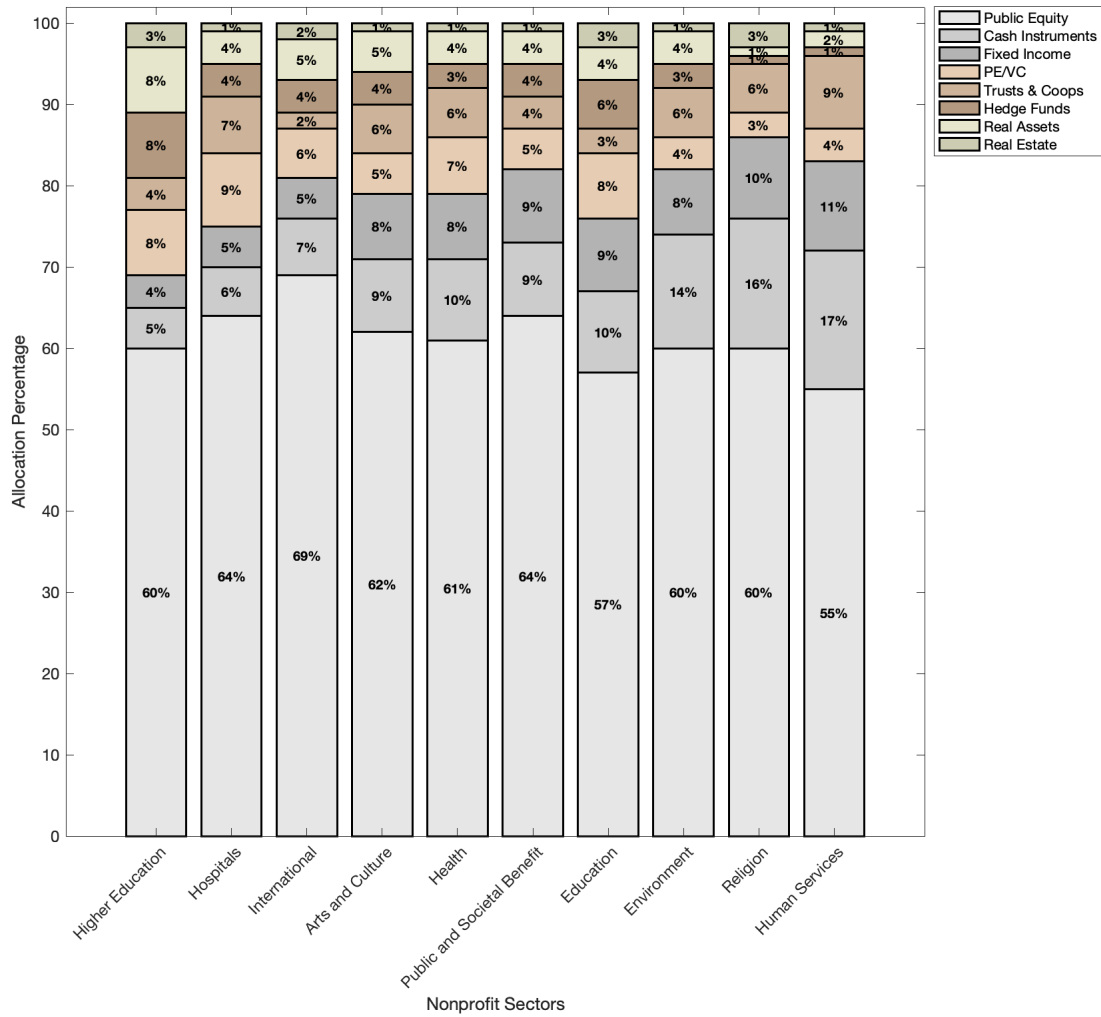


Figure 5: Investment Return by Fund Size

This figure shows the relationship between fund size and net investment return. All endowment funds are sorted into 25 bins based on their average size over the sample period. Within each bin, we compute the equal-weighted return as well as the returns at the 25th and 75th percentiles. The mean return is represented by a circle, and the percentile values are shown with dashed lines.

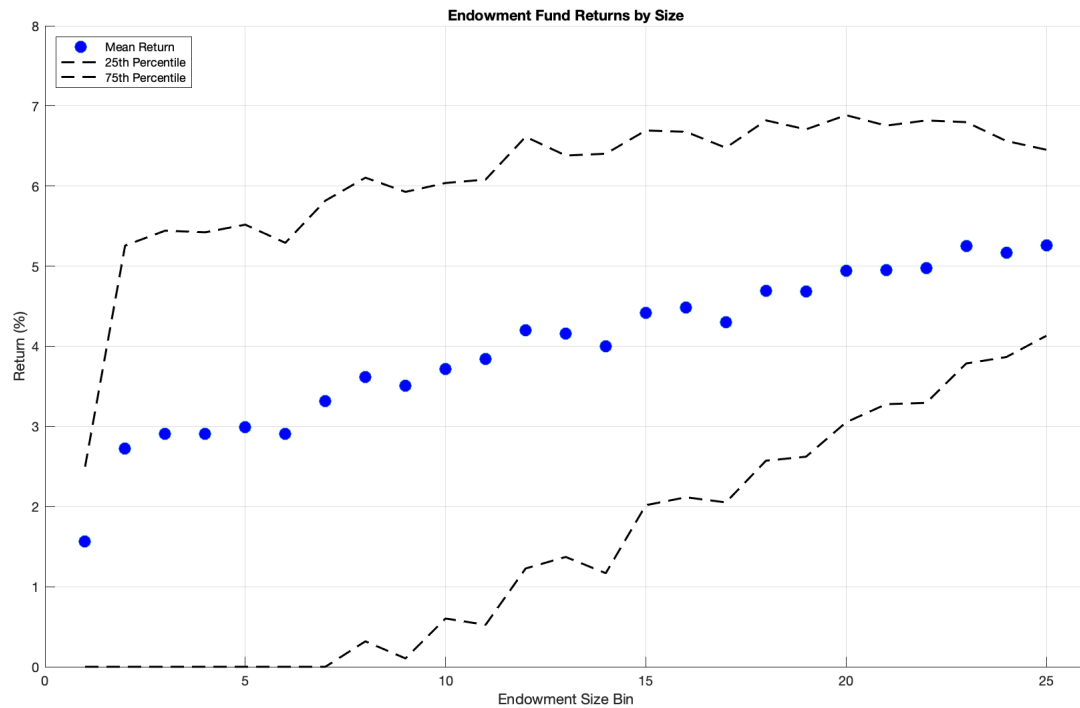


Table 1: Characteristics of Nonprofit Organizations and their Endowment Funds

This table presents summary statistics for nonprofit organizations and their endowment funds in our sample. The sample period covers 2008–2020. Panel A reports key characteristics for all organizations, as well as for subsamples of organizations with and without endowment funds. All variables are summarized at the organization level before being aggregated across the sample. Difference denotes the difference in means between organizations with and without endowments. Difference with Size Control is the difference in means after controlling for the natural logarithm of total assets. Asterisks *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. Panel B shows the distribution of assets and endowment funds across nonprofit sectors. Sectors are defined using the 12 major National Taxonomy of Exempt Entities (NTEE) categories. The last column in Panel B provides an example organization for each sector.

Panel A: Characteristics of Nonprofit Organizations							
Variable	Obs	Orgs	Mean with Endowment	Mean without Endowment	Mean	Difference	Difference with Size Control
Basic Characteristics							
Total Assets (\$000s)	2,284,172	374,351	14,987	64,572	9,482	55,090***	–
Age	2,112,764	347,085	32	48	30	18***	10***
#Employees	2,284,172	374,351	62	262	39	223***	179***
#Employees >\$100k	1,613,188	255,099	6	23	3	20***	15***
#Volunteers	1,680,165	266,219	658	1,986	479	1,507***	1,209**
Revenues (\$000s)	2,284,172	374,351	7,099	29,466	4,626	24,840***	17,132***
Contributions (\$000s)	1,900,884	310,213	1,620	5,764	1,110	4,653***	3,555***
Functional Expenses (\$000s)	2,284,172	374,351	6,622	27,433	4,324	23,110***	15,834***
Management Compensation (\$000s)	1,335,871	205,508	181	455	142	314***	197***
Spending Statistics and Growth Rates							
Program Services Expense Ratio	2,110,669	347,597	75.91%	77.97%	75.61%	2.36%***	2.67%***
Administrative Expense Ratio	2,103,264	346,596	15.91%	16.01%	15.89%	0.12%	0.86%***
Fundraising Expense Ratio	2,087,715	344,848	2.27%	4.73%	1.97%	2.76%***	2.95%***
Compensation-to-Expense Ratio	1,330,949	204,129	10.82%	7.58%	11.22%	-3.64%***	-2.11%***
Travel Expense Ratio	1,430,483	217,008	2.01%	1.37%	2.09%	-0.72%***	-0.26%***
Asset Growth	2,229,368	349,840	11.18%	5.96%	10.83%	-4.87%***	1.59%***
Revenue Growth	1,809,251	297,835	-2.11%	1.09%	-2.41%	3.51%***	2.99%***
Contribution Growth	1,391,054	229,850	-2.88%	1.12%	-3.43%	4.55%***	3.43%***
Expense Growth	1,817,489	301,247	1.91%	2.81%	1.80%	1.01%***	3.97%***

Table 1 Continued: Characteristics of Nonprofit Organizations and their Endowment Funds

Panel B: Distribution of Organizations and Endowment Assets by Sector						
Sector	Number of organizations	Number of orgs with endowments	Fraction of orgs without endowments	Average endowment AUM (in millions)	Endowment AUM over Organization AUM	Examples
Arts	17,383	4,233	24.4%	10.2	32.1%	Metropolitan Museum
Higher Education	1,771	1,246	70.4%	274.8	25.2%	Harvard College
Education	26,394	5,619	21.3%	21.5	34.4%	Milton Hershey School
Hospitals	3,703	1,281	34.6%	39.2	6.3%	Shriners Hospitals
Environment	8,568	1,757	20.5%	5.2	25.1%	New York Botanical Garden
Health	25,502	4,424	17.3%	7.2	24.9%	The Broad Institute
Human Services	67,578	8,682	12.8%	3.5	22.5%	American National Red Cross
International	4,271	509	11.9%	20.2	29.9%	The Oxford Funds
Mutual Benefit	472	53	11.2%	5.4	42.7%	Children's Dyslexia Centers
Public & Societal Benefit	21,964	3,654	16.6%	14	35.0%	The Oregon Community Foundation
Religion	11,299	843	7.5%	3.5	32.6%	American Bible Society
Uncategorized	185,446	7,565	4.1%	14.3	37.6%	–
All organizations	374,351	39,866	10.6%	20.1	29.6%	

Table 2: Summary Statistics for Endowment Funds

This table reports summary statistics for endowment fund-year observations from 2008 to 2020. Endowment size is measured in thousands of dollars. Endowment growth is defined as the change in AUM over the year, calculated as end-of-year AUM minus beginning-of-year AUM, divided by beginning-of-year AUM. Contribution and distribution rates are measured as contributions to, and distributions from, the fund, scaled by beginning-of-year AUM. Net investment return (50% of new contributions) is calculated as net investment earnings (including realized and unrealized gains and losses), divided by beginning-of-year AUM plus 50% of new contributions; alternative versions use 0% or 100% of contributions in the denominator. Returns/(Fund Inflows) and Contributions/(Fund Inflows) measure the share of total inflows (investment returns plus contributions) attributable to each component. Gross investment return is calculated for gross-reporting funds as gross earnings (including realized and unrealized gains and losses) divided by beginning-of-year AUM plus 50% of contributions. The corresponding net return for gross-reporting funds uses net earnings and the same denominator.

Variable	Number of obs	Mean	SD	P10	P25	P50	P75	P90
Endowment Size	318,726	25,635	384,228	43	198	1,059	5,182	23,000
Endowment Growth	318,757	9.44%	28.93%	-6.10%	0.00%	3.36%	11.35%	22.00%
Contribution Rate	318,757	9.57%	28.98%	0.00%	0.00%	0.31%	4.94%	21.05%
Distribution Rate	318,757	4.42%	9.22%	0.00%	0.00%	1.73%	4.73%	9.68%
Net Investment Return (50% of new contributions)	318,757	4.30%	7.44%	-2.48%	0.00%	2.73%	9.10%	14.32%
Net Investment Return (0% of new contributions)	318,757	4.47%	7.76%	-2.50%	0.00%	2.84%	9.41%	14.79%
Net Investment Return (100% of new contributions)	318,757	4.21%	7.28%	-2.39%	0.00%	2.64%	8.87%	14.04%
Returns/(Fund Inflows)	290,084	67.84%	54.77%	0.00%	31.08%	94.22%	100.00%	100.00%
Contributions/(Fund Inflows)	290,084	32.16%	54.77%	0.00%	0.00%	5.78%	68.92%	100.00%
Gross Investment Return (Gross-reporting funds)	104,532	6.20%	8.01%	-2.52%	0.66%	5.94%	11.74%	16.28%
Net Investment Return (Gross-reporting funds)	104,532	5.19%	6.19%	-2.52%	0.37%	5.26%	10.64%	14.50%

Table 3: Portfolio Composition and Investment Returns

This table presents regression results for investment returns at the organization-year level. The dependent variable is the net investment return, calculated as net investment earnings (including realized and unrealized gains and losses) divided by beginning-of-year AUM plus 50% of new contributions to the fund. Independent variables in Panel A are indicator variables for major asset classes. The detailed composition of asset classes is provided in the Appendix. Panel B includes indicator variables for holdings in individual stocks, bonds, and equity and fixed income ETFs or mutual funds. Fixed effects are included as specified, and standard errors are clustered by organization. Asterisks *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Major Asset Classes				
	(1)	(2)	(3)	(4)
	Investment Return	Investment Return	Investment Return	Investment Return
Public Equity	0.004*** (3.80)	0.005*** (4.43)	0.005*** (4.35)	0.005*** (4.61)
Cash Instruments	-0.017*** (-7.76)	-0.018*** (-7.91)	-0.017*** (-7.73)	-0.018*** (-7.99)
Fixed Income	-0.007** (-2.46)	-0.009*** (-2.96)	-0.008** (-2.57)	-0.008*** (-2.82)
PE/VC	-0.001 (-0.39)	0.009*** (3.62)	0.001 (0.23)	0.007*** (3.14)
Hedge Funds	0.004 (1.19)	0.008*** (2.66)	0.005 (1.40)	0.008*** (2.69)
Real Estate	-0.011 (-1.60)	-0.010 (-1.64)	-0.009 (-1.37)	-0.010* (-1.67)
Real Assets	0.007** (2.14)	0.010*** (3.29)	0.009** (2.50)	0.010*** (3.24)
Trusts & Coops	-0.007 (-0.45)	-0.005 (-0.43)	-0.007 (-0.46)	-0.004 (-0.34)
Constant	0.047*** (69.22)	0.046*** (73.14)	0.047*** (68.27)	0.046*** (73.04)
Observations	41,510	41,510	41,510	41,510
Adjusted R^2	0.002	0.459	0.004	0.484
Fiscal year-end FE	No	Yes	No	No
NTEE sector FE	No	No	Yes	No
Fiscal year-end by sector FE	No	No	No	Yes

Table 3 Continued: Portfolio Composition and Investment Returns

Panel B: Allocation to individual securities versus ETFs and MFs				
	(1)	(2)	(3)	(4)
	Investment Return	Investment Return	Investment Return	Investment Return
Individual stocks	0.004 (0.30)	0.001 (0.12)	0.004 (0.32)	0.002 (0.18)
Equity ETFs and MFs	0.013*** (3.32)	0.009*** (2.68)	0.012*** (3.09)	0.010*** (2.78)
Individual bonds	-0.021* (-1.94)	-0.019* (-1.70)	-0.020* (-1.83)	-0.019* (-1.65)
Bond ETFs and MFs	-0.006 (-1.19)	-0.010* (-1.94)	-0.007 (-1.29)	-0.010** (-1.99)
Constant	0.047*** (116.98)	0.048*** (126.44)	0.047*** (117.65)	0.048*** (126.67)
Observations	41,510	41,510	41,510	41,510
Adjusted R^2	0.000	0.456	0.002	0.481
Fiscal year-end FE	No	Yes	No	No
NTEE sector FE	No	No	Yes	No
Fiscal year-end by sector FE	No	No	No	Yes

Table 4: Funding Risk and Asset Allocations

This table presents results from regressions at the organization-year level (Regression 1) and the organization level (Regressions 2–5). In Regression 1, the dependent variable is the growth rate of donations, measured as the difference in the natural logs of total donations between consecutive years. Total donations are taken from Part VIII, Line 1h (“Contributions and grants”) of IRS Form 990. In Regressions 2 and 3, the dependent variable is the fraction of endowment assets invested in public equity securities, while in Regressions 4 and 5 it is the fraction invested in cash and fixed income. Operational funding risk is measured as the standard deviation of the ratio of program service expenses to program service revenues across all available years for each organization. Regressions 3 and 5 additionally control for the logarithm of endowment assets under management (AUM). Fixed effects are included as indicated. Standard errors are clustered by organization in Regression 1 and by NTEE sector in Regressions 2–5. Asterisks *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Variable	Growth rate of donations	Portfolio weight on public equity	Portfolio weight on public equity	Portfolio weight on cash & fixed income	Portfolio weight on cash & fixed income
Return on the Market	0.030*** (8.68)				
Operational Funding Risk		-0.140*** (-5.75)	-0.109*** (-3.83)	0.203*** (8.53)	0.104*** (5.47)
Log (AUM)			0.008** (2.24)		-0.027*** (-18.28)
Observations	330,269	6,526	6,526	6,526	6,526
Adjusted R^2	0.000	0.008	0.010	0.028	0.055
NTEE Sector FE	No	Yes	Yes	Yes	Yes

Table 5: Differences in Performance by Fund Size

This table reports return statistics at the organization-year level across size categories, defined by beginning-of-year AUM. Size classification reflects an organization's AUM in its last available sample year. Net investment returns are computed using 50% of new contributions to the fund, as described in Table 2. Sector-adjusted returns are computed by subtracting the equally weighted average return of all organizations within the same NTEE sector. Reporting period-adjusted returns subtract the average return of all funds with the same fiscal year-end. Benchmark-adjusted returns equal net returns minus the return on a benchmark portfolio with an allocation of 40% to U.S. equities, 20% to international equities, 20% to investment-grade bonds, 10% to real estate, and 10% to cash. The Relative Sharpe Ratio (RSR) is defined as the fund's Sharpe ratio divided by that of the benchmark over the same period. For each variable, the first row reports the mean, and the second row reports the t-statistic for a test against zero (against one for RSR). Asterisks *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	All Funds 39,645 Orgs (100%)	AUM ≥ \$100M 3,366 Orgs (8.5%)	AUM [\$10M-\$100M) 11,032 Orgs (27.8%)	AUM [\$1M-\$10M) 17,744 Orgs (44.8%)	AUM < \$1M 7,503 Orgs (18.9%)
Net investment return	4.30%*** [327.5]	4.73%*** [100.8]	4.59%*** [184.1]	4.25%*** [219.8]	3.75%*** [123.0]
Sector-adjusted return	0.00% [0.0]	0.66%*** [22.6]	0.36%*** [20.3]	-0.10%*** [-6.6]	-0.75%*** [-28.7]
Reporting period-adjusted return	0.00% [0.0]	0.69%*** [22.3]	0.38%*** [21.0]	-0.11%*** [-7.4]	-0.76%*** [-29.1]
Benchmark-adjusted return	-3.26%*** [-170.8]	-2.34%*** [-34.7]	-2.72%*** [-76.2]	-3.40%*** [-121.5]	-4.35%*** [-95.8]
Sharpe ratio	0.535*** [286.0]	0.541*** [141.6]	0.559*** [225.5]	0.548*** [219.5]	0.448*** [82.5]
Relative Sharpe Ratio (RSR)	0.759*** [91.9]	0.943*** [140.9]	0.870*** [208.4]	0.735*** [183.1]	0.491*** [60.1]
CAPM alpha	-0.39%*** [-62.2]	-0.55%*** [-30.9]	-0.22%*** [-20.9]	-0.36%*** [-38.4]	-0.65%*** [-38.8]

Table 6: Differences in Performance by Nonprofit Sector

This table reports differences in investment returns across nonprofit sectors. Sectors are classified according to the National Taxonomy of Exempt Entities (NTEE), with the corresponding NTEE code listed in parentheses. Net investment returns are computed using 50% of new contributions to the fund, as described in Table 2. The reporting period-adjusted return is defined as the net investment return demeaned by the average return of all funds reporting for the same fiscal year-end. Size-adjusted (EW) and size-adjusted (VW) returns are calculated as the net investment return minus the equally weighted (EW) and value-weighted (VW) average returns, respectively, of funds in the same size quintile, where quintiles are based on beginning-of-year endowment value. For each row, the first number reports the mean, and the second number reports the corresponding t-statistic for a test against zero. Return Difference (High–Low) measures the difference between returns in the best- and worst-performing sectors for each return measure. The associated t-statistic tests for equality of means between the best and worst sectors. Asterisks *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively. To facilitate interpretation, sectors are sorted in descending order based on equally weighted size-adjusted returns.

Sector	Net Investment Return	Reporting Period-Adjusted Return	Size-Adjusted Return (EW)	Size-Adjusted Return (VW)
Arts (AR)	4.51%*** [119.2]	0.21%*** [7.2]	0.35%*** [12.7]	0.16%*** [5.6]
Environment (EN)	4.58%*** [75.3]	0.20%*** [4.2]	0.29%*** [6.5]	0.15%*** [3.2]
Human Services (HU)	4.32%*** [158.2]	-0.02% [-1.0]	0.22%*** [11]	0.04%* [1.9]
Public and Societal Benefit (PU)	4.55%*** [109.1]	0.25%*** [8.2]	0.21%*** [7.3]	-0.09%*** [-2.8]
Education (ED)	4.45%*** [141.9]	0.20%*** [8.7]	0.09%*** [4.2]	-0.16%*** [-7.1]
Higher Education (BH)	4.81%*** [66.7]	0.87%*** [19.3]	0.07%** [2.0]	-0.79%*** [-20.6]
Religion (RE)	4.05%*** [47.4]	-0.30%*** [-4.4]	-0.09% [-1.4]	-0.17%** [-2.5]
Health (HE)	3.82%*** [104.9]	-0.39%*** [-13.1]	-0.40%*** [-14.1]	-0.66%*** [-22.0]
Mutual Benefit (MU)	3.94%*** [12.7]	-0.36% [-1.4]	-0.41% [-1.6]	-0.70%** [-2.5]
International (IN)	3.99%*** [36.1]	-0.31%*** [-3.5]	-0.48%*** [-5.8]	-0.77%*** [-8.8]
Hospitals (EH)	3.23%*** [51.4]	-0.79%*** [-14.4]	-1.40%*** [-26.5]	-2.03%*** [-36.5]
High Sector	BH	BH	AR	AR
Low Sector	EH	EH	EH	EH
Return Difference (High–Low)	1.58%***	1.66%***	1.75%***	2.19%***
T-statistic	[16.17]	[23.61]	[29.84]	[35.46]

Table 7: Sector-by-Size Benchmarks

This table presents returns (Panels A and B) and Relative Sharpe Ratios (Panel C) for funds sorted into size quintiles and NTEE sectors. Panel A first sorts funds by size and then into sectors (across-sector size sort), while Panel B first sorts funds into sectors and then by size within each sector (within-sector size sort). In Panels A and B, each sector row reports average returns in the first line, the number of funds in the second line, and average AUM in thousands of dollars in the third line. The final column in Panels A and B presents t-tests for differences in returns between the largest (Q1) and smallest (Q5) quintiles. In Panel C, t-tests evaluate whether Relative Sharpe Ratios differ significantly from one. Asterisks *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Across-Sector Size Sorting						
Sector	Q1	Q2	Q3	Q4	Q5	T-Test (Q1-Q5)
All Funds	5.25% 5,567 117,419	4.77% 5,559 7,584	4.37% 5,559 2,622	3.77% 5,559 886	2.77% 5,555 144	2.43%***
Arts	5.52% 585 66,215	5.34% 625 4,222	4.78% 649 1,238	4.05% 787 381	3.14% 754 67	2.38%***
Higher Education	5.04% 912 391,401	4.34% 168 4,616	3.20% 81 1,319	2.38% 47 452	0.25% 25 65	4.79%***
Education	5.24% 1278 83,077	4.97% 1157 4,371	4.44% 991 1,262	3.99% 851 391	2.40% 693 67	2.84%***
Hospitals	4.25% 389 116,975	3.46% 233 4,431	2.77% 182 1,314	1.98% 128 370	1.61% 106 65	2.64%***
Environment	5.68% 186 37,155	5.39% 249 3,985	4.68% 293 1,250	4.08% 328 383	3.24% 280 66	2.43%***
Health	4.74% 530 50,229	4.42% 729 4,231	3.86% 697 1,270	3.28% 751 381	2.39% 737 65	2.35%***
Human Services	5.49% 612 31,730	4.91% 1320 4,108	4.53% 1541 1,249	3.93% 1551 378	3.03% 1823 63	2.46%***
International	4.91% 80 73,261	4.20% 80 4,284	3.92% 67 1,238	3.50% 75 375	2.28% 74 72	2.63%***
Mutual Benefit	4.32% 9 40,079	3.96% 9 4,382	5.43% 9 1,015	3.58% 14 364	2.28% 11 62	2.04%*
Public & Societal Benefit	5.43% 712 67,560	4.92% 603 4,208	4.36% 579 1,240	3.91% 575 385	3.07% 532 68	2.35%***
Religion	5.57% 60 33,640	5.05% 129 4,001	3.98% 145 1,279	3.75% 122 399	2.51% 168 68	3.06%***

Table 7 Continued: Sector-by-Size Benchmarks

Panel B: Within-Sector Size Sorting						
Sector	Q1	Q2	Q3	Q4	Q5	T-Test (Q1-Q5)
All Funds	5.25% 5,567 117,419	4.77% 5,559 7,584	4.37% 5,559 2,622	3.77% 5,559 886	2.77% 5,555 144	2.43%***
Arts	5.50% 678 58,212	5.15% 677 3,357	4.70% 677 967	3.91% 677 301	3.13% 677 58	2.37%***
Higher Education	5.34% 247 1,321,607	4.95% 246 82,435	4.92% 247 31,208	4.80% 246 11,311	3.14% 246 1,715	2.20%***
Education	5.25% 993 107,745	5.06% 992 6,713	4.66% 993 2,078	4.32% 992 665	2.77% 992 114	2.48%***
Hospitals	4.71% 207 200,700	3.65% 207 12,428	3.44% 206 3,871	2.46% 207 1,204	1.84% 206 177	2.87%***
Environment	5.62% 268 27,533	5.19% 268 2,542	4.75% 268 911	3.87% 268 311	3.16% 267 60	2.45%***
Health	4.69% 688 40,797	4.15% 687 3,181	3.94% 687 1,047	3.16% 687 322	2.38% 687 58	2.31%***
Human Services	5.21% 1,369 17,105	4.77% 1,369 2,013	4.23% 1,368 738	3.75% 1,369 224	2.86% 1,368 41	2.36%***
International	4.85% 77 75,998	4.42% 76 4,705	3.89% 76 1,350	3.52% 76 369	2.15% 76 68	2.70%***
Mutual Benefit	4.79% 11 34,112	4.46% 10 3,464	5.28% 10 779	2.86% 10 289	2.16% 10 55	2.63%**
Public & Societal Benefit	5.49% 598 78,693	4.90% 597 5,630	4.58% 597 1,525	3.89% 597 465	3.19% 597 81	2.30%***
Religion	5.29% 129 18,061	4.88% 129 2,128	3.95% 128 864	2.94% 129 248	2.59% 128 46	2.70%***

Table 7 Continued: Sector-by-Size Benchmarks

Relative Sharpe Ratios are computed by dividing the Sharpe Ratio of each fund by the Sharpe Ratio of the benchmark over the same time period. The benchmark consists of 40% U.S. equities (VTI), 20% international equities (VEU), 20% bonds (AGG), 10% real estate (VNQ), and 10% cash (BIL).

Panel C: Relative Sharpe Ratios						
Sector	Q1	Q2	Q3	Q4	Q5	T-Test (Q1-Q5)
Across-Sector Size Sorting						
Arts	1.051*	1.026	0.806***	0.705***	0.319***	0.732***
Higher education	0.975	1.024	0.526*	0.484***	-1.031***	2.006***
Education	0.977	0.988	0.816***	0.726***	0.019***	0.958***
Hospitals	0.938	0.778**	0.518***	-0.026***	0.238***	0.700***
Environment	1.026	0.933	0.684***	0.605***	0.180***	0.846***
Health	0.914*	0.809***	0.651***	0.592***	0.120***	0.794***
Human services	0.963	0.831***	0.805***	0.667***	0.199***	0.764***
International	0.927	0.600***	0.974	0.413***	0.020***	0.907***
Mutual Benefit	1.190	0.932	0.837	0.576*	-0.584	1.774
Public & Societal Benefit	0.885***	0.801***	0.801***	0.725***	0.174***	0.711***
Religion	1.018	0.859***	0.747***	0.592***	0.208***	0.810***
Within-Sector Size Sorting						
Arts	1.069**	0.986	0.794***	0.634***	0.298***	0.771***
Higher education	0.952**	0.901*	0.998	1.072	0.594***	0.358***
Education	0.965	0.997	0.911**	0.785***	0.217***	0.748***
Hospitals	1.049	0.808*	0.759***	0.431***	0.084***	0.964***
Environment	1.008	0.878	0.711***	0.511***	0.115***	0.894***
Health	0.896**	0.796***	0.656***	0.570***	0.067***	0.829***
Human services	0.883***	0.851***	0.748***	0.542***	0.145***	0.738***
International	0.921	0.640**	0.917	0.436***	-0.027***	0.948***
Mutual Benefit	1.143	0.945	0.893	0.618*	-0.752	1.895
Public & Societal Benefit	0.875***	0.837***	0.761***	0.726***	0.264***	0.611***
Religion	0.931	0.826*	0.783***	0.362***	0.238***	0.693***

Table 8: Endowment Returns and Fund Management in Nonprofit Organizations

This table presents results of return regressions on fund management structure (Panel B) and fees paid to external financial advisors (Panel C). Panel A reports summary statistics for the variables used in the analysis. Internal Fund Management is a dummy variable equal to 1 if an organization does not use external advisors and 0 otherwise. CIO (Chief Investment Officer) is a dummy variable equal to 1 if the organization has a dedicated, highly paid employee managing investments. Log (CIO Comp) is the natural logarithm of the CIO's annual compensation, expressed in thousands of dollars. Fund Size is the natural logarithm of the fund's assets under management (AUM). Fees/AUM is the ratio of fees paid to external advisors, scaled by fund AUM and expressed as a percentage. In Panel B, the dependent variables are net returns and excess returns relative to the within-sector size benchmark constructed in Section 3.3 and reported in Panel B of Table 7. Panel C uses the same return measures and additionally includes gross returns. The Matched Subsample includes funds for which all advisory fees are attributable to endowment assets. The subsample labeled $E/A \geq 75\%$ includes funds where at least 75% of the organization's total assets are held in the endowment. See Section 4 and the Appendix for further details on variable construction. Fixed effects are as indicated. Standard errors are clustered by organization. Asterisks *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Statistics for the fees and fund management								
Variable	Number of observations	Mean	Standard deviation	10P	25P	Median	75P	90 P
Fees/AUM (all funds)	130,060	0.65%	0.60%	0.14%	0.31%	0.53%	0.82%	1.13%
Fees/AUM ($E/A \geq 75\%$ Subsample)	26,332	0.61%	0.50%	0.15%	0.32%	0.53%	0.79%	1.06%
Fees/AUM (Matched Subsample)	11,391	0.72%	0.42%	0.23%	0.42%	0.66%	0.95%	1.27%
Organization has a CIO	195,313	3.77%	19.05%	0.00%	0.00%	0.00%	0.00%	0.00%
CIO Compensation (\$000s)	3,291	329.1	438.8	70.3	126.8	201.8	363.1	669.3

Table 8 Continued: Endowment Returns and Fund Management in Nonprofit Organizations

Panel B: Organizational structure of investment management and investment returns				
	Net return	Net return	Excess return over size/sector benchmark	Excess return over size/sector benchmark
Internal fund management	-0.398*** (-10.16)	-6.518* (-1.71)	-0.345*** (-8.92)	-6.260* (-1.73)
CIO	-0.201* (-1.92)		-0.224** (-2.21)	
Internal fund mgmt × CIO	-0.211 (-1.00)		-0.084 (-0.41)	
Log (CIO Comp)		-0.230* (-1.67)		-0.150 (-1.14)
Internal fund mgmt × Log (CIO Comp)		0.532* (1.69)		0.525* (1.75)
Fund Size	0.544*** (65.15)	0.455*** (7.59)		
Observations	187,325	3,083	187,325	3,083
Adjusted R^2	0.280	0.418	0.002	0.004
Fiscal year-end by sector FE	Yes	Yes	No	No

Table 8 Continued: Endowment Returns and Fund Management in Nonprofit Organizations

Panel C: Investment management fees and returns									
Variable	All Organizations			Matched Subsample			E/A \geq 75%		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Gross return	Net return	Excess return over size/sector benchmark	Gross return	Net return	Excess return over size/sector benchmark	Gross return	Net return	Excess return over size/sector benchmark
Internal fund management	-0.380*** (-12.28)	-0.328*** (-10.31)	-0.590*** (-18.62)						
Fees/AUM				27.036* (1.87)	-47.325*** (-3.27)	-27.854** (-2.30)	-7.872 (-0.67)	-33.907*** (-2.72)	-26.536** (-2.33)
Fund Size	0.424*** (62.60)	0.458*** (66.21)		0.242*** (7.14)	0.282*** (8.24)		0.225*** (8.47)	0.283*** (10.05)	
Observations	327,544	327,544	327,544	11,391	11,391	11,391	25,884	25,884	25,884
Adjusted R^2	0.319	0.304	0.002	0.418	0.421	0.061	0.419	0.403	0.012
Fiscal year-end by sector FE	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No

Table 9: Organizational Governance and Investment Return

This table presents results of return regressions on measures of organizational governance at the organization-year level. Panel A reports summary statistics for the governance measures. Panel B presents regressions of net investment returns on governance characteristics. Panel C reports regressions of excess returns relative to the within-sector size benchmark constructed in Section 3.3 and reported in Panel B of Table 7. Administrative Expense Ratio is defined as the ratio of management and general expenses to total expenses. Fraction of Highly Paid Employees is the ratio of employees earning over \$100,000 in annual salary to the total number of employees. Small Board is a dummy variable equal to 1 if the board has 10 or fewer members and 0 otherwise. Board Independence is defined as the ratio of independent board members to the total number of board members. CEO/O&D Pay is the ratio of CEO pay to total pay of all officers and directors. See the Appendix for further details on variable construction. Fixed effects are as indicated. Standard errors are clustered by organization. Asterisks *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Statistics for the organizational governance measures								
Variable	Number of observations	Mean	Standard deviation	10P	25P	Median	75P	90 P
Administrative Expense Ratio	336,932	15.52%	13.41%	3.26%	7.57%	12.54%	19.50%	29.36%
Fraction Highly Paid Employees (\$100k+)	225,139	4.60%	9.69%	0.00%	0.00%	0.99%	4.68%	13.56%
Small Board (<=10 Members)	342,492	24.32%	42.90%	0.00%	0.00%	0.00%	0.00%	100.00%
Board Independence	341,940	94.25%	16.06%	83.33%	96.15%	100.00%	100.00%	100.00%
CEO/O&D Pay	238,625	55.89%	37.54%	0.00%	21.87%	54.04%	100.00%	100.00%

Table 9 Continued: Organizational Governance and Investment Return

Panel B: Net Investment Returns						
	(1)	(2)	(3)	(4)	(5)	(6)
Administrative Expense Ratio	-0.003** (-2.41)					-0.007*** (-3.10)
Fraction Highly Paid Employees		-0.023*** (-11.49)				-0.024*** (-10.33)
Small Board (<=10 Members)			-0.001*** (-3.99)			-0.003*** (-4.20)
Board Independence				0.009*** (8.58)		0.007*** (3.25)
CEO/O&D Pay					0.006*** (12.12)	0.006*** (9.10)
Log (Assets)	0.005*** (74.16)	0.005*** (65.54)	0.005*** (73.71)	0.005*** (75.36)	0.005*** (66.11)	0.005*** (54.58)
Observations	336,774	225,023	342,311	341,761	238,521	164,071
Adjusted R ²	0.313	0.331	0.311	0.312	0.331	0.347
Fiscal year-end by sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Excess Returns over the Sector-Size Benchmark						
Administrative Expense Ratio	-0.002** (-2.01)					-0.010*** (-3.89)
Fraction Highly Paid Employees		-0.024*** (-11.67)				-0.026*** (-10.70)
Small Board (<=10 Members)			-0.002*** (-4.48)			-0.003*** (-4.11)
Board Independence				0.010*** (8.70)		0.008*** (3.51)
CEO/O&D Pay					0.006*** (12.20)	0.006*** (9.40)
Observations	319,687	212,378	324,927	324,402	225,707	154,558
Adjusted R ²	0.003	0.006	0.003	0.004	0.005	0.009
Fiscal year-end by sector FE	No	No	No	No	No	No

Internet Appendix to
**THE RISK, REWARD, AND ASSET ALLOCATION OF
NONPROFIT ENDOWMENT FUNDS**

Andrew W. Lo
MIT Sloan

Egor Matveyev
MIT Sloan

Stefan Zeume
UIUC Gies

May 2025

Contents

- A IRS Form 990: Variable Definitions and Data Extraction** **2**
- A.1 Variable Definitions 2
- A.2 Asset Classification Methodology 2
- A.3 General Structure of IRS Form 990 XML 2
- A.4 Schema Evolution from 2008 to 2020 3
- A.4.1 Changes in tag names and structure 3
- A.5 Handling Schema Changes in the Data Pipeline 4

- B Comparison to NACUBO Higher Education Endowment Data** **5**

- C Supplementary Analyses on Endowment Size and Returns** **5**
- C.1 AUM Growth by Size 5
- C.2 Performance by Fiscal Year-End and Fund Size 5

- D Identification of Investment Management Roles** **6**

- E Investment Management Fees and Fund Size** **6**

- F Governance Measures by Endowment Fund Size** **7**

A IRS Form 990: Variable Definitions and Data Extraction

A.1 Variable Definitions

As discussed in the paper, the source of our dataset is IRS Form 990, the annual tax filing that U.S. public nonprofit organizations are required to submit under Section 6033 of the Internal Revenue Code. Table A.1 provides exact variable definitions. For each variable, we identify the specific source on Form 990, including the relevant part of the form, line number, and, where applicable, the corresponding schedule (e.g., Schedule D).

A.2 Asset Classification Methodology

Asset holdings disclosed by nonprofit organizations on Form 990 are reported in a non-standardized manner, with no uniform taxonomy for asset categories. The IRS requires organizations to report both publicly traded and other securities on their balance sheet. If these holdings exceed 5 percent of total assets, organizations must provide additional detail in Part VII of Schedule D. However, the IRS does not prescribe how these assets should be categorized, which leads to wide variation in how nonprofits describe their portfolios.

To ensure comparability, we manually classify all reported investments into eight standardized asset classes: (1) public equity, (2) fixed income, (3) private equity and venture capital, (4) cash and cash equivalents, (5) real assets and real return, (6) real estate, (7) hedge funds and absolute return, and (8) trusts and cooperatives. Table A.2 provides a complete list of the holdings included in each category.

Table A.2 reflects the full set of asset descriptions observed in the data and their assignment to the appropriate class. For example, we distinguish public equity holdings by geography (domestic, international developed, and emerging markets) and by type (individual stock versus pooled vehicle). Similarly, fixed income holdings are broken down by issuer (government, agency, corporate) and by structure (direct bond versus fund). The remaining categories follow a similar logic, with classifications designed to reflect both the economic substance of the asset and the consistency of reporting language across filers.

When organizations report holdings that span multiple categories and cannot be reliably separated (such as “public & private equity”), we exclude those assets from allocation analysis to preserve accuracy. In cases where individual securities are explicitly named, we flag them as directly held, allowing us to examine stock- and bond-picking behavior. Finally, several organizations report investments in cooperative vehicles or trust-based structures not typically found in institutional portfolios; we include these under the category of “trusts and cooperatives.”

A.3 General Structure of IRS Form 990 XML

IRS Form 990 electronic filings are structured as XML documents conforming to the IRS’s Modernized e-File (MeF) schemas. Each filing is wrapped in a root <Return> element, with a returnVersion attribute indicating the schema version used. Inside the return, major sections are organized hierarchically. For example, a <ReturnHeader> contains metadata about the filer and

tax period, and a <ReturnData> section contains the form data itself. Within <ReturnData>, each core form or schedule is encapsulated in its own XML element (e.g., <IRS990> for the main form, <IRS990ScheduleA> for Schedule A), reflecting the structure of the paper form and its schedules. This parent-child tag design mirrors the form’s parts and line items. For instance, many financial line items are grouped: a parent tag (often ending with “Grp”) represents a line or part of the form, and it contains child elements for detailed values. A typical example is the balance sheet fields for assets or liabilities, which appear as a <TotalAssetsGrp> that contains child elements like <BOYAmt> and <EOYAmt> for beginning-of-year and end-of-year amounts. In general, the XML tags are verbose, descriptive names corresponding to specific lines or questions on the form, rather than using line numbers. The schema also uses consistent suffix conventions for data types, such as “Amt” for monetary amounts, “Cnt” for counts, “Txt” for text fields, and “Ind” for boolean indicators (yes/no flags), and organizes related fields under common parent nodes to preserve the form’s hierarchy.

A.4 Schema Evolution from 2008 to 2020

Between 2008 and 2020, the IRS implemented several updates to the Form 990 XML schema, including at least two significant structural shifts. The first was prompted by the major redesign of Form 990 for the 2008 tax year, when the IRS introduced a substantially expanded core form (Parts I–XI) and a new series of schedules (Schedules A–R). This overhaul, the first comprehensive redesign since 1979, required a corresponding update of the e-file schema to accommodate the new layout and additional schedules. XML tags were added or restructured to mirror the revised parts of the form, including new elements for each schedule and many new fields within the core form. Subsequent annual changes between 2008 and 2012 were relatively incremental. A more extensive schema revision occurred in 2013. Most e-file forms underwent a major schema update that year, reflected in schema version “2013v3.0.” This update introduced a new naming taxonomy and hierarchy for many elements. One analysis noted that the “XML data was massively transformed from 2012 to 2013” (Barker, Huynh, Lacey and Nguyen, 2022), meaning that many tag names in 2013 filings differ markedly from those in 2012. After this overhaul, the schemas for 2014 through 2020 evolved more gradually, with relatively modest changes each year. In other words, once the 2013 schema was in place, the set of tags remained largely stable, with only a few dozen to a few hundred additions or changes in any given year.

A.4.1 Changes in tag names and structure

The 2013 schema revision introduced more standardized naming conventions. In many cases, tags that existed in 2012 were replaced by new names that followed a consistent pattern. For example, a boolean flag such as “Address change?” was represented as <AddressChange> in older filings but renamed to <AddressChangeInd> in 2013 and later. Similarly, amount fields that formerly had no explicit suffix (e.g., <AdministrativeExpenses>) were renamed with an “Amt” suffix, such as <AdministrativeExpensesAmt>. Many abbreviations were standardized. A tag like <AdequateBooksAndRecdsMaintaind> in older XML was replaced by a clearer name, <AdequateBooksAndRecMaintInd>, indicating a boolean field. Another structural change affected the naming of container elements. Earlier schema versions often used the word “Table” in group labels, whereas the 2013 schema adopted “Grp” for grouping tags. For example, a section covering

activities outside the U.S. was nested under an <AcctsActvsOutUSTable> tag in early versions, but under <ActivitiesOutsideUSGrp> in the newer schema, reflecting the same concept. In summary, the 2013 update introduced a more uniform tag taxonomy: every field’s XML name became more self-descriptive and consistently typed, making the hierarchy deeper but clearer.

Changes introduced around 2014–2015 were mostly refinements to the 2013 schema. One notable adjustment was in the naming of multi-line text fields. For instance, in the 2013 schema, the principal officer’s name and address fields were labeled <BusinessNameLine1> and <AddressLine1>. By 2014, the schema explicitly appended “Txt” to these names, such as <BusinessNameLine1Txt> and <AddressLine1Txt>, clarifying that these elements are text strings. This change aligned with the broader convention of using the “Txt” suffix for textual inputs. Dozens of such tag name refinements were introduced during the mid-2010s to improve consistency. These changes did not affect the overall structure of the return, but they did introduce slight differences in tag names or nesting. As a result, a given data point might appear under different tag names depending on the year. After 2014, however, the schema stabilized considerably. Aside from occasional additions reflecting updates to the form itself, the overall structure introduced in 2013 remained intact through 2020.

A.5 Handling Schema Changes in the Data Pipeline

These schema changes posed challenges for longitudinal data analysis. A given financial or operational field might appear under different XML paths in different years, so a fixed XPath extraction would fail to capture all relevant instances. Our data processing pipeline is therefore designed to track schema variation and reconcile tag differences across years. In practice, this involves maintaining a mapping of equivalent tags and writing extraction code that checks multiple possible parent-child tag combinations for each data field. We draw on schema concordances from community efforts and IRS documentation to identify which tags from earlier returns correspond to which tags in later filings. When the IRS renames or restructures a field, both versions are recognized by the code.

For each target field (such as total revenue or number of employees), our parser tries all known XML paths that could contain the value, based on the relevant schema version. For example, if a field may appear as <AddressChangeInd> in newer schemas or as <AddressChange> in older ones, the parser attempts both and consolidates the result into a single normalized field. The code also accounts for cases where the schema permits multiple structures for the same concept. One such case is identifying individuals in Part VII (compensation of officers and key employees). In most recent filings, names are reported using a <PersonNm> tag. In some filings, however, the name is embedded in a “business name” block using <BusinessNameLine1Txt>. Our pipeline checks for both patterns and captures the name regardless of which XML logic is used. By applying this kind of fallback logic across all fields, we are able to extract consistent values across the 2008–2020 period. This schema-aware parsing strategy is critical for constructing reliable time series from Form 990 XML data. Despite the IRS’s changes in naming and structure, especially those introduced in 2013, our system consistently retrieves conceptually equivalent data across years, allowing for robust longitudinal analysis.

B Comparison to NACUBO Higher Education Endowment Data

In this section, we compare the coverage of higher education endowments in our dataset to that in the dataset compiled by the National Association of College and University Business Officers (NACUBO). Figure A.3, Panel A, shows the number of higher education endowments per year in our dataset and in NACUBO. We plot data through 2018, the latest year for which NACUBO data are available. The figure shows that our dataset includes over 1,200 higher education endowments annually, compared to roughly 800 in NACUBO. On average, our higher education subsample is approximately 50% larger. As discussed in the paper, higher education institutions account for just 3% of the 39,866 endowments in our full sample.

Panel B displays the average annual return for higher education endowments in both datasets. NACUBO returns tend to be higher in strong market years (but lower in 2008), resulting in a higher overall average return. There are two key reasons for this. First, as discussed in the main text, larger endowment funds tend to earn higher returns. Second, the NACUBO sample systematically overrepresents larger institutions, as documented by [Lerner, Schoar and Wang \(2008\)](#). In addition, NACUBO data are more heavily weighted toward private universities, which tend to have larger endowments on average.

C Supplementary Analyses on Endowment Size and Returns

C.1 AUM Growth by Size

Figure A.4 shows cumulative net investment returns of endowments by fund size over our sample period.

We implement two types of size-based sorts. First, we group funds into fixed size bins: (1) large funds have assets under management (AUM) above \$100 million; (2) medium funds fall between \$10 million and \$100 million; (3) small funds range from \$1 million to \$10 million; and (4) very small funds have less than \$1 million in AUM. Second, we sort funds into size quintiles based on average endowment size over the sample period. Within each size category, we compute equal-weighted returns and plot the cumulative performance over time.

The figure illustrates that the outperformance of large endowments accumulates to a substantial return differential over the full sample period.

C.2 Performance by Fiscal Year-End and Fund Size

Most nonprofits file in either Q2 or Q4. Here, we assess whether the relationship between endowment size and investment performance is robust to differences in fiscal year-end.

The results in Table A.5 show a consistent pattern across both Q2 (June 30) and Q4 (December 31) filers: larger funds earn higher net investment returns and outperform smaller funds on a benchmark-adjusted basis. Among Q2 filers, endowments with over \$100 million in assets

outperform their benchmark by 0.66 percentage points annually, while the smallest funds underperform by 0.70 percentage points. A similar pattern holds for Q4 filers, with the largest funds outperforming by 0.80 percentage points and the smallest underperforming by 0.72 percentage points.

Relative Sharpe Ratios (RSR) also decline with size. For Q2 filers, large funds attain an RSR close to one (0.966), while the smallest funds report a substantially lower RSR of 0.545. Across all size categories, Q4 filers perform worse on a risk-adjusted basis, with RSR values ranging from 0.715 among the largest funds to 0.428 among the smallest. These results corroborate the evidence presented in Figure 1 of the main text.

Overall, the size-performance gradient appears robust to fiscal year-end timing, though performance levels are generally stronger among Q2 filers, particularly at the top of the size distribution.

D Identification of Investment Management Roles

Our goal is to identify whether an organization has a dedicated individual whose primary responsibility is managing investments.

We rely on IRS reporting requirements, which mandate that organizations disclose their top officers, directors, trustees, key employees, and highest-compensated employees, including their job titles.

We are able to identify titles for 1,608,995 individuals in our sample. From these, we construct a list of unique titles, totaling 64,423. The titles “Trustee” and “President” each appear over 100,000 times. Several other titles appear more than 10,000 times, including “Vice President,” “Vice Chair,” “Chair,” “CFO,” “CEO,” “Vice Preside” (a truncated variant), and “Past President.”

From this list of unique titles, we conduct textual analysis to identify all possible titles related to the investment management function. Table A.6 provides the complete list of identified investment-related titles, along with their frequency in the data.

For each individual, we also identify whether they were the highest-compensated employee in their organization for that year. We report the average and maximum value of this indicator by title. In many cases, investment managers were the highest-paid individuals in a given year. In fact, for the majority of identified investment-related titles, there is at least one organization-year in which the person holding that title was the highest-compensated employee.

Finally, we report the average and maximum compensation associated with each title.

E Investment Management Fees and Fund Size

This section documents the relationship between investment management fees and endowment size. Figure A.7 reports average fees, defined as payments to external asset managers divided by assets under management (Fees/AUM), by size quintile (Panel A) and decile (Panel B). The data

reveal a clear inverse relationship between fund size and fees. Endowments in the smallest quintile pay an average of 1.16% of AUM in fees, compared to just 0.38% for those in the largest quintile. A similar pattern holds across deciles, with particularly high fees among the smallest funds and a flattening of fees at the top.

Table A.8 formalizes this relationship by regressing Fees/AUM on the log of endowment size (Log(AUM)). Column (1) includes sector-by-year (SEC-YR) fixed effects, with standard errors clustered at the sector-year level. Column (2) adds organization fixed effects (EIN) to control for time-invariant heterogeneity across funds. In both specifications, the coefficient on Log(AUM) is large, negative, and highly statistically significant. The estimates imply that a one-log-point increase in endowment size is associated with a 14 to 37 basis point reduction in fees.

These findings highlight substantial economies of scale in investment management. Larger endowments appear able to negotiate lower fees, potentially due to greater bargaining power, more sophisticated internal oversight, or access to lower-cost fund structures.

F Governance Measures by Endowment Fund Size

Table A.9 presents summary statistics for the governance measures used in the paper, disaggregated by endowment fund size. As in the main analysis, we group funds into four categories based on AUM: over \$100 million, \$10–100 million, \$1–10 million, and under \$1 million. The table reports both averages and medians for each variable across all funds and size groups.

There is a clear size gradient in administrative expense ratios. Smaller funds exhibit higher expense ratios, with the average rising from 13.4% among the largest funds to 17.2% among the smallest. This pattern is consistent with fixed administrative costs representing a larger share of assets for smaller organizations. Median values show a similar trend, increasing from 11.8% to 13.1%.

The fraction of highly paid employees also varies systematically by fund size. Larger endowments are more likely to report a higher share of employees above the reporting threshold. The average is 8.6% for the largest funds, compared to just 2.1% for the smallest. Median values reinforce this pattern, with small funds frequently reporting zero highly paid employees.

Board structure also differs meaningfully across fund sizes. The prevalence of small boards, defined as having 10 or fewer members, declines sharply with fund size. Among the largest funds, only 8.6% have small boards, compared to nearly 40% among the smallest. Board independence remains high across all size groups, although the largest funds appear slightly less independent on average. Organizations with AUM below \$100 million exhibit very similar levels of board independence, with median values at or near 100%.

CEO compensation relative to total officer and director pay is strongly inversely related to fund size. In the smallest funds, the CEO typically receives the majority, and often the entirety, of total reported officer and director compensation, with a median share of 100%. In contrast, the largest funds exhibit much lower concentration, with an average share of 23.8% and a median of 17.9%. These patterns suggest that smaller organizations tend to concentrate authority and compensation in a single individual, whereas larger organizations distribute leadership responsibilities and pay more broadly across an executive team.

References

Barker, Kaleb, Nicky Huynh, Jack Lacey, and Long Nguyen. 2022. “Development of an IRS 990 Database.” Working paper.

Lerner, Josh, Antoinette Schoar, and Jialan Wang. 2008. “Secrets of the Academy: The Drivers of University Endowment Success.” *Journal of Economic Perspectives*, 22(3): 207–222.

Table A.1: Variable Definitions

This appendix defines the variables used in the paper. Column (2) provides the definition of each variable, while Column (3) identifies the exact location of the corresponding data item in IRS Form 990. “Header” refers to the header section of Form 990; “Part” refers to the relevant part of the form; and “Schedule” refers to the applicable schedule within Form 990.

Variable (1)	Definition (2)	Source (3)
Panel A: Variables related to the parent organization		
Total Assets	Total value of organization’s assets at the end of the year	Part X, line 16, Column (B)
Age of the organization	The difference between the current fiscal year and the year organization was founded. Year of formation is given in the return header.	Header, line L
Number of employees	Total number of individuals employed during the fiscal year.	Part I, line 5; Part V, line 2a
Number of highly compensated employees	Total number of individuals who received more than \$100,000 of reportable compensation.	Part VII, line 2
Number of volunteers	Total number of volunteers involved in the organization during the fiscal year.	Part I, line 6
Revenue	Total revenue generated by the organization in a given fiscal year.	Part VIII, line 12, Column (A)
Contributions	Contributions, gifts, grants and other similar amounts.	Part VIII, line 1h, Column (A)
Expenses	Total expenses of the organization.	Part IX, line 25, Column (A)
O&D Compensation	Total compensation paid to current officers, directors, trustees, and key employees.	Part IX, line 5, Column (A)
Program services ratio	The ratio of total program service expenses (line 25, Column (B)) to total expenses (line 25, Column (A)).	Part IX, line 25, Column (A); Part IX, line 25, Column (B)
Administrative expense ratio	The ratio of management and general expenses (line 25, Column (C)) to total expenses (line 25, Column (A)).	Part IX, line 25, Column (A); Part IX, line 25, Column (C)
Fundraising expense ratio	The ratio of fundraising expenses (line 25, Column (D)) to total expenses (line 25, Column (A)).	Part IX, line 25, Column (A); Part IX, line 25, Column (D)
Compensation-to-expense ratio	The ratio of O&D compensation to total expenses of the organization.	Part IX, line 5, Column (A); Part IX, line 25, Column (A)
Asset growth rate	The growth rate of total assets from the beginning of the fiscal year until the end of the year.	Part X, line 16, Column (A); Part X, line 16, Column (B)
Revenue growth rate	The growth rate of revenue from the beginning of the fiscal year until the end of the year.	Part I, line 12, Prior Year; Part I, line 12, Current Year
Contribution growth rate	The growth rate of contributions to the organization from the beginning of the fiscal year until the end of the year.	Part I, line 8, Prior Year; Part I, line 8, Current Year
Expense growth rate	The growth rate in total functional expenses from the beginning of the fiscal year until the end of the year.	Part I, line 18, Prior Year; Part I, line 18, Current Year
CEO Compensation / O&D Compensation	The ratio of CEO compensation to the O&D compensation. CEO is identified from titles reported in Part VII.	Part VII, line 1a, Sum of Columns (D), (E), and (F)
Small board	Defined based on the number of voting members of the governing body (Part VI, line 1a).	Part VI, line 1a

Table A.1 Continued: Variable Definitions

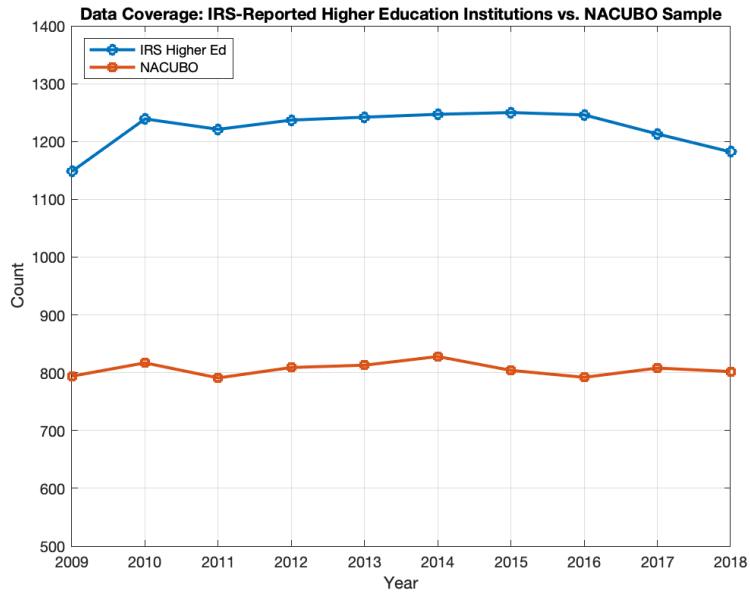
Variable (1)	Definition (2)	Source (3)
Board independence	The ratio of the number of independent voting members of the governing body (Part VI, line 1b) to the number of voting members of the governing body (Part VI, line 1a).	Part VI, line 1a; Part VI, line 1b
Panel B: Variables related to the organization's endowment fund		
Endowment AUM	Total value of Assets Under Management (AUM) in organization's endowment fund at the end of the year.	Schedule D, Part V, line 1g, Column (A)
Endowment growth rate	The growth rate in endowment AUM from the beginning of the fiscal year until the end of the year.	Schedule D, Part V, line 1a, Column (A); Schedule D, Part V, line 1g, Column (A)
Contribution rate	The ratio of contributions (line 1b, Column (A)) to the endowment fund to the beginning of year endowment value (line 1a, Column (A)).	Schedule D, Part V, line 1a, Column (A); Schedule D, Part V, line 1b, Column (A)
Distribution rate	The ratio of grants or scholarships (line 1d, Column (A)) plus other expenditures for facilities and programs (line 1e, Column (A)) to the beginning of year endowment value (line 1a, Column (A)).	Schedule D, Part V, line 1a, Column (A); Schedule D, Part V, line 1d, Column (A); Schedule D, Part V, line 1e, Column (A)
Net investment return	Net investment returns (line 1c, Column (A)) divided by the AUM at the beginning of the year (line 1a, Column (A)) plus half of the contributions to the endowment during that year (line 1b, Column (A)).	Schedule D, Part V, line 1a, Column (A); Schedule D, Part V, line 1b, Column (A); Schedule D, Part V, line 1c, Column (A)
Investment management fees	The ratio of investment management fees paid (Part IX, line 11f, Column (A)) to the end-of-year total asset value (Part X, line 16, Column (B))	Part IX, line 11f, Column (A); Part X, line 16, Column (B)
Organization has a Chief Investment Officer	Indicator variable that takes value of "1" if the organization has an employee with a title of "Chief Investment Officer," which is identified from titles reported in Part VII.	Part VII, Section A
Chief Investment Officer salary	Salary of Chief Investment Officer (CIO).	Part VII, line 1a, Sum of Columns (D), (E), and (F)

Table A.2: Composition of Asset Categories

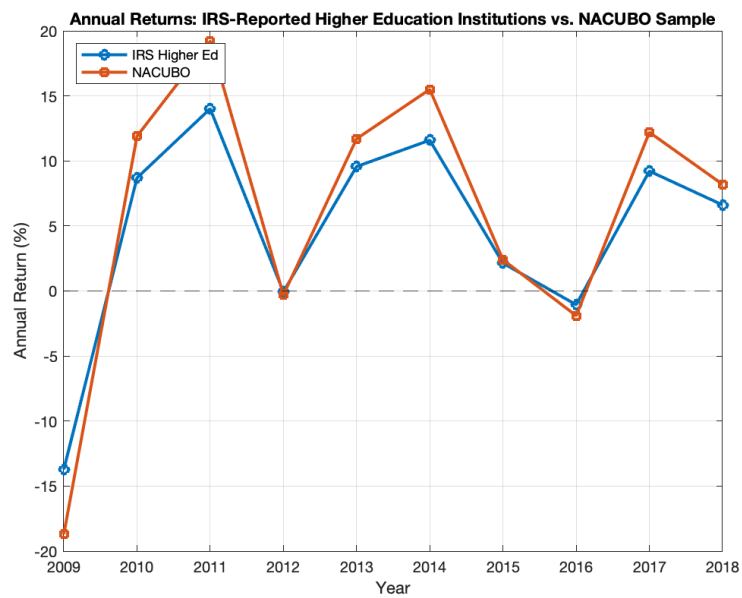
Asset category	Description
Public equity	<p>Domestic equity</p> <ul style="list-style-type: none"> • Individual stock • Pooled investment vehicle (mutual funds and ETFs) <p>Emerging markets</p> <ul style="list-style-type: none"> • Individual stock • Pooled investment vehicle (mutual funds and ETFs) <p>International developed markets</p> <ul style="list-style-type: none"> • Individual stock • Pooled investment vehicle (mutual funds and ETFs)
Fixed income	<p>Government bonds</p> <ul style="list-style-type: none"> • Individual bond • Pooled investment vehicle (mutual funds and ETFs) <p>Agency bonds</p> <ul style="list-style-type: none"> • Individual bond • Pooled investment vehicle (mutual funds and ETFs) <p>Corporate bonds</p> <ul style="list-style-type: none"> • Individual bond • Pooled investment vehicle (mutual funds and ETFs)
Private equity and venture capital	<p>Private equity</p> <p>Venture capital</p> <p>Private debt</p> <p>Partnerships, including joint ventures, and other closely-held investments</p>
Cash and cash equivalents	<p>Money market funds</p> <p>Certificates of deposit</p> <p>Annuities</p>
Real assets and real return	<p>Real asset funds</p> <p>Real return funds</p> <p>Commodities</p> <p>Inflation-hedged government bonds</p>
Real estate	<p>Real estate holdings</p> <p>Real estate investment trusts (REITs)</p> <p>Infrastructure investments, including infrastructure funds</p>
Hedge funds and absolute return	<p>Hedge funds</p> <p>Investment vehicles that guarantee return</p> <p>Guaranteed investment contracts</p>
Trusts and cooperatives	<p>Common trusts</p> <p>Collective trusts</p> <p>Trust funds</p> <p>Investments in cooperatives and credit unions</p>

Figure A.3: Comparison of Higher Education Endowments in IRS and NACUBO Data

This figure compares our dataset to NACUBO. Panel A plots the number of higher education endowments per year in each dataset. Panel B shows the average annual returns reported by each source over the overlapping sample period (2008–2018).



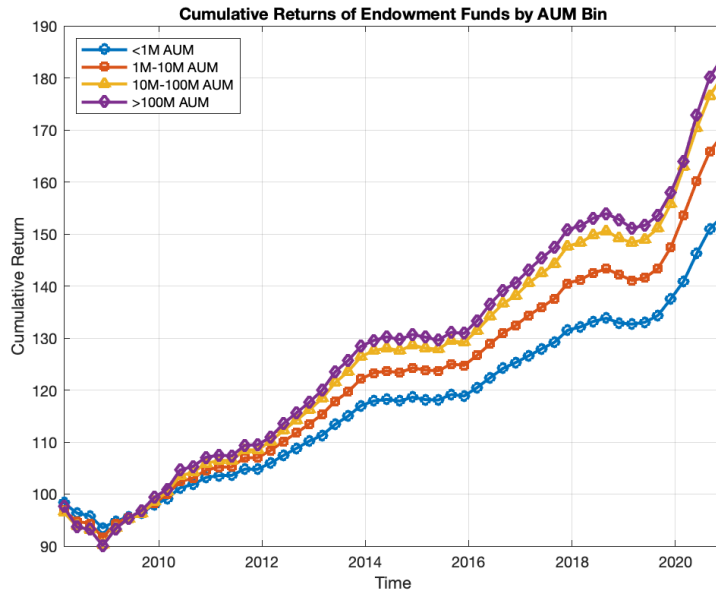
Panel A: Number of institutions



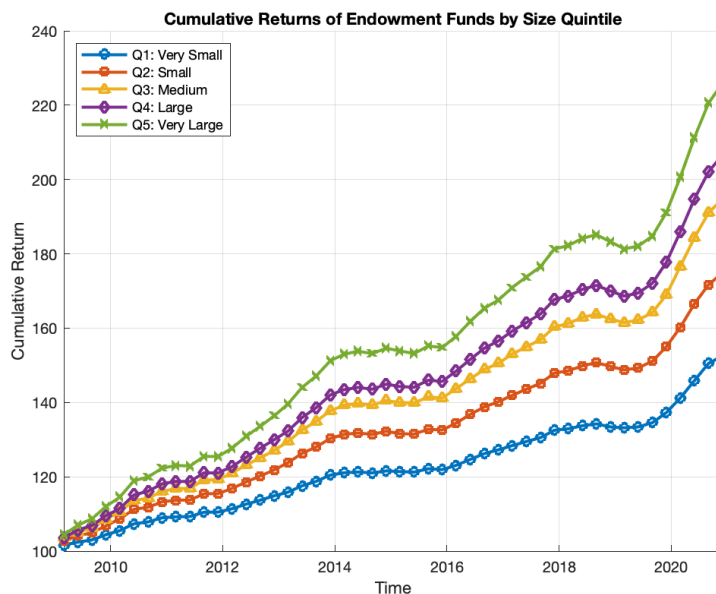
Panel B: Average Annual Returns

Figure A.4: Cumulative Investment Returns of by Fund Size

This figure shows cumulative net investment returns of endowments by fund size. Panel A sorts all funds into 4 size bins: 1) large funds are those with above \$100 million in assets under management (AUM), 2) medium funds are between \$10 million and \$100 million AUM, 3) small funds are between \$1 million and \$10 million AUM, and 4) very small funds are below \$1 million AUM. Panel B sorts all funds into quintiles by their mean endowment size over the sample period. Within each size category, we compute equal-weighted return and plot it over time.



Panel A: Cumulative returns of endowment funds by AUM bin



Panel B: Cumulative returns of endowment funds by size quintile

Table A.5: Differences in Performance by Fund Size and Reporting Period

This table reports average net returns, benchmark-adjusted returns, and relative Sharpe ratios (RSR) for nonprofit endowment funds by asset size category. Results are shown separately for funds with fiscal year ends in the second quarter (Q2, i.e., June 30) and the fourth quarter (Q4, i.e., December 31). The Relative Sharpe Ratio (RSR) is defined as the fund's Sharpe ratio divided by that of the benchmark over the same period. For each variable, the first row reports the mean, and the second row reports the t-statistic for a test against zero (against one for RSR). Asterisks *, , and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Filing Quarter	All Funds	AUM ≥ \$100M	AUM [\$10M-\$100M)	AUM [\$1M-\$10M)	AUM < \$1M
Net investment return	Q2	4.17%*** [206.04]	4.74%*** [70.04]	4.39%*** [121.77]	3.99%*** [132.74]	3.67%*** [72.63]
Net investment return	Q4	4.55%*** [203.16]	4.76%*** [51.11]	4.93%*** [106.85]	4.57%*** [142.68]	3.92%*** [83.51]
Benchmark-adjusted return	Q2	0.03%* [1.83]	0.66%*** [17.85]	0.34%*** [14.05]	-0.16%*** [-6.76]	-0.70%*** [-16.37]
Benchmark-adjusted return	Q4	-0.01% [-0.37]	0.80%*** [11.85]	0.40%*** [12.1]	-0.03% [-1.42]	-0.72%*** [-18.38]
Relative Sharpe Ratio (RSR)	Q2	0.825*** [200.72]	0.966*** [130.78]	0.931*** [152.03]	0.782*** [109.9]	0.545*** [39.8]
Relative Sharpe Ratio (RSR)	Q4	0.622*** [162.41]	0.715*** [44.56]	0.725*** [124.05]	0.628*** [117.99]	0.428*** [37.54]

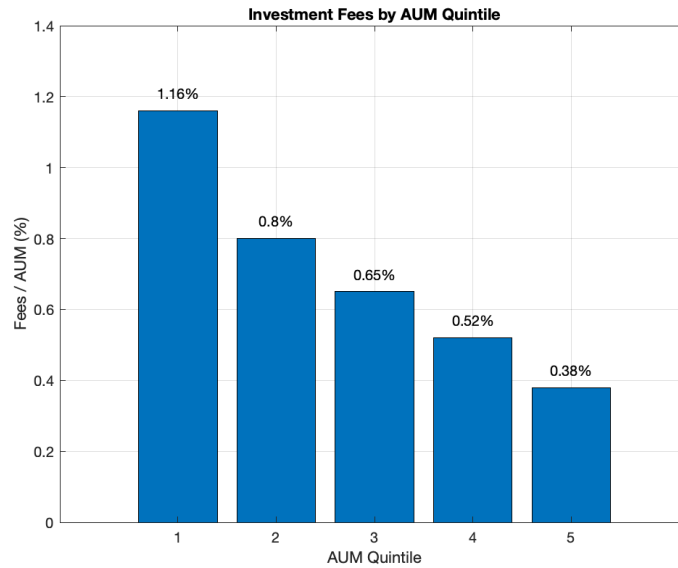
Table A.6: Titles Related to Investment Management

This table presents examples of titles responsible for investment management. The “Count” column indicates the number of occurrences of each title in our dataset. “Average compensation” represents the mean compensation for each title in USD. The “Had highest comp, Average” column shows the percentage of times individuals with the corresponding title had the highest compensation in their organization in a given year. “Had highest comp, Max” is an indicator variable that signifies whether a person with the given title ever had the highest compensation in their organization in any year. The last column shows the highest annual compensation recorded for each title.

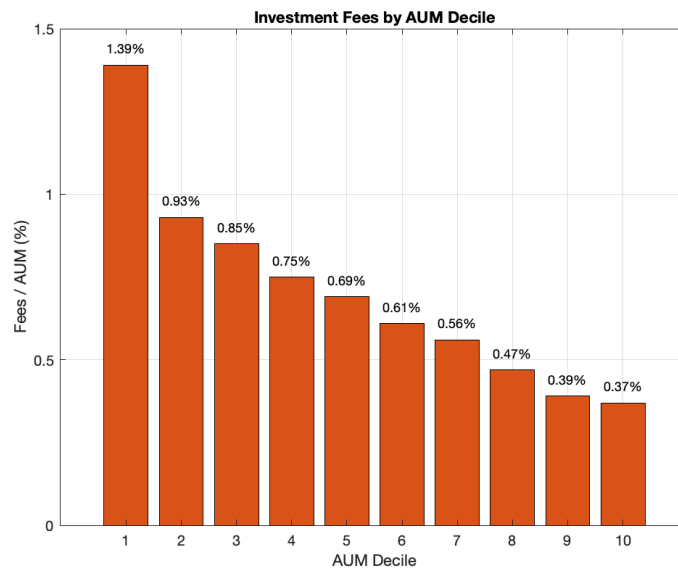
Title	Count	Comp (USD) Average	Had highest comp Average	Had highest comp Max	Comp (USD) Max
CIO	640	\$ 154,172	41.4%	1	\$ 1,446,320
CHIEF INVESTMENT OFFICER	554	\$ 564,615	34.3%	1	\$ 4,888,288
VP/CIO	72	\$ 245,365	16.7%	1	\$ 780,154
INVESTMENT OFFICER	47	\$ 196,392	59.6%	1	\$ 504,411
DIRECTOR - INVESTMENTS	34	\$ 546,612	58.8%	1	\$ 1,361,507
SVP & Chief Investment Officer	25	\$ 1,089,958	36.0%	1	\$ 3,225,102
SVP/CIO	19	\$ 340,754	47.4%	1	\$ 640,160
SR. VP-CIO	19	\$ 382,893	5.3%	1	\$ 581,783
INVESTMENT CHAIRMAN	17	\$ 273,780	9.0%	1	\$ 1,220,302
CIO/EXECUTIVE VICE PRESIDENT	16	\$ 151,915	25.0%	1	\$ 216,295
Managing Director, Investments	16	\$ 696,066	100.0%	1	\$ 1,208,583
VP & CHIEF INVESTMENT OFFICER	15	\$ 1,582,465	33.3%	1	\$ 4,483,355
Chief Invest Officer	15	\$ 400,150	26.7%	1	\$ 849,285
SENIOR VP/CIO	14	\$ 135,796	0.0%	0	\$ 468,323
SENIOR INVESTMENT OFFICER	14	\$ 193,917	78.6%	1	\$ 350,619
Vice Chairman, Investments	12	\$ 234,610	8.4%	1	\$ 944,942
VP, CHIEF INVESTMENT OFFICER	11	\$ 249,185	0.0%	0	\$ 936,454
MANAGING DIRECTOR - IMCO	11	\$ 883,904	100.0%	1	\$ 1,495,549
INVESTMENT DIRECTOR	11	\$ 141,374	45.5%	1	\$ 504,386
Senior Director of Investments	11	\$ 208,180	100.0%	1	\$ 319,310
AVP/CIO	10	\$ 153,680	80.0%	1	\$ 166,251
FORMER SVP/CIO	10	\$ 95,016	0.0%	0	\$ 177,164
Vice President/CIO	10	\$ 180,048	20.0%	1	\$ 598,083
VP/CHIEF INVESTMENT OFFICER	10	\$ 307,747	10.0%	1	\$ 963,343
COO/CIO	10	\$ 196,777	0.0%	0	\$ 283,015
SVP/VICE DEAN, CIO	10	\$ 494,093	0.0%	0	\$ 846,938

Figure A.7: Investment Management Fees by Fund Size

This figure presents investment management fees, expressed as a percentage of assets under management (Fees/AUM), by endowment size. Panel A reports average fees by AUM quintile, and Panel B by AUM decile. The sample covers years 2008 through 2020 and includes all U.S. endowment funds.



Panel A: Fees by AUM Quintile



Panel B: Fees by AUM Decile

Table A.8: Relationship Between Fees and Endowment Size

This table reports OLS regressions of investment management fees, defined as fees paid to external asset managers divided by assets under management (Fees/AUM), on the log of endowment size (Log(AUM)). Column (1) includes sector-by-year (SEC-YR) fixed effects and clusters standard errors at the sector-year level. Column (2) adds organization fixed effects (EIN).

	(1)	(2)
	Fees/AUM	Fees/AUM
Log(AUM)	-0.140*** (-41.34)	-0.368*** (-41.36)
Observations	130,058	128,173
Adjusted R^2	0.209	0.778
Fixed Effects	SEC-YR	EIN & SEC-YR
Cluster	SEC-YR	SEC-YR

Table A.9: Governance Characteristics by Endowment Fund Size

This table reports summary statistics for governance-related variables, disaggregated by endowment size. Endowments are grouped into four categories based on assets under management (AUM): over \$100 million, \$10–100 million, \$1–10 million, and under \$1 million. For each group, we report the average and median values of five governance measures: the administrative expense ratio, the fraction of highly paid employees, the share of organizations with small boards (defined as 10 or fewer members), board independence (measured as the share of independent directors), and the share of total officer and director compensation received by the CEO.

	All funds	AUM >100M	AUM [10-100]	AUM [1-10]	AUM <1M
Administrative Expense Ratio					
Average	15.5%	13.4%	14.7%	15.9%	17.2%
Median	12.5%	11.8%	12.4%	12.7%	13.1%
Fraction Highly Paid Emp					
Average	4.6%	8.6%	5.2%	3.6%	2.1%
Median	1.0%	4.9%	1.7%	0.0%	0.0%
Small Board (<=10 Members)					
Average	24.3%	8.6%	16.0%	27.2%	39.5%
Median	0.0%	0.0%	0.0%	0.0%	0.0%
Board Independence					
Average	94.3%	88.7%	93.9%	95.5%	94.6%
Median	100.0%	95.2%	100.0%	100.0%	100.0%
CEO/O&D Pay					
Average	55.9%	23.8%	45.8%	68.3%	72.7%
Median	54.1%	17.9%	37.8%	82.3%	100.0%