

Secrets of the Academy: The Drivers of University Endowment Success

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I. Introduction

University endowments have played a critical role in the success of many American universities. The importance of endowments can be illustrated by considering the consequences for universities that failed to sustain and build their endowments. In fact, a recent government review of the British university system traced many of these institutions' woes to their lack of substantial endowments, arguing that it was critical for this condition to change:

We see a much greater role for universities establishing endowment funds and using the income from them, in much the same way as is done in the United States... This will ensure the sector is less dependent on any single source of funding, as well as enabling it to take advantage of new opportunities that they could not otherwise afford (DfES (2003)).

A stark example of the negative impact of poor endowment performance in the United States is the University of Rochester, which dramatically downsized its faculty and programs in the mid-1990s in response to financial troubles largely brought about by its underperforming endowment. In the early 1970s, Rochester had the third largest endowment in the country (after Harvard and the University of Texas). However, it suffered poor returns in the subsequent two decades, and its endowment fell to the 25th-largest by 1995. Among the endowment managers' poor choices were heavy allocations to local companies such as Kodak and Xerox, which suffered substantial reversals during the period (Shea (1995), "Manifold" (1974)).

To be sure, university endowments have received considerable attention in recent years. Each fall sees a flurry of press articles about the growth and returns of the major endowments;

occasional events—such as the departures of the chief investment officers of major endowments and the \$350 million investment loss that Harvard recently experienced in Sowood Capital Management—attract attention and speculation; and occasionally, proposals surface from various quarters to deploy endowments in alternative ways (e.g., Hansmann (1990)). But when it comes to a more systematic understanding of these institutions, many mysteries persist.

Foremost among these is the persistent success of many of the largest and most visible endowments. Over the past two decades, a significant number of the major university endowments have been in the top percentile of performance among institutional investors. A significant number of university endowments have been in the top percentile of performance among institutional investors: for instance, between 1996 and 2005, over five percent of the endowments in our data set (26 out of 499) exceeded the top percentile return for a corporate pension fund with over \$100 million of assets during the same period.¹ This type of extraordinary performance is particularly striking given the gaps between the compensation that can be offered by non-profits and that seen in private investment firms: e.g., in the hedge fund world, where nine-figure annual compensation packages have become commonplace and billion-dollar-plus packages are not unheard of.

Given the crucial role that universities play in society, it is thus important to understand the performance and investment patterns of university endowments. This paper takes a first step in looking systematically at the overall trends in the size of endowments, their returns, and the

¹ This calculation employs SEI's rankings of performance of large defined benefit plans. We thank Peter Ammon for this information.

characteristics of endowment investments. In addition, our findings suggest some broader questions for research, which we hope will be explored in the years to come.

In this paper, we document a few major facts about the growth of endowments over the last decade. Overall, endowments have grown dramatically over the 1990s. The average endowment size increased from \$128 million in 1992 (\$177 million in 2005 dollars) to \$483 million in 2005, an inflation-adjusted increase of more than 270%. The same picture holds true if we look the average endowment per student over the last decade, which has gone up by 173%.

Also dramatic has been the enormous increase in the skewness in the distribution of endowment sizes since the beginning of the 1990s. To make this difference salient, in 1992 the top 10% of the endowments had total asset values of 160 times that of the bottom 10%. When we repeat this calculation for 2005, the top 10% of the endowments had a total value which was nearly 400 times that of the of the bottom 10%. In particular, we find that the high SAT schools and the Ivy League schools account for most of the increase in average endowment size.

What explains this dramatic rise in the skewness of endowment size at the top? While endowments can grow both through investment returns and fundraising, the divergence in endowment growth seems to be largely driven by differences in investment returns. We show that Ivy League schools (and their peers), and high SAT schools more generally, systematically outperform other schools in investment returns. For example, the average annual return between 1992 and 2005 was 14% for Ivy Plus schools versus 9% for other schools.

By way of contrast, we do not find a significant difference in average endowment returns between private versus public universities. In fact, we show that the endowments of public universities grew faster over the last fifteen years than their private counterparts. This result is quite surprising, since we might have expected that private schools would find it easier to recruit top-tier investment officers and compensate them accordingly. Instead, we find that the size of the endowment and the size of the student body are much more closely associated with the returns of the endowment than whether it is a public or private university. One interpretation of these findings suggests that only once an endowment reaches a critical size can it afford the professional and sophisticated investment staff and investment committee that can help in maintaining high levels of returns.

These findings beg the question of how top endowments manage to consistently outperform the market. While we do not have a definite answer to this question, we suggest that one explanation lies in the differences in allocations across asset classes. Specifically, endowments which invested earlier and more heavily in alternative assets have performed particularly well over the sample period. This pattern holds true across the board but is most pronounced for elite schools. Better endowments also allocate more heavily toward investments that are correlated with smaller stocks and growth stocks, which have tended to generate higher returns over the past several decades. These universities compensate their employees better. Qualitative evidence suggests that the investment committees of better schools are also more effective.

We of course need to caution that these results are not prescriptive but merely document the existing patterns in endowment investments across U.S. schools. In other words, while we show that the top university endowments have done exceptionally well with their investment strategy, it does not mean that all endowments would have been able to achieve the same returns if they adopted a similar strategy. Indeed, the same strategies that have worked so well for the Ivy Plus schools in the past two decades may not do so in the future. We discuss the implications of these findings in the last part of the paper.

II. Data Description

Our primary data on endowment returns, asset allocations, and returns comes from annual surveys conducted by the National Association of College and University Business Officers (NACUBO). Membership in NACUBO currently includes 2,500 public and private institutions, and the schools in our sample represent on average about a quarter of the student population in four-year institutions nationwide. On an annual basis since the 1970s, NACUBO has conducted annual voluntary surveys of member schools regarding endowment returns and investment characteristics.

Participation in this survey has increased steadily year by year, and we focus our analysis on the period from 1992 to 2005, over which data from nearly 1,300 schools are available. Of particular interest are the data on endowment allocations to individual asset classes, which the surveys have collected since 1993. In order to analyze the correlation between endowment and school characteristics, we supplement the NACUBO surveys with data from the College Board, a

non-profit organization which includes a majority of higher-education institutions nationwide.² In particular, these surveys include detailed information on each school's student population, including total number of enrolled students and the percentile scores on the SAT test.

In addition to data from the College Board, we also match the NACUBO endowment data with information on endowment staff compensation provided by GuideStar, a database of financial filings by non-profits. In their annual Form 990 filings with the U.S. Internal Revenue Service, schools are required to submit reports of compensation (including salary, bonus, and benefits) of their officers, trustees, and their five most highly paid other employees. Our data encompasses the years between 1997 and 2004. This time period is explained by the limited availability of these data: GuideStar did not begin compiling these reports until the late 1990s, the Internal Revenue Service does not retain old filings,³ and there are substantial lags between the completion of the fiscal year and the posting of the filings by GuideStar. Although these data give us the opportunity to relate the compensation of the endowment managers with endowment performance and other variables, their major limitation is that for most schools and most years, endowment staff⁴ are not among the five highest-paid employees, so we are not able to observe their compensation. Due to this limitation, we are only able to observe the compensation of

² The College Board administers the SAT and other assessments, and their data forms the basis for the *U.S. News* and other popular rankings of school quality.

³ While summary information from the Form 990s is preserved by the Internal Revenue Service in electronic files, it does not include the detailed compensation information.

⁴ We define endowment staff as anyone whose title includes words such as "investment," "endowment," "asset," etc. or whose titles otherwise indicate direct involvement in endowment management.

employees directly involved in endowment management for on average 23 schools per year from 1997 and 2004.⁵

Panel A of Table 1 presents some summary statistics for our sample. The reported averages in the descriptive statistics below are for the entire sample period. The majority of the sample consists of private schools, which comprise 68% of the sample: public schools comprise the remainder. Both school size and endowment size have highly skewed distributions; median student size is 2,353 and median endowment size is \$53 million, while a few large schools and endowments pull the averages up to 5,538 students and \$261 million. In our analysis, we contrast the endowments of the handful of elite universities and other schools, and in particular we focus on the Ivy Plus group, an informal association of 13 U.S. institutions which includes those schools in the Ivy League athletic association and four others.⁶

In Panel B of Table 1, we also provide a comparison of the sample characteristics between the schools that report endowment data in the NACUBO surveys and those that are in the broader College Board sample, which includes most major institutions in America. One particular pattern is that the NACUBO surveys cover a disproportionate number of private institutions: our endowment data covers about 45% of the private universities but on only 18% of the public ones in the College Board sample. By way of contrast, we have 100% coverage for the

⁵ Another difficulty relates to matching the NACUBO and GuideStar data. For instance, in some cases, a multi-branch university will undertake a single 990 filing but fill out multiple responses to the NACUBO survey, or *vice versa*.

⁶The Ivy Plus group consists of Brown University, California Institute of Technology, University of Chicago, Columbia University, Cornell University, Dartmouth College, Duke University, Harvard University, Massachusetts Institute of Technology, University of Pennsylvania, Princeton University, Stanford University, and Yale University, as well as the Universities of Cambridge and Oxford, which are not included in our analysis.

Ivy Plus schools. In particular, we see that NACUBO has a much better coverage of small private schools but very little coverage of the smaller public schools. While the differences in coverage may truly reflect the types of schools that have active endowments, we must be careful about sample selection when interpreting the magnitudes of our results. Therefore, we rely heavily on the comparison between Ivy Plus and the rest of the sample since we have 100% coverage of this subset. We also rerun all of our tests for the subsample of private endowments where we assume the same coverage ratio of private and public endowments: that is, we drop the smallest of the private endowments from the sample to make sure that our results are not driven by sampling biases. All our findings are robust to this adjustment.

III. Endowment Size: The Rich Get Richer

Many observers of the endowment sector have noted a remarkable increase in the size of a few of the largest endowments. Harvard tops the list by a large margin with an overall endowment of more than \$35 billion at the end of the 2007 fiscal year, followed by Yale at \$22.5 billion.⁷ While these schools have received tremendous scrutiny, we want to understand whether they are reflective of the broader sector.

The first interesting finding that emerges from Figure 2 is the dramatic increase in average endowment size since 1992. Between 1992 and 2005, the mean endowment size increased from \$128 million (\$177 million in 2005 dollars) to \$483 million, an inflation-adjusted increase of more than 270%. Figure 2 also highlights that endowment growth accelerated in the second half of the 1990s, declined slightly in 2000 and 2001, and increased again between 2002

⁷University fiscal years typically end on June 30th.

and 2005. The same picture holds true if we look at the average endowment size per student over the last decade, which has gone up by 190% (not shown).

Figure 2 also hints at an even more striking trend within the endowment sector: the significantly higher growth of top-tier endowments. While endowments grew across the board in the 1990s, growth was significantly faster for schools with higher-quality students (as measured by SAT score). Endowments of universities in the top quartile by SAT score grew by 310% over the same time period, while the bottom SAT quartile only grew by 260%. Similarly, the Ivy Plus schools started the 1990s with much larger endowments than other schools and they also grew much faster than the rest of the schools, increasing by 340% between 1992 and 2005. The same pattern occurs across endowment size, with the large endowments growing considerably faster between 1992 and 2005.

We also find a significant difference in average endowment size over time when we differentiate between private versus public schools. Our calculations based on Figure 2 shows that the average public endowment grew by 420% from 1992 to 2005, while the private endowments increased by only 290%. These results might at first glance seem very puzzling, since we usually associate public schools with less fundraising expertise and perhaps lower investment capabilities. On average, however, that does not seem the case. The results become more intuitive if we take into account that some public schools such as the University of California system have been very successful in their endowment management. On the other hand, there are a large number of very small private schools with endowments that seem to be struggling.

To be sure that the differences in the endowment growth rate between private and public schools are not due to sample selection, we re-ran our analysis using only the top 30% of private schools by either student population or by SAT score⁸ to make the ratio of private to public schools equal to that in the College Board sample. Because larger and more elite schools tend to have larger endowments as observed above, it comes as little surprise that the private schools in this reduced sample tend to have larger endowments. However, even in these reduced samples, the average growth of private endowments remains about 300% between 1992 and 2005, falling well short of the growth of public endowments.

Another way to visualize the dramatic shift in the size distribution of university endowments is by comparing the size distribution of endowments in 1992 versus 2005. Figure 3 plots the histogram of the distribution of endowment sizes in 1992 (the solid line) versus in 2005 (the dotted line). This exercise highlights another manifestation of the “rich get richer” phenomenon: a large increase in the skewness of endowment sizes between the beginning of the 1990s and the middle of this decade. From Figure 3, we see an enormous right tail of the size distribution in 2005 that was not present in 1992, occupied mainly by the endowments of elite institutions: those of schools with high SAT scores and the Ivy Plus schools.

In analyzing the size of endowments, we find that the last decade has seen the emergence of an enormous gap between schools in their ability to grow their endowments. The schools which started off the 1990s with large endowments also saw growth which outstripped that of smaller endowments. This pattern also emerges when considering various demarcations between

⁸ The schools included in the NACUBO surveys tend to be larger and more selective.

elite and non-elite schools. Hence, no matter how we divide the data, we consistently find a “rich get richer” phenomenon among educational endowments. To understand this striking trend, we will investigate endowment returns and fund allocation decisions by endowments.⁹

IV. Discussion of Trends in Endowment Returns

To obtain a better understanding of the dramatically different growth paths of the endowments of elite and non-elite schools, we now analyze endowment returns over the same time period of 1992 to 2005. Figure 4 plots the aggregate trends in excess return over the 1990s and first half of 2000.¹⁰

One interesting finding is that endowments overall tended to perform counter-cyclically over the last fifteen years. We see that excess returns in the middle of the 1990s were around 10%, while the average excess returns for the endowment sector in 2000 and 2001 were almost 15%. Endowments seem to have followed a contrarian approach to investment over this time period, and, on average, this strategy has provided favorable results for the endowment sector.

As before, we ask whether there are marked differences in the return patterns between schools with different characteristics. In parallel to the results on endowment size, we do not find very large differences in average excess returns between private and public universities: for most of the time period, the two different subgroups of endowments have practically identical returns. In sharp contrast, the Ivy Plus schools have dramatically different excess returns compared to the

⁹ We will not discuss the other drivers of endowment size, in particularly the fiscal policies of these schools and donations. It is important to note that the latter have been already covered by papers such as Oster (2001) and Ehrenberg and Smith (2003).

¹⁰ We define excess returns as those net of the S&P 500 over the same time period.

rest of the endowments, persistently outperforming the overall average by more than 3% per year. This difference is particularly striking in 2000 and 2001, in which Ivy Plus schools outperformed the other universities by up to 10% in excess returns. When we repeat this exercise for the highest versus lowest quartile of schools based on student SAT scores, we again get significantly better returns for the high SAT schools, but the difference in returns is much smaller. Finally, we also find slightly better excess returns for larger endowments than for smaller ones, but this gap is not nearly as dramatic as in the case of the Ivy Plus schools versus non-Ivy Plus schools.

The univariate comparisons above are also corroborated by Table 5, which shows the results of a regression of the annual returns of endowments using a three-factor Fama-French (1992) model for annual returns. This regression is the standard multi-factor asset pricing model, which seeks to explain the average return in each fiscal year of endowments using as explanatory variables the market return (the difference between the market returns and the risk-free rate, or RMRF), the disparity in the return between small and large stocks (SML, or the difference between the returns of portfolios of small and large stocks), and the disparity between growth and value stocks (HML, or the difference between the returns of stocks with a high book-to-market ratio and a low ratio).¹¹ We also examine the returns for various sub-samples of schools, taking a simple average of their performance.

¹¹Each of these independent variables is computed over the same July to June period into which the typical academic fiscal year falls. The source of these data is Ken French's web-site: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

The analysis in column 1 of Table 5 shows that the annual returns of endowments loads heavily on the market factor and the size factor, but is not significantly correlated with the book-to-market factor. Since our prior results suggested strong cross-sectional differences in endowment growth and returns, we now separate high- and low-SAT scores and Ivy Plus schools and others, to see if these differences are also reflected in the factor loadings. In column 2 of Table 5, we include interaction terms between a dummy for schools with high SAT scores and the different factors of the market model. We find that high SAT endowments do not have significantly different correlations with the market portfolio than the average, but they have significantly more loading on SMB, meaning that they have greater exposure to the more volatile smaller stocks. High SAT endowments also a negative and significant overall correlation with HML, meaning that they have more exposure to growth stocks. The results become even more dramatic when we differentiate the Ivy Plus schools from the rest of the schools in column 3. We find that like the high SAT schools, the Ivy Plus schools have significantly less correlation with the market and greater exposure to small stocks and growth stocks. These results indicate that the endowments of elite schools adopted a contrarian investment approach over the last two decades that was markedly different from the rest of the endowments and the broader market.¹²

These findings are supported by (unreported) multivariate regressions of excess returns on the school characteristics, which control for year effects and other control variables at the university level. In these regressions, we also include the endowment and school characteristics described above along with lagged excess return at the endowment level. The results of these

¹² We also repeated the regressions interacting with a private schools dummy or interacting with the size of the endowment (unreported regressions are available from the authors). However, we did not find any significant differences in factor loadings for these sub-samples.

regressions confirm the findings in the univariate analysis shown in the figures. We further find endowment size and student SAT score are the two biggest determinants of the magnitude of excess return, while membership in the Ivy Plus group and past fund performance also make a significant difference.

Finally, we find remarkable persistence in excess returns. The persistence seems particularly striking at the low end: underperforming schools perform poorly year after year. These findings corroborate the findings in the recent paper by Lerner, Schoar, and Wongsunwai (2007), which also reported persistence in returns at the institutional investor level. While the prior paper focused only on returns in private equity, it is even more puzzling that we find persistence of returns across a wide spectrum of asset classes for educational endowments, including competitive markets such as stocks and bonds. In the remainder of the paper, we will try to shed some light on the question how the top tier endowments have succeeded in consistently showing such superior performance over the last decade.

V. Asset Allocation and Alternative Assets

A key differentiator between many of the top-tier endowments and their peers has been a willingness to rely on alternative investments. The Yale endowment provides an extreme example of this willingness to hold illiquid assets: at the end of the 2006 fiscal year, the university's target allocation was to hold 69% of its portfolio in private equity, hedge funds, and real estate (Lerner (2007)).

Figure 6 provides an overview of the allocation of university endowments by asset class between 1993 and 2005. The chart makes clear that there has been a broad secular shift during this decade away from equities and fixed income and towards alternatives (here defined as hedge funds and private equity, the latter of which includes both buyout and venture funds). The combined share of equities and fixed income fell from 83% in 1993 to 73% in 2005, while the share of alternatives rose from 9% to 18%. Interestingly, the modest but continuing movement away from publicly traded equities was a reversal of the trend seen in the late 1970s and 1980s, where NACUBO's tabulations suggest that the typical endowment was shifting its holdings from fixed income and cash into equity securities.

Similar to the results with endowment size and returns above, these aggregate tabulations of asset allocation mask a great deal of variation across different endowments. In Figure 7, we show the share of investments devoted to alternatives for endowments as a whole and for several subclasses of schools: private schools, the Ivy Plus group, those in the largest quartile of student populations, and those with in the largest quartile of SAT scores. None of these groups are especially different from the average school with the exception of the Ivy Plus schools, whose share devoted to alternatives is consistently twice as high as the average (19% vs. 9% in 1993; 37% vs. 18% in 2005). This analysis counts each school equally, regardless of its size. In unreported regression analyses, there is a clear association between the extent of the allocation to alternative investments and the size of the endowment and the mean SAT scores of the student body.

Thus, on average, the endowments with the best performance have also most aggressively allocated toward alternative investments. Furthermore this univariate correlation is confirmed by unreported regression analyses which control for many university attributes. A natural conclusion from this evidence might be that endowments which are lagging ought to shift their allocations toward alternative assets. In fact, many institutional investors around the world have come to this conclusion: see, for instance, the discussion of how the Kuwait Investment Fund decided to emulate Yale's allocation when shifting its investment strategy (Sender (2007)). But however appealing it may be, the conclusion that more exposure to alternative assets will always lead to better performance may be a false one. Figure 8 compares the performance of schools that had above and below the median allocation to alternatives, dividing the schools by whether the students' SAT scores were above or below the median. Over these years, even among those endowments with a heavy allocation to alternatives, the high SAT score schools still outperformed the low SAT universities considerably: the average excess returns were 4.2% vs. 3.1%. This outperformance is particularly visible during the 1999 to 2001 period, a time of great flux in the venture capital market.¹³ Variability among schools with exposure to alternative

¹³The perils that schools that are unfamiliar with alternative investments face can be illustrated by the experience of Boston University. The school's administration established a venture capital subsidiary, believing that it could successfully make investments. (Most leading universities have done the bulk of their alternative investing through outside partnerships, rather than trying to undertake these activities directly.) The fund invested in a privately held biotechnology company, Seragen, founded in 1979 by a number of scientists affiliated with Boston University. As part of its initial investment in 1987, the school bought out the stakes of a number of independent venture capital investors, who had apparently concluded after a number of financing rounds that the firm's prospects were unattractive. Between 1987 and 1992, the school, investing alongside university officials and trustees, provided at least \$90 million dollars to the private firm, and provided another \$17 million in financing in 1995 and 1997. (By way of comparison, the school's entire endowment in the fiscal year in which it initiated this investment was \$142 million.) While the company succeeded in completing an initial public offering, it encountered a series of disappointments with its products. By late 1997, the University's equity stake was

assets is also evident from unreported regression analyses, which show that the share of alternatives mainly impacts the returns of high SAT schools. While low SAT schools only modestly seem to benefit from increased allocation to this asset class, among the universities with the highest SAT scores the relationship between allocation to alternatives and overall returns is strongly positive.

The observed dominance of a few top endowments also emerges from our earlier analysis of the returns from private equity investments (Lerner, Schoar, and Wongsunwai (2007)). While the returns from private equity investments for the top 25% of the endowments in our sample far outperform those of any other class of investor, the other schools have relatively modest returns that are indistinguishable from those of average investors. When we looked at the characteristics of the schools whose endowments succeeded in private equity, the two most consistent correlates are the SAT scores of the student body and the rate of the alumni giving.

Thus, we need to be cautious in the interpretation of the association between alternative assets and returns. To conclude that more investments in alternatives will lead to higher returns is simplistic. There are a considerable number of omitted variables that we are not measuring here, which may be impacting the results. In particular, these include:

- *Experience.* The Ivy Plus schools were among the first institutional investors to invest in alternatives. Experience appears to be very important in the success of alternative

worth only about \$4 million. (This account is based on Seragen's filings with the U.S. Securities and Exchange Commission.)

investment programs: there is a great deal of disparity in the returns of individual managers within the asset class, placing a premium on manager selection (see, for instance, the data in Yale (2006)). This problem is compounded in private equity due to the long lags between the time when investments are made and when their success can be evaluated, highlighting the importance of being able to interpret ambiguous data in making fund selection decisions.

- *Access.* Many of the best private equity and hedge funds are essentially closed to new investors and have been so for many years. Thus, one important aspect of having been pioneers in alternative investments is that the Ivy Plus endowments enjoy is a “seat at the table” in some of the most elite and desirable groups. An endowment beginning an alternative investment program is unlikely to be able to access the top- and even, in many cases, the second-tier alternative funds. However, our previous paper (Lerner, Schoar, and Wongsunwai (2007)) suggests that access cannot explain all of the superior returns of established endowments. We found that top endowments even outperformed the rest of the investors when investing in undersubscribed funds, which suggests that those endowments were able to pick better funds even when there was equal access for all investors.
- *Timing.* Viewed as a whole, the past 25 years have been a benign environment for many alternative funds. On the venture capital side, there have been extensive innovation and (until 2000) a robust market for new issues. Buyouts and hedge funds have benefited from the plethora of “value” investment opportunities in recent years and (until recently) the ready availability of debt on favorable terms. Whether these conditions will continue to hold in the decade to come remains to be seen.

VI. Compensation and Endowment Managers

One natural question is the extent to which these disparities in performance are affected by compensation of the investment managers. Compensation of internal investment staff at some schools has proven to be intensely controversial (e.g., Seward (2005)), but even at the best-paid universities, the pay of investment managers is generally far below what many of them would make at a hedge fund or other private organization.

So far, we have undertaken only a preliminary examination of these questions, using the IRS data described above. Our limited ability to draw conclusions reflects the limited number of endowment managers whose compensation is reported to us and, as discussed above, the relatively short historical time-series available to us.

But several conclusions can be drawn:

- Overall compensation levels are relatively modest. The mean compensation for a reported endowment officer is \$360,816 in 2004. Moreover, compensation data are only reported if the endowment manager is listed as a university officer, director, trustee, or one of the “Five Highest Paid Employees Other Than Officers, Directors, and Trustees,” so the totals are likely to be biased upwards.
- In unreported regressions, we find that compensation of endowment managers is higher at larger universities and at Ivy Plus schools. Again, the direction of causality here is not

apparent: are these schools successful investors because they pay their endowment managers more, or does compensation merely reflect success (and deep pockets)?

- More qualitatively, there does not appear to be a sure association between the level of compensation and staff longevity. For instance, a number of schools that have offered or discussed offering substantial incentive-based compensation to their staff, such as Harvard and Stanford (see Grant and Buckman (2006), Seward (2005)), have also been among those hit by large-scale defections of investment staffs. While it is difficult to show analytically, it seems that many of the schools with established, successful investment staffs have maintained them by emphasizing the non-pecuniary benefits that come from being a part of an academic community.

VII. Discussion and Conclusion

In this paper, we have sought to understand what has been the performance of university endowments, and what drives the observed pattern of performance. Our key observations are as follows:

- The endowments of elite universities have grown dramatically faster than endowments overall.
- Initial endowment size, size of student population, student SAT scores, and membership in the Ivy Plus group are significantly correlated with endowment growth and endowment returns. However, endowment returns for public and private schools are very similar.
- There is considerable persistence of returns across the endowments, particularly among underperforming schools.

- Alternative investments appear to play an important part in the success of the highest-return endowments. The evidence suggests, however, that this strategy cannot be emulated with ease.

But it is important to acknowledge that there are many unanswered questions. Three gaps in our understanding seem particularly interesting from an academic perspective, as well as practically relevant for those who run or oversee university endowments and other investment pools.

The first of these relates to *the ways in which endowment offices are organized*, and how these choices contribute to their success or failure. It is important to note that this question reflects a more fundamental gap in our understanding: while there has been a voluminous literature on the pricing, risk, and returns of various types of assets, the organizational economics of investing, such as the challenges that institutional investors face in recruiting and rewarding investment professionals, remains poorly understood.

When we examine the top-performing university endowments and contrast them with other institutional investors, three organizational features of the endowments stand out:

- An active investment committee, typically drawn from the ranks of alumni. These bodies typically see their role not as micro-managing the decisions of the investment staff, but rather in setting broad policy and serving as an informed sounding board for grappling

with challenges that the staff is facing. The contrast with public pension funds, where the bulk of the staff is drawn from rank-and-file employees, is particularly stark.

- A staff with considerable experience who have often worked together for many years. These shared experiences provide a common background that helps them undertake complex and subjective investment decisions. Again, the contrast with many other institutional investors, such as corporate pensions which frequently rotate personnel across assignments, is stark.
- An academic orientation, which leads to a process of periodic self-evaluation. Many of these funds will occasionally stop to consider the processes that led them to make investments that proved to be particularly successful or problematic. Moreover, they often engage in an active dialog with their peers.

Better understanding which of these features is critical to success, and why, is an important challenge.

A natural related question is whether these organizational features will be sustainable over time. Regarding the first bullet above, there is unlikely to be a shortage of alumni willing to help the institutions from which they graduated make effective decisions. But the recent, high-profile departures at Harvard and Stanford emphasize that the demand for investment talent is probably greater than it has ever been. The increased interest in alternative investments, and the demand for talent to lead the growing number of investment funds pursuing sophisticated strategies world-wide, are likely to increase the temptation for endowment managers to pursue

their activities elsewhere. Whether the attraction of working for the good of an academic institution will be sufficient remains to be seen.

A second question relates to the *viability of the strategies* pursued by endowments going forward. As alluded to above, the past two decades have been kind to strategies pursued by many of the leading endowments. But it is unclear whether these patterns will remain true.

As illustrated in Table 5 discussed earlier, the large endowments—and those of the Ivy Plus schools in particular—are considerably less correlated with the market, and have greater exposure to the more volatile smaller stocks. These patterns highlight the extent to which these schools have been willing to pursue a different investment strategy from the conventional approach. Better understanding these differences, and the extent to which they contribute to these schools' performance, is a second challenge.

Understanding the institutional qualities which allow some endowments to pursue unconventional investment strategies is particularly relevant given the history of endowment investing in the U.S. In a number of past episodes, schools have pursued strategies that ultimately would have been successful, but were forced to abandon them in the face of initial losses, which triggered media scrutiny and alumni complaints. In these cases, the pressures against contrarian strategies became too great.

To cite one vivid example, the Ford Foundation had encouraged universities to invest more into small-capitalization stocks in the late 1960s. A task force consisting of McGeorge

Bundy, the foundation's president, and a number of distinguished academic leaders reviewed the historical returns data, and wrote that "It is our conclusion that past thinking by many endowment managers has been overly influenced by fear of another major crash. Although nobody can ever be certain what the future may bring, we do not think that a long-term policy founded on such fear can survive dispassionate analysis" (Advisory Committee (1969)).

While this recommendation, if followed for the next several decades, would ultimately have yielded a very attractive returns, it was a disaster for a number of university endowments. Having increased their allocation to small-capitalization stocks at the peak of the 1960s bull market, the schools' endowment staffs were bitterly criticized by the media, alumni, and their investment committees for their poor timing when returns for stocks in general, and small-capitalization stocks in particular, were poor for most of the 1970s. In the face of unrelenting criticism, these schools typically abandoned these strategies at exactly the wrong time. (This report and its consequences at one school are discussed in Lerner (2007).) More recent examples along the same lines include endowment managers who attempted to hedge out their exposure to venture capital in the late 1990s, but who were forced by their investment committees to abandon their positions right before the 2000 technology market collapse after experiencing several quarters where the hedges lost money. Perhaps further research would help schools avoid repeating these episodes in the future.

A final concern relates the *challenges of imitation*. Academic research (Gompers and Lerner (2000), Kaplan and Schoar (2005), Ljungqvist, Richardson, and Wolfenzon (2007)) has established that the alternative investment markets on which successful endowments have relied

are particularly vulnerable to influxes of capital. Because there are often a limited number of opportunities in a given sector, additional capital tends to be associated with the purchase of securities at higher prices and ultimately lower returns. But the temptation to grow quickly (which translate into increased fees and profit shares for fund managers) frequently outweighs the potential deterioration of returns that may result, especially since many of the detrimental effects will affect the industry more generally.

This concern is particularly relevant because the strategies of the elite endowments are being scrutinized and imitated as never before. In the past, there was often a substantial lag between the time endowments first began investing in an asset class and other institutions followed. For instance, many of the Ivy Plus schools began investing in venture capital in the early 1970s, but most corporate and public pensions did not follow until the 1980s and 1990s, respectively. But today, the lags are much shorter. Within a couple of years of Harvard initiating a program to invest in forestland, for instance, many other institutions had adopted similar initiatives. The same dynamics also play themselves out at the individual fund level: an investment by an elite endowment into a fund can trigger a rush of capital seeking to gain access to the same fund.¹⁴ Aware of these dynamics, fund managers have in some cases demanded a greater share of the economics from their investments. In some cases, the fund managers have increased the share of the fund's profits they receive, in others, they have sold part of the management companies to third parties, or made the ability to invest in their main fund conditional on also investing in less attractive (or at least less proven) "side car" funds (Buckman

¹⁴It is ironic that on the campuses of a number of elite universities, student activists are demanding greater disclosure of their endowment's holdings. Such steps would be likely to intensify the problem of imitative investment, leading to lower returns and fewer resources for future generations of students.

(2007)). Whatever the particular mechanism chosen, these strategies may lower the returns that endowments enjoy in the future.

In short, the elite endowments have enjoyed a period of remarkable success. This success of these endowments has had important implications for the academic enterprise. Much remains to be understood, however, about what the key sources of their performance are. While difficult to answer definitively, these questions are important for shedding light onto whether endowments can continue to succeed, and whether the approaches of endowment managers can work among investment managers more generally.

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Table 1

Descriptive statistics

In Panel A, we present sample statistics of the annual observations of schools between 1992 and 2005 for which we have data on endowment characteristics from the National Association of College and University Business Officers (NACUBO). In the second panel, we present statistics for the universe of schools in the same period about which data are reported by the College Board. The last column indicates the percentage of school-years where these data are available for which we observe endowment performance data. (The exceptions are the “Percent Ivy Plus,” “Percent Public,” and “Percent Private” rows, where we present the share of cases where the answer is yes where we have data. Endowment size and endowment manager compensation are presented in 2005 dollars using the Consumer Price Index.

	Panel A: Schools with endowment data				
	Mean	Median	Std	Count	
Endowment size (\$Bil)	0.3	0.1	1.5	9217	
% alternative allocation	14%	11%	13%	2405	
% equity allocation	56%	57%	14%	2405	
% fixed income allocation	21%	20%	10%	2405	
Total students (000)	5538	2353	10210	12194	
SAT Math 75 percentile	609	600	63	8503	
Mean salary (\$000), endowment managers	810.3	228.3	2,556.8	177	
Percent Ivy Plus	2%			182	
Percent Public	32%			3899	
Percent Private	68%			8447	
Total number of schools				1292	
	Panel B: Full sample				Percent coverage
	Mean	Median	Std	Count	
Total students (000)	4096	1879	9574	40570	30%
SAT Math 75 percentile	586	580	68	14304	59%
Percent Ivy Plus	1%			182	100%
Percent Public	54%			21798	18%
Percent Private	46%			18766	45%
Total number of schools				3141	41%

Figure 2

Endowment size trends

Mean endowment size is shown for samples of schools which report at least ten years of endowment size data between 1992 and 2005. “Ivy Plus” denotes schools in the Ivy Plus group, which consists of the Ivy League along with Duke, MIT, Caltech, and Stanford. “Large” denotes schools in the top quartile percentile by student population in 1992, and “High SAT” denotes schools in the top quartile of SAT score in the sample in 1992. Endowment size is reported in 2005 dollars.

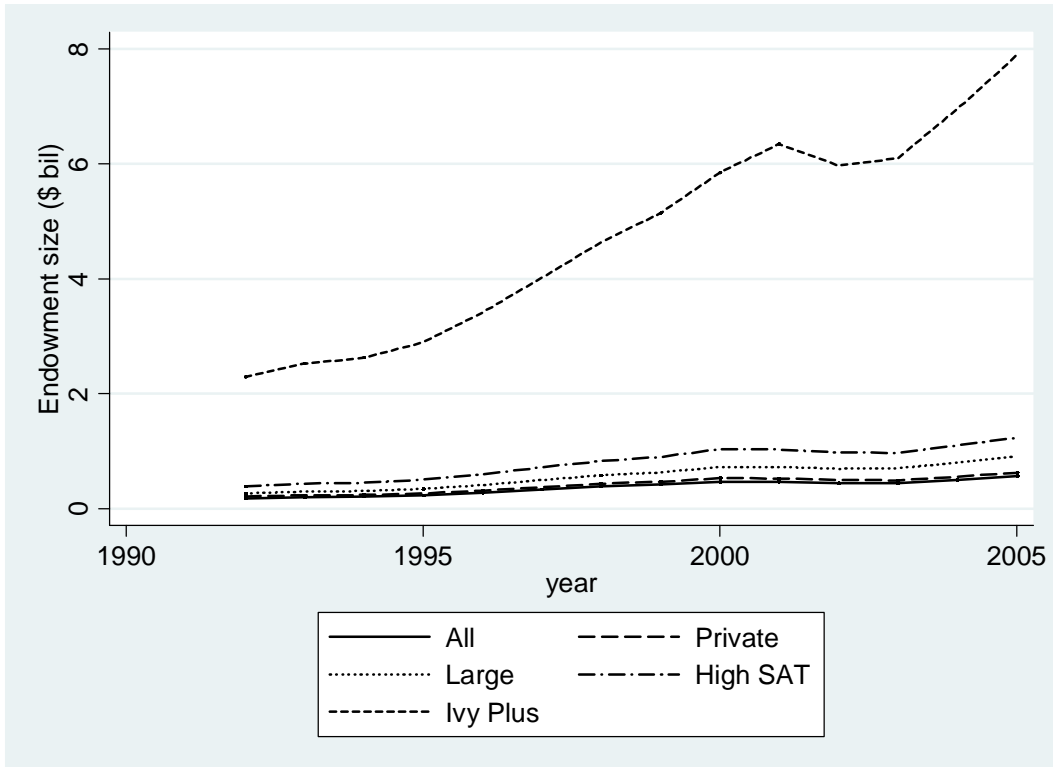


Figure 3

Endowment size distributions in 1992 and 2005

The distributions are shown for the 459 endowments which report endowment size in both 1992 and 2005. An estimated kernel density is shown, which is winsorized at the 95th percentile. Endowment size is reported in 2005 dollars.

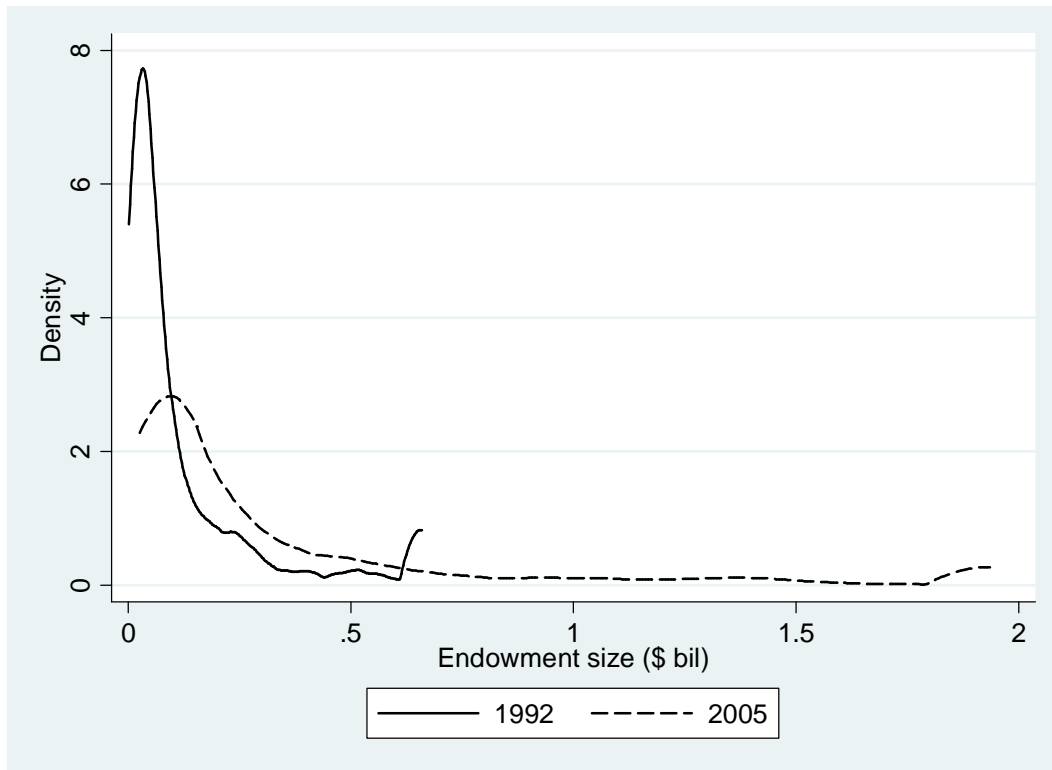


Figure 4

Excess returns by school type

Excess returns are calculated as the endowment return subtracted by the S&P 500 return in same year. Average excess returns are shown for all schools which reported at least 10 years of return data between 1992 and 2005. “Ivy Plus” denotes schools in the Ivy Plus group, which consists of the Ivy League along with Duke, MIT, Caltech, and Stanford. “Large endowment” denotes schools in the top quartile of endowment size in 1992, and “High SAT” denotes schools in the top quartile of SAT score in the sample in 1992.

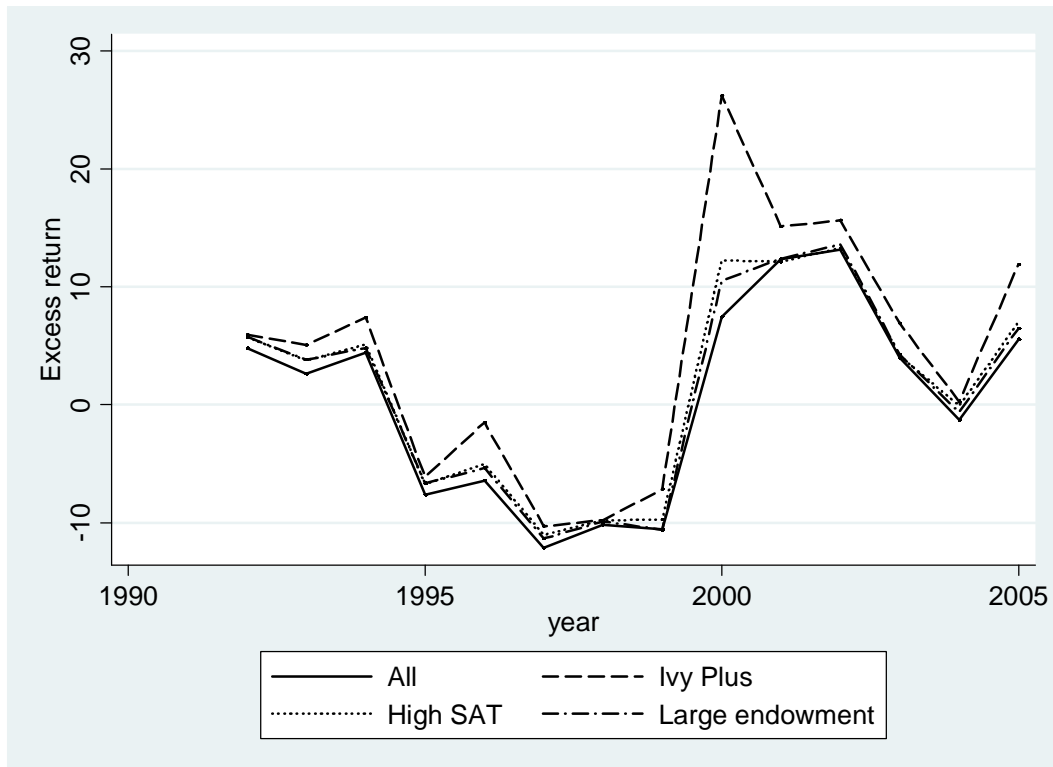


Table 5

Regression analysis of endowment returns

In each regression below, the dependent variables are annual returns for endowments for years between 1992 and 2005. These average returns are then regressed using OLS against the three Fama-French factors. “Ivy Plus” denotes schools in the Ivy Plus group, which consists of the Ivy League along with Duke, MIT, Caltech, and Stanford. “High SAT” denotes schools in the top quartile of SAT score in the sample in 1992. Robust standard errors clustered at the school level are reported in parentheses.

	(1)	(3)	(3)
Rm-Rf	0.564 (77.80)***	0.568 (71.95)***	0.568 (77.89)***
SMB	0.055 (6.87)***	0.048 (5.34)***	0.053 (6.48)***
HML	-0.004 (0.59)	0.012 (1.93)*	0.002 (0.24)
High SAT		2.451 (6.08)***	
Rm-Rf*High SAT		-0.022 (1.13)	
SMB*High SAT		0.037 (1.99)**	
HML*High SAT		-0.091 (3.81)***	
Ivy Plus			5.819 (6.26)***
Rm-Rf*Ivy Plus			-0.149 (4.35)***
SMB*Ivy Plus			0.076 (2.16)**
HML*Ivy Plus			-0.203 (3.68)***
Constant	5.321 (40.78)***	4.885 (39.47)***	5.159 (41.99)***
Observations	6038	6038	6038
R-squared	0.65	0.66	0.66

Robust t statistics in parentheses

* significant at 10% confidence level; ** significant at 5%; *** significant at 1%.

Figure 6

Asset allocation by year

Asset values for each asset class are aggregated across all schools with at least 10 years of data between 1993 and 2005 and which report asset values for all five asset classes.

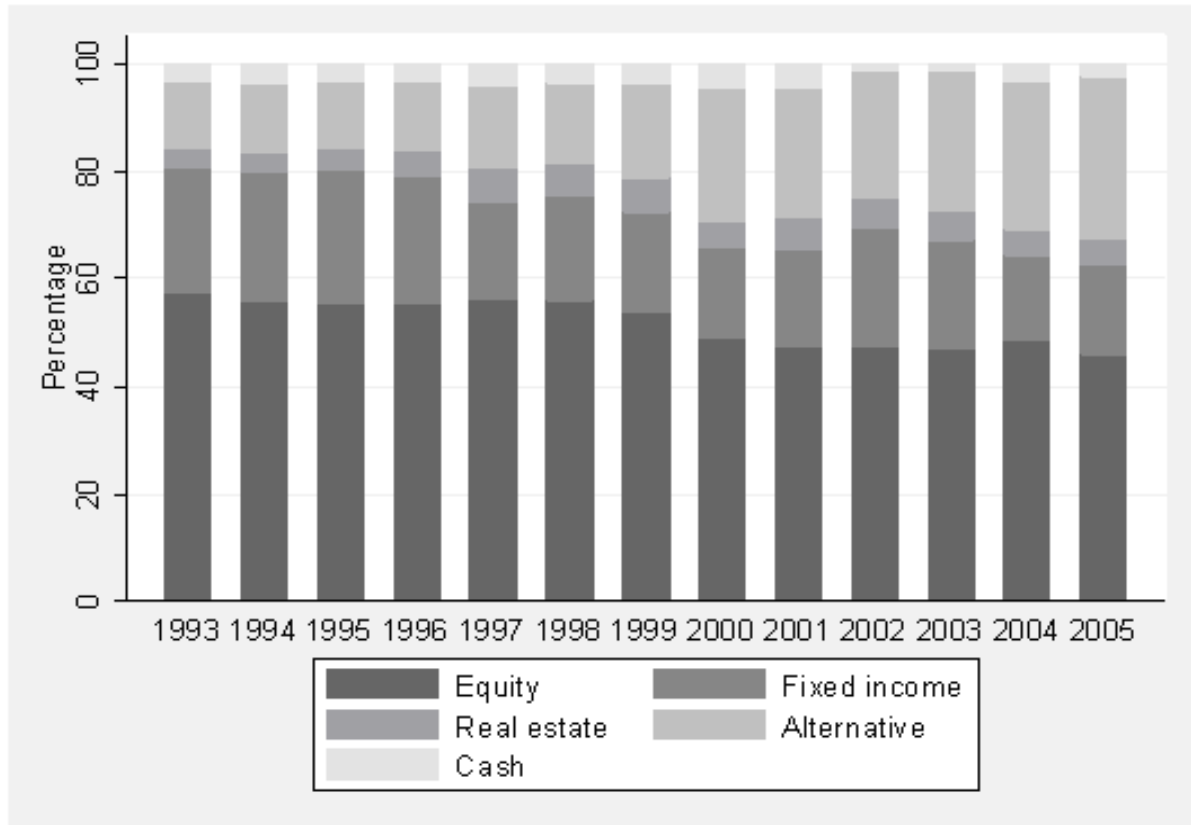


Figure 7

Asset allocation by school type and year

The fraction of assets invested in alternative asset classes (including hedge funds, venture capital, and private equity) are calculated for all schools, “Ivy Plus” schools, “High SAT” schools, and “Large” schools which reported at least 10 years of return data between 1992 and 2005. “Ivy Plus” denotes schools in the Ivy Plus group, which consists of the Ivy League along with Duke, MIT, Caltech, and Stanford. “Large” denotes schools in the top quartile of student population in 1992, and “High SAT” denotes schools in the top quartile of SAT score in the sample in 1992.

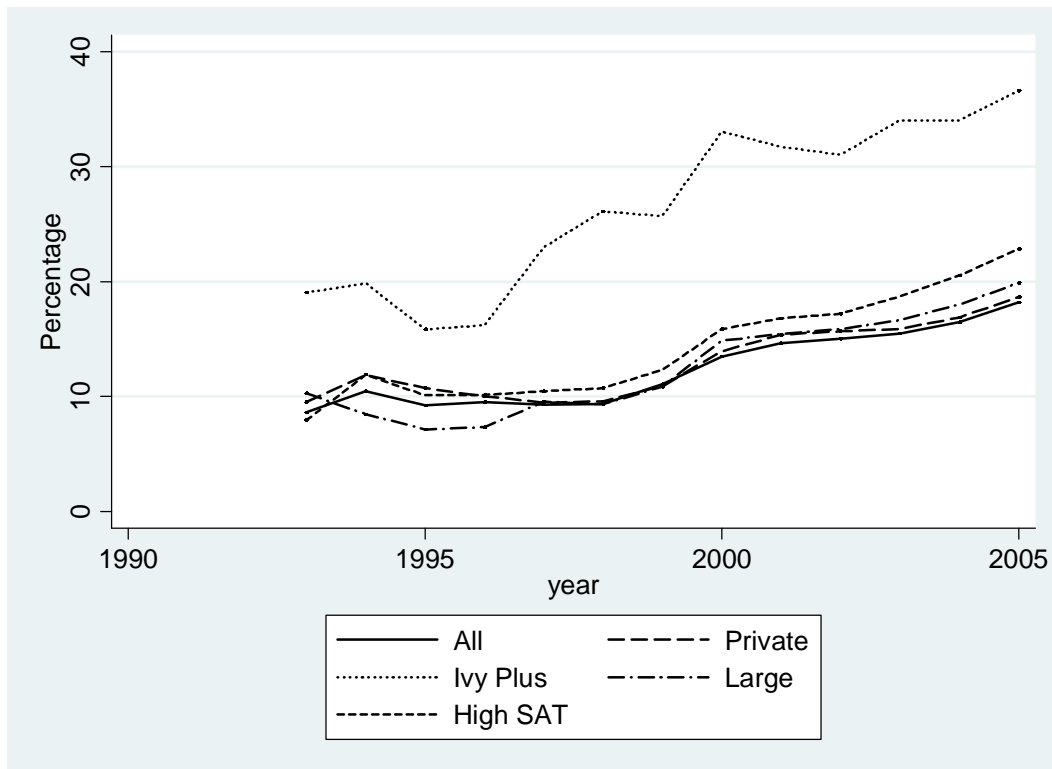
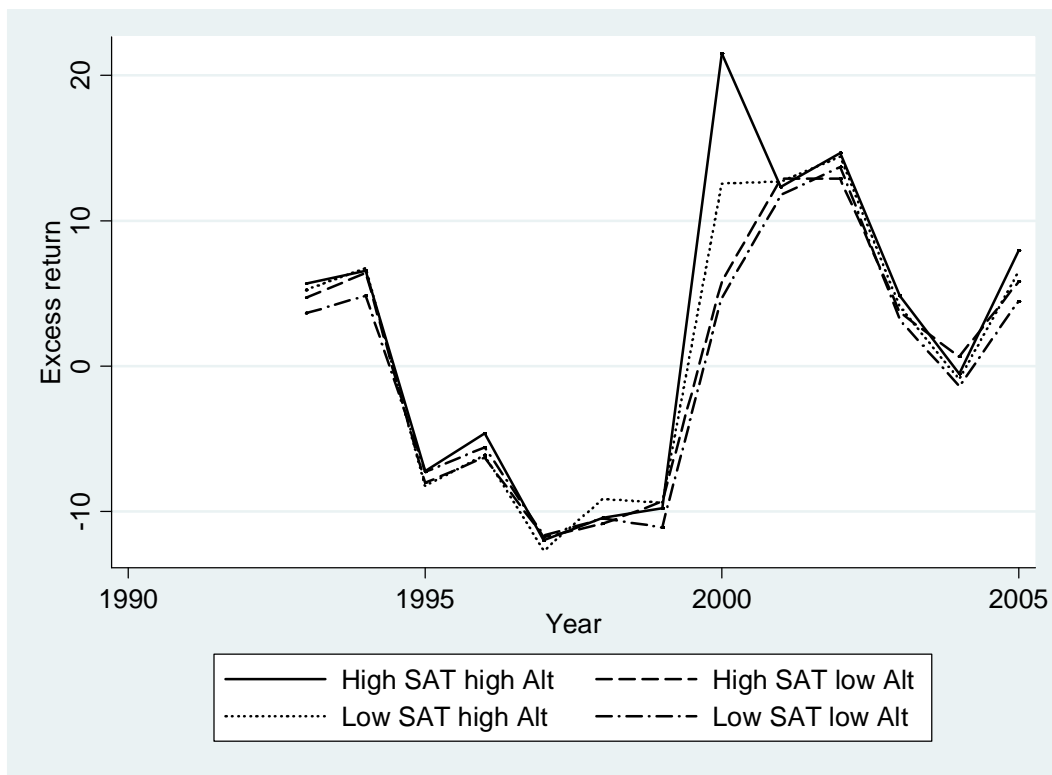


Figure 8

Returns by alternative asset allocation and SAT score

The equal-weighted mean of the excess returns of endowments in each of four groups is plotted in the figure. Excess returns are calculated as the endowment return subtracted by the S&P 500 return in contemporaneous year. Each year, schools are sorted independently by SAT score and allocation to alternative assets to form four mutually exclusive groups. “High SAT high alt” includes endowments in the top half of our sample by SAT score and top half of our sample by allocation to alternative assets, “Low SAT high alt” includes endowments in the top half by SAT score and bottom half by allocation to alternative assets, and “High SAT low alt” and “Low SAT low alt” are defined similarly.



Appendix (Can be included if desired for publication)

Table A

Cross-sectional determinants of excess returns

The following table presents cross-sectional ordinary least squares regressions of excess returns on endowment and school characteristics. Excess returns are calculated as the endowment return subtracted by the S&P 500 return in 2005. “Lag excess return” is the excess return of the same school in 2004. “Ivy Plus” denotes schools in the Ivy Plus group, which consists of the Ivy League along with Duke, MIT, Caltech, and Stanford. Because endowment size and student population distributions are extremely skewed, we include the logarithm of endowment size in 2004 and the logarithm of the number of enrolled students as independent variables. “High SAT” is a dummy variable for schools in the top half by SAT score, and “% alternative” is the ratio of the allocation to alternative assets (hedge funds, venture capital, and private equity) to total asset value. Robust standard errors are reported in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)
Log endowment size 2004	1.178 (13.51) ^{***}	0.854 (5.20) ^{***}	0.786 (4.72) ^{***}	0.622 (4.04) ^{***}	0.632 (4.07) ^{***}	-0.089 (0.39)
Log students	0.041 (0.25)	0.024 (0.11)	0.028 (0.13)	-0.029 (0.14)	0.154 (0.26)	0.110 (0.38)
Private	0.044 (0.11)	-0.468 (0.95)	-0.515 (1.05)	-0.437 (0.97)	-1.014 (0.65)	-0.502 (0.82)
High SAT		0.013 (3.61) ^{***}	0.012 (3.42) ^{***}	0.008 (2.46) ^{**}	0.007 (0.80)	0.009 (1.83) [*]
Ivy Plus			2.081 (2.18) ^{**}	2.789 (3.17) ^{***}	2.772 (3.12) ^{***}	1.908 (1.84) [*]
Lag excess return				0.261 (8.97) ^{***}	0.285 (0.69)	0.357 (8.12) ^{***}
Lag*High SAT					0.000 (0.12)	
Lag*Private					0.037 (0.39)	
Lag*Log students					-0.012 (0.33)	
% alternative						0.081 (5.92) ^{***}
Observations	622	451	451	449	449	247
R-squared	0.28	0.31	0.32	0.42	0.42	0.43
Absolute value of t statistics in parentheses						

* significant at 10% confidence level; ** significant at 5%; *** significant at 1%.