ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics

Master Thesis Financial Economics

The Investment Beliefs and Strategies of US University Endowments

Vincent Klose
478288

Supervisor: Onno Steenbeek

Erasmus School of Economics

Abstract:

The significance of university endowment funds increases on a yearly basis. Recent high returns of some famous university endowments have led to further attention on this topic. In this work, I analyze the investment practices and investment beliefs of the two biggest endowments in the world. I find that smaller endowments tend to copy the behavior of bigger endowments after a certain time period. Fee adjusted returns suggest, that replicating the strategies of the past of other endowments does not lead to a favorable outcome for the average endowment. The effect is caused by differences in timing, size, networks and preferential access.

Keywords: university endowment funds, yale endowment model, investment strategies of endowments

Date final version: 19.03.2019

Table of contents

1. Introduction

In recent years university endowment funds have become more and more important for universities to enable funding for operating activities. The Erasmus University of Rotterdam (EUR) has recently launched a campaign called "Challenge Accepted" with the goal to establish an endowment fund, and is planning to increase its size to 100 million euros by 2025 ("Alumni contribute 26 million", 2017). The chairman of the Erasmus Trustfonds, Michiel Muller, states that the fund aims to contribute to the university's budget around 8 to 10 million euros per year. Considering the university's current available budget of around 600 million euros, the additional funds could provide further capital for research grants or study grants for students in financial need who would otherwise not be able to take up their place at the university. The planned 8 to 10 percent return, if the target goal of €100 million would be reached, is an ambitious goal. In comparison to the recent bank base rate which has been at 0 percent since March 2016 (European Central Bank), net returns in the region of 10 percent would be immense. They should cause the reader to wonder how and if such above average returns are possible in a long-term scenario with reasonable risk levels. But are these returns really "above average" if we compare them to endowment fund average returns? Or are they a realistic assumption?

To answer these questions, it is useful to look at countries in which university endowment funds play traditionally a more important role for a university's budget. Here, universities in the United Kingdom and the United States of America stand out with regards to the amount and size of their endowment funds. In continental Europe, the biggest university endowment fund is from the French graduate business school "INSEAD", valued at "only" 213 million euros (INSEAD, 2017). By contrast, in the U.S. there are more than 200 universities alone with bigger endowment funds than this one.

To investigate the nature of the investment beliefs and strategies of the endowment funds, this Master thesis will thus narrow down its focus to the analysis of US endowment funds. In addition, because of the size and significance of US endowment funds, most of the available literature and data focuses on the U.S.. Looking at these endowment funds, it quickly becomes evident that indeed returns in the double-digits amounts are not uncommon. Still, the returns of specific endowment funds fluctuate with or sometimes against the market and differ substantially individually even in the same time frame.

Sadly, there is no public data on individual returns of endowments available on any database. Annual data on the sheer size of an endowment is available and therefore also of the endowments increase or decrease of the total assets. But as various factors influence the increase or decrease of the value of an endowment, it would not be sound to infer any conclusion of this movements if we cannot adjust

for these different characteristics. The problem is, that we cannot know if the increase of value happened through donations or good management.

This Master thesis then tries to answer the question why these periodic returns of endowment funds vary so substantially between different institutions and if bigger universities are the better investors. Subsequently, a resulting question then is, if the same investment strategies of the bigger endowments should be adopted by smaller endowments. Relating back the EUR Trustfund the null hypothesis of the Master thesis is as follows:

H_0: New or starting endowments should mimic the behaviour of established and successful endowments

In order to test this hypothesis, this thesis will focus on different investment beliefs of the biggest university endowment funds. The beliefs lead to different investment strategies and asset locations, which drive the return and value of the endowment in diverse direction in any given years. Although there is already some literature on the topic how the endowment management environment is changing over time, some of the findings do not hold true for the present as some of the studies were conducted during specific timeframes with unique characteristics. To show the most recent changes in endowment investment strategies and to answer the question what influences the investment beliefs of university endowment funds, this master thesis includes a case study of the two biggest endowment funds of the U.S., Harvard University and Yale University, in the fifth chapter. The next chapter reviews and assesses the existing literature. The third chapter explains the data for the case study and the relating descriptive statistics. Chapter 4 then provides these descriptive statistics which help us identify recent shifts in endowment investing beliefs. The last chapter will give a short conclusion and relates back to the new program initiated by the EUR.

2. Theoretical framework, definitions and overview of existing academic research

The following chapter will provide the theoretical framework of endowments. It will explain the nature and goals of endowments, and how they are managed. The chapter also outlines an overview of the existing literature on endowment investment strategies. Furthermore, it includes some of my own hypotheses on how and why endowment investment strategies change over time.

2.1 Theoretical framework, definitions and facts about endowments

2.1.1 Definition of endowments

First of all, it is important to define what the term "endowment" actually means. The Oxford English Dictionary (2018) gives two fitting definitions of the act of "endowing" with "to enrich with property" or "to provide (by bequest or gift) a permanent income for (a person, society, or institution)". In our specific case it refers to financial reserves in form of financial and real assets possessed by the universities given by a donor. One characteristic of these "endowments" is generally that the beneficiary holds the principal amount until perpetuity and solely uses the endowments income for any outflows. Endowments of this kind are labelled "true endowments" by Ehrenberg (2009). This is not true for all parts of the assets of an endowment. Sometimes parts of the endowment are not solely restricted to the income[1]. These endowments are referred as "quasi-endowments" according to Hansmann (1990). For these quasi endowments, the university can not only spend the income but also the principal to fund activities they see fit. Another term used by some scholars as Ehrenberg (2009) used for this "quasi-endowments" is "funds functioning as endowment", which is also predominantly used in financial statements of various institutions. In the endowment literature generally, unless mentioned otherwise, the term endowment implicitly includes these "quasi-endowments" and other forms of assets, so this thesis adopts this definition of endowments. Taking Harvard University's endowment as an example, the endowment consists of circa 13,500 separate endowment funds (Harvard University, 2017). These endowment funds balances have a variety of different purposes and classify within three different restriction classes. Additionally, in the majority of cases other substantial assets classes like "pledge balances" or "interests in trusts held by others" are included in the term of "endowment fund".

[1] Depending on the country and the legal framework in which the endowment operates there could be still some restrictions opposed on the endowment even if the donor did not explicitly restrict the use. Also, for taxation reasons it can be favourable for an endowment to restrict the use of some endowment fund capital so that it does not fall into a different non-profit tax class (Hansmann, 1990).

Figure 1 – Excerpt of Harvard's financial statement regarding the endowment's composition

	2017			
	Unrestricted	Temporarily restricted	Permanently restricted	Total
Endowment funds	$ (3,401)	$ 19,648,050	$ 6,971,295	**$ 26,615,944**
Funds functioning as endowment	6,151,574	2,889,572		**9,041,146**
Pledge balances		480,577	594,381	**1,074,958**
Interests in trusts held by others		13,845	350,581	**364,426**
TOTAL ENDOWMENT	**$ 6,148,173**	**$ 23,032,044**	**$ 7,916,257**	**$ 37,096,474**

Source: Harvard University (2017)

The restrictions on the use of the endowments are often explicitly given by the donor to the university. One common purpose is to allocate the fund towards student tuition aid to enable financially disadvantaged students their studies. Similar to the student aid, another big part of the endowment income is aimed to support specific faculties of the university e.g. the Arts Department. Donors sometimes also explicitly donate to a specific research field or a specific department of a faculty to establish funds for a particular project. Other purposes can include more general university purposes which are not directly related to research or tuition such as recruitment activities, social activities of the university such as sport clubs or other public services.

2.1.2 Importance of Endowments

In order to reach the previously mentioned goals of the endowments, the number and value of endowments increase year after year. From 2009 to 2017 the number of endowments with a total asset value of 1 billion U.S. dollar nearly doubled from 52 to 97 endowments. The aggregated market value of all endowments combined shows a similar trend (NACUBO, 2018a). As institutions mostly pay out their contribution to the university, the relative importance of endowments as an income stream deepens. This is especially true for Ivy League endowments as their average contribution to the universities budget is around 30 percent of the total budget. This is not limited to Ivy League endowments. Intuitively we can conclude that if the endowment value is higher, the proportion of the university's budget it can finance with its payout is higher. These additional funds further widen the gap between smaller universities and Ivy League or other top tier universities even further. The already bigger universities can use the additional funds to attract more prestigious professors or build nicer facilities which therefore attract more students. The next subchapter outlines how endowments decide on how much of their assets they pay out to the university's budget.

2.1.3 Overview of spending rules and payout ratios

Several normative models exist to theoretically describe university endowment behaviour (see e.g. Tobin, 1974; Mertin, 1992 and Black, 1976). One major part of every model is the payout ratio. The

payout ratio theoretically defines the sustainable consumption rate of the endowment with which the endowment can support their activities infinitely. The endowment therefore should not have any time preference and just use the endowment income to smooth out the income streams to the institution they belong to (Tobin, 1974). In practice, it is not easy to determine which payout ratio can sustain an infinite time horizon while being fair towards current and future generations. To determine a "fair" payout ratio, which does not discriminate scholars of economically bad years, universities use a spending rule. This spending rule is set by the board of the endowment according to their spending policy and beliefs. The National Association of College and University Business Officers (NACUBO) classifies the spending rules using eight different definitions. The most basic form is to just spend all current income which is generated by the endowment fund. It is intuitively clear that this approach, by design, does not guarantee a fair distribution of funds among different years. Surprisingly, table 1 shows that still 3 percent of all endowments of the NACUBO sample (2018a) state that they perform this practice. In contrast the most widely used approach with 73 percent is to use a percentage moving average. This method determines the annual payout as a percentage of an average of market values of the endowment over a specified series of periods, which often ranges from three to five years. 9 percent of all endowment funds choose to decide on an appropriate payout ratio manually each year. This approach also lacks objectivity and can cause some agency problems. Another spending rule is to increase the previous year's payout by the inflation rate. This rule on its own is not used very often but rather together with an upper and lower bound and/or other components in a hybrid rule. A hybrid rule combines two or more payout rules and is mostly used by the bigger endowment funds. The average actual payout in the fiscal year 2017 was 4.7 percent which is under the Internal Revenue Services (IRS) set minimum of 5 percent for a non-profit organization.[2]

[2] In theory by American law, a foundation or an endowment needs to spend at least 5 percent of its value to its charitable cause. If an endowment violates this rule on a constant basis, it can lose his status as a non-profit organization. But in practice most endowments do not have any problems with the rule as there is no consequence by IRS if an endowment violates the rule in a specific year. The IRS also allows for a 1.5 percent set-aside adjustment for cash needs.

Table 1 - Spending rule distributions in percent for the fiscal year 2017

Spending rule	Total Institutions	Over $1 Billion	$501 Million to $1 Billion	$101 to $500 Million	$51 to $100 Million	$25 to $50 Million	Under $25 Million
Spend all current Income	3	2	2	2	4	3	6
Percentage of Moving average	73	48	63	77	82	80	73
Decide on appropriate rate each year	9	6	2	9	10	12	11
Grow distribution at predetermined inflation rate	1	0	4	0	0	1	0
Spend pre-specified percentage of beginning market value	2	0	1	1	3	6	1
Last years' spending plus inflation with upper and lower bounds	5	12	15	3	2	0	4
Weighted average or hybrid method	9	21	13	9	4	5	4
Other	9	19	12	7	9	4	9

Notes: All numbers in percent. Multiple answers are allowed; therefore, the sum of the percentages can exceed 100 percent.
Source: NACUBO and Commonfund Institute (2018a).

Historically, payout rates have been around 4.5 to 5.5 in the last years. Table 2 displays an overview of the payout rates for the time period between 1998 and 2017. The table shows that on average spending rates are systematically lower than the 5 percent of the IRS guideline. This is especially true for endowment funds with a value of under 50 million dollars, where the average spending rate equals to 4.4 percent. The table also shows that the spending rates of high value endowments increase while the spending rates of low value endowments decrease. Furthermore, high value endowment funds seem to increase their spending rates after a recession, whereas the endowment funds with lower values are reducing their spending rates.

2.2 Literature Review

2.2.1 Endowment payout behaviour and agency problems

Brown, Dimmock, Kang and Weisbenner (2014) investigate in detail how positive and negative movements of the endowments' returns affect the payout rates of the university. They show that the majority of universities do not follow the model of Tobin (1974) and smooth over negative shocks, but actively reduce their payouts after negative shocks to their returns. After positive shocks universities do neither increase nor reduce their payout rates, which complies with the model. This asymmetrical

behaviour towards financial shocks impacts universities. The authors show that universities which do not smooth over negative shocks compensate the reduced amounts of funds by reducing staff. The effect is especially high for universities with high payout reductions. The authors therefore accuse the universities' endowment boards of hoarding the endowments assets while losing the focus on the main goal—the financial support of the university. The authors' findings validate earlier findings of Hansmann (1990).

Hansmann labels the behaviour of the endowment's trustees "overly conservative" when it comes to financing university activities. He gives a possible explanation to these payout rates reductions with this following agency problem: "Perhaps the reason for this is that, for the reasons of expertise mentioned above, they feel themselves likely to take the blame if the institution fails financially, while others are likely to get the credit if it succeeds academically. Consequently, large financial reserves are a source of substantial comfort to them."

Conti-Brown (2011) gives another possible explanation of the findings of Brown et al. (2014). He labels the size and value of a university endowment as a symbol of the university's status. He compares it to other representative symbols, for example a university's art collection, library or certain faculty buildings. These assets incorporate a certain prestige for the university; therefore, the university does not sell them on to finance its operational budget. The university's endowment fund can serve a similar purpose. The endowment value or size is a value in itself for a university. Therefore, university endowment funds do not spend enough in certain times to accomplish their actual goal: providing additional budget for the university's core activities.

"Universities' endowments are like cowboys' belt buckles: the bigger the buckle, the more impressive is the cowboy." Conti-Brown.

Table 2 - Average annual effective spending rates for U.S. College and University endowments for 1998 to 2017

Size of the Endowment	Fiscal Year																			
	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Over 1$ Billion	4.2	4.2	4.2	4.2	4.9	5.3	5.2	4.7	4.6	4.4	4.2	4.6	5.6	5.2	4.7	4.8	4.6	4.3	4.4	4.8
$501 Million to $1 Billion	4.5	4.3	4.5	4.5	5.1	5.3	5.2	4.8	4.5	4.4	4.5	4.9	5.7	5.2	4.7	4.6	4.3	4.1	4.3	4.6
$101 Million to $500 Million	4.5	4.5	4.6	4.9	5.1	5.2	4.9	4.7	4.6	4.5	4.2	4.4	4.9	5.0	4.3	4.4	4.3	4.1	4.3	4.5
$51 Million to $100 Million	5.2	5.0	5.1	5.3	5.3	5.2	4.9	4.7	4.7	4.8	4.6	4.7	4.6	4.5	4.3	4.4	4.4	4.4	4.4	4.5
$25 Million to $50 Million	4.4	4.6	4.7	4.9	4.9	5.0	4.8	4.7	4.8	4.8	4.3	4.3	4.1	4.0	3.8	4.3	4.2	4.0	4.1	4.2
Under $25 Million	5.5	4.5	4.6	4.9	4.7	4.8	4.6	4.8	4.6	4.6	4.1	3.9	3.5	3.7	3.7	4.1	4.6	4.5	3.8	4.0

Notes: “The effective spending rate represents the distribution for spending divided by the beginning market value (endowment value on or around the beginning of the fiscal year). The distribution for spending is the dollar amount withdrawn from the endowments to support expenditures on student financial aid, faculty research, maintenance of facilities, and other campus operations, as determined and defined by each institution. The rate is calculated net of investment fees and expenses for managing the endowment.” (NACUBO Commonfund Study of Endowments Public Tables, 2003-2018)

2.2.2 Governance of Endowment Funds

According to Brown, Dimmock, Kang, Richardson, and Weisbenner (2011) there are two different types of legal structures for endowment funds which are most common: (1) they are either directly part of the university, or (2) they are structured as a legally separate foundation. If the endowment is structured as a foundation, which is quite often the case for the bigger endowments, it is required to have a board of directors. As Brown et al. (2011) and Desai and Yetman (2006) point out, university endowments are not obliged to adhere to legal limitations as many other foundations are. Brown et al. (2011) give the example that most foundations are required to pay out at least 5 percent of their assets annually, but university endowment funds are exempted from this constraint in common practice. If the legal constraint would actually be enforced, it would limit the endowment funds and change their behaviour because the previous subchapter showed that the payout ratio is lower than 5 percent in many cases. The board of the endowment fund is not limited to just oversee the decisions but actively participates in the decision-making process. The endowment board is usually appointed by the university and consists mainly of donors.

Table 3 – Composition of endowment fund investment committees

N= 256	Average	25th %	Median	75th %
Total Board Members	12.6	7.0	9.0	13.0
Voting Board Members	8.2	6.0	8.0	10.0
Alumni	4.3	1.0	4.0	6.0
Percent Alumni	48.2%	16.7%	50.0%	80.0%
Parents	1.4	0.0	1.0	2.0
Percent Parents	15.6%	0.0%	10.0%	25.0%
Donors	7.8	5.0	7.0	9.0
Percent Donors	89.7%	100.0%	100.0%	100.0%
University Employees	0.8	0.0	0.0	1.0
Percent University Employees	8.9%	0.0%	0.0%	12.5%
None of the above	0.8	0.0	0.0	0.0
Percent None of the above	9.5%	0.0%	0.0%	0.0%
Members with Formal Credentials (e.g., MBA)	4.6	2.0	4.0	7.0
Percent Members with Formal Credentials	56.5%	33.3%	58.3%	87.5%
Members Holding Executive or Other Board Positions	5.8	4.0	5.5	7.0
Percent Members Holding Executive or Other	67.5%	70.0%	75.0%	100.0%
Percent Members Compensated	1.2%	0.0%	0.0%	0.0%

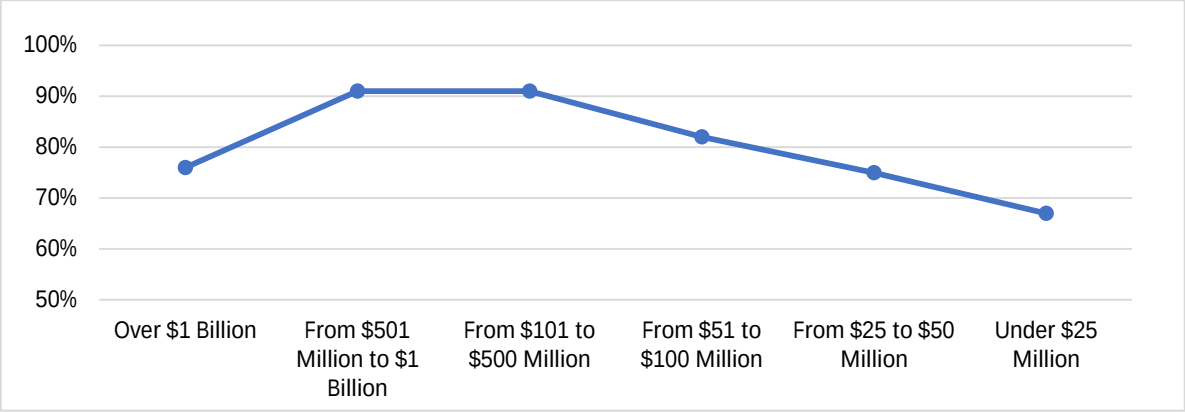
Source: Brown et al. (2011)

A survey, which was conducted by the Teachers Insurance and Annuity Association-College Retirement Equities Fund (TIAA-CREF) and summarized on behalf of the organization by Brown et al. (2011), shows the composition of these boards. As 99 percent of all board members are not compensated and are volunteering, the majority of board members have some kind of affiliation with the university. Unsurprisingly, nearly half of them are alumni of the University. 16 percent are parents of current students, and 9 percent are university employees. Also, 90 percent of the board members were donors for the endowment fund they were governing. It is unclear in which way the causality

works. It is possible that the universities primary appoints only top-donors, or that endowment fund board members donate to the endowment just because they are expected to donate by the time they are members of the board. The survey also states that roughly half of all board members do have an educational background in business or economics[3]. Two-third of the participating board members are members of other boards at the same time. This is not very surprising, as it is generally common for board members to be members of more than one board. Another question Brown et al. (2011) try to answer with the help of the TIAA-CERF Endowment Survey is how the investment committee composition impacts administrative decisions and procedures. In their sample group, the investment committees met on average 4.4 times a year. The 87 percent of investment committees, which hire outside counselling services have on average additional 3.3 meetings per year with their consultant. The degree to what extent the participants make use of consulting varies. 35 percent state that they outsource the "Asset Allocation" completely and another 31 percent state that they outsource it partially. The statistics are very similar with regards to outsourcing the investment manager selection: while 31 percent outsource it completely, another third of the participations outsource it partially. To investigate on which factors the outsourcing decisions depend, the authors conduct a simple ordered logit regression in which the dependent variable can either be "no outsourcing", "combination of outsourcing and in-house" or "mainly outsourcing". The independent variables are the different voting member groups of the investment committee and the size of the endowment. From their regression, the authors conclude that larger endowments are less likely to outsource and state higher "in house" capacities and expertise as a reason. However, the methodology of Brown et al. (2011) does not allow for any true analysis of which groups of endowments' sizes are truly reliant on consulting services. The NACUBO study (2018a) portrays a more nuanced image. As displayed in figure 2, it is true that the usage of consulting services decreases in the bracket of the biggest endowments which supports the findings of Brown et al. (2011). However, it also decreases on the other site of the distribution. From $100 million portfolios downwards the percentage usage of endowments is decreasing. A possible explanation of this is that smaller endowments cannot justify the additional spending in terms of fees, which would arise by hiring an outside consultant.

[3] The Survey defines an educational background as either having a universal degree in the fields of business and economics or holding a certificate as for example the Chartered Financial Analyst (CFA) or the Chartered Alternative Investment Analyst (CAIA).

Figure 2 – The use of consultants in percent



Source: NACUBO Commonfund Study of Endowments (2018a)

An interesting result of the regression by Brown et al. (2011) is that boards which have a higher percentage of donors are more likely to outsource some decisions. One reason behind this could be to avoid a problem of conflict with donors, who get overly cautious because it is "their" money, which is being invested. Another more feasible explanation is that eventually non-donors are generally more knowledgeable to make investment decisions and got appointed to the board as non-donors precisely because of their expertise (Brown et al., 2011).

Binfare, Brown, Harris, Lundblad (2018) connect the governance of endowments with investment strategies. The authors demonstrate that the expertise of the university board members in fields of venture capital, private equity and hedge funds is positively correlated with investment returns after controlling for risk. In addition to expertise, they also capture larger professional networks of the board members as a significant factor. According to Binfare et al. (2018), the superior investment returns result because of various effects: a higher distribution to alternative assets[4] in general, which enables higher investment returns, greater manager and staff picking abilities and access, and the possibility to invest directly in funds rather than in aggregated fund of funds.

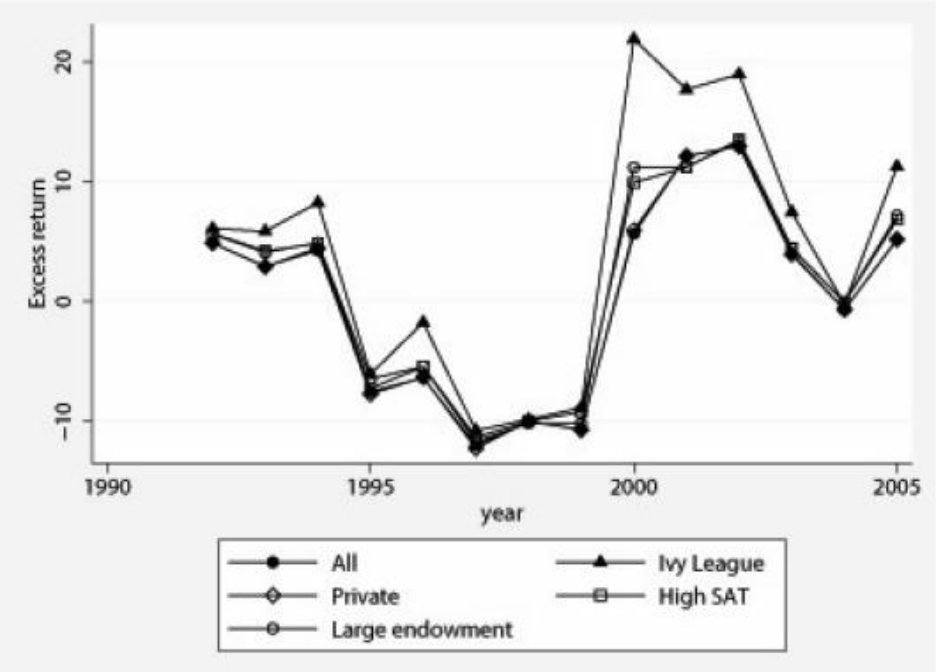
2.2.3 Endowment fund investing strategies and endowment performance

History gives examples of various endowments which through good asset management enabled universities to broaden access to the university and increase funds offered for various research purposes. Especially the Ivy League universities are realizing high total returns with their endowments.

[4] Alternative assets include asset classes such as hedge funds, commodities, natural resources, venture capital and private equity buyouts. Sometimes real estate is also classified as an alternative asset. In contrast to traditional assets as bonds and publicly traded equity, alternative asset classes are traditionally less liquid and it is harder to determine their value.

An extensive study by Lerner et al. (2008) explores the trend that large endowments are continuously outperforming smaller endowments by analysing a sample of 1,300 endowments from 1992 to 2005. During their thirteen-year sample period the median growth rate of the endowments was at 7.4 percent annually and the median return was at 6.9 percent annually. During the same timeframe the Ivy-League endowment funds outperformed the median endowment return by more than 3 percent. The authors show this impressively when plotting the excess returns of different endowments with the S&P 500. It becomes apparent that Ivy League endowment funds seem to have a higher upward potential in good years while they have at the same time a similar downward risk as the other endowments.

Figure 3 – Excess returns of different endowment groups in regard to the S&P500



Source: Lerner et al. (2008)

As the subchapter 2.1.2 showed, the relative payout ratios do not differ substantially between all endowments groups. Therefore, the higher returns of already original bigger endowments lead to increasing differences in size between the individual endowment groups. In the beginning of the authors' sample period in 1993, the median Ivy League endowment was 40 times larger than the median public endowment, and at the end of the sample period it was up to 70 times the size (Lerner et al., 2008).

To tackle the question what drives the excess returns and why they differ between the institutional types so significantly, it helps to take a step back and take a quick look at some fundamentals of portfolio performance. Generally, the performance of a portfolio can be determined by three different

fundamental components of the investment management process: investment policy; market timing; and security selection.

Brinson, Hood and Beebower (1987) define investment policy—sometimes also called asset allocation policy—as the "specification of the plan sponsors objectives, constraints and requirements, including identification of the normal asset allocation mix". In other words, it is the so called "passive" determinant of the investment process and can be expressed by the right benchmark with the right specifications. Furthermore, in an updated article the authors Brinson, Singer and Beebower (1991) also give a definition for "market timing" or "active asset allocation" as: "temporarily deviating from the policy asset mix in order to benefit from a state of capital market disequilibrium with respect to the investment fundamentals underlying the policy mix". While the authors do not give any information about the effectiveness of investment policies, they investigate the impact of the specific investment management activities on the actual portfolio returns. In their sample of 91 large U.S. pension plans from 1974 to 1983, the variation in total returns could be described on average by circa 90 percent just through investment policies. Using the same framework and similar data from 80 large pension plans over a 10-year sample period from December 1977 to December 1987, they confirm their initial assumptions and conclude that active investment decisions, namely market timing and security selection, have a relatively small effect on improving portfolio performance (Brinson et al., 1991).

In more recent times, however, various researchers released literature that contradicts these findings. Different studies that try to explain the variation of returns across funds by investment policies find results with vastly varying percentage levels from 33 percent to 75 percent as in Vardharaj and Fabozzi (2007), or 45 percent as in Ibbotson and Kaplan (2000). Results differ because the samples used by the authors differ from each other across various dimensions like time, fund specific properties or measurement variations (Xiong, Ibbotson, Idzorek, and Chen, 2010). Ibbotson (2010) directly addresses the hypotheses of Brison et al. (1987, 1991) by stating that the authors neglect the fact that in the return variations, displayed as R^2, attributed to the policy mix, the aggregate market movement is also included. The market movement theory is also approved by other researchers such as Hensel, Ezra, and Ilkiw (1991) or Barber and Wang (2013).

So far, these studies were focussing mostly on pension funds or institutional investors in general. Lerner et al. (2008) try to approach the question why returns between endowments vary from a different angle. When trying to give reasons for these differences in returns, which are displayed in figure 3, the authors state the economics of scale in management (Lerner et al., 2008). As already shown in the subchapter 2.3 "Governance of Endowment Funds" of this thesis, the smaller sized

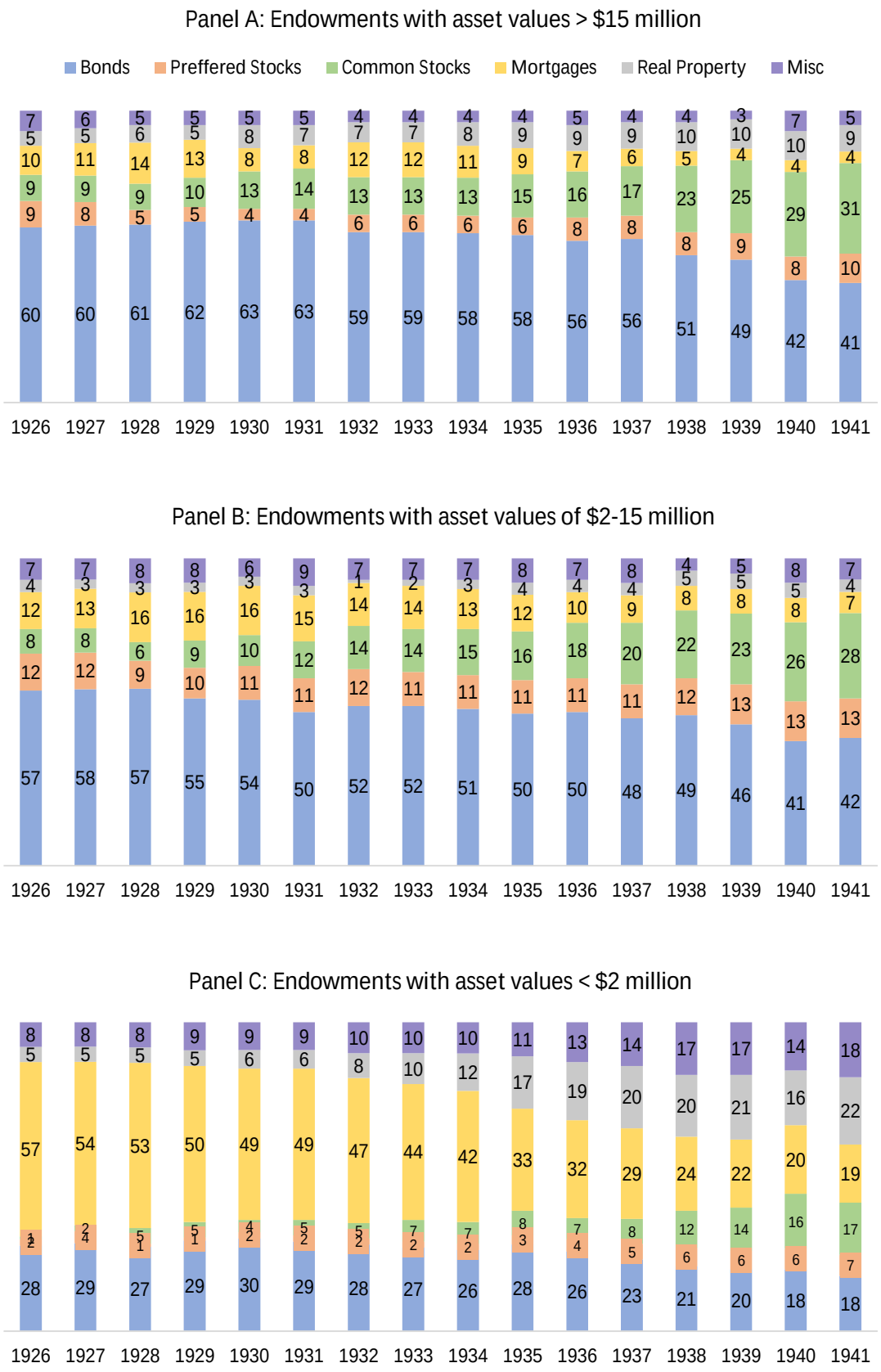
endowments hire fewer outside consultations and rely more on the general financial officer of the university which can be attributed to monetary reasons. Additionally, Lerner et al. (2008) suggest that the asset managers of these smaller endowments do not have the same sophistication and expertise as the asset managers of the larger endowments. Although the assumption cannot be verified with any specific data other than returns (expertise and sophistication are subjective matters after all), it is still a plausible assumption, as we can assume that the more prestigious universities have a "better"[5] pool of alumni and potential professional staff. In the fifth chapter of this thesis we will conduct a case study and take a closer look at the current composition of the management of the two Ivy League endowments of Harvard and Yale. The next reason of the differences is how the endowment funds set up their investment policies and therefore their asset allocation policy. In the case of endowment funds, asset classes are nowadays often split into five different segments: alternative assets, cash, equities, fixed-income, and real estate. Historically there have been various major waves of shifts in asset allocations.

Goetzmann, Griswold, and Tseng (2010) analyse university endowments during the 20s and 30s and go on to compare the situation during and after the Great Depression with the situation during and after the Financial Crisis in 2008. Figure 4 shows the endowments asset allocations from 1926 to 1941. The data is grouped in three different endowment sizes: endowments with asset values of 15 million dollar or more; endowments with asset values of 2 to 15 million dollar; and endowments with asset values of less than 2 million dollars. It is interesting to see that also in the past the size of an endowment was highly influential on other endowment characteristics. During the 20s, smaller endowments did not really participate in financial markets with low allocations to fixed-income and nearly no investments in equity at all. Mid and high size endowments already invested more in these categories when on the 24th of October 1929 the stock market crash begun with the "Black Thursday". During that time both, equities and fixed-income securities, were basically only invested in domestic markets and not in foreign ones. After the financial crash the proportion of equities rose to more than 40% in 1941 for the mid- and high-sized endowments. The authors describe the difficulties endowment managers must have faced while shifting towards a more equity dependent portfolio. It was a difficult task to persuade the trustees to accept the—back then—unconventional allocation towards equity investments. In hindsight this shift payed off and equity investing has gained widespread acceptation. According to Goetzmann et al. (2010), the recent allocations to "Alternative Assets" share a lot of similarities to the shift of equities. In both cases, long-time historic data of the

[5] Or at least a broader pool.

performance of these assets was or is missing, and in both times there was a shock which particularly hit the returns in that asset class.

Figure 4 – U.S. Endowments asset allocations, 1926-1941



Source: Goetzmann et al. (2010)

Lerner et al. (2008) illustrate the second wave in which asset allocation shifted from equities and fixed-income securities towards alternative assets. These alternative assets are often attributed with higher illiquidity and risk, but therefore inherit a premium to compensate these downsides. This second shift to alternative assets is particularly true for bigger sized endowments and even more for Ivy League endowments. On average, the Ivy League universities proportion of assets that was invested in alternative investments doubles the proportion of the median university. Lerner et al. (2008) also show that the Ivy League endowments shifted to these asset classes first, and a few years later the other endowments followed this trend after they observed the positive returns realized by the Ivy League endowments. The authors suggest that this issue of early access, in combination with the sheer size of the endowments, enabled the Ivy League endowment funds to invest in hedge funds and private equity which are often not accessible for the other endowment funds anymore. The authors Kaplan and Schoar (2005) explain this by the fact that the best performing private equity funds limit their size[6] and only give existing shareholders re-investing rights but do not accept new investors. The endowment funds which missed the beginning of this trend and which are also smaller in size, therefore do not possess the same opportunities anymore. Additionally, in another study of Lerner, Schoar, and Wongsunwai (2007) the authors conclude that their empirical results show that some differences in the performance of endowments might be attributable to preferential access because they have been investing in the field of industry for a longer period. But as these "established" endowment funds also achieve higher returns in young and undersubscribed private equity funds, hence private equity funds that are also equally accessible to "new" investors, the preferential access cannot be the sole driver of the superior returns.

Goetzmann and Oster (2013) examine the process of asset allocation changes by endowments. The authors particularly focus on the importance of "strategic competition" in the shift towards alternative assets. They find that the performance of the competitors of a university endowment influence the changes in the asset allocations of the endowment. The changes—which are predominantly in alternative assets—function as a method to "catch up" with the universities nearest competitors and consequently are a measure to compete for students. They also find proof for some other behavioural economic effects such as herding-behaviour and trend-chasing. As shown by Goetzmann, Griswold, and Tseng (2010), a similar shift has proven beneficial for the universities in the past. But Goetzmann and Oster (2013) conclude that the historical data for alternative assets is too limited to give any definite judgement. They conclude that the shift towards marketable alternative assets is only a good

[6] Private Equity fund performance and the size of the fund have a concave relationship. Therefore, the fund managers incorporate these upper size boundaries (Kaplan and Schoar, 2005).

thing on a general level if the markets are not efficient, or at least if there will be a big enough pool of managers who can take advantage of these inefficiencies.

Another study which analyses endowment returns was done by Barber and Wang (2013). The authors investigate whether university endowment funds are able to realize excess returns. If one compares the study with the previously discussed one of Lerner et al. (2008), the reader can get the first impression that the studies contradict each other as Barber and Wang (2013) are basically stating that they cannot find any evidence that manager selection, market timing, and tactical asset allocation let the university endowments funds create an excess return (alpha). Still, they do not essentially contradict each other, as Lerner et al. (2008) do not ask the question if an alpha exists but rather give a more descriptive explanation of the endowment return variations. Furthermore, the authors do not fully adjust for the risk and differences in the different asset allocations. We can see that the graph they plot in figure 3 uses the S&P 500 as a benchmark for the endowment returns. While this benchmark might make sense for equities, it clearly does not make sense as a benchmark for the whole portfolio since the alternative assets have totally different risk and liquidity characteristics. The danger of the downside potentials these asset classes possess is easily visible if we look at the returns which followed the sample period used in the paper. After the authors published their paper in 2008 the subprime mortgage financial crisis hit the markets and the Ivy League endowments incurred huge losses. During 2009 the value of the endowments of Harvard, Yale and Stanford all dropped by more than 20 percent because of their huge exposure to the market. Smaller endowments funds did also endure losses, but these were not nearly as high in most cases (Barber and Wang, 2013).

In order not to neglect the specifics of each asset class while analysing endowment returns, Barber and Wang (2013) use their style attribution model which is based on a model by Sharpe (1992). The Sharpe model delivers intercepts, which can be interpreted as the additional return achieved by the endowment funds relative to a portfolio that is designed to replicate the endowments as accurately as possible (Barber and Wang, 2013). The authors initially start by using a two-factor model with the "S&P 500 Index" as a benchmark for U.S. stocks and the "Barclays Capital U.S. Aggregate Bond Index" as a benchmark for U.S. bonds. This two-factor model already can capture 94 percent of the time-series variation in the return of the average endowment. After including the "MSCI ACWI excluded USA Index" for international stocks as much as 99 percent of the returns can be explained. Using this three-factor model with Ivy League endowments returns the authors receive a positive significant alpha relative to the benchmarks of 3.82 percent. So far this is what we would expect after Lerner et al. (2008), but there is still no benchmark included for the alternative assets. To more accurately assess the top performing returns, the authors include the "HFRI Fund Weighted Composite Index" as a hedge fund benchmark, and the "Cambridge Associates U.S. Private Equity Index" as a benchmark for

private equity. After these measures of adjustment, the intercepts of the top-performing institutions drop below to somewhere near zero, ranging from -0.99 percent for high SAT institutions to 0.5 percent for the best performing endowments. Therefore, the authors conclude that the endowments do not create any alpha themselves under the assumption that the used benchmarks do not provide any alpha on their own.[7]

A recent study by the two researchers Dahiya and Yermack (2018) about investment returns of non-profit endowments opposes the previously mentioned studies of Lerner et al. (2007 and 2008). Dahiya and Yermack's research paper is not only focussed on university endowments but also includes other non-profit endowments. But as the authors covered university endowments as an own subgroup of their sample we can also derive information about university endowments of their research paper. Their sample period spans from 2009 to 2016 and the data they use comes from IRS tax filings. As benchmark the authors use a 60 percent equity (CRSP value weighted index) and 40 percent bond (CRSP 10-Year U.S. Treasury bond) portfolio. And for the alpha estimates they use the standard Fama and French four-factor model. In their sample, higher education institutions significantly underperform the market benchmarks with negative abnormal returns of 189 basis points. In their sample also the elite universities, in this case represented by the endowments of the top 20 U.S. universities, have not a positive alpha but earn abnormal returns of circa zero. The authors even state that "investment wisdom of top universities is largely a myth, as one could expect to earn these types of returns simply by chance" (Dahiya and Yermack, 2018). Another aspect of the paper is how the performance of an endowment impacts its fundraising. The authors' results suggest that if an endowment outperforms the benchmark and generates an alpha it has a positive small but positive effect on the donations of the following year. The "flow-to-performance" findings of the authors are in line with similar researchers such as Chevalier and Ellison (1997). The study of Dahiya and Yermack (2018) is another example of how the assessment and interpretations of returns can be varying if we look at different sample sizes and time periods.

Ang, Ayala and Goetzmann (2018) examine the beliefs of universities in certain asset classes. Their paper is an addition to the existing academic papers in the way that they use historic returns and asset allocation data to infer the endowments belief about an asset class. They find that asset managers believe that their private equity portfolio generates an alpha of 3.9 percent, and their hedge fund portfolio of 0.7 percent. They do not include any private equity or hedge fund indices in their model. Therefore, the alpha relates to conventional equity investments. The private equity alpha expectation

[7] There is an open discussion on whether asset managers generate an alpha after fees. Baber and Wang argue against it using the market equilibrium theory.

of 3.9 percent is a bit higher than the illiquidity premium of 3% estimated by Franzoni, Nowak, and Phalippou (2012), and the public market equivalent findings of Harris, Jenkinson and Kaplan (2014)[8]. The implied hedge fund belief of 0.7 percent on the other hand is lower than findings from other researchers. Similar to the private equity example given above the alphas differ between the different research papers and their including datasets, but recent researchers suggest hedge fund alphas to up to 3 percent (Ibbotson, Chen, and Zhu, 2011).

[8] Harris et al. (2014) use a public market equivalent model, which compares the net of fees earnings of private equity investments to investments of public equity markets. Their findings imply an outperformance of at least 3% on an average annual basis. However, their results vary depending on the usage of different datasets and public equity benchmarks.

3. Data

To investigate the investment beliefs and strategies of major US endowment funds we can use data on a macro level and micro level. For the aggregated macro data, the best source for the U.S. Endowment fund landscape is the NACUBO Commonfund Study of Endowments (NSCE). This data is mostly used in chapter 4. To study the micro level, we can use information I have manually collected from the annual financial reports, tax filings, and the endowment reports of the universities. These manually collected data is the basis for the case study of the endowment funds of the Harvard and Yale University in chapter 5.

3.1 NACUBO Commonfund Study of Endowments

Since 2009 the National Association of College and University Business Officers (NACUBO) and the Communfund Institute have jointly released the NACUBO Commonfund Study of Endowments on an annual basis. The aim of the NCSE is to offer a primary information resource for parties involved in the decision making of universities and colleges regarding governance, financial, and investment management (NCSE, 2018). The data of the NCSE is collected using online and phone questionnaires as well as field interviews with the respective executives of the participating endowment funds or other employees "most knowledgeable about investment matters at participating institutions" (NCSE, 2018). As the individual endowment data with which an individual institution could be identified is not published and only used for internal calculations, the participating executives do not have any incentive to state any false data while completing the survey.[9] The sample size of the survey comprises around 800 institutions and sufficiently covers the U.S. endowment fund landscape. The authors of the study also state that year-to-year comparisons can be done as the participating institutions are relatively stable throughout different years with more than 95 percent of institutions recurring in the data. The NCSE consists of five different categories: "Returns and Investment Objectives", "Asset Allocation, Investment Policies, Restrictions and Responsible Investing Criteria", "Debt", "Fund Flows" and "Resources, Management and Governance". Generally, the institutions are divided into six different endowment assets size cohorts when a topic is tackled. The endowments are divided into groups with a first category representing endowments containing over $1 billion of assets, a second category of endowments between $501 million and $1 billion of assets, between $101 million and $500 million of assets, a fourth category comprising between $51 million and $100 million of assets,

[9] In some cases, NACUBO provides renowned researchers with the individual Endowment fund data of the institutions (e.g. in Brown, Garlappi and Tiu, 2010) but for this thesis the request was rejected because of the high confidentiality of the data.

followed by a firth category of between $25 million and $50 million of assets, and lastly, a sixth category of endowments with an asset size under $25 million.

Although the intention of publication of the NCSE is primarily for the institutions themselves to compare their endowment fund with their respective peers, the NCSE is also the primary data source for endowment fund comparisons in academic research. Nearly all recent published papers, which focus on endowment fund performance or governance, use data from the NACUBO (Brown, Garlappi, and Tui, 2010; Barber and Wang, 2013; Smith, 2015; Ang, Ayala, and Goetzmann, 2018).

3.2 Endowment fund financial reports and press releases

For the micro oriented view, we can collect information from the universities' financial statements or treasury reports as well as their published annual investing reports. The quality and extensiveness of these reports and other individual information however differs vastly. The university itself has an obligation to disclose their total investments and assets. Yet, they do not need to publish explicit endowment information as asset allocations to the public. Some universities, as the University of Texas System, just share their information to donors and other stakeholders. Unsurprisingly, for the more renowned institutions with larger endowment asset sizes, the information and data available is better than for smaller institutions with a smaller endowment asset sizes. It can be argued that this trend reflects bad management on part of these smaller universities. Actually, more transparent information can be a positive factor for possible future donors who want to have information about the investment activities of such endowments. Transparency can also act as another safety mechanism against mismanagement and reduce risks, which arise due to conflict of interest. In extreme cases this conflict of interest can lead to fraud and misuse of power, an example being the University of Yeshiva. In 2008, a board member set up a Ponzi scheme in which the university was massively invested in (Hernández, 2008).

In this thesis, however, the focus is on the endowment funds of Harvard and Yale University. Both universities publish comparatively comprehensive information on their investment activities. Still, also in these two cases the published information is far from perfect. In addition, asset class distinction is a subjective topic, and it changes between the institutions and often even within an institution when we compare different years.

4. Descriptive Statistics

The following chapter gives an overview over the historic returns and asset allocations. It helps to determine past and current trends in endowment asset management. Furthermore, the data shown in this chapter helps to identify differences between specific groups of endowments.

4.1 Returns

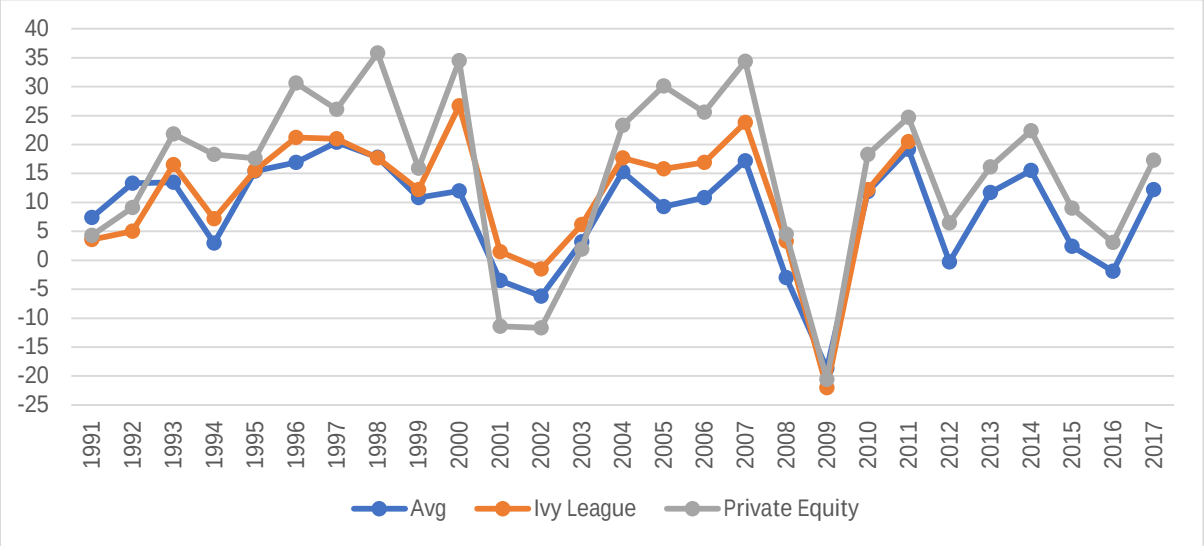
Table 1 in the annex displays an aggregated summary of endowment returns from 1991 to 2017. The endowments are grouped in two different methodologically. As displayed in the left side of the table, the endowments are split into three different groups according to their relative performance. The second grouping depends on the type of the universities. These are divided into the categories "Ivy League", "Top SAT"[10] and "Others". For reasons of comparison, various benchmarks are on the right side of the table. The benchmark for U.S. equities is the S&P 500, for bonds it's the Barclays U.S. Aggregate Bond, for foreign equities it's the MSCI World excluding U.S. bonds, for Private Equities the Cambridge Associates Private Equity Index, and for the hedge funds it's the HFRI Fund Weighted Composite Index. These are the same benchmarks Barber and Wang (2013) use. The Elite Comparison was also taken from the paper of these authors. From this table, we can see that the average return of all endowments is 8 percent. For the Ivy League universities the value until 2011 is at 11.9 percent, which is 3 percent higher than the average endowment return during the same timeframe. The Ivy League universities therefore outperform the equities and bond benchmark, but not the hedge fund or private equity indices during the same timeframe. Therefore, we can see that the mean of all endowment funds solely beat the mean of the foreign equity and the U.S. bond benchmark. A condensed graph of this data is visible in figure 5.

Table 2 in the annex shows the historic returns on an annual, 3-year, 5-year and 10-year basis based for the 808 funds in the NACUBO dataset. Among the five different size buckets during the last 10 years, there is not one size bucket which performs extraordinarily well. No size bucket achieves more than 5 percent return, which would be needed to satisfy the payout goals most universities adopt. Note that the value of the endowment funds still grows because of new donations. Interestingly, the groups which perform best are the groups with the most and the least total assets. They both achieve a 10-year annualized return of 5 percent. As already mentioned in the subchapter 3.1, the biggest group in the NACUBO dataset starts at $1 billion. If we would create another group to further differentiate between the biggest 50 percent in that category, the 10-year return would increase for

[10] SAT stands for "Scholastic Assessment Test" which is a standardized test used for universities' admissions. In the "Top SAT" category are 30 non Ivory League universities included whose freshmen have the highest average math SAT scores. Barber and Wang (2013) use this as an approximation of status.

that category even more. On the other side of the spectrum, the worst performing quartile stunningly underperforms various benchmarks with a net return of only 3.8 percent. The Higher Education Price Index (HEPI)[11] adjusted return equals merely to 1.1 percent, which shows how inefficiently the large number endowments make their investments. These recent numbers are in line with Barber and Wang (2013) who protocol that bottom performing endowments earn negative benchmark adjusted returns on a regular basis from -1.5 to -3 percent. The table also includes the returns of the two universities Harvard and Yale, which are included in the case study the thesis will present in the following chapter. Both universities perform better than the average endowment on a 3-year, 5-year, and 10-year basis, but in relative terms Harvard is behind their direct peers[12] performance-wise. Potential reasons are discussed in the case study.

Figure 5 - Endowment and benchmark percentage returns, 1991-2017



Notes: See Table 1 in the annex for the full dataset.

4.2 Asset Allocations

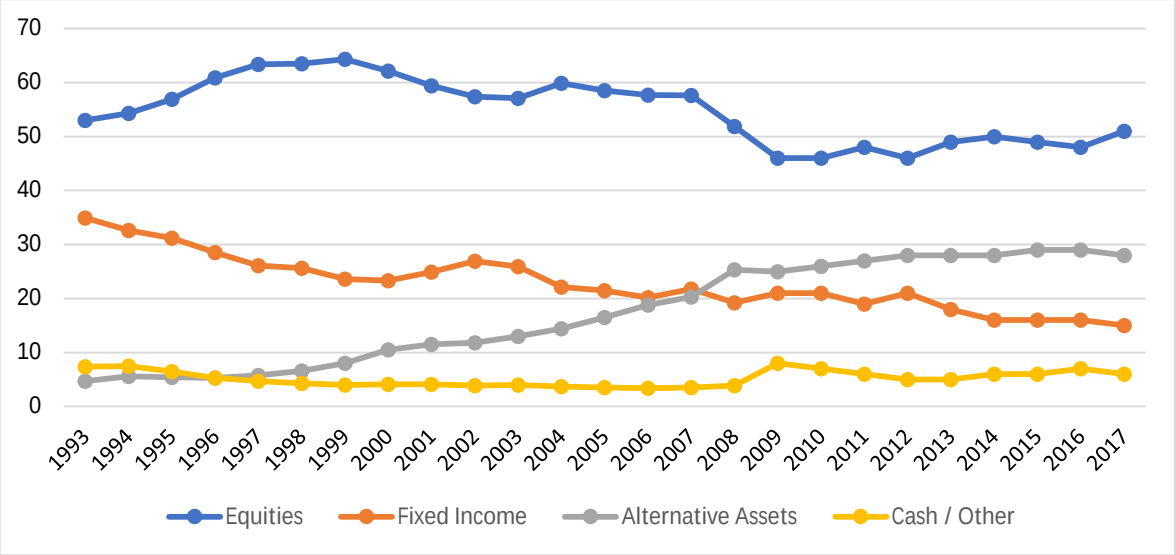
Asset Allocations tell us a lot about the investment beliefs of the university endowments. The figure 6 below displays the equally weighted asset allocations in percentages from 1993 to 2017. Note that during the sample period the classification of asset classes changed. The graph below is adjusted for that issue except for the fact that on-campus real estate is included in "Alternative Assets" from 1993 to 2008. Conversely however, from 2009 to 2017, on-campus real estate is included in "Cash & Others"

[11] The HEPI is an inflation index created by the Commonfund Institute. It is composed as an indicator for price movements in the higher education sector. Main components of the index are: university salaries, university supplies and materials, utilities, and university fringe benefits. In 2017 the HEPI equalled to 3.7 percent. (Commonfund Institute, 2017)

[12] "direct peers" is referring to other endowments with a notional value of 1 billion dollar or more.

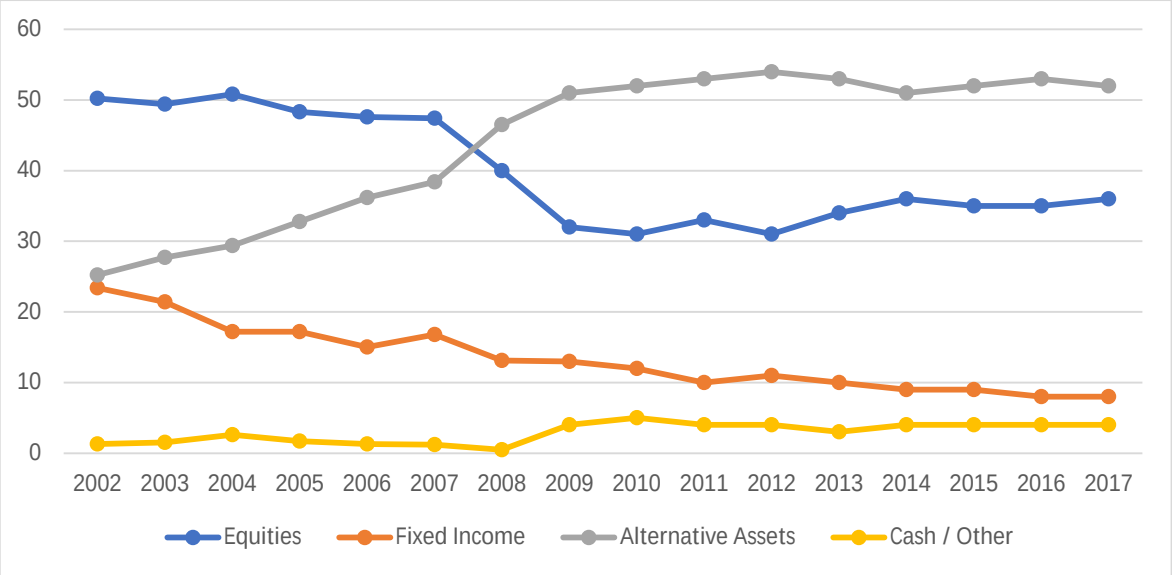
as it should be. As the on-campus asset allocation is never stated on its own, the classification can't be correctly fixed, but it distorts the results by a maximum of 1.5 percent. The graph illustrates the decline of fixed-income as an asset class and the rise of alternative assets. The proportion of alternative assets rose from 5 percent in 1993 to 28 percent in 2017. During the same time frame the proportion of fixed-income declined from 35 percent to 15 percent. The share of public equities fluctuated during that time, but by the end it slightly decreased. Note how the picture changes if we use dollar weighted returns as shown in figure 7. The data for dollar weighted returns is unfortunately only available for the years from 2002 to 2017. Here, we see a more elevated increase to Alternative Assets and a more drastic reduction in fixed-income and especially in public equities. The exact percentages for asset classes, which are also displayed here in the graphs, are included in the annex under table 3.

Figure 6 - Equally weighted asset allocations from 1993-2017



Notes: Alternative Assets definitions of NACUBO are used and include: LBOs, mezzanine, M&A funds, international private equity, hedge funds, absolute return, market neutral, long/short, 130/30, event-driven, derivatives, venture capital, private equity real estate (non-campus), energy, natural resources, managed futures and distressed debt. Source: NACUBO-Commonfund Study of Endowments (2009-2017) and NACUBO Endowment Study (2002-2008)

Figure 7 - Dollar Weighted Asset Allocations from 2002-2017



Notes: Alternative Assets definitions of NACUBO are used and include: LBOs, mezzanine, M&A funds, international private equity, hedge funds, absolute return, market neutral, long/short, 130/30, event-driven, derivatives, venture capital, private equity real estate (non-campus), energy, natural resources, managed futures and distressed debt. Source: NACUBO-Commonfund Study of Endowments (2009-2017) and NACUBO Endowment Study (2002-2008)

The tables 4, 5 and 6 in the annex show a detailed list of asset allocations per asset class by the size of the endowment's total asset value. The reduction of public equities from the very high value endowments explains the general decrease of the dollar weighed public equity share. For the group of 501$ million to 1$ billion (Over 1$ billion), the equity share decreased from 56 (45) percent to 42 (32). During the same time, the share for the group of an endowment size of 25 million dollars or less even slightly increased from 55 percent to 58 percent. These differences are in line with findings of Barber and Wang (2013), Lerner et al. (2008) and Ang et al. (2018). The smaller institutions do not have the capabilities to invest in the same asset classes as the bigger institutions. As table 2 of the previous paragraph shows, at least during the timeframe of the last 10 years it had not been a disadvantage for the smaller institutions, as their 5 percent 10-year annualized return was not beaten. Note that mid-size endowments seem to follow the trends of the big endowments but are not able to achieve the same returns. As mentioned earlier in this thesis, this seems to be the consequence of a later access and a smaller investment manager pool of smaller endowment funds.

Another distinction of smaller endowments compared to bigger ones is their differing choices of public equity investments. Table 7 in the annex shows dollar weighted domestic and foreign equity allocation in percentages by endowment size for the years 2009 to 2017. The table shows that big endowments comparatively tend to invest more in foreign equities lately, which also explains their increase in

general equity allocations from 2010 onwards. Although the smaller endowments have also increased their investments in foreign equity, they act with more restraint and still have their main focus on domestic equities. However, as smaller endowments usually adopt the strategies of bigger endowments after an uncertain period of years, it would not be unreasonable to expect that the relative portion of foreign equities will also increase for them in the future.

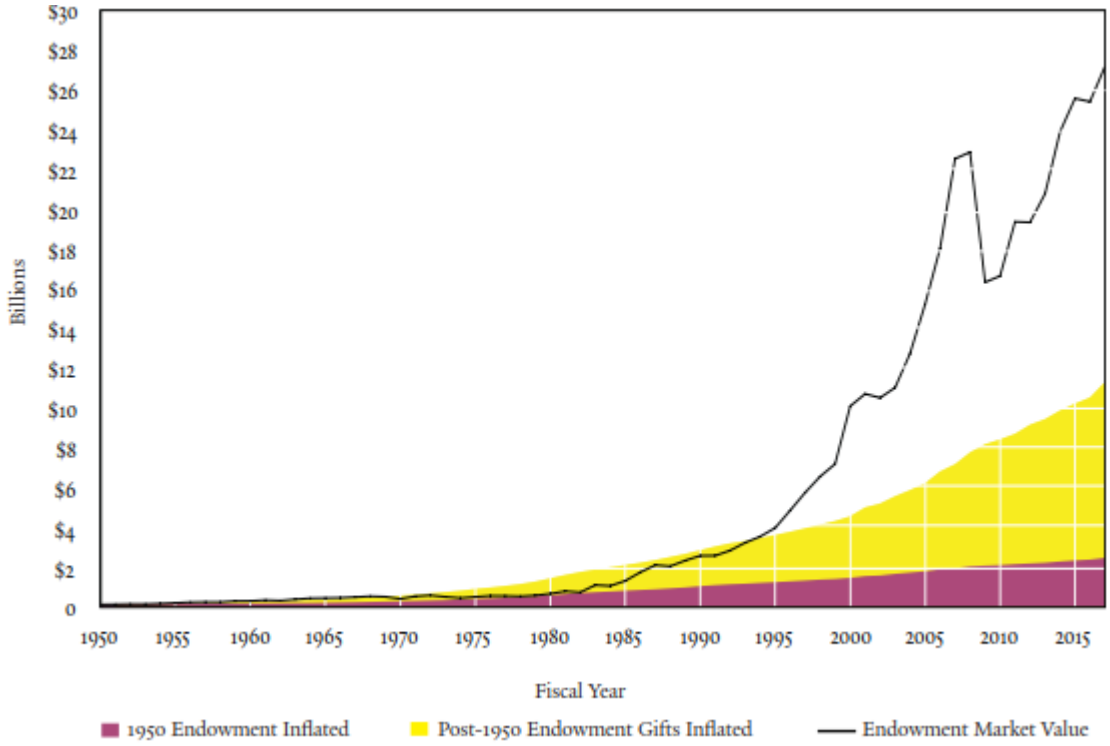
5. Case study: In-depth analysis of the university endowments of the Harvard University and Yale University

This section will give an in-depth analysis of the Harvard University's and the Yale University's endowment funds. The main source of data for the analysis are financial statements of these universities. The data from the financial statements is complemented by publications of stakeholders of these universities and publicly available tax filings.

5.1 The Yale University Endowment

Yale University is an American private Ivy League university, and is one of the oldest and most prestigious universities in the U.S.. Yale University's endowment fund is probably the best known of all endowments because of its CIO David Swensen. The former gained public recognition in the mainstream media with his book: "Pioneering portfolio management: An unconventional approach to institutional investment" (2000), in which he summarizes his knowledge and insights about institutional fund management from his long experience as an investment manager for Yale. As we can see in figure 8, the historic growth of Yale's endowment has been immense, especially if we account for the fact that the endowment also has yearly payouts it fulfils. After surpassing its pre-subprime mortgage debt crisis value level in 2014, the endowment is valued at $27.18 billion in 2017. This makes Yale the second most valuable university endowment fund after Harvard.

Figure 8 – Endowment Growth of the Yale Endowment from 1950-2017



Source: Yale University (2017)

5.1.1 Endowment Objective and Endowment Performance

Yale does not report any nominal long-term investment objectives, like the 8 to 10 percent the EUR spokesman released, but it obviously wants to make sure that it can continue to provide cash flows for the current operational budget while maintaining the endowment's value after inflation for future generations. To fulfil these two goals the endowment spending policy is based around a payout ratio calculated using a "hybrid method". The payout equals to the sum of 80 percent of last year's payout and 20 percent of the target long-term spending rate, which is set at 5.25 percent, multiplied to the value of the endowment taken from two years in the past each time. The payout has lower and upper boundaries of 4 and 6.5 percent of the endowment value (Yale University, 2017). As shown in the subchapter 2.2 of this thesis, only 9 percent of all endowments have a spending policy like Yale. The vast majority of endowments use a moving average (NCSE, 2017). Contrary to the findings of Brown, Dimmock, Kang, and Weisbenner (2014), the university is consistent in its policy and does not change payout ratio after a negative shock (Yale University, 2008-2010). The actual payout to the university in 2017 was $1.2 billion, which embodies circa one third of the whole university's income for that year. This is well above the peer average of 12.1 percent and the overall average of 2.5 percent of all endowments. This number clearly shows that Yale is largely dependent on the performance of the endowment.

In 2017, the performance of Yale's endowment underperformed with a return of 11.3 percent compared to the endowment average of 12.2 percent. Although one-year endowment performances certainly matter, the long-term comparison horizon provides more important information. During the last 10 years, the endowment realized annual net of fee returns of 6.6 percent which is 2 percent above the endowment average of 4.6 percent. It is also significantly above its peer-group average of 5 percent (NACUBO, 2018a).

5.1.2 Yale's sustainable and ethical investment policy

To comply with ethical and social standards Yale established the Advisory Committee on Investor Responsibility (ACIR) already in 1973 (Yale Investment Office, 2018). The main task of the committee is to advise on the voting of corporate proxies regarding ethical issues but also to establish divesting principles if needed. Guidelines published by the ACIR include the topics of tobacco companies, the Sudan genocide and associated oil companies, climate change, private prisons and assault weapon retailers. However, in most cases the ACIR does not recommend divesting but just note guidelines on how to vote on specific resolutions. An example would be to request tobacco companies to cease advertising tobacco products to minors. Only recently, in 2018, after several mass shootings, the ACIR adopted a policy which restricts Yale to invest in public assault weapon[13] retailers. Still, as this policy is only targeted towards the distribution of assault weapons, standard firearm distributors and in general all manufacturers of weapons are not included (Yale Investment Office, 2018).

Even in the few cases where divesting policies were issued, Yale is not obliged to act on it if it is invested in the company through a commingled fund (How the Investments Office Implements Yale's Ethical Investment Policies). It can be concluded that Yale's published framework on sustainable and ethical investments shines at first sight, but when it comes to the actual few implementations of ethical investment policies, the set policies can be labelled rudimentary at best.

5.1.3 Endowment investment beliefs and strategy

In their Endowment Report, the Yale University Endowment Investment Committee state that their portfolio is structured using a "combination of academic theory and informed market judgement." The theoretical framework it uses relies on the standard mean-variance analysis of Markowitz (1952) and Tobin (1958). A huge amount of academic research, critics, limitations, uses and adaptation to this model exists. Steinbach (2001) gives an overview of existing literature regarding the model. The mean-variation optimization model in its simple form is an analytical model which uses expected return, expected risk and expected correlation to calculate the efficient portfolio. There is no other

[13] In the U.S. assault weapon are typically semi-automatic rifles with detachable magazines.

portfolio with the same risk level which can achieve higher returns than the efficient portfolio. An obvious point of criticism is that the model uses assumptions about the future which are not perfectly accurate. Merton (1991) shows that the standard model fails to incorporate university specifics such as spending rules or financing needs. He argues that two universities with similar investment objectives and endowment characteristics can still have totally different optimal portfolios and spending patterns if their cash flows from other activities like tuition fees, research expenditures or teaching differs. Yale's CIO David Swensen also points out in his book (2000) that mean-variance optimization fails to consider important attributes such as liquidity and marketability. If the investor uses the mean-variance optimization to construct the efficient portfolio for his risk levels he needs to rebalance the portfolio on a frequent level using the most current risk and return inputs. While this might be more or less possible for bonds and equities where rebalancing is also not cost-free, it is especially difficult for alternative asset classes as natural resources, venture capital or leverage buyouts. Because of these limitations Swensen argues for including market judgements to adjust and critically interpret the outputs of the mean-variance optimization model. The Endowment Report of Yale University (2017) states the importance of "qualitative considerations" and even calls investment management "as much art as science". These qualitative judgements point out Yale's huge belief in active management and professional outside managers. This philosophy of management is visible in their asset allocations which are heavily based on asset classes that traditionally require more active management such as absolute return, leveraged buyouts, natural resources, real estate and venture capital. Their current portfolio of 2017 is divided into the following asset classes with the expected returns as shown in table 5.

Table 5 - Actual Asset Allocations of the Yale University Endowment Fund from 2013 to 2017

Asset Class	Actual 2017	Actual 2016	Actual 2015	Actual 2014	Actual 2013
Absolute Return	25.10	22.1	20.5	17.4	17.8
Domestic Equity	3.9	4	3.9	3.9	5.9
Fixed Income	4.6	4.9	4.9	4.9	4.9
Foreign Equity	15.2	14.9	14.7	11.5	9.8
Leveraged Buyout	14.2	14.7	16.2	19.3	21.9
Natural Resources	7.8	7.9	6.7	8.2	7.9
Real Estate	10.9	13	14	17.6	20.2
Venture Capital	17.1	16.2	16.3	13.7	10
Cash	1.2	2.3	2.8	3.5	1.6

Source: Yale University (2017)

Yale's current target asset mix has an expected net long term growth rate of 6.9 percent and an expected standard deviation of 15 percent.

As endowment funds don't need to comply with specific kinds of external regulations such as pension funds, they are not obliged to have any specific percentage of fixed-income securities in their portfolios. This enables the endowment funds to shift their asset allocation more towards alternative assets as shown in Capital 4.2 in this thesis. The endowment report (Yale University, 2017) states that the long-term target is to allocate 50 percent of their portfolio to illiquid asset classes as LBO, Natural Resources, Real Estate and Venture Capital. After the financial crisis in 2008 and the huge losses the endowment faced, the university made efforts to reduce illiquidity. When comparing the current asset allocation to the one 30 years ago, this shift is very clearly visible. In 1987, Domestic Equity and Domestic Bonds made up 80 percent of the whole endowment. In 2017, the two categories only comprised 8.5 percent of the portfolio. As explained in Swensen (2009), the belief in mainly investing into the Alternative Assets is based on their, in comparison to conventional asset classes like fixed-income, inefficient pricing. Therefore, inefficient pricing enables skilled active managers to outperform the market and achieve superior returns. Furthermore, the alternative assets also incorporate an illiquidity premium, which is especially favourable for endowments and their extremely long-term investment horizons. With a target rate of only 5 percent fixed-income is an asset class with a low allocation. As a general rule, fixed-income securities are less valuable for endowment funds compared to pension funds or insurance companies because endowment funds have fewer fixed liabilities they need to serve other than the yearly payout. Yale's allocation of 5 percent is a bit below the average among their direct peers which is at 7 percent, and the dollar weighted average allocation which is at 8 percent as table 5 in the annex shows. The Investment Committee also states another reason in the report why their fixed-income allocation is comparably low. The government bond market is one of the most efficiently priced ones and, investment managers at Yale are sceptical about the effectiveness of active bond management. Therefore, the Investment Office manages the bond portfolio completely internally. Additionally, in recent years interest rates were at a considerably low level, which makes the fixed-income markets even less attractive for endowment funds. From December 2008 to March 2018 the federal fund rate of the U.S. was constantly under 2 percent. However, it is possible that further increases of the federal fund rate will make fixed-income securities more attractive again in the future and stop the shrinkage of the average fixed-income allocations.

Yale's fixed-income portfolio is set up in a way that it has a low covariance with all the other asset classes in their portfolio serving as a hedge against unexpected financial accidents or phases of unexpected deflation. The Yale University endowment uses the "Barclays Capital one to three Year Treasury Index" as their benchmark for the portfolio. The expected return after inflation is 0.5 percent

with a risk or standard deviation of 3 percent. Both values are the lowest compared to the other asset classes (Yale University, 2017).

Another asset class which has a very low allocation with 4 percent is domestic equity. Yale's allocation differs substantially to other endowments in this category. This again can be explained in the university's investment beliefs to exploit the market with illiquidity and inefficiency premiums. The U.S. equity market is one of the most researched and traded markets in the world. Yale's strategy towards domestic equity is an active management approach by professional managers, which are hired because of their stock selection skills, and which are encouraged to invest in value stocks. Value stocks are stocks that are undervalued with regard to their fundamental economic values such as expected earnings. As this strategy leans more towards small cap stocks, Yale uses the "Wilshire 5000 Total Market Index" as its benchmark. Yale's portfolio has a real return after inflation and fees of 6 percent with a standard deviation of 18 percent. In a time span of 20 years the domestic equity portfolio realized returns of 12.2 percent per year (Yale University, 2017)[14]. The Foreign Equity Investments with an overall allocation of 15.5 percent, split up into 7 percent to foreign developed market equities and 8.5 percent allocation to emerging market equities, follow quite a similar strategy, but also provide some diversification benefits for the portfolio. Similar to the domestic equities, Yale follows an active management strategy, but as the foreign equity markets are less efficient and less researched the belief is that they can be exploited more than the domestic ones. Each capital allocation is scrutinized closely based to the individual country allocation within the portfolio (Yale University, 2017). The expected returns after fees and inflation equal to 6 percent for the developed portfolio and to 7.5 percent for the emerging markets portfolio. Subsequently, the associated standard deviations are 18 percent and 23 percent. As benchmark, Yale is using a composite benchmark, which is rebalanced and composed frequently according to the current investments and market exposures. In 2017, it was composed of the MSCI Europe, Australia and the EAFE Investable Market Index for the developed markets and out of the MSCI Emerging Markets Investable Market Index and the MSCI China A-Share Investable Market Index for the emerging markets. From 1997 to 2017 the annualized return of the foreign equities portfolio equals to 14.1 percent (Yale University, 2014; 2017).

[14] The stated returns by Yale are always given after fees. However, Yale calculates the return rates with time-weighted returns for marketable equities and absolute returns and with dollar-weighted internal rates of returns for real estate, leverage buyouts, natural resources and venture capital. This calculation leads to distortion in the results because it assumes that already realized returns can be re-invested with the same rate of return for all future periods to come. This in cooperation with the internet boom of the late nineties accelerates the venture capital annual returns to an unrealistic 106 percent (IRS, 2018).

The 7 percent allocation towards natural resources, such as agriculture, fossil fuels or timber, is used as a hedge against an unanticipated inflation, as a source for cash flows and to exploit inefficiencies which are created through market cycles. The expected returns after fees and inflation are 6.5 percent with a risk level of 24.5 percent. During a 20 years' time horizon starting back from 1997, Yale's annual returns match to 15.2 percent. Quite similar to the natural resources, the 10 percent allocation by Yale's endowment to real estate aims to bring more diversification, a steady income which generates cash flows, and a hedge for unanticipated inflation. Also, like natural resources the real estate market is heavily cyclical. Therefore, despite producing varying returns this cyclical quality can enable managers with a long-term investment horizon to generate substantial excess returns. In Swensen (2000) the author explains that historical data shows that most investors create high allocations during the peaks of the real estate market circle and allocate low when the market is at its lowest. Therefore, it is certainly possible for skilled investors to outperform the market if the investment horizon is of long enough duration. Swenson refers to a paper of Firstenberg, Ross, and Zisler (1988), which was released in the time of a real estate peak, as a negative example to show that even sophisticated researchers overestimate the explanatory power of historical data as well as the use of the mean-variance model. In the article of Firstenberg et al. (1988), the authors argue that funds should allocate more assets into real estate because of historic high returns, historic low risk and historic low correlations between real estate and marketable security markets. The expected real returns of the real estate portfolio for 2017 is 5.5 percent with a risk of 10 percent. The annual portfolio returns from 1997 to 2017 are 10.3 percent (Yale University, 2017).

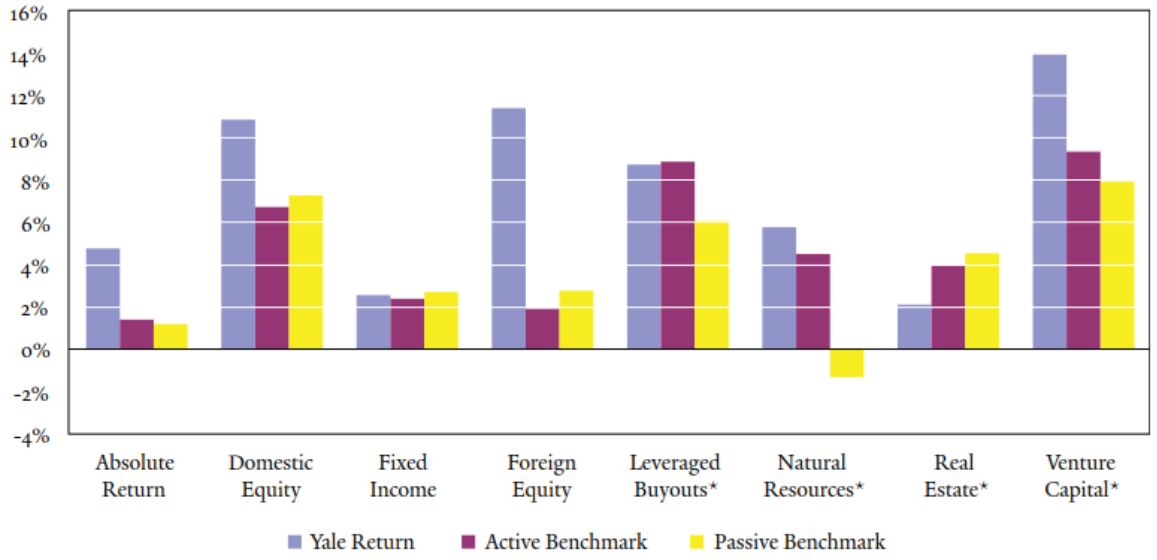
With a target allocation of 17 percent venture capital is the biggest asset class in Yale's portfolio in 2017. This asset is substantially higher than Yale's peer group allocation of 7 percent of assets. As the equally weighted endowment average of only 2 percent shows, investment by smaller endowments in venture capital are the exception. Yale was one of the first endowments which tried to step into the field of venture capital. Swensen (2000) explains Yale's investment beliefs by stressing that the key advantage of good investment performance in venture capital is "the ability to foster the development of early stage ventures" while just joining at the pre-IPO round of financing and just providing capital does not give any real value, as at this stage it is already a highly competitive environment. The strategy behind this is to add value due to operation improvements in an extremely early stage. As it is necessary to have managers to have an extensive network and early access through already established relationships, this strategy complies with the theories of Lerner et al. (2008) who also explain the success of the Ivy League endowments is mostly due to access, experience and timing. In 2017, the expected real returns of 16 percent incorporate a risk of 37.8 percent. The report states an annual time weighted-return of 25.5 percent during the period of 1997 to 2017. The second private

equity asset class is leveraged buyout with a target allocation of 14 percent. Yale's strategy towards leverage buyouts is to partner up with outside firm and establish a lasting relationship with them. Similar to Yale's venture capital strategy, this approach to leverage buyout roots rather on a value-added approach than to financial tweaking methods as explained in Swensen (2000). The calculated risk level of Yale's portfolio is 23.6% and its twenty-year annual returns are 12.6% in 2017 (Yale University, 2017).

The last separate asset class is absolute return which Yale uses to even further diversify its portfolio and to create relatively high long-run returns capitalizing on market inefficiencies. Generally, absolute return strategies differ from the other asset classes as their aim is to generate positive real returns in every state of the market. In practice, this does not always work. During the 2009 Financial Crisis the absolute return asset class realized a loss of 9.1 percent.[15] Yale's investment committee divides absolute return strategies into two different approaches. Firstly, event-driven strategies which take advantage of temporarily mispriced securities due to current events in the corporate world. These events can include, but are not limited, to: mergers and acquisitions, takeovers, bankruptcy, restructurings or spin-offs. Secondly, value-driven strategies, which exploit mispricing based on a different "true" economic value (Ineichen, 2003). In 2017 Yale allocated one fourth of their whole portfolio towards absolute return strategies, which equals to 6.8 billion dollar. It is the university's asset class with the highest allocation on average since its distinct differentiation from other asset classes in 1990 (Yale University, 2001-2017). The NCSE (2018a) does not list absolute return as an own asset class. However, for comparison purposes, the asset class marketable alternative strategies which includes event-driven strategies, absolute return, and market neutral strategies should be sufficient. The average university in a peer group with Yale allocates 5 percent less to marketable alternative strategies. Yale does not give any explanation why they increased the allocation towards absolute return strategies. One reason might be that the investment managers at Yale estimated a high uncertainty on future market movements and wanted to be relatively safe against any potential market movements which could hurt their equity positions. Other possible assets to secure their position as investment grade rated bonds currently do not possess enough yield to comply with Yale's investment objectives.

[15] Nevertheless, it achieved still the best performance between all equity-based securities of the portfolio.

Figure 9 – Yale returns by asset class compared to active and passive benchmarks, 2007-2017.



Notes: The returns of Yale and active benchmarks are dollar weighted and active benchmark returns are fee adjusted. Active benchmarks include: absolute return: Credit Suisse and HFRI Hedge Fund Composite; domestic equity: BNY Median Manager, U.S. Equity; fixed-income: BNY Median Manager, Fixed Income; foreign equity: BNY Median Manager Composite, Foreign Equity; leveraged buyouts: Cambridge Associates Leveraged Buyouts Composite; natural resources: Cambridge Associates Natural Resources; real estate: Cambridge Associates Real Estate; venture capital: Cambridge Associates Global Venture Capital. Passive benchmarks include: absolute return: Barclays 9-12 month treasury; domestic equity: Wilshire 5000; fixed-income: Barclays 1-3 Year Treasury, Barclays 1-5 Year Treasury and LB Treasury Index; foreign equity: blend of MSCI EAFE Investable Market Index, MSCI Emerging Markets Investable Market Index, MSCI China A-Share Investable Market Index; leveraged buyout: Blend of Russell 2000; MSCI ACWI ex-U.S. Small-Cap Index; natural resources: Blend of Custom Timber REIT Basket, S&P O&G Exploration & Production Index, Euromoney Global Mining Index; real estate: MSCI U.S. REIT Index; venture capital: Blend of Russell 2000 Technology, MSCI China Small-Cap Index, MSCI India Small-Cap Index. Source: Yale University (2017)

As shown in figure 9, Yale's investment managers beat most of their benchmarks on a consistent basis. It was Yale's investment office itself that created this figure to present to its donors, and the benchmarks are chosen by the University. Therefore, these figures are not necessarily objective, and this graphic can be used as an example for how the usage of specific benchmarks can reflect the agenda of the creator of a figure. Taking the 10-year annualized results of the "Barclays Aggregate Bond" as an example, as in table 2 of the annex, the benchmark performance would be higher.

5.1.4 Compensation of investment managers and fee structure

The fee structure of endowments is a topic that is widely discussed in media (Wyland, 2015, Fleischer, 2015). Data regarding the best payed employees is publicly available due to the IRS Form 990 non-profit tax documents. These tax filings show the university pays its internal investment staff way more than it does any other employees. For Yale University David Swenson is on top of this income list with a reported compensation of more than 4.4 million dollars for the fiscal year of 2016. This is more than three times the salary of Yale University's President, Peter Salovay, who received 1.2 million dollars.

Looking at the reported outside investment management fees, the reported fees vary very drastically as shown in table 6 with a more than 100 percent increase from 2015 to 2016 (Internal Revenue Service, 2017).

Table 6 – Yale Investment management fees as stated in the IRS tax form 990 for the years of 2009 to 2017 in million US$.

Fiscal Year	2016	2015	2014	2013	2012	2011	2010	2009	2008
Yale Investment Management Fees	124.5	54.8	49.9	90.9	97.4	71.8	82.2	82.3	130.4

Source: Internal Revenue Service (2009-2017).

Still these numbers appear quite small in relation to the amount of money which requires management, and it is not clear what exact costs and fees are in- or excluded in the data. It is very hard to estimate the actual management costs of an institution, as institutions have a high interest in keeping the data as confidential as possible to limit any potential negative effects on public relations. The NCSE used to publish estimates in the past but stopped this method after concluding that "data has typically understated the costs" (NCSE, 2018). This shows that even the national bureau which has a larger access to confidential data fails to deliver a proper and realistic estimate of investment management expenses.

A general strategy of Yale against agency problems arising with performance-based incentives is to align the incentives of external managers with the incentives of the university. Yale tries to do this with long-term incentive plans and co-investments by the managers. But basically, Swensen (Yale University, 2017) argues that people should not focus on fees endowments pay but on the after fee returns of these institutions. The debate of compensation for investment managers is a huge topic, and Swensen having a vested interest himself as a manger is arguably not a neutral participant in this debate.

5.2 Harvard University endowment

Harvard University's endowment fund is manged by the "Harvard Management Company" (HMC), which is a legal subsidiary of Harvard University. It was established in 1974 to "ensure Harvard University has the financial resources to confidently maintain and expand its pre-eminence in teaching, learning, and research for future generations." ("Supporting the Goals of Harvard", n.d.). The Endowment Reports of the HMC can be used as a very useful and interesting example for the investment beliefs and strategies of an endowment fund and how these beliefs can change due movements in markets or even due to personal beliefs of different governing executives. The endowment report of 2017 (Harvard Management Company, 2017) differs a lot from an usual endowment report, as it does not state any asset allocations and their returns, but discusses changes

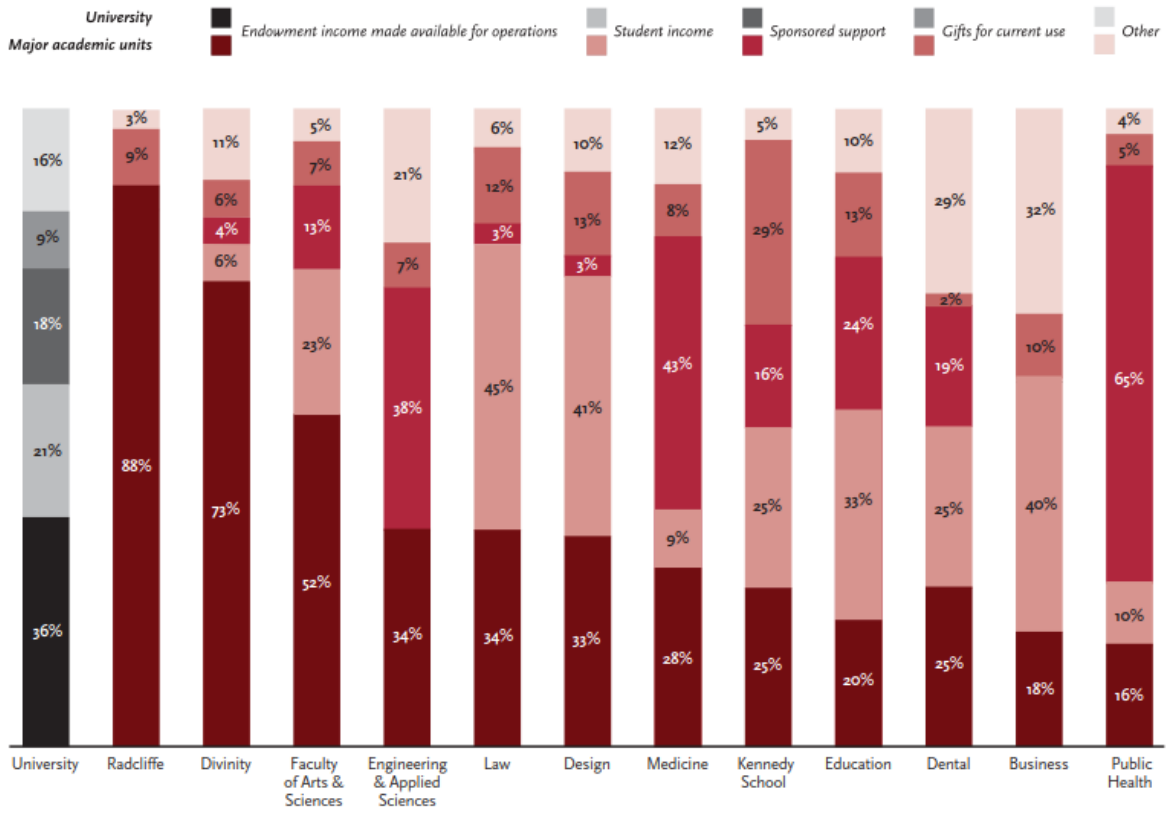
in the endowment's governance, risk framework and investment culture. Another interesting source for historic data is an in-house case study that focuses on the Harvard Management Company from 2010 by Andre Perold and Erik Stafford from the Harvard Business School.

5.2.1 Introduction

As of 2018, Harvard's endowment fund has a market value of 37 billion dollar which makes it the most valuable university endowment fund in the world. The 5.4% payout equals to roughly 1.8 billion dollars, which represents the highest proportion of the operational revenue of the fiscal year 2017 (Harvard University, 2017). It is noteworthy that in addition to the donations to the endowment, the university also has a large pool of donors who do not contribute their money to the endowment fund, but rather directly gift it to the university for current use. In the fiscal year 2017 these gifts for current use were valued at 450 million dollars. It is possible that some donors have problems with some characteristics of the management of the endowment fund, for example the high fees given to investment managers or the low payout rates, which may lead to a discrimination of current generations. As displayed in the figure 10 below, the relative proportions of the sources of operating revenue per college/faculty vary substantially. Some departments have better possibilities to receive other sources of funding than others. The Public Health Department for instance gets a high share of federal funding because of its specific activities, and therefore does not rely on endowment income as much. The Radcliffe Institute for Advanced Study, a former female-only college historically connected with women rights activities, has the highest share of endowment revenue.[16]

[16] In 1995 the committee for the equity of women at Harvard chose to boycott the fundraising campaigns of Harvard, but established a women's faculty fund which was set up as an escrow account and in 2000 was released to the college after the former female-only Radcliffe College and Harvard University merged in 1999.

Figure 10 – Sources of operating revenue (fiscal year 2017)



Source: Harvard University. Financial report, fiscal year 2017.

Table 8 in the annex shows the value of the endowments for the years from 1980 to 2018, the endowment spending in absolute terms, the endowment spending in relative terms as a percentage of the endowment value and lastly, as a percentage of the universities budget. We can see that since the creation of the endowment fund, its contributions to the university's revenue have increased considerably. Since 1980 the endowment's nominal spending has increased from 740 million to 1.8 billion dollars in 2018. In line with the nominal increase, the percentage of the budget contributed by the endowment more than doubled from 1980 to 2008. This development makes the university vulnerable to the volatility of the markets, and has real consequences for the university's operational decision making as Brown et al. (2014) show in their study. As seen from Harvard's perspective, the university really has no choice other than making these volatile, market-dependent investments; raising Harvard's already high tuition fees is no viable alternative due to further exacerbating social inequality. Unless the political landscape in the U.S. changes with more public funding to private universities like Harvard, the former will continue to heavily rely on endowments for funding their operational activities.

5.2.2 Endowment Objective and Performance

In general terms, the "goal" of the endowment is, as explained in previous chapters, to preserve the real value of the endowment and its income distribution to the university in perpetuity. The nominal value therefore must be adjusted with Harvard expenses growth, which can be estimated using the higher education price index. In 2015, the HMC set three specific objectives to achieve this goal. The first goal is to achieve a real return of at least 5 percent on a rolling ten-year basis after adjusting for inflation by the HEPI. The second target is an aggregated 1 percent outperformance compared to the industry benchmark on a five-year annualized basis. The third objective directly compares Harvard's performance with the performance of its peers and aims for Harvard to be in the top quartile of the ten highest value endowments in the US on a 5-year annualized basis (Harvard Management Company, 2015).

In addition to these objectives, Harvard wants to maintain a portfolio liquidity of 5 percent, which can be realized in 30 days. Table 9 of the annex shows that in 2009, 26 percent of the assets can be liquidated in a 30 days' timeframe. Therefore, at least in that year this objective was reached easily. For more recent years Harvard has not disclosed any information on exact liquidity numbers, but just reported that they have an adequate liquidity management program in place. The following subchapter shows that recently the proportion of alternative assets, which are less liquid, increased compared to 2009. Therefore, it can be assumed, that the proportion of the portfolio which can be liquidated in the next 30 days will be lower than in 2009. On the other hand, the university has a larger pool of cash and cash equivalents at its disposal in case of any unexpected outflows. In 2017, the university estimated to have 4.4 billion cash and cash equivalents available, which have a maximum maturity of three months or less, plus additional 3.2 billion U.S. government securities for immediate short-term needs. Liquidity is a less "flashy" objective as returns, but it is an unneglectable factor for endowments too. During the 2008 Financial Crisis, Harvard faced serious illiquidity issues, and the endowment had a negative cash balance of 7 percent, and together with additional leverage in certain asset classes, the overall leverage of the endowment exceeded 20 percent. During that time the portfolio liquidity still was more than four times higher than the set objective of 5 percent. A higher liquidity does not only ensure that the endowment can sustain the financial needs of the institution, but also ensures that the endowment can always take on favourable investment opportunities in times of market turmoil. In general, the possibility to invest in these kinds of adverse scenarios should be an advantage of an endowment over other type of funds who more heavily depend on investor decisions.

The goal of the third objective is mostly status, or in other words, prestige related. A return comparison with only nine other peer endowments seems rather unhelpful and is not connected to

the actual goal of the endowment. This "competition" based comparison can lead to unnecessary risks. Furthermore, the objective is overly ambitious as historic data indicates that Harvard has failed to comply with this objective in all the years of 2009 to 2017.

In 2017 the return of Harvard's endowment was 8.1 percent, so the university underperformed by more than 4 percent compared to the general endowment average of 12.2 percent. The three-year annualized return stands at 4 percent, which is not enough to fulfil Harvard's objectives and reflects the fund's poor performance in recent years. In the same years, the CEO of HMC changed three times. This fluctuation and inconsistency in management is harmful for an endowment fund. As Lerner et al. (2008) explain, one of the reasons why some endowments are more successful than others, is that they have better access to good investment opportunities, which are not accessible to all endowments. However, frequent changes in the managing personnel and the relating differing opinions on investment strategy can make an endowment fund an unreliable long-term partner for other firms or funds, and it therefore ceases to receive as many private investment opportunities. The new CEO of the HMC, Narv Narvekar, (HMC, 2017) explains that under his guidance Harvard seeks to re-establish their reputation again to be an attractive and reliable investment partner.

5.2.3 Harvard's sustainable and ethical investment policy

There is a lot of literature available on the topic of "environmental, social, and governance" (ESG) factor-based investing. However, it is not in the scope of this thesis to discuss this topic on a general level. The authors Friede, Busch and Bassen (2015) made an overview research paper of the influence of ESG's and financial performance.

Like most endowments, Harvard has an "environmental, social, and governance" (ESG)-integration framework in place. As part of their framework Harvard signed the United Nations supported Principles for Responsible Investment (PRI). As the PRI are completely voluntarily, not binding and for outsiders impossible to scrutinize, the relevancy of such framework can be questioned. On the HMC website it is written that:

"[…] the University maintains a strong presumption against divesting investment assets for reasons unrelated to the endowment's financial strength and its capacity to further Harvard's academic goals. Harvard conceives of the endowment fundamentally as an economic resource, not as a lever to advance political positions or to exert economic pressure for social purposes, which could entail serious risks to the independence of the academic enterprise and the ideal of free inquiry." (Investing for the Long-Term).

This seems to show that although there is officially an ESG integration in place it is definitely not a priority of Harvard. Still, in the past there were some occasions in which the University instructed the HMC not to own shares in certain companies, the shares of tobacco companies are an example of these. These restrictions however, do not count for comingled funds where Harvard is not the only investor. Additionally, the companies Harvard is invested in show that the ESG factors are not necessarily strict. Naturally, it is not publicly disclosed in which equities Harvard is invested in but there is an annual publication of the "Advisory Committee on Shareholder Responsibility" about recommendations on how Harvard should vote its shares. This report shows that Harvard has voting rights of companies such as Facebook, Pfizer and Chevron (Harvard University Corporation Committee on Shareholder Responsibility, 2018). Especially the multinational energy corporation Chevron is associated with numerous violations against the environment. This example shows that although an ESG framework officially exists, it is not clear how much of an influence in the investment decision-making it really has.

5.2.4 Harvard's endowment investment belief and strategy

Table 7 displays that historically Harvard used a hybrid model with regards to its internal and external investments, but in recent years shifted more and more towards external management of investments. In 1998, 69 percent of all assets were invested and overseen by internal managers. Over the next ten years, this proportion decreased to 33 percent by 2009. The stated reason for the decrease were several spinouts of investment managers and teams, which left the HMC to open up their own investment firms. These firms then continued to manage assets of the endowment as external partners. Although the HMC report states that the HMC achieves favourably fee arrangement through these kinds of ties, it is likely that the same managers' compensation was lower by the time they still worked internally. In 2010 the internally managed assets only consisted of publicly traded assets and the Natural Resources portfolio which entails long-term direct investments in timber and agricultural land that are controlled by the HMC (Perold and Stafford, 2010).

Table 7 - Percentage of assets invested with internal and external managers

Percentage of Assets Invested:	98	99	00	01	02	03	04	05	06	07	08	09
Internal	69	61	62	74	62	62	55	49	43	38	34	33
External	26	33	36	32	46	43	43	52	61	68	73	64
Cash	5	6	2	(6)	(8)	(4)	2	(1)	(4)	(5)	(7)	3

Notes: Proportions for the years of 2010-2018 are not published but qualitative comments of HMC executives suggest that the trend continues and the share of internal managed investments decreased further. Source: Perold and Stefford (2010)

Narvekar (HMC, 2017) proposes to intensify the shift from internal management to external management even more. This shift especially targets the management of public assets, while the natural resource portfolio should remain internally managed. The aim of this change is to create a broader pool of investment managers to pick from for Harvard. This proposed intensity of outsourcing, however, is uncommon among Harvard's peer endowments. While hiring a substantial number of outside managers only 14 percent of the endowments with a value of 1 billion or more, Harvard's peer endowment class, report that they "substantially outsource" their investment functions. However, when taking the whole sample of all endowments (not just Harvard's peer group), nearly half of them report that they have substantially outsourced their investment functions (NCS, 2017).

Although the shift towards external management gives Harvard a broader access to highly skilled investment managers, it simultaneously increases Harvard's exposure towards illiquidity risks. Assets invested in funds, geared towards private equity, real estate or similar alternative assets, where Harvard does not have full control, often incorporate provisions which restrict Harvard from liquidating them. These restrictions can be lockup periods, which disable the withdrawal of assets, gate provisions or a limited redemption frequency and redemption notice. During the financial crisis the endowment already endured substantial illiquidity problems as the markets and interest rates were moving downwards and collateral needs for debt swaps increased (Perold and Stafford, 2010).

Table 8 below shows the historical asset allocations of the endowment from 1992 to 2016. The data confirms the trends of a general shift towards alternative assets, as observed by researchers on a broader scale. In 2016, the Public Equity portfolio represented only half of the share of its proportion compared to 1992. A similar trend is visible for the bond portfolio, which also decreased from 22 percent to 12.5 percent during the previously mentioned time frame. Public equities also shifted from domestic equities to emerging equities, which are less efficiently priced and have more active management potential. In the bond asset allocations, this shift is not visible, but this aberration from the trend can easily be explained with the low interest rate environment that prevails in Europe, as a result of the low base rate and the corresponding "Quantitative Easing" program of the European Central Bank. These low interest rates make investing in the European bond market especially unattractive for institutional investors who do not need to fulfil any bond-holding requirements. The proportion of alternative assets on the other side more than doubled during the same timeframe from 25 percent in 1992 to 58.5 percent in 2016. Especially private equities stand out in the year of 2016 and comprise one fifth of the total assets. As investing directly in private equities is not as straight-forward as it is for public equities, the returns of this asset class is not only dependent on good investment-picking qualities, but also contingent on the amount of opportunities for investment

accessible to the investor. This development again shows the increased importance of good networks for the success of an endowment as demonstrated by Binfare et al. (2018).

Also, the different values in the cash holdings include some information. As the previous chapter mentioned, the endowment previously used leverage strategically to increase returns but then ran into difficulties and additional negative returns because of that strategy during the 2008 Financial Crisis. Since then the university has changed the policy and does not take advantage of negative cash holdings anymore for liquidity reasons.

Table 8 - The historical asset allocations of Harvard's endowment from 1992 to 2016 in percent.

Asset Class	1992	1996	2000	2004	2008	2010	2014	2016
Domestic equities	40	36	22	15	12	11	11	10,5
Foreign equities	18	15	15	10	12	11	11	7
Emerging markets	-	9	9	5	10	11	11	11,5
Total:	58	60	46	30	34	33	33	29
Private equities	12	15	15	13	11	13	16	20
Absolute return	-	-	5	12	18	16	15	14
Commodities*	6	3	6	13	17	14	15	10
Real estate	7	7	7	10	9	9	10	14,5
Total:	25	25	33	48	55	52	56	58,5
Domestic bonds	15	13	10	11	5	4	**	9
Foreign bonds	5	5	4	5	3	2	**	1
Inflation-indexed bonds	-	-	7	6	7	5	**	2
High-yield	2	2	3	5	1	2	**	0,5
Total:	22	20	24	27	16	13	11	12,5
Cash	-5	-5	-3	-5	-5	2	0	0

Notes: *Commodities and Natural Resources are grouped together. ** For the year 2014 only the cumulated percentage invested in Fixed-income was disclosed. Source: Perold and Stafford (2010) and Harvard University (2014; 2016)

Using the information from chapters four and five we can use the results to create a list of investments beliefs of Harvard University. Some of the beliefs are directly stated by the university but most of the beliefs have to be inferred from the data.

1. Active Investing

   As most of all endowments, Harvard follows an active investment approach. The asset allocations in table 8 are in line with this approach as it shows that Harvard is primarily invested in alternative asset classes which typically require more active investing.

2. Illiquid premium

Harvard is mainly invested in illiquid assets which include an illiquid premium. Although we do not have recent exact data on the maturity and liquidity of Harvard's assets, we can use the data from 2009 and the current asset allocations to make an educated sound guess on the liquidity as mentioned in the previous subchapter. The table 9 in the annex shows that in 2009, 44 percent of all assets could not be liquidated in the next five years. This illiquidity preference is also visible in Harvard's asset allocations as Harvard is mainly invested in illiquid assets such as private equities, commodities, real estate and absolute return funds and less in liquid assets such as bonds.

3. Focus on long-term returns

Closely connected to the previous investment belief is Harvard's very long-term investment orientation. Harvard does not focus on short-term volatility targets to achieve returns from day-to-day market returns but focusses on the long-term forecasts and assumptions about assets. Again, alternative assets fit well with this investment beliefs as alternative assets are in most cases not valued on a day-to-day basis, often only add value after a specific time and have relatively high transaction costs.

4. External investment managers

As explained in the previous paragraph, Harvard recently changed its investment approach from a hybrid model to an external investment approach to benefit from the investment expertise of the whole market and not only of internally available investment managers.

5. Generalist model investing

Historically, Harvard followed a "silo investment model" for their investment portfolio. A silo model means, that the portfolio managers only worked and invested in their specific division of the portfolio and made their investment choices independently from the investments of other asset classes. Recently Harvard has changed this model towards a "generalist investment model". In this model the whole investment team at Harvard is responsible for the total performance of the endowment and not only for their respective division. Additionally, investment decisions are discussed and evaluated not only within but across all asset classes (HMC, 2017).

6. Risk allocation framework

Since 2017 Harvard has changed from an asset allocation approach to a risk allocation approach. This risk allocation framework incorporates a total risk estimate of the whole portfolio instead of only the risk of the respective divisions. With the risk allocation framework, Harvard also steps

away from using a policy portfolio as specific risk levels can be theoretically achieved independently on the allocations of the asset classes.

7. Compensation of managers is related to the performance of the whole portfolio

As the compensation framework is closely connected to the investment activities, the way of compensation can also be classified as an investment belief. As most endowments, Harvard's compensation policy is performance based (NACUBO, 2018a). The special thing is that the compensation of any investor is depended on the performance of the whole portfolio and not on the sub-portfolio or the personal performance of the individual investment manager. Furthermore, connected to the third investment belief, the compensation will be based on a five-year look back period and therefore there are incentives to invest in more medium- or long-term investments rather than to focus on short-term returns.

5.2.5 Compensation of Investment Managers

Just as in the example of Yale, for the compensation of internal and external investment managers the IRS tax forms can give us some insights into Harvard's case. However, there is already one major difference between the two universities from the outset. Harvard has its own legal entity with the "HMC". Therefore, the internal investment managers are not mentioned in the IRS 990 form of the university, but the HMC files an own 990 tax form instead. In the fiscal year of 2016, the highest compensated employee of the HMC was Daniel Cummings, the Managing Director of Real Estate, with a compensation of 23.8 million dollars—this is more than the salaries of the deans of all faculties combined. For the new CEO, Narv Narvekar, the stated compensation of 58,000 dollar has to be taken with a pinch of salt. After all, the former CEO, Stephen Blyth, received 14.8 million dollars for the fiscal year of 2015 (Internal Revenue Service, 2016-2017a). The reason for the recent low compensation of Narvekar is most likely connected to the fact that he just started his position, and that his compensation is linked to certain investment goals.

Table 9 - Harvard's Investment management fees as stated in the IRS tax form 990 for the years 2009 to 2017 in million US$.

Fiscal Year	2016	2015	2014	2013	2012	2011	2010	2009	2008
Harvard Investment Management Fees	231.3	171.7	210.6	177.4	166.4	141.2	118.4	110.9	131.8

Source: Internal Revenue Service (2009-2017b).

6. Conclusions

It can be concluded that the investment beliefs and strategies of U.S. endowment funds are geared towards alternative assets and especially the two private equity asset classes, venture capital and leverage buyout. This shift towards these asset classes clearly benefited some endowments as visible in the case study and the NACUBO data. However, it must be stated that because the nature and characteristics of endowments vary so significantly, a strategy which is profitable for one endowment doesn't necessarily imply it can or should be adopted by another endowment. To return back to the hypothesis H_0: "New or starting endowments should mimic the behaviour of established and successful endowments", the findings of this master thesis reject it. Chapter 2 showed evidence, that only a very small group of endowments are able to generate an alpha and only during certain time periods. The vast majority of the endowments do not beat a simple 60/40 equity/bond portfolio on a consistent basis. Although the case study in chapter 5 showed that at least Yale and Harvard showed relative consistent high long-term returns, these two endowments have unique characteristics which starting endowments do not possess. The sheer size of the endowments allows them to take part in investments which are not accessible to starting endowments. Some of the alternative asset investment opportunities require high entry amounts which cannot be paid by smaller endowments. Additionally, their size also enables the biggest endowments to pay higher fees in absolute terms which in comparison to their size are still relatively lower than the fees smaller endowments would pay. Another evidence against the hypothesis is that already established endowments have long lasting relationships with investment firms which give them preferential access to private investment opportunities. The new endowments eventually can just invest in aggregated fund of funds instead of direct funds which limit the possibilities even further (Binfare et al., 2018).

To sum up, especially the smaller endowments should be very careful to mimic the active management strategies of the Ivy League investments, which are incredibly fee intensive and require highly experienced and skilled managers. The 8 to 10 percent return goal for the Erasmus University Endowment, which was set by the chairman of the Erasmus Trustfonds, Michiel Muller, seems a bit too ambitious in the long term if the university doesn't want to reach exorbitant risk levels. A 10-year annualized return of 4.5 to 5 percent as is shown in table 1 of the appendix would be a more realistic goal for the beginning. Following the suggestions of Ang et al. (2018), a more conservative and rather passive investing approach should be used for the starting years. The case study of the two Ivy League Universities, Harvard and Yale, showed that over the years these institutions have slowly but steadily increased their endowment to the size that it is today. The investment strategies of their past significantly differ from their investment strategies of recent years. These changes in strategy are certainly market-driven, but this is not the only explanation. Instead, a large part of an optimal

investment strategy for an institution depends on the individual institutional characteristics of an endowment and the underlying university. Following the findings of Merton (1991) for determining an optimal investing strategy, other characteristics of the endowment have to be specified first. How will the payout ratio be defined? Will there be any programs to mitigate conflict of interests? What compensation framework should the endowment use? There are a lot of different questions that should be asked in the beginning by the board of trustees to establish a solid ground to work from.

As the EUR will be a new player in the fund industry with a limited amount of assets as the principal, it will not have the same investing opportunities in alternative investments, as the already established Ivy League endowments. Furthermore, it can be doubted that future will hold the same returns on similar assets as the past. And even Ivy League endowments were not invincible, it became apparent that, in times of high managing personnel fluctuations the returns of the endowment were negatively affected. Therefore, the university should try to establish a good surrounding framework for its endowment. This framework includes:

- A stable endowment board which optimally consists of board members who have a financial background and/or have a good network which enables superior investment opportunities.
- A program to mitigate problems related to any potential conflicts of interest that minimises the misuse of funds, and as the fund is not supervised through outside investors these mechanisms have to be implemented by the board itself internally.
- As a measurement to avoid chasing away potential donors, an ESG framework should be implemented to mitigate bad PR which would arise from investing in weapon stocks or similar[17]. The framework does not necessarily need to be very strict as the example of Harvard showed in chapter five.
- A comparably high proportion of low-fee investment management for the beginning is suggested, as high external fees would be especially unfavourable for the endowments returns in regard to its relatively small size. Additionally, high external management fees would, most likely, result in bad PR. This effect was already visible in the U.S. when the compensation of investment managers was publicly leaked. However, in the Netherlands this effect would be intensified, as the society is more egalitarian driven than the U.S.. Negative

[17] An illustrative negative example is the case of the Northeastern University in Boston, a university which has always prominently advertised itself as the forefront of sustainability, whereas it received a lot of negative PR when it was discovered through the paradise papers that the university invested in an offshore hedge fund specialized in oil and shale gas exploration based in the Cayman Islands (Pilkington, November 2017).

PR leads to a decreased pool of donors who do not want to contribute money if they believe that at the end they are paying the fees of investment managers with their own money.

Interesting topics for future research relate to the last point of the suggested framework. As for the compensation of investment managers, there is only some literature available on the topic of portfolio managers of hedge funds or other for-profit organisations, but there is no study which investigates the effect of endowment managers' compensation on the returns of an endowment. Additionally, another interesting topic for further research could be the investigation of any possible impacts of managers' compensation on the behaviour of donors.

References

Alumni contribute 26 million euros to new endowment fund. (2017). Retrieved from https://www.eur.nl/en/news/alumni-contribute-26-million-euros-new-endowment-fund

Ang, A., Ayala, A., & Goetzmann, W. (2018). Investment beliefs of endowments. European Financial Management,24(1), 3-33. doi:10.1111/eufm.12149

Barber, B., & Wang, G. (2013). Do (Some) university endowments earn alpha? Financial Analysts Journal, 69(5), 26-44. Retrieved from https://doi.org/10.2469/faj.v69.n5.4

Brinson, G., Hood, L., & Beebower, G. (1986). Determinants of portfolio performance. Financial Analysts Journal, 42(4), 39-39. Retrieved from https://doi.org/10.2469/faj.v51.n1.1869

Brinson, G., Singer, B., & Beebower, G. (1991). Determinants of portfolio performance: An update. Financial Analysts Journal, 47(3), 40-40. Retrieved from https://doi.org/10.2469/faj.v47.n3.40

Brown, J., Dimmock, S., Kang, J., Richardson, D., & Weisbenner, S. (2011). The Governance of University Endowments: Insights from a TIAA-CREF Institute Survey. TIAA-CREF Research Dialogue Issue no. 102. Retrieved from https://www.tiaainstitute.org/sites/default/files/presentations/2017-02/102b.pdf

Brown, J., Dimmock, S., Kang, J., & Weisbenner, S. (2014). How university endowments respond to financial market shocks: Evidence and implications. The American Economic Review, 104(3), 931-962. doi:10.1257/aer.104.3.931

Brown, K., Garlappi, L., & Tiu, C. (2010). Asset allocation and portfolio performance: Evidence from university endowment funds. Journal of Financial Markets, 13(2), 268-294. doi:10.1016/j.finmar.2009.12.001

Chevalier, J., & Ellison, G. (1997). Risk Taking by Mutual Funds as a Response to Incentives. Journal of Political Economy, 105(6), 1167-1200. doi: 10.1086/516389

Commonfund Institute. (2017). Commonfund Higher Education Price Index – 2017 Update. Retrieved from https://www.commonfund.org/wp-content/uploads/2017/12/2017-HEPI-Report.pdf

Dahiya, S. & Yermack, D. (2018), Investment Returns and Distribution Policies of Non-Profit Endowment Funds. European Corporate Governance Institute (ECGI) - Finance Working Paper No. 582/2018. Retrieved from http://dx.doi.org/10.2139/ssrn.3291117

Desai, M., & Yetman, R. (2015). Constraining managers without owners: Governance of the not-for-Profit enterprise. Journal of Governmental & Nonprofit Accounting, 4(1), 53-72. doi:10.2308/ogna-51138

European Central Bank. Retrieved from https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html

Endowment. (2018) In Oxford Dictionary of English. Retrieved from https://en.oxforddictionaries.com/definition/endowment

Ehrenberg, R. G. (2009). Demystifying endowments [Electronic version]. TIAA-CREF. Retrieved from https://digitalcommons.ilr.cornell.edu/reports/41/

Firstenberg, P., Ross, S., & Zisler, R. (1988). Real estate: The whole story. Journal of Portfolio Management, 14(3), 22-22. Retrieved from https://doi.org/10.3905/jpm.1988.409154

Fleischer, V. (2015, August 15). Stop Universities From Hoarding Money. The New York Times. Retrieved from https://www.nytimes.com/2015/08/19/opinion/stop-universities-from-hoarding-money.html

Franzoni, F., Nowak, E., & Phallipou, L. (2012). Private equity performance and liquidity risk. The Journal of Finance, 67(6), 2341-2373. Retrieved from https://dx.doi.org/10.2139/ssrn.1517044

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. Journal of Sustainable Finance & Investment, 5(4), 210–233. doi: 10.1080/20430795.2015.1118917.

Goetzmann, W., Griswold, W., & Tseng, Y. (2010). Educational Endowments in Crises. Journal of Portfolio Management 36(4):112–23. Retrieved from https://doi.org/10.3905/jpm.2010.36.4.112

Goetzmann, W., Oster, S., & National Bureau of Economic Research. (2012). Competition among university endowments (Nber working paper series, no. 18173). Cambridge, Mass.: National Bureau of Economic Research. doi:10.3386/w18173

Hansmann, H. (1990). Why do universities have endowments? The Journal of Legal Studies, 19(1), 3-42. doi:10.1086/467841

Harris, R., Jenkinson, T., & Kaplan, S. (2014). Private equity performance: What do we know? The Journal of Finance, 69(5), 1851-1851. Retrieved from https://doi.org/10.1111/jofi.12154

Harvard Management Company. (2015-2017). Annual Endowment Report 2015-2017. Retrieved from http://www.hmc.harvard.edu/about-hmc/performance-history.html

Harvard University. (2004-2017). Financial Report Fiscal Year 2004-2017. Retrieved from https://finance.harvard.edu/annual-report

Harvard University Corporation Committee on Shareholder Responsibility (CCSR). (2018). CCSR Annual Report 2018. Retrieved from https://www.harvard.edu/sites/default/files/content/CCSR%20Annual%20Report%202018%20-%20FINAL-c.pdf

Hernandez, J., C. (2008). Betrayed by Madoff, Yeshiva U. Adds a Lesson. New York Times. Retrieved from https://www.nytimes.com/2008/12/23/nyregion/23yeshiva.html

Hensel, C., Ezra, D., & John H. Ilkiw. (1991). The Importance of the Asset Allocation Decision. Financial Analysts Journal, 47(4), 65-72. Retrieved from http://www.jstor.org/stable/4479458

How the Investments Office Implements Yale's Ethical Investment Policies. (n.d.). Retrieved from https://static1.squarespace.com/static/55db7b87e4b0dca22fba2438/t/5bbcf540c830256cbbd1cbfb/1539110208355/Implementation+of+Ethical+Investment+Policies.pdf

Ibbotson, R. (2010). The importance of asset allocation. Financial Analysts Journal, 66(2), 18-20. Retrieved from https://www.jstor.org/stable/27809175

Ibbotson, R., & Kaplan, P. (2000). Does asset allocation policy explain 40, 90, or 100 percent of performance? Financial Analysts Journal, 56(1), 26-33. Retrieved from https://doi.org/10.2469/faj.v56.n1.2327

Ibbotson, R. G., Chen, P., C.F.A., & Zhu, K. X. (2011). The ABCs of hedge funds: Alphas, betas, and costs. Financial Analysts Journal, 67(1), 15-25. Retrieved from https://doi.org/10.2469/faj.v67.n1.6

Ineichen, A. (2003). Absolute returns: The risk and opportunities of hedge fund investing (The wiley finance series). New York: John Wiley & Sons.

INSEAD. (2017). Investing INSEAD's Endowment 2016/2017. Retrieved from: https://www.insead.edu/sites/default/files/assets/dept/alumni/docs/Investing_INSEAD_s_Endowment_2016-2017.pdf

Internal Revenue Service. (2018). Tax on Net Investment Income of Private Foundations: Reduction in tax. Retrieved from https://www.irs.gov/charities-non-profits/private-foundations/tax-on-net-investment-income-of-private-foundations-reduction-in-tax

Internal Revenue Service. (2009-2017). Form 990 for Yale University. Retrieved from https://projects.propublica.org/nonprofits/organizations/60646973

Internal Revenue Service. (2009-2017a). Form 990 for Harvard Management Company. Retrieved from https://projects.propublica.org/nonprofits/organizations/237361259

Internal Revenue Service. (2009-2017b). Form 990 for President And Fellows Of Harvard College. Retrieved from https://projects.propublica.org/nonprofits/organizations/42103580

Investing for the Long-Term. (n.d.) Retrieved from http://www.hmc.harvard.edu/investment-management/sustainable_investment.html

Kaplan, S., Schoar, A. (2005). Private equity performance: Returns, persistence, and capital flows. The Journal of Finance, 60(4), 1791-1823. doi:10.1111/j.1540-6261.2005.00780.x

Lerner, J., Schoar, A., & Wang, J. (2008). Secrets of the academy: The drivers of university endowment success. The Journal of Economic Perspectives, 22(3), 207-222. doi:10.1257/089533008785539872

Lerner, J., Schoar, A., & Wongsunwai, W. (2007). Smart institutions, foolish choices: The limited partner performance puzzle. The Journal of Finance, 62(2), 731-731. Retrieved from https://www.jstor.org/stable/4622285

Markowitz, H. (1952). Portfolio Selection. The Journal of Finance, 7(1), 77-91. doi:10.1111/j.1540-6261.1952.tb01525.x

National Association of College and University Business Officers. (2003-2009). NACUBO Endowment Study - Public NCSE Tables. Retrieved from https://www.nacubo.org/Research/2018/Public-NCSE-Tables.

National Association of College and University Business Officers and Commonfund Institute. (2010-2018). NACUBO-Commonfund Study of Endowments (NSCE) - Public Tables. Retrieved from: https://www.nacubo.org/Research/2018/Public-NCSE-Tables.

National Association of College and University Business Officers and Commonfund Institute. (2018a). NACUBO-Commonfund Study of Endowments (NCSE) 2017.

Perold, A., Stafford, E. (2010). Harvard Management Company 2010. Harvard Business School No. 201-129.

Pilkington, E. (Nomveber 8, 2017). Top US universities use offshore funds to grow their huge endowments. The Guardian. Retrieved from https://www.theguardian.com/news/2017/nov/08/us-universities-offshore-funds-endowments-fossil-fuels-paradise-papers

Sharpe, W. (1992) Asset allocation: Management style and performance measurement. The Journal of Portfolio Management, 18(2), 7-19. Retrieved from https://doi.org/10.3905/jpm.1992.409394

Smith, R. (2015). University endowment: Wealth, income, asset allocation, and spending. Journal of Applied Finance, 25(1), 21-30. Retrieved from: https://search.proquest.com/openview/407006bdbada27cf55759b288844faea/

Supporting the Goals of Harvard. (n.d.). Retrieved from http://www.hmc.harvard.edu/about-hmc/index.html

Tobin, T. (1958). Liquidity Preferences as a Behavior Towards Risk. Review of Economic Studies, 25, 65-85. Retrieved from https://doi.org/10.2307/2296205

Tobin, J. (1974). What is permanent endowment income? The American Economic Review, 64(2), 427-432.

Vardharaj, R., & Fabozzi, F. (2007). Sector, style, region: Explaining stock allocation performance. Financial Analysts Journal, 63(3), 59-70. Retrieved from https://doi.org/10.2469/faj.v63.n3.4691

Wyland, M. (2015, August 21). Large University Endowments and Investment Fees Under Fire. Non Profit Quarterly. Retrieved from https://nonprofitquarterly.org/2015/08/21/large-university-endowments-and-investment-fees-under-fire/

Xiong, J., Ibbotson, R., Idzorek, T., & Chen, P. (2010). The equal importance of asset allocation and active management. Financial Analysts Journal, 66(2), 22-30. Retrieved from https://doi.org/10.2469/faj.v66.n4.13

Yale University. (2001-2017). Yale Endowment Report. Retrieved from: http://investments.yale.edu/reports/

Yale Investment Office. (2018). Ethical Investing Policy. Retrieved from https://static1.squarespace.com/static/55db7b87e4b0dca22fba2438/t/5c0022cc70a6ade1e9d7e96a/1543512780518/Ethical+Investing+Overview+vFinal.pdf

Appendix

Table 1 - Endowment and benchmark percentage returns, 1991-2017

	All Endowments					Elite Comparison			Benchmarks				
Year	N	Avg	25th Percentile	Median	75th Percentile	Ivy League	Top SAT	Others	US Stocks	Foreign Stocks	US Bonds	Private Equity	Hedge Funds
1991	346	7,4	5,6	7,5	9,2	3,6	7,7	7,4	7,4	-9,8	10,7	4,3	14,0
1992	365	13,3	11,6	13,2	15,0	5,0	14,9	13,1	13,4	0,7	14,1	9,1	23,4
1993	384	13,5	11,0	13,7	16,0	16,5	14,0	13,4	13,6	20,0	11,8	21,8	27,5
1994	397	3,0	1,0	2,9	4,6	7,2	4,3	2,8	1,4	17,5	-1,3	18,3	15,5
1995	415	15,4	13,2	15,4	17,3	15,5	16,8	15,3	26,1	2,2	12,6	17,6	13,0
1996	425	16,9	15,0	16,8	18,9	21,2	19,9	16,6	26,0	13,2	5,0	30,6	26,0
1997	435	20,4	17,9	20,3	22,7	21,0	21,0	20,3	34,7	14,1	8,2	26,1	17,2
1998	445	17,8	15,3	18,0	20,2	17,7	19,1	17,8	30,2	1,4	10,5	35,8	10,9
1999	577	10,8	8,2	10,7	13,3	12,2	12,6	10,7	22,8	9,5	3,1	15,9	11,7
2000	600	12,0	6,2	10,0	15,5	26,7	24,6	11,1	7,2	18,1	4,6	34,5	23,2
2001	564	-3,5	-7,2	-3,7	0,1	1,5	-5,8	-3,5	-14,8	-23,8	11,2	-11,4	1,5
2002	601	-6,2	-8,7	-6,3	-3,8	-1,5	-6,3	-6,3	-18,0	-8,2	8,6	-11,7	1,6
2003	643	3,2	1,6	3,0	4,6	6,2	2,8	3,1	0,3	-4,2	10,4	1,9	7,0
2004	665	15,3	13,5	15,9	17,7	17,7	17,3	15,2	19,1	32,5	0,3	23,3	13,0
2005	683	9,3	7,5	9,0	10,9	15,8	13,6	9,0	6,3	16,9	6,8	30,1	8,2
2006	707	10,8	8,5	10,9	13,0	16,9	15,1	10,5	8,6	28,4	-0,8	25,6	13,8
2007	723	17,2	15,5	17,5	19,1	23,8	21,9	17,0	20,6	30,1	6,1	34,4	14,4
2008	728	-3,0	-5,8	-3,3	-0,7	3,3	0,5	-3,2	-13,1	-6,2	7,1	4,5	0,9
2009	793	-18,7	-21,7	-19,1	-16,4	-22,0	-21,2	-18,6	-26,2	-30,5	6,0	-20,6	-10,1
2010	817	11,9	10,2	12,1	13,7	12,2	12,2	11,9	14,4	10,9	9,5	18,3	9,1
2011	792	19,2	17,8	19,8	21,8	20,5	19,9	19,2	30,7	30,3	3,9	24,7	11,5
2012	809	-0,3	-1,9	-0,5	1,0	*	*	*	5,5	-14,1	7,4	6,4	6,4
2013	813	11,7	10,4	11,7	13,0	*	*	*	20,6	17,1	-0,7	16,1	9,1
2014	828	15,5	14,4	15,8	17,2	*	*	*	24,6	23,8	4,4	22,4	3,0
2015	804	2,4	0,7	2,2	3,7	*	*	*	7,4	-5,3	1,9	9,0	-1,1
2016	792	-1,9	-3,3	-2,1	-0,7	*	*	*	4,0	-9,8	4,1	3,1	5,4
2017	808	12,2	11,1	12,5	13,7	*	*	*	17,9	19,5	6,0	17,3	8,6
Mean		8,4	6,2	8,3	10,4	11,9*	10,7*	8,7*	10,8	7,2	6,4	15,1	10,5

Notes: All Endowment returns are net of fees. The Benchmark for US Stocks is the S&P 500, for Foreign Stocks it's the MSCI World Index excluding the US, for US Bonds it's the Barclays Capital U.S. Aggregate Bond Index, for Private Equity it's the Cambridge Association U.S. Private Equity Index and for Hedge funds it's the HFRI Fund Weighted Composite Index. Source: Elite Comparison: Barber and Wang (2013); Endowments Returns: NCSE (2017); Benchmarks: Bloomberg, Datastream, HFRI and Camebridge Assosiates. *No data available for 2012-2017

Table 2 – Annualized Returns for the year 2017 by endowment size, by performance percentile, for Harvard and Yale University and Benchmark Returns

	N	1-year return	3-year annualized return	5-year annualized return	10-year annualized return
Total Institutions	809	12,2	4,2	7,9	4,6
Over 1 Billion	97	12,9	5	8,6	5
$501 Million-$1 Billion	82	12,7	4,2	8,1	4,6
$101-$500 Million	275	12,5	4,1	7,8	4,4
$51-$100 Million	157	11,9	3,9	7,7	4,4
$25-$50 Million	113	11,7	4	7,7	4,5
Under $25 Million	85	11,6	4,7	8,1	5
75th Percentile		13,7	5	8,7	5,2
Median		12,5	4,1	7,9	4,4
25th Percentile		11,1	3,3	7,1	3,8
Harvard		8,0	5,3	8,5	5,6
Yale		11,3	8,7	11,8	6,6
S&P 500		17,9	9,6	14,6	7,2
Barclays Aggregate Bond		-0,3	2,5	2,2	4,5
MSCI World ex-U.S.		19,5	0,7	8,2	1
Camebridge Private Equity		17,3	11,8	13,4	11,2
HRFI Weighted Fund Index		8,6	8,2	5,3	5,2
Bloomberg Commodity		-6,5	-14,8	-9,2	-6,5

Notes: All Endowment returns are net of fees. Source: NACUBO-Commonfund Institut (2018a), Harvard University (2010-2017), Yale University (2015-2017)

Table 3 – Asset Allocations in percent for Endowments from 1993-2017

	Equally Weighted Asset Allocations				Dollar Weighted Asset Allocations			
Year	Equities	Fixed Income	Alternative Assets	Cash / Other	Equities	Fixed Income	Alternative Assets	Cash / Other
1993	53	35	5	7	*	*	*	*
1994	54	33	6	8	*	*	*	*
1995	57	31	5	7	*	*	*	*
1996	61	29	5	5	*	*	*	*
1997	63	26	6	5	*	*	*	*
1998	64	26	7	4	*	*	*	*
1999	64	24	8	4	*	*	*	*
2000	62	23	11	4	*	*	*	*
2001	59	25	12	4	*	*	*	*
2002	57	27	12	4	50	23	25	1
2003	57	26	13	4	49	21	28	2
2004	60	22	14	4	51	17	29	3
2005	59	22	17	4	48	17	33	2
2006	58	20	19	3	48	15	36	1
2007	58	22	20	4	47	17	38	1
2008	52	19	25	4	40	13	47	1
2009	46	21	25	8	32	13	51	4
2010	46	21	26	7	31	12	52	5
2011	48	19	27	6	33	10	53	4
2012	46	21	28	5	31	11	54	4
2013	49	18	28	5	34	10	53	3
2014	50	16	28	6	36	9	51	4
2015	49	16	29	6	35	9	52	4
2016	48	16	29	7	35	8	53	4
2017	51	15	28	6	36	8	52	4

Notes: * No Data available for dollar weighted asset allocations from 1993-2001 Source: NACUBO-Commonfund Study of Endowments (2009-2017) and NACUBO Endowment Study (2002-2008)

Table 4 – "Equity" Asset Allocations in percent and dollar weighted by size from 2002 to 2017

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Over $1 Billion	45	45	46	45	45	47	39	26	26	28	27	30	31	32	32	32
$501 Million to $1 Billion	56	54	57	54	53	51	43	37	35	37	35	39	40	41	38	42
$101 Million to $500 Million	57	57	59	58	57	57	50	43	42	45	43	46	48	48	46	49
$51 Million to $100 Million	61	59	63	61	60	60	54	51	49	50	49	53	52	53	52	55
$25 Million to $50 Million	60	60	62	61	62	63	58	52	51	54	51	53	56	58	55	56
Under $25 Million	55	57	62	61	59	60	56	51	53	55	53	57	57	57	59	58
Dollar-weighted Average (All Institutions)	50	49	51	48	48	47	40	32	31	33	31	34	36	35	35	36
Equal-weighted Average (All Institutions)	57	57	60	59	58	58	52	46	46	48	46	49	50	49	48	51
All Public Institutions	57	58	61	58	58	57	52	38	37	37	35	38	39	40	39	40
All Private Colleges and Universities	57	57	59	59	58	58	52	27	29	31	29	32	34	33	33	35

Source: NACUBO-Commonfund Study of Endowments (2009-2017) and NACUBO Endowment Study (2002-2008)

Table 5 – "Fixed Income" Asset Allocations in percent and dollar weighted by size from 2002 to 2017

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Over $1 Billion	21	19	15	14	13	11	11	10	10	9	9	8	8	7	7	7
$501 Million to $1 Billion	20	18	16	16	14	13	15	14	14	11	12	11	10	9	9	9
$101 Million to $500 Million	25	24	20	19	17	15	17	17	17	15	16	15	14	13	13	13
$51 Million to $100 Million	28	27	22	22	21	19	20	21	21	20	22	20	18	17	17	17
$25 Million to $50 Million	29	28	25	23	22	21	21	23	24	22	24	22	19	20	20	20
Under $25 Million	31	30	27	28	29	28	27	27	27	25	29	26	26	24	24	24
Dollar-weighted Average (All Institutions)	23	21	17	17	15	17	13	13	12	10	11	10	9	9	8	8
Equal-weighted Average (All Institutions)	27	26	22	22	20	22	19	21	21	19	21	18	16	16	16	15
All Public Institutions	29	28	24	24	23	19	21	16	15	13	14	12	11	11	10	10
All Private Colleges and Universities	26	25	21	21	19	13	18	11	11	10	10	9	8	8	8	7

Source: NACUBO-Commonfund Study of Endowments (2009-2017) and NACUBO Endowment Study (2002-2008)

Table 6 – "Alternative Assets" Asset Allocations in percent and dollar weighted by size from 2002 to 2017

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Over $1 Billion	33	35	36	39	41	40	48	61	60	60	61	59	57	57	58	57
$501 Million to $1 Billion	23	26	26	29	32	34	41	43	45	46	48	45	44	44	45	42
$101 Million to $500 Million	15	17	19	21	24	25	31	33	35	35	36	34	33	34	35	32
$51 Million to $100 Million	8	9	11	14	16	17	21	22	24	23	24	23	24	25	24	22
$25 Million to $50 Million	8	9	10	12	12	12	18	18	17	18	19	20	18	16	17	17
Under $25 Million	9	7	6	5	7	7	9	13	12	10	11	11	10	11	10	11
Dollar-weighted Average (All Institutions)	25	28	29	33	36	38	47	51	52	53	54	53	51	52	53	52
Equal-weighted Average (All Institutions)	12	13	14	17	19	20	25	25	26	27	28	28	28	29	29	28
All Public Institutions	10	10	11	14	15	18	22	41	44	45	54	47	46	46	47	46
All Private Colleges and Universities	13	14	16	18	21	24	27	55	55	56	28	55	54	54	55	54

Source: NACUBO-Commonfund Study of Endowments (2009-2017) and NACUBO Endowment Study (2002-2008)

Table 7 – Equity Asset Allocations by Type of Equity and by Endowment Size in percent

	Foreign Equities						Domestic Equities					
	Over $1 Billion	$501 to $1 Billion	$101 to $500 Million	$51 to $100 Million	$25 to $50 Million	Under $25 Million	Over $1 Billion	$501 to $1 Billion	$101 to $500 Million	$51 to $100 Million	$25 to $50 Million	Under $25 Million
2009	12	17	17	17	15	13	14	20	26	34	37	38
2010	15	17	17	18	16	13	11	18	25	31	35	40
2011	16	19	18	18	17	14	12	18	27	32	37	41
2012	15	17	18	18	16	14	12	18	25	31	35	39
2013	17	19	19	20	17	14	13	20	27	33	36	43
2014	18	20	21	21	18	14	13	20	27	31	38	43
2015	19	20	21	20	18	15	13	21	27	33	40	42
2016	19	18	20	19	17	15	13	20	26	33	38	44
2017	19	22	22	22	19	16	13	20	27	33	37	42

Source: NACUBO Commonfund Study of Endowments Public Tables (2009-2018)

Table 8 – Harvard's endowment spending in monetary terms and in percent from 1980-2018

Fiscal Year	Endowment Value in billion US dollars	Endowment Spending in billion US dollars	Endowment Spending as % of Endowment	Endowment Spending as % of Total Harvard Budget
1980	1.5	0.1	5.6	15
1981	1.6	0.1	5.1	14
1982	1.6	0.1	5.1	14
1983	2.3	0.1	5.8	14
1984	2.2	0.1	4.6	15
1985	2.7	0.1	5.1	14
1986	3.4	0.1	4.4	13
1987	4.0	0.1	3.6	13
1988	4.2	0.1	3.3	13
1989	4.5	0.1	3.6	13
1990	4.7	0.2	4	15
1991	4.6	0.2	4.2	17
1992	5.1	0.2	4.5	17
1993	5.7	0.2	4.4	17
1994	6.2	0.3	4.5	19
1995	7.0	0.3	4.6	19
1996	8.6	0.3	4.4	20
1997	10.7	0.3	3.9	21
1998	12.7	0.4	3.7	24
1999	13.9	0.4	3.4	24
2000	18.2	0.6	4	28
2001	17.6	0.6	3.3	28
2002	16.9	0.7	4.8	32
2003	18.6	0.8	5.1	31
2004	21.8	0.8	4.9	31
2005	25.2	0.9	4.5	31
2006	28.6	0.9	4.3	31
2007	34.3	1.0	4.3	33
2008	36.2	1.2	4.1	35
2009	25.4	1.4	4.1	38
2010	27.6	1.3	6.1	35
2011	32	1.2	5.3	32
2012	30.7	1.4	5.5	35
2013	32.7	1.5	5.5	36
2014	36.4	1.5	5.6	35
2015	37.6	1.6	5.1	35
2016	35.7	1.7	5.1	36
2017	37.1	1.8	5.4	36
2018	39.2	1.8	5.2	35

Source: The data for the years of 1980-2009 is from Perold and Stafford (2010) and from Harvard University's financial statements of 2010-2018.

Table 9 – Percentage of Endowment Assets that can be liquidated within a specified time interval as of July 2009

Days					Years			
0-5	6-30	31-90	91-180	181-365	1-2	2-3	3-5	5+
24	2	1	7	6	9	4	3	44

Source: Perrold and Stafford (2010)