

DIPLOMARBEIT

Titel der Diplomarbeit

„Asset Management and University Endowments“

Verfasser

Katrin Ramsebner

Angestrebter akademischer Grad

Magistra der Sozial- und Wirtschaftswissenschaften
(Mag. rer. soc. oec.)

Wien, im Oktober 2009

Studienkennzahl lt. Studienblatt:
Studienrichtung lt. Studienblatt:
Betreuer/Betreuerin:

157
Internationale Betriebswirtschaft
o. Univ.Prof. Dr. Engelbert J. Dockner

Table of contents

Endowments Discussion

1.	Introduction	5
2.	Review of US endowment funds	6
2.1.	Overview about the largest US-endowments	6
2.2.	The endowment fund investment process	10
2.3.	Spending policy	13
2.4.	Differences between university endowment funds and traditional funds	14
2.5.	Differences among US endowment funds	15
2.5.1.	Hard facts	15
2.5.2.	Investment returns	18
2.5.3.	Endowment managers	19
2.5.3.1.	Importance of endowment managers	19
2.5.3.2.	Compensation of internal endowment managers	19
3.	Alternative asset allocation – the key to success?	22
3.1.	The successful asset allocation of endowment funds	22
3.2.	Benefiting from the super endowment's asset allocation	25
3.3.	There is more behind it than a successful asset allocation	27
4.	Performance analysis	31
4.1.	Data explanation	31
4.2.	The strategic asset allocation	33
4.3.	The tactical asset allocation, i.e. market timing	35
4.4.	The security selection	36
4.5.	Results	36
4.5.1.	Results for all funds	36
4.5.2.	Subdivided results	38
5.	Why are US endowment funds so successful?	41

Case Study - The Yale endowment fund

6.	The structure of Yale's endowment fund	44
6.1.	Endowment purpose	46
6.2.	Investment philosophy	47
7.	Yale's asset allocation	49
7.1.	Absolute return	51
7.2.	Domestic equity	52
7.3.	Fixed income	53
7.4.	Foreign equity	53
7.5.	Private equity	54
7.6.	Real assets	56
8.	Yale's performance	57
9.	Yale's spending policy	60
10.	Conclusion: University endowment funds using the example of the Yale endowment fund	62
11.	Annex	63

1. Introduction

Understanding and also examining the strategies of the US endowment funds is of fundamental relevance to investors for several reasons. US endowment funds achieved over the last years consistently superior investment returns, especially those with assets larger than \$ 10 bn, comprising Yale, Harvard, Texas, Stanford and Princeton University. Until 2007 they achieved an average 10 year annualized return of about 15%, which lies about 7% higher than the return of a traditional 50% bond and 50% equity portfolio at much lower risk level.¹

Universities show in comparison to other (also institutional) investors some special characteristics:

- Universities live forever, e.g. they do not have the typical life cycle and so they have theoretically an infinite investment horizon.²
- It seems that university endowments are relying more on asset allocation than other (institutional) investors³, this can be seen as well in the exposure to multiple asset classes. Endowment funds usually have a stable asset allocation over time and a long-term investment horizon. Lower trading costs occur due to the lower reliance on market timing for generating the investment returns.⁴
- Universities have access to the latest portfolio optimization theories⁵ and furthermore they have also the knowledge to apply these theories.
- Endowment funds enjoy tax relieves⁶ and in addition they get in pleasure of fewer regulatory constraints on their investments⁷.
- Universities receive donations from other external sources and moreover it is generally legally forbidden for them to spend more than their return on investments. So when analyzing university endowment funds the overall fund size can be seen as an exogenous variable.⁸

¹ cp. Frontier Capital Management (2007), page 1

² cp. e.g. Dimmock (2007), page 2 or Brown, Garlappi, Tiu (2008), page 2

³ cp. Brown, Garlappi, Tiu (2008), page 2

⁴ cp. Frontier Capital Management (2007), page 2

⁵ cp. Brown, Garlappi, Tiu (2008), page 2

⁶ cp. Dimmock (2007), page 2

⁷ cp. Brown, Garlappi, Tiu (2008), page 2

⁸ cp. Dimmock (2007), page 2

- Universities have very simple spending rules, where usually only a small contingent of the assets is expended, which leads to a smaller asset-liability-management-problem.⁹

2. Review of US endowment funds

2.1. Overview about the largest US-endowments

The US endowment funds are non-taxable vehicles, which were founded to support and manage funding requirements of universities and colleges. The funding consists of a combination of gifts, legacies and investment returns. In the United States there exist over 700 endowments with an average fund of about \$ 521 million¹⁰, whereas in the United Kingdom the endowment funds cannot compete with the large US endowment funds. In the UK for example the Cambridge University (by the way the largest endowment fund in Europe) had an endowment fund of \$ 1,797 million¹¹ in July 2008, whereas Harvard (the largest endowment fund in the US) had an endowment fund of \$ 36,556 million.

The existence of university endowment funds is especially in the United States very distributed. The university endowment funds are a good possibility for the university of receiving stable returns for their operating management. NACUBO, the National Association of College and University Business Officers, reports at regular intervals the most important data about the endowment funds. Universities usually have their fiscal year beginning at the 1st of July and ending at the 30th of June and that is the reason why most data here is stated as of the end of June and for most university endowments (as Yale) the data for the financial year 2009 is not yet available.

Here is an extract of the 20 largest universities from the NACUBO report with the largest endowment funds concerning market value. As the fiscal year for universities usually lasts till the end of June the data for 2009 is not yet available, as NACUBO has to collect all the data, so the following information is based on fiscal year 2008.

⁹ cp. Brown, Garlappi, Tiu (2008), page 2

¹⁰ cp. 2008 NACUBO Endowment Study, © 2009 National Association of College and University Business Officers, All Institutions Listed by Fiscal Year 2008 Market Value of Endowment Assets with Percentage Change Between 2007 and 2008 Endowment Assets

¹¹ cp. The Guardian December 2008, Crisis blows £250m hole in university funding,
<http://www.guardian.co.uk/education/2008/dec/12/oxford-university-funding-credit-crunch>

All Institutions Listed by Fiscal Year 2008 Market Value of Endowment Assets with Percentage Change Between 2007 and 2008 Endowment Assets					
Rank	Institution	State	2008 Endowment Funds (\$000)	2007 Endowment Funds (\$000)	*Percentage Change in Endowment (2008 - 2007)
1	Harvard University	MA	36,556,284	34,634,906	5.5%
2	Yale University	CT	22,869,700	22,530,200	1.5%
3	Stanford University	CA	17,200,000	17,164,836	0.2%
4	Princeton University	NJ	16,349,329	15,787,200	3.6%
5	University of Texas System	TX	16,111,184	15,613,672	3.2%
6	Massachusetts Institute of Technology	MA	10,068,800	9,980,410	0.9%
7	University of Michigan	MI	7,571,904	7,089,830	6.8%
8	Northwestern University	IL	7,243,948	6,503,292	11.4%
9	Columbia University	NY	7,146,806	7,149,803	0.0%
10	The Texas A&M University System and Foundations	TX	6,659,352	6,590,300	1.0%
11	University of Chicago	IL	6,632,311	6,204,189	6.9%
12	University of Pennsylvania	PA	6,233,281	6,635,187	-6.1%
13	University of Notre Dame	IN	6,225,688	5,976,973	4.2%
14	University of California	CA	6,217,340	6,439,436	-3.4%
15	Duke University	NC	6,123,743	5,910,280	3.6%
16	Emory University	GA	5,472,528	5,561,743	-1.6%
17	Cornell University	NY	5,385,482	5,247,097	2.6%
18	Washington University	MO	5,350,470	5,567,843	-3.9%
19	Rice University	TX	4,610,164	4,669,544	-1.3%
20	University of Virginia	VA	4,572,613	4,370,209	4.6%

Table 1: Overview about the largest US endowment funds¹²

¹² cp. 2008 NACUBO Endowment Study, © 2009 National Association of College and University Business Officers, All Institutions Listed by Fiscal Year 2008 Market Value of Endowment Assets with Percentage Change Between 2007 and 2008 Endowment Assets

*According to NACUBO the "percentage change" does not mean the rate of return on investment for the stated endowment. This figure tells the endowment's change from the market value between the fiscal year 2007 and the fiscal year 2008 (always fiscal year end). Factors such as the growth from gifts, reductions from expenditures and withdrawals, and investment returns have an impact on the fiscal year end market value of an endowment. As the fiscal year ends in June for universities, there is a time lag concerning the publication of their data. Unfortunately there is no information about the performance and asset allocation of university endowment funds available yet.

As one can see in table 1, the big players in the endowment business are the universities of Yale and Harvard, which will be also described and explained later on. The US endowment funds reported over the last years considerable investment returns, however now during the financial crisis also the universities are affected.

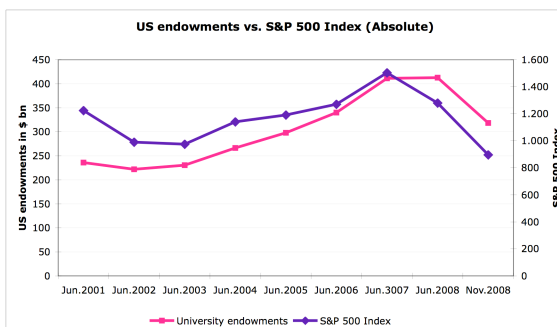


Figure 1: Total AuM of US endowment funds vs. S&P 500 Index (absolute performance)¹³

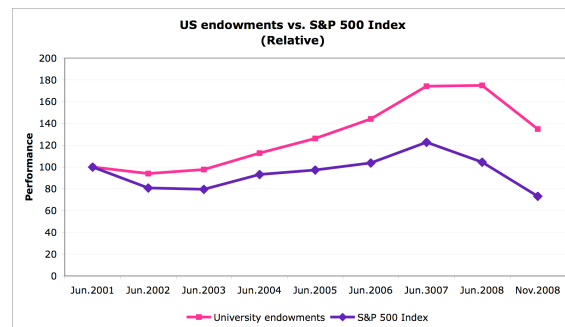


Figure 2: Total AuM of US endowment funds vs. S&P 500 Index (relative performance)¹⁴

In the first figure one can see the total assets under management (AuM) of the universities reported by NACUBO in comparison to the absolute performance of the S&P 500 Index. One can see clearly the similar movements, especially when the financial crisis started. However, in the second figure, the relative performance starting at 100 at the 30th of June 2001, one can see that although the universities were criticized and debated a lot with their "aggressive asset allocation"¹⁵, they still considerably outperformed the S&P 500 Index at any time between June 2001 and November 2008. Although they were affected by the credit crunch, they still did a good job and outperformed other institutions.

¹³ cp. NACUBO (2002-2008) and Bloomberg

¹⁴ cp. NACUBO (2002-2008) and Bloomberg

¹⁵ cp. Handelsblatt (March 2009)

The interims report of NACUBO, which deals with the first half of the financial year 2009, reported a decline in endowments of 22% (in the same period the S&P 500 Index fell 29%).¹⁶ Nevertheless, the university endowment funds showed considerable returns during the last years and the losses in 2008 and 2009 only showed the impact of the financial crisis and that no one was immune against the credit crunch.

¹⁶ cp. NACUBO (2008), page 1

2.2. The endowment fund investment process

For getting a better understanding for endowment funds, I want to deal with the typical endowment fund investment process. In the typical endowment fund investment process decisions of both, internal and external personnel are comprised, which makes it a decentralized management problem.¹⁷

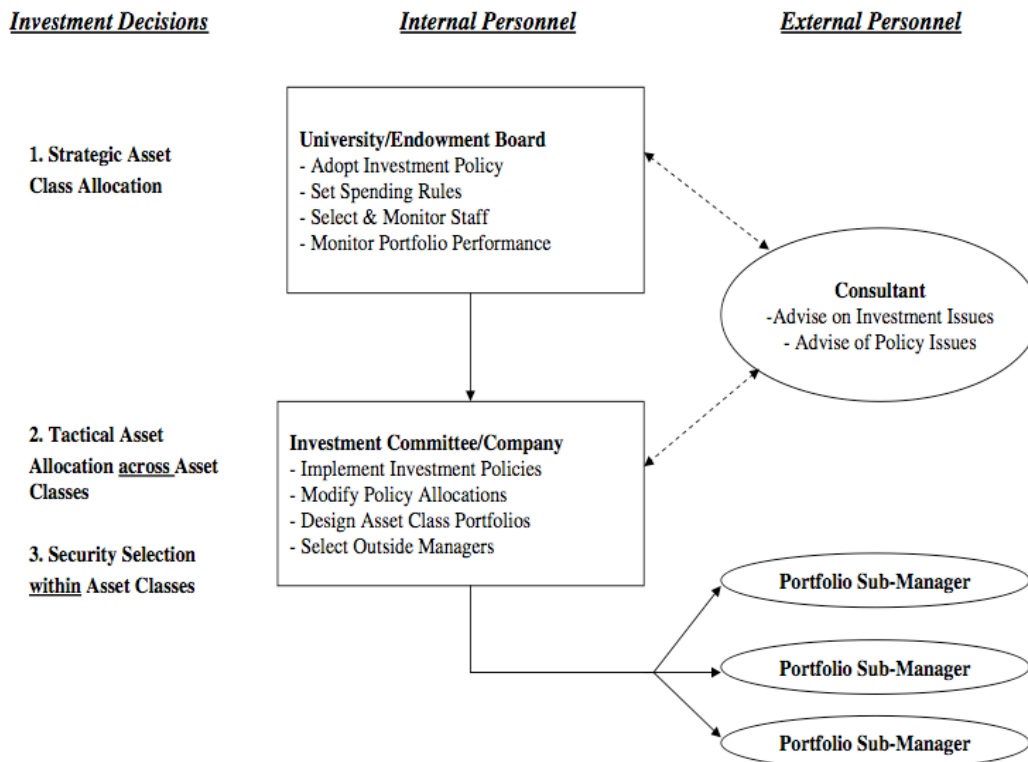


Figure 3: The typical endowment fund investment process¹⁸

The investment decision process consists usually of three major tasks, (i) the strategic asset class allocation, (ii) the tactical asset allocation across asset classes and finally (iii) the security selection within the asset classes. The two main internal parties involved are the university/endowment board and the investment committee/company. As external personnel we can have on the one hand the consultants and on the other hand the portfolio sub-managers as involved personnel.

Usually the board of trustees or regents has the ultimate fiduciary and custodial responsibility over the endowment's assets and the governing body. The main task of the board is the development of the investment policy, which tells one everything about the

¹⁷ cp. Barry and Starks (1984) and van Binsbergen, Brandt and Koijen (2006).

¹⁸ Brown, Garlappi, Tiu (2008), page 36 and 51 and Swensen (2000) and Acharya and Dimson (2007)

guidelines, objectives and also the constraints under which the assets can be invested. An important feature of the policy statement is the determination of allowable asset classes, that can be held in the endowment portfolio and furthermore the benchmark decision for each asset class and also the allowable tactical allocation range.¹⁹ More detailed information about asset allocation in university endowment funds will be discussed later on.

Setting high-level policies is the task of the entire board, whereas the board is usually not involved with the endowment day-to-day management decisions. Therefore is either the investment committee or a formally constituted investment company responsible. The investment committee could be made of a sub-committee of board members with assistance of volunteer or paid non-board members. The investment company, like the University of Texas Investment Management Company or the Harvard Management Company, has to report directly to the board. The investment committee or company is responsible for implementing the board's policies in the fund's portfolio and furthermore for several specific decisions concerning investments, which are categorized in tactical asset allocation decisions (across the universe of approved asset classes) and security selection within each asset class. Brown, Garlappi and Tiu (2008) pointed also another interesting aspect out, namely that it is quite common for the investment committee's internal staff delegating the ongoing maintenance and the initial formation of each asset class-specific portfolios to groups of external portfolio-managers.²⁰

The NACUBO survey report from 2005 examined that on average external portfolio managers controlled about 90.4% of the total assets hold by the comprised endowment funds.²¹

Usually NACUBO divides the endowment assets into six classes:

- Endowment assets greater than \$ 1 billion
- Endowment assets between \$ 500 million and \$ 1 billion
- Endowment assets between \$ 100 million and \$ 500 million
- Endowment assets between \$ 50 million and \$ 100 million
- Endowment assets between \$ 25 million and \$ 50 million
- Endowment assets less than or equal to \$ 25 million

¹⁹ cp. Brown, Garlappi, Tiu (2008), page 36

²⁰ cp. Brown, Garlappi, Tiu (2008), page 36

²¹ cp. NACUBO survey report (2005), page 32

For larger endowments the statistic concerning control of external portfolio managers is slightly lower, at about 86.3% of the assets in endowments with assets under management in excess of \$ 1 bn.²² One will also see in the following examples that there is always a considerable difference between larger and smaller endowment funds, possible explanations therefore will be stated later on.

However, this high percentage tells us that usually the investment committees delegate the security selection process in traditional (e.g. fixed-income, public equity) and alternative asset classes (e.g. real estate, hedge funds, private equity) to external, professional portfolio-managers, who are not directly employed by the board. As a consequence, although it is kind of a convenience to suggest that the security selection decisions are made by the committee's investment staff, in reality it is much more accurate to tag the choice they face as manager selection problem, that means also all the entailing principal-agent conflicts such a relationship denotes.²³

²² cp. Brown, Garlappi, Tiu (2008), page 37

²³ cp. Brown, Garlappi, Tiu (2008), page 37

2.3. Spending policy

The endowment funds provide the universities the possibility of stable returns and money to invest for the university's current operations. Each university has a spending policy, stating the rules for the different spending rates for them, which is calculated by dividing the dollars spent from the endowment with the beginning market value of the endowment.²⁴ An example for a spending policy and also how the Yale university invests the money from the endowment will be stated in the second part of my paper.

Endowment assets	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
	N=772	N=776	N=769	N=756	N=738	N=718	N=700	N=693	N=668	N=633
Greater than \$ 1 bn	4.3%	4.4%	4.6%	4.7%	5.2%	5.3%	4.9%	4.2%	4.2%	4.2%
> \$ 500 mn to <= \$ 1 bn	4.4%	4.4%	4.5%	4.8%	5.2%	5.3%	5.1%	4.5%	4.5%	4.3%
> \$ 100 mn to <= \$ 500 mn	4.5%	4.5%	4.6%	4.7%	4.9%	5.2%	5.1%	4.9%	4.6%	4.5%
> \$ 50 mn to <= \$ 100 mn	4.7%	4.8%	4.7%	4.7%	4.9%	5.2%	5.3%	5.3%	5.1%	5.0%
> \$ 25 mn to <= 50 mn	4.6%	4.8%	4.8%	4.7%	4.8%	5.0%	4.9%	4.9%	4.7%	4.6%
<= \$ 25 mn	4.8%	4.6%	4.6%	4.8%	4.6%	4.8%	4.7%	4.9%	4.6%	4.5%
Public	4.6%	4.5%	4.5%	4.6%	4.5%	4.9%	4.9%	4.8%	4.6%	4.5%
Independent	4.6%	4.7%	4.7%	4.8%	5.1%	5.2%	5.1%	4.9%	4.7%	4.6%
Full sample	4.6%	4.6%	4.7%	4.7%	4.9%	5.1%	5.0%	4.9%	4.6%	4.5%

Table 2: Average annual calculated spending rates, 1999-2008²⁵

The overall sample from the NACUBO survey in 2008 states an average spending rate of 4.6%. As one can see in the last table the spending rates are very stable and so the university can plan in advance how much money will be available from the endowment fund.

²⁴ cp. NACUBO commonfund endowment study follow-up survey (2008), page 4

²⁵ cp. NACUBO endowment study, average annual calculated spending rates 2008-1999 (2008), page 1

2.4. Differences between university endowment funds and traditional funds

When comparing university endowments to other (also institutional) investors, there arise some interesting points. Universities live theoretically forever and so they have an infinite investment horizon.²⁶ Furthermore it can be said that universities rely more on the tactical and also strategic asset allocation than the managers of traditional funds do. Especially the large universities have a higher exposure to alternative assets than the average traditional fund, which can also be explained by higher knowledge of the portfolio managers at the university funds. At the universities the portfolio managers have access to the latest portfolio optimization theories and very important in this context is the knowledge how to apply these theories.²⁷ The next difference between a traditional fund and a university endowment fund are the tax relieves they enjoy²⁸ and the fewer regulatory constraints on their investments²⁹.

Particularly the large endowment funds, like Yale and Harvard, have a volume of their funds where others can only dream of having that. The university endowment funds achieve considerable returns at a much lower risk level than the typical 50% equity and 50% bond portfolio.³⁰ Another point is that when having such a huge volume of the fund, one can cope easier with losses on investments, the universities have a clear defined spending policy and it is legally forbidden for them to spend more than their return on investments.³¹

²⁶ cp. e.g. Dimmock (2007), page 2 or Brown, Garlappi, Tiu (2008), page 2

²⁷ cp. Brown, Garlappi, Tiu (2008), page 2

²⁸ cp. Dimmock (2007), page 2

²⁹ cp. Brown, Garlappi, Tiu (2008), page 2

³⁰ cp. Frontier Capital Management (2007), page 1 et seqq.

³¹ cp. Dimmock (2007), page 2

2.5. Differences among US endowment funds

2.5.1. Hard facts

An interesting fact about the schools included in the NACUBO survey is that schools included in the survey tend to be more likely private, larger and selective than the common average school. Lerner, Schoar and Wang examined in their study, that only 45% of the private schools of the College Board sample are covered in their endowment data (which they got from NACUBO), and only 18% of the public schools are comprised. Summarising, NACUBO covers much more small private schools, than small public schools.³² The results of Lerner, Schoar and Wang are combined in the following table "Differences between the average endowment and the Ivy League³³".

The table comprises data for all schools and three sub-samples: the Ivy League, private (besides the Ivy League) and public schools. The asset allocation is calculated in percentage of the endowment's total market value. "Median growth" shows the median for each sub-sample for the mean annual growth (from 1993 to 2005), for the available data. Lerner, Schoar and Wang adjusted the dollar values to 2005 values and the returns were deflated using the Consumer Price Index. Endowment return is the return for the stated fiscal year.³⁴

³² cp. Lerner, Schoar and Wang (2008), page 4

³³ Members of the Ivy League are: Brown, Columbia, Cornell, Dartmouth, Harvard, Penn, Princeton and Yale
Ivy League is an old nickname for the above mentioned schools, which formed an athletic association in 1954

³⁴ cp. Lerner, Schoar and Wang (2008), page 22

Descriptive statistics:

	1993		2005		Median Growth
	Median	# schools	Median	# schools	
All					
Endowment size (\$ mil)	60	533	72	726	7.4%
% endowment return	13.2%	486	9.0%	707	N/A
% alternative allocation	4.8%	50	7.6%	712	23.8%
% equity allocation	60.1%	58	59.6%	719	-1.4%
% fixed income allocation	31.5%	52	20.4%	719	-3.1%
Spending rate	5.0%	350	4.9%	681	0.3%
Total students	2,271	875	2,283	879	0.6%
SAT math 75th percentile	590	555	620	563	0.4%
Tuition (\$)	11,556	643	16,490	879	2.7%

Ivy League

Endowment size (\$ mil)	2,040	8	4,780	8	8.6%
% alternative allocation	17.6%	5	37.1%	6	23.0%
% equity allocation	52.9%	5	38.1%	6	-2.3%
% fixed income allocation	27.8%	5	13.0%	6	-1.4%
Spending rate	4.6%	7	4.6%	6	0.6%
Total students	5,600	8	5,510	8	0.3%
SAT math 75th percentile	735	8	760	7	0.4%
Tuition (\$)	24,023	6	29,995	8	1.8%

Public

Endowment size (\$ mil)	50	129	66	187	10.6%
% alternative allocation	2.9%	10	5.2%	185	22.0%
% equity allocation	61.4%	12	60.5%	187	-1.2%
% fixed income allocation	33.6%	11	22.1%	187	-1.2%
Spending rate	5.0%	79	4.4%	174	-0.2%
Total students	9,800	272	9,280	272	0.4%
SAT math 75th percentile	580	119	610	136	10.6%
Tuition (\$)	2,343	208	3,591	272	3.8%

Private

Endowment size (\$ mil)	60	353	72	471	6.3%
% alternative allocation	5.3%	32	9.0%	461	26.0%
% equity allocation	59.8%	38	59.5%	466	-1.6%
% fixed income allocation	31.7%	34	19.5%	466	-2.3%
Spending rate	5.0%	231	5.0%	447	0.5%
Total students	1,590	595	1,740	595	0.8%
SAT math 75th percentile	590	428	620	420	6.3%
Tuition (\$)	14,331	429	19,600	595	2.5%

Table 3: Differences between the average endowment and the Ivy League³⁵

³⁵ cp. Lerner, Schoar and Wang (2008), page 22, NACUBO and the College Board

As one can see in the last table, only about 31% (in 2005) of the schools covered are public schools, showing a lower median endowment size, a lower median exposure to alternative assets, but a higher median exposure to equity and fixed income than the average endowment fund. Furthermore public schools have lower spending rates, a lower tuition and a lower SAT³⁶ math 75th percentile.

However, the median of total students over all endowments lies at 2,283, public schools have 9,280 and the Ivy League has on average 5,510 students per university (in 2005). Great differences can also be seen in the section of the endowment size, the median in 2005 for all universities was at \$ 72 million, public schools had \$ 66 million, private schools had \$ 72 million and the Ivy League had \$ 4,780 million. Another interesting point is the exposure to alternative assets (like hedge funds, commodities or private equity), where the Ivy League shows an above-average exposure: the median for all endowment funds lies at 9.0%, public schools have 5.2%, private schools 9.0% and the Ivy League has an exposure to alternative assets of 37.1%. Due to the lower asset allocation to alternative assets, the other universities have higher exposures to equities and fixed income, whereas the Ivy League has much lower exposures to these asset classes.

Reasons for the differences in the asset allocation might be that smaller universities do not have enough financial resources to hire managers with such a specific and considerable knowledge in alternative assets and furthermore one also have to keep the minimum investment requirements in mind. Another point is that it seems likely that for larger funds it is easier to manage the illiquid private equities and in addition they have enough capital to research on those investments.³⁷

Differences can be detected as well in the growth rate of the endowment fund value, where public schools show a larger growth rate of 10.6% than the other universities involved (median 7.4%). This can be avowed by a more important role of donations and other government transactions in the public university sector.³⁸

Summarising, roughly speaking one cannot compare the Ivy League in any sector with the average US university, whereas the differences between public and private schools are neglectable.

³⁶ Scholastic Assessment Test: a test in three major areas, critical reading, mathematics and writing, which is necessary for many university applications in the United States
http://www.collegeboard.com/about/news_info/sat/factsheet.html

³⁷ cp. Brown, Garlappi and Tiu (2008), page 11

³⁸ cp. Lerner, Schoar and Wang (2008), page 5

2.5.2. Investment returns

There exist also large changes in the endowment fund values of the large universities over time, which go along with the "rich getting richer" phenomena. The explanation therefore includes three major categories: higher investment returns, higher donations and lower spending-rates. In the survey of Lerner, Schoar and Wang (2008) the differences concerning spending-rates are only minor. So the higher endowment fund value is achieved by higher investment returns and a higher amount of donations, where unfortunately no detailed data is available.³⁹

In the below figure one can see the excess returns (computed with the S&P 500 Index) separated by school types.

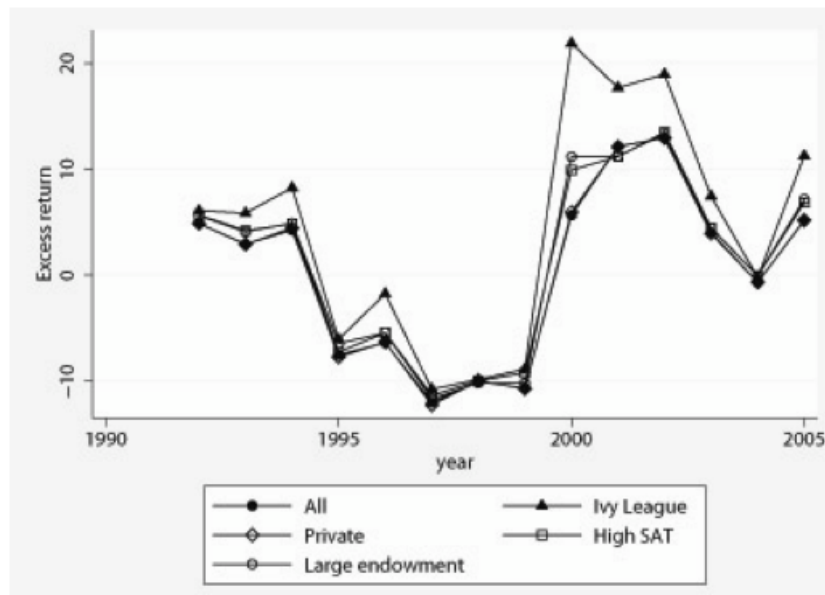


Figure 4: Excess returns in 2005 separated by school type⁴⁰

It is obviously that the Ivy League always outperformed drastically the other universities, especially in 2000 where the outperformance lies at 14%. Also private universities (again excluding the Ivy League) are located at the above average. Concerning the persistence the data shows that schools with higher SAT and larger endowments performed similarly between 1992 and 2005. The statistical analysis of Lerner, Schoar and Wang (2008) has shown a correlation coefficient of 0.4 between the endowment performance and endowment size and/or SAT score. Both variables are positively and independently correlated with the endowment fund performance.

³⁹ cp. Lerner, Schoar and Wang (2008), page 6

⁴⁰ Lerner, Schoar and Wang (2008), page 24

The figure includes only schools with data available for minimum 10 years.

2.5.3. Endowment managers

2.5.3.1. Importance of endowment managers⁴¹

The overall endowment size plays also a decisive role concerning the economies of scale. The smaller the endowments are, the larger is the probability that the endowment is managed by an internal general university financial officer. Larger universities have the possibility of hiring external and internal managers with more extensive skills. According to the NACUBO Endowment Survey 87% of the assets in university endowment funds are managed by external managers and 74.6% hire outside consultants.⁴²

Another point worth mentioning is that the top universities have the ability of finding the best new members of staff in their alumni network. The skill of the manager plays a central role in the endowment fund's investment success. Among others, Brown et. al. (2008) argue that managers of large endowment funds have higher skills compared to the smaller funds.

2.5.3.2. Compensation of internal endowment managers⁴³

The compensation of internal endowment managers is a difficult and controversial topic at some universities, e.g. two bond traders of the Harvard endowment group, Maurice Samuels and David Mittelman, earned each about \$ 34 million in the year 2003. But after different outcries their compensation has been reduced to \$ 25 million in the following year, which lead again to debates.

These salaries are very high compared to other university staff, but if one compares the compensation to what the managers would earn in other private organization or hedge funds, the university wages lie far below these figures. Lerner, Schoar and Wang (2008) examined investment officers' compensation by GuideStar, which said that the investment officers are "one of the five highest-paid employees, between 1997 and 2004". Besides, they examined a sample of 206 employees, where it says that the compensation levels are relatively modest by the private financial sector standards. The mean compensation for a reported endowment officer per year was at \$ 1.9 million. In addition one can keep track on increasing salaries with increasing endowment fund sizes and excess returns, as well as high SAT scores, which are consistently correlated with the overall endowment fund performance.

⁴¹ cp. Lerner, Schoar and Wang (2008)

⁴² cp. Dimmock (2009), page 7 (based on the NACUBO Endowment Survey 2003)

⁴³ cp. Lerner, Schoar and Wang (2008) and Seward (2005)

Lerner, Schoar and Wang compared yearly compensation data of top quarter schools with bottom quarter schools, measured by the excess return above the S&P 500 Index, where top quarter managers earned \$ 4.2 million compared to \$ 1.7 million for the bottom quarter managers. When comparing the data by endowment size, top quarter managers earn \$ 5.3 million compared to the bottom quarter managers with \$ 100,000. Schools and universities being part of the top quarter by SAT scores, pay their manager on average \$ 6.1 million, compared to the compensation of bottom quarter managers with \$ 130,000.

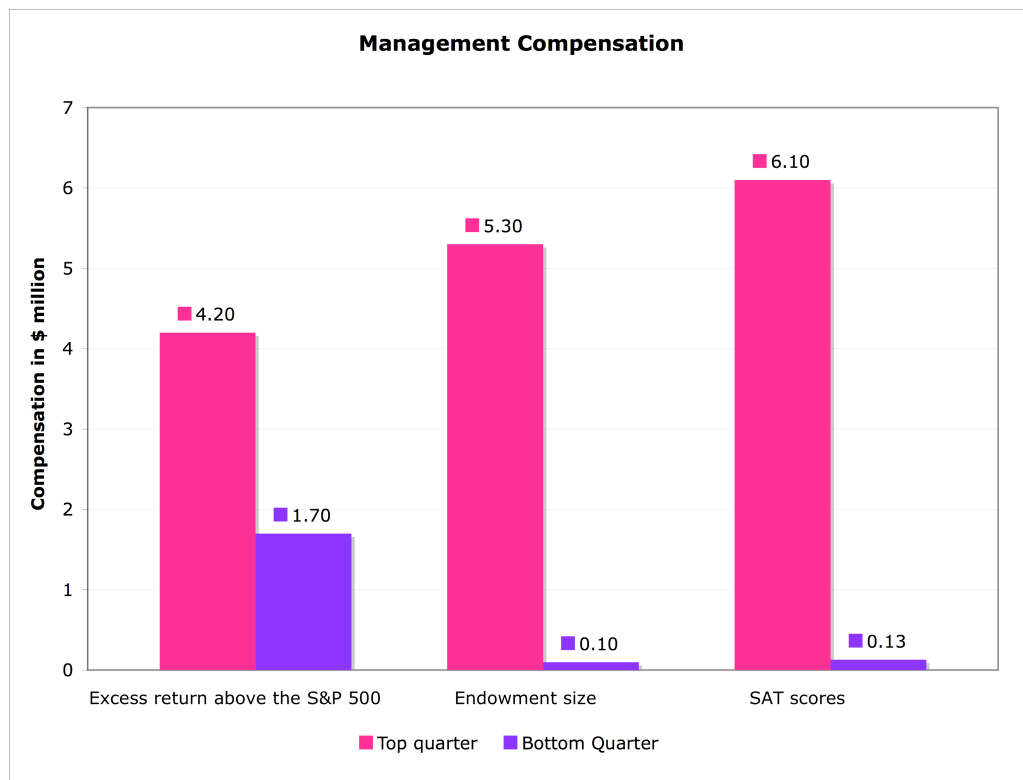


Figure 5: Management compensation⁴⁴

The question that appears now is "are top endowments more successful, because they compensate their managers higher, or is the higher compensation just reflecting their success"? The correlation in this case seems only weak and there is just qualitative evidence. Also schools with incentive-based compensation, e.g. Harvard Management Company⁴⁵ or Stanford⁴⁶, were affected by large-scale betrayals by their investment staff.

⁴⁴ cp. Lerner, Schoar and Wang (2008), page 14

⁴⁵ cp. Seward (2005)

⁴⁶ cp. Grant and Buckman (2006)

However, not only in the investment sector incentive-based compensation is tended to be more and more debated, this is a general problem of remuneration of higher level employees.⁴⁷ The universities react with non-pecuniary benefits, like being a member of a successful academic community.

Endowment managers and the investment committee fall important decisions as the asset allocation, which will be dealt on in the next chapter.

⁴⁷ cp. Mayer, Pfeiffer and Reichel (2005)

3. Alternative asset allocation – the key to success?

3.1. The successful asset allocation of endowment funds⁴⁸

For a portfolio the asset allocation is an important decision and whether it is the most important decision or not, will be dealt later on. Concerning asset allocation we can see considerable differences among the different endowment funds. Much of the performance is achieved through the decision about asset classes, which have different return and risk characteristics. Especially Yale and Harvard have the part of a role model, because they are the largest and most successful endowment funds. They are the leaders in investing into diversified multi-asset-classes over the last two decades, whereas the crucial point for their consistently achieved high double-digit annual returns is among others their considerable exposure to alternative asset classes.

The basic principle for multi-asset-classes-investing is based on the Modern Portfolio Theory by Harry Markowitz, where he explained how one can improve risk adjusted returns, by diversifying the portfolio across assets with varied correlations.

As one can see in the following table "10 year annualised returns by endowment fund size to June 2006" the endowments with assets greater than \$ 10 bn achieved annual returns of 14.8%. Very interesting is the aspect that the fraction of traditional assets in the portfolio lies by only 47.5% whereas the average endowment fund has invested 81.2% in traditional assets.

	US Equity/Bond Portfolio	UK Equity/Bond Portfolio	Average endowment funds	Endowment funds with assets > \$ 1 bn	Endowment funds with assets > \$ 10 bn
10 year annualized return	7.5%	7.4%	8.8%	11.4%	14.8%
Traditional Assets % of Total Portfolio	100%	100%	81.2%	59.6%	47.5%

Table 4: 10 year annualised returns by endowment fund size as of June 2006⁴⁹

⁴⁸ cp. Frontier Capital Management (2007)

⁴⁹ cp. Frontier Capital Management (2007), page 2

The large US endowment funds have compared to the others very innovative portfolios with exposures to multiple asset classes, providing additional diversification benefits, like many years ago also promoted by Harry Markowitz. In the following figures one can see the differences between an average US endowment fund asset allocation and the asset allocation of funds with assets greater than \$ 10 bn.

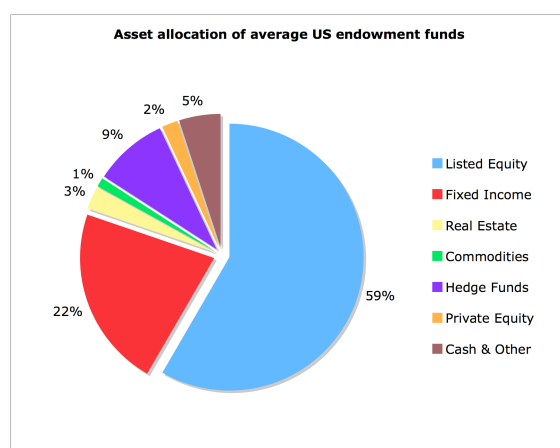


Figure 6: AA of Average US endowment funds⁵⁰

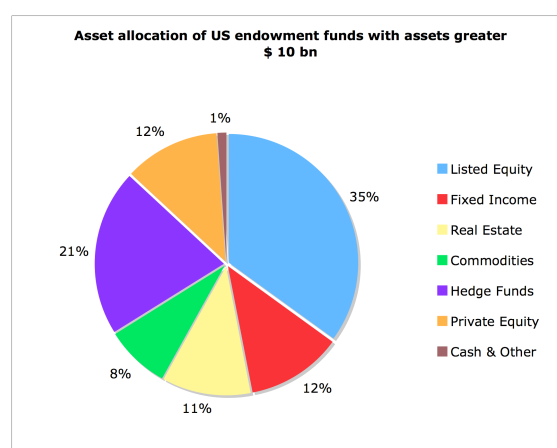


Figure 7: AA of US endowment funds with assets greater than \$ 10 bn⁵¹

As one can see in the above figures, large US endowment funds have a much larger exposure to real estate, commodities, hedge funds and private equity, whereas having a smaller exposure to listed equity, fixed income and cash than the average US endowment fund.

Yale and Harvard are the two largest endowment funds in the US and not also concerning the size they are the trend-setter, but also their asset allocation is different to the other endowment funds.

There has always been a considerable time-lag between the investment of super endowments in an asset class and the investment of the average endowment fund. As an example examine the investment in venture capital: Members of the Ivy League started to invest into venture capital in the early 1970s, whereas corporation pension funds followed mainly in the 80s and in the 90s the public pension funds did so. Nowadays one can see that the time-lags have declined.⁵²

⁵⁰ cp. Frontier Capital Management (2007), page 2 and Nacubo (2006)

⁵¹ cp. Frontier Capital Management (2007), page 2 and various annual reports

⁵² cp. Lerner, Schoar and Wang (2008), page 18

As one can see in the following figure the asset allocation of the "super endowments", Yale and Harvard, deviates from those of endowment funds with assets greater than \$ 10 bn. Yale and Harvard have a slightly larger exposure to alternative asset classes than the other endowment funds have and they take out a loan in cash. However, both invest the majority of the alternative exposure into hedge funds.⁵³

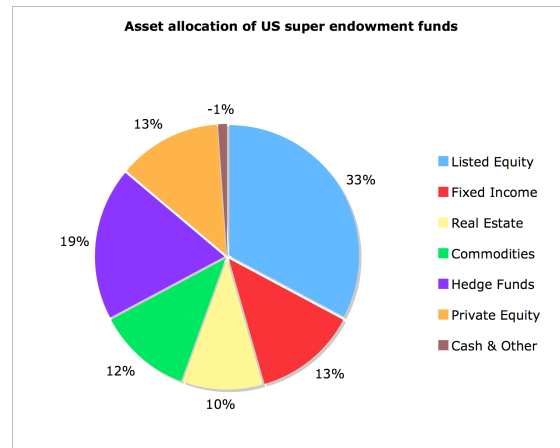


Figure 8: Super Endowment's Asset Allocation⁵⁴

In the next figure one can see the asset allocation from the super endowment funds from 1999 to 2006. For sure, also the super endowments make adjustments from time to time to their asset allocation, but overall they stick to their principle asset allocation.

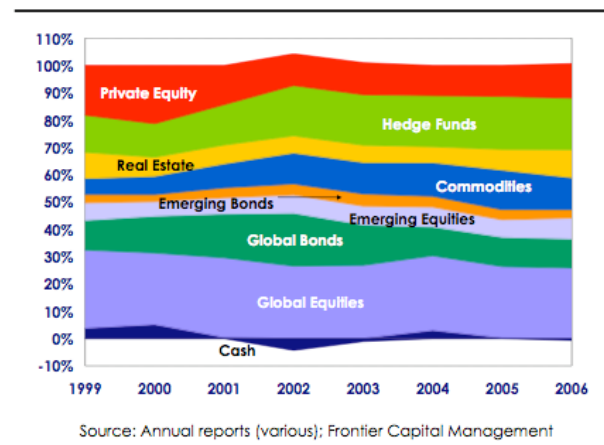


Figure 9: Super endowment asset allocation over time⁵⁵

Summarising, the super endowments feature far less correlation to the equity market than their smaller peers do and they have a far larger exposure to volatile, smaller stocks.⁵⁶

⁵³ cp. Frontier Capital Management (2007), page 3

⁵⁴ cp. Frontier Capital Management (2007), page 3 and annual reports (Yale and Harvard)

⁵⁵ Frontier Capital Management (2007), page 4 and various annual reports

⁵⁶ cp. Lerner, Schoar and Wang (2008), page 16

3.2. Benefiting from the super endowment's asset allocation⁵⁷

The Frontier Capital Management tried to reconstruct the super endowment's asset allocation with benchmarking to the asset allocation. An important point is, that most individuals do not have the ability to actively invest like the super endowments, especially in asset classes like private equity. However, one can also see significant results with an index-tracking portfolio following the multi-asset investing approach from the super endowment funds. The index-tracking portfolio of Frontier Capital Management used the annual asset allocation of the super endowment funds, which were applied to the returns on eight certain global asset class indices.

The benchmark indices used by the Frontier Capital Management are:

(All indices are currency hedge into USD and total return)

- Global equities: MSCI World Equities
- Global bonds: JPMorgan GBI; Citigroup US Corporate Bonds
- Emerging equities: MSCI Emerging Market Equities
- Emerging bonds: JP Morgan Emerging Market Bonds
- Real estate: Dow Jones Wilshire Global Real Estate Securities Index
- Commodities: Dow Jones AIG Commodity Index
- Hedge funds: HFR fund of funds
- Managed futures: CISDM Composite

As private equity is not suitable for an index-tracking portfolio it was excluded, as well as cash for a better comparison to traditional equity-bond-portfolios. As it was difficult for FCM to get data concerning super endowment funds before January 1999, portfolio returns were estimated since this date. In the following figure 6 one can see the adjusted asset allocation with the corresponding benchmark.

⁵⁷ cp. Frontier Capital Management (2007)

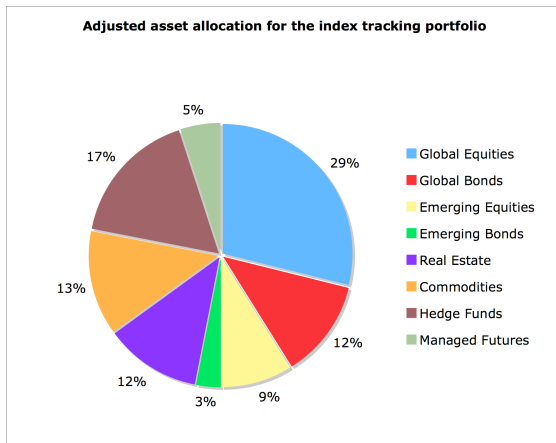


Figure 10: Adjusted super endowment's asset allocation⁵⁸

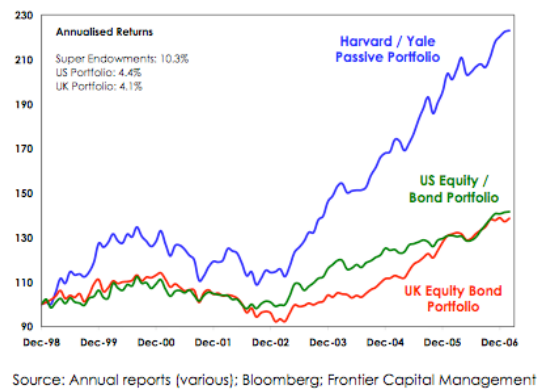


Figure 11: Index tracking portfolio vs. classical⁵⁹

The index-tracking portfolio achieved for the tested period (December 1998 till December 2006) an annualized return of 10.3% whereas the traditional US equity-bond-portfolio achieved only 4.4% and the UK equity-bond-portfolio reached 4.1% (hedged into USD). The estimated index-tracking portfolio outperformed not only the US and UK equity-bond-portfolio, but also many managed macro funds, like UK IMA Balanced Managed or UK IMA Cautious Managed over the last one and three years.

	Annualised 1 year return	Annualised 3 year return	Annualised 3 year standard deviation	3 year return / 3 year standard deviation
IMA Cautious Managed	3.5%	9.2%	8.3%	1.1
IMA Balanced Managed	3.6%	12.7%	8.3%	1.5
Super Endowment Index Portfolio	10.4%	14.7%	6.9%	2.1

Table 5: Index-tracking portfolio (hedged into GBP) vs. UK managed funds⁶⁰

One of the main advantages of the endowment funds is that they provide higher returns at much lower volatility, as one can see in table 4. The super endowment funds achieve also compared to other institutional investors much higher investment returns.⁶¹ By the way, the super endowments can influence the funds they invest in, as the investment of an elite university can initiate a rush of capital to the invested fund.⁶²

⁵⁸ cp. Frontier Capital Management (2007), page 5 and annual reports

⁵⁹ Frontier Capital Management (2007), page 5 and annual reports and Bloomberg

⁶⁰ cp. Frontier Capital Management (2007), page 5 and Morningstar

⁶¹ cp. Lerner, Schoar and Wang (2008), page 1

⁶² cp. Lerner, Schoar and Wang (2008), page 18

Summarising, the US endowment funds have due to their multi-asset approach a progress asset allocation with exposures to alternative asset classes. Especially Yale and Harvard achieved over the last years constantly double-digit returns at lower volatility compared to other (institutional) investors. The Frontier Capital Management argues that one can achieve similar returns with an index-tracking portfolio, however for individual investors it is more difficult because of investing constraints. Though, other studies which will be dealt later on will show that asset allocation per se is not sufficient for an overall endowment success. When someone tries to mimic a super endowment's asset allocation by an index-tracking portfolio, one have to take it with a pinch of salt.

3.3. There is more behind it than a successful asset allocation

It is true, that the asset allocation of the super endowments is very successful and innovative, but there is more to it than the asset allocation. For investing that profitable, a high security selection ability is necessary. There are some institutional investors around the globe who tried to imitate the super endowment's asset allocation, e.g. Kuwait Investment Fund imitated Yale's asset allocation, when changing their investment strategy.⁶³

In the following table "return decomposition" one can see what a difference the security selection makes, i.e. the difference between the benchmark return and the endowment fund investment return. The Ivy League shows the highest overall return with a mean of 14.9% and also the highest excess return over the benchmark with a mean of 5.09% from 1994 till 2005.

⁶³ cp. Lerner, Schoar and Wang (2008), page 10 and Sender (2007)

Year	All			Ivy League			Private			endowments			High SAT score		
	Return	Bench	Excess return	Return	Bench	Excess return	Return	Bench	Excess return	Return	Bench	Excess return	Return	Bench	Excess return
1994	5.8	-1.1	6.9	8.5	-0.1	8.6	3.4	-2.1	5.5	3.3	-1.9	5.2	3.3	-2	5.3
1995	16.1	16.2	-0.1	16.4	17.2	-0.8	16.0	16.2	-0.2	16.5	16.5	0.0	16.0	16.2	-0.2
1996	19.7	16.6	3.1	24.4	19.6	4.8	18.7	16.5	2.2	18.9	16.7	2.2	19.1	16.8	2.3
1997	21.5	21.4	0.1	24.6	21.4	3.2	20.7	22.0	-1.3	20.8	22.2	-1.4	20.4	21.6	-1.2
1998	18.6	20.9	-2.3	19.1	21.0	-1.9	18.8	21.2	-2.4	18.5	21.3	-2.8	18.7	21.1	-2.4
1999	10.4	15.8	-5.4	11.9	16.2	-4.3	9.7	16.1	-6.4	10.0	16.3	-6.3	10.3	16.4	-6.1
2000	20.2	15.9	4.3	26.8	24.1	2.7	18.5	14.2	4.3	21.0	16.0	5.0	21.9	16.8	5.1
2001	-2.9	-8.9	6.0	2.4	-7.3	9.7	-4.2	-9.5	5.3	-4.7	-9.5	4.8	-4.6	-9.5	4.9
2002	-4.5	12.1	7.6	-0.8	11.5	10.7	-5.4	-12.4	7.0	-5.4	-12.4	7.0	-5.2	-12.4	7.2
2003	4.6	0.2	4.4	9.1	0.2	8.9	3.7	0.2	3.5	3.3	0.0	3.3	3.3	-0.1	3.4
2004	17.3	11.3	6.0	19.5	10.0	9.5	16.6	11.9	4.7	17.2	11.6	5.6	17.1	11.6	5.5
2005	13.1	6.1	7.0	16.9	6.9	10.0	12.2	6.1	6.1	13.0	6.3	6.7	13.5	6.6	6.9
Mean	11.66	8.53	3.13	14.90	9.81	5.09	10.73	8.37	2.36	11.03	8.59	2.44	5.0	8.59	2.56

Table 6: Return decomposition⁶⁴

⁶⁴ cp. Lerner, Schoar and Wang (2008), page 27 and NACUBO

Data explanation:⁶⁵

The benchmark returns for the table "return decomposition" were computed on the following basis (annual yields):

- Equities: S&P 500 Index
- Fixed income: Lehman US Aggregate bond index
- Real estate: Case-Shiller index
- Cash: three-month treasury rate
- Private equities and venture capital: investments reported in the VentureXpert database
- Hedge funds: returns reported in the Hennessee Hedge Fund Index

The sample contains only schools, which reported at least 10 years of their total return data.

The subgroups are defined as the following:

- Ivy League: Brown, Columbia, Cornell, Dartmouth, Harvard, Penn, Princeton and Yale
- Private: all private schools and universities, except members of the Ivy League
- Large endowments: all schools and universities in the top quartile of endowment size concerning the data of 1992, except members of the Ivy League
- High SAT: all schools and universities in the top quartile of SAT scores concerning the data of 1992, except members of the Ivy League

Return indicates the value-weighted average endowment return and the benchmark returns are calculated with the asset allocation of each group of endowments (with the five asset classes fixed income, equities, real estate, alternatives and others).

As one can see in the prior table "return decomposition", between 2000 and 2005 all subgroups outperformend their benchmarks. The reason therefore is the good security selection ability of the endowment fund managers. Having a look at the table, shows that from 1994 to 1999 outperforming was not that easy for the managers, this might be explained by the growing security selection ability of the managers and also the changing asset allocation.

The outperformance is especially visible in the alternative asset class, where the super

⁶⁵ cp. Lerner, Schoar and Wang (2008)

endowments have been definitely the precursors. They tended to invest earlier into alternative assets and they achieved much higher returns within this asset class, than the other schools and universities. The key factors for their success are likely to be timing, experience and access to information and products. In some cases it is even more difficult for the small educational institutions to invest because of minimum investments and also for over the counter products it is not that easy for them.

Summarising one can say, that the super endowments achieve considerable returns over time and whether the asset allocation is the clue or not will be dealt on in the next step.

4. Performance analysis⁶⁶

Brown, Garlappi and Tiu (2008) made a performance analysis, based on the decomposition of the returns to the following active and passive components:

- Passive: The long-term strategic asset allocation decision.
- Active: The short-term tactical asset allocation decision, i.e. market timing.
- Active: The potentially short-term security selection decision.

Similar methodologies have also been applied by Wermers (2000) and Daniel, Grinblatt, Titman and Wermers (1997) for mutual funds. For a classical attribution analysis see also Bodie, Kane and Marcus (2009).

For analyzing the separate components of the return, the first step is to determine the overall endowment return:

$$R_{i,t} = \sum_{j=1}^N w_{i,j,t-1} r_{i,j,t}$$

$R_{i,t}$	realized return on the fund i
t	period
$w_{i,j,t}$	actual portfolio weight of the fund i in asset class j at the end of period t
$r_{i,j,t}$	period-t return on asset class j
N	set of investable asset classes

This formula implies that the portfolio weights will be adjusted only one time per period and this will be stated at the end of the period for the next period; furthermore $r_{i,j,t}$ is the buy-and-hold-return. In the NACUBO surveys one can only see the realized return on the fund, but not the return on the separate asset class.

4.1. Data explanation

The study is based on data from the NACUBO surveys from 1984 till 2005, including universities in the US, Canada and Puerto Rico with complete information (i.e. asset allocation, return and overall fund size).

⁶⁶ cp. Brown, Garlappi and Tiu (2008)

	AUM (\$ million)							Return					Payout				
	N. obs.	Total	Mean	Median	Std	Min	Max	Mean	Median	Std	Min	Max	Mean	Median	Std	Min	Max
Year																	
2005	709	249297.3	352.6	77.4	1294.3	1.3	25473.7	9.2	9.0	3.3	11.4	22.2	4.8	4.9	1.4	0.2	17.1
2004	705	228466.7	324.5	71.9	1138.8	1.9	22143.7	15.0	15.8	4.4	-0.6	32.1	4.9	5.0	1.6	0.0	18.4
2003	665	196111.7	294.9	72.4	1003.8	0.3	18849.5	2.7	2.6	3.7	14.7	28.1	5.2	5.0	1.5	0.1	22.0
2002	535	176545.4	336.9	88.9	1053.2	0.2	17169.8	-6.0	-6.2	4.2	19.8	10.1	5.2	5.0	1.5	0.3	22.0
2001	568	218186.0	393.1	106.2	1172.0	1.2	17950.8	-3.2	-3.6	6.3	26.9	24.8	5.2	5.0	1.4	0.3	14.2
2000	507	222928.5	462.5	120.0	1373.9	6.2	18844.3	12.7	10.7	10.1	12.2	58.8	5.0	5.0	1.4	0.1	13.3
1999	467	181781.6	410.3	132.5	1085.0	7.2	14256.0	10.8	10.5	4.7	15.8	29.3	4.8	5.0	1.2	0.1	13.0
1998	445	159620.9	371.2	114.2	991.1	5.2	13019.7	18.1	18.1	4.0	3.7	31.8	4.7	4.7	1.2	0.3	14.7
1997	456	145123.0	328.3	99.3	858.5	5.8	10919.7	20.1	19.9	4.4	6.8	46.9	4.8	4.6	1.8	0.3	24.0
1996	405	112603.9	282.2	81.2	738.9	3.7	8811.8	17.3	17.2	4.0	0.8	39.0	4.8	4.8	1.3	0.1	12.8
1995	422	99416.7	236.1	72.1	600.9	0.1	7045.9	15.1	14.8	4.2	0.5	37.9	5.0	5.0	1.5	0.1	15.0
1994	375	70354.3	189.1	61.2	406.4	0.5	3529.0	3.3	3.2	4.4	13.0	43.0	5.2	5.0	1.8	1.8	18.2
1993	394	76838.2	196.0	60.4	469.0	1.5	5778.3	13.2	13.3	4.3	-2.8	36.3	N/A				
1992	318	62236.1	196.3	53.7	533.9	1.7	5315.5	13.0	13.0	4.9	1.1	65.0					
1991	328	56023.6	171.9	51.7	437.9	3.4	5118.1	7.3	7.1	4.9	14.4	53.0					
1990	298	51420.2	174.3	58.9	411.0	2.0	4653.2	10.0	9.6	6.0	10.3	75.0					
1989	281	45818.4	165.4	56.9	391.0	1.9	4479.0	13.6	13.4	4.7	-6.2	37.4					
1988	262	49467.1	157.0	47.6	381.4	1.7	4155.8	1.3	0.7	4.8	14.7	17.4					
1987	276	45223.0	152.8	46.4	360.7	1.5	4018.3	13.6	13.8	5.7	-6.9	31.9					
1986	258	39317.9	150.6	46.3	354.9	1.1	3435.0	27.2	27.2	6.7	5.2	52.5					
1985	280	31511.8	112.5	31.2	295.3	1.0	2927.2	25.6	26.0	7.0	1.3	52.1					
1984	200	25399.1	127.0	40.1	289.1	1.0	2486.3	-2.3	-2.2	6.0	17.0	17.6					

Table 7: Overview NACUBO data from 1984 till 2005⁶⁷

⁶⁷ cp. Brown, Garlappi and Tiu (2008), page 38

As one can see in the last table, the AuM (assets under management) rose by nearly ten times from \$ 25.39 bn up to \$ 249.30 bn. Whereas in the AuMs one can see a clear positive trend, the returns show high fluctuations.

4.2. The strategic asset allocation

The strategic asset allocation decision is a passive decision, which is typically taken by the management board of the endowment.

Brown, Garlappi and Tiu (2008) ranked the funds to the return by the stated asset allocation decision and the total return of the portfolio. For a coherence of return and asset allocation the correlation needs to be close to one, though they computed a correlation of 0.05, which predicts an independence of the two variables.

The second test consists of the performance of a hypothetical portfolio, which tries to mimic the portfolio by investing like the stated asset allocation into representative indices. The conclusion says that this indices portfolio lies only at the bottom 40% of the comparison group, which means that asset allocation is not the most important component of the return.

Principally one can test the success of the asset allocation by investing into the benchmarks for each asset class, this means that there is no security selection ability and no market timing necessary. The return therefore can be computed as follows:

$$R_{i,t}^B = \sum_{j=1}^N w_{i,j,t-1}^B r_{j,t}^B$$

$R_{i,t}^B$	benchmark return for fund i
t	period
$w_{i,j,t-1}^B$	asset allocation policy weight in asset class j at the end of period t-1
$r_{j,t}^B$	buy-and-hold-return on the benchmark index in period t for asset class j
N	set of investable asset classes

The security selection return can be computed very easily, because therefore one only needs the asset allocation and the benchmark indices for the separate asset class. As both information is available in the stated annual reports of the colleges, one can compute the benchmark return for the funds. However, keep in mind that the information is usually not available in advance and so one will only have lagged portfolio weights. By applying only one weight of the asset class for the prior period one also neglects possible weight adjustments during the period. The information about benchmarks is summarised in the

following two tables, "Benchmark definitions and calculations" and "Benchmark correlations". The table reports summary statistics for the asset class representative indices, SR (Sharpe Ratio) and alpha's and their t-statistics were computed.

Summary statistics:

	Asset Class	Benchmark index	Mean	Std	Median	SR	Alpha	t-stat
1.	US Equity	Russell 3000	9.93	13.37	11.39	0.43	-2.11	-3.25
2.	Non US Equity	MSCI World (Excl. US)	4.46	13.31	5.82	0.02	1.02	0.22
3.	US Fixed Income	Lehman Bond Aggregate	8.04	4.41	8.64	0.88	0.54	0.52
4.	Non US Fixed Income	Salomon Brothers Non US Bond Index	7.89	9.08	7.60	0.41	4.99	1.02
5.	Public Real Estate	NAREIT	13.27	12.79	9.06	0.71	-1.77	-0.34
6.	Private Real Estate	NCREIF	7.81	6.55	8.07	0.56	4.59	1.07
7.	Hedge Funds	HFRI-all fund Composite	14.31	7.61	13.09	1.34	7.13	2.01
8.	Venture Capital	Cambridge Associate VC Index	26.59	56.20	17.42	0.40	26.07	1.47
9.	Private Equity	Cambridge Associate PE Index	14.76	13.74	15.38	0.77	5.87	1.27
10.	Natural Resources	AMEX Oil (before 1992), GCSI (after 1992)	7.02	16.87	1.33	0.17	6.07	0.59
11.	Other Investments	-	-	-	-	-	-	-
12.	Cash	30-day US T-bill	4.14	1.92	4.73	0.00	0.00	-

Table 8: Benchmark definitions and calculations⁶⁸

⁶⁸ cp. Brown, Garlappi and Tiu (2008), page 41

	Asset Class	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.	US Equity	1.00											
2.	Non US Equity	0.60	1.00										
3.	US Fixed Income	-0.03	-0.57	1.00									
4.	Non US Fixed Income	-0.10	-0.11	0.26	1.00								
5.	Public Real Estate	-0.02	0.20	0.08	-0.17	1.00							
6.	Private Real Estate	0.20	0.17	-0.31	-0.57	0.02	1.00						
7.	Hedge Funds	0.55	0.56	-0.05	0.07	0.03	-0.46	1.00					
8.	Venture Capital	0.37	0.45	-0.31	-0.20	-0.30	0.21	0.53	1.00				
9.	Private Equity	0.79	0.80	-0.32	-0.22	0.14	0.36	0.56	0.56	1.00			
10.	Natural Resources	0.79	0.47	-0.42	-0.09	-0.12	0.28	0.18	0.49	0.28	1.00		
11.	Other Investments	-	-	-	-	-	-	-	-	-	-	-	
12.	Cash	0.27	-0.21	0.32	-0.35	-0.40	-0.04	0.23	0.21	0.01	-0.09	-	1.00

Table 9: Benchmark correlations⁶⁹

4.3. The tactical asset allocation, i.e. market timing

The tactical asset allocation, i.e. market timing, deals with the returns from adjusting the asset allocation when varying expected returns occur. In other papers this component is also called "characteristic timing".⁷⁰

The marketing timing return can be computed as follows:

$$R_i^T = \sum_{j=1}^N (w_{i,j,t-1} - w_{i,j,t-1}^B) r_{j,t}^B$$

In order to increase or decrease the returns and/or risk, one have to change the weights to the benchmark assets. Here occurs the problem with the lag in portfolio weights as well, i.e. that one only knows the real portfolio weights ex post.

R_i^T	market timing return
t	period
$w_{i,j,t-1}$	actual asset allocation policy weight in asset class j at the end of period t-1
$w_{i,j,t-1}^B$	corresponding policy weight for the same investment horizon, decided one period in advance
$r_{j,t}^B$	buy-and-hold-return on the benchmark index in period t for asset class j
N	set of investable asset classes

⁶⁹ cp. Brown, Garlappi and Tiu (2008), page 41

⁷⁰ cp. Daniel, Grinblatt, Titman and Wermers (1997) and Wermers (2000)

4.4. The security selection

As also mentioned before, the super endowments enjoy a strong ability in choosing the right securities, which can be lead back to a good investment committee and employees. Brown et al. (2008) show the empirical evidence that security selection is the key determinant of the successful performances.

The security selection ability can be shown by computing the excess return from the asset class over the benchmark of the asset class. This can be expressed as follows:

$$R_{i,t}^S = \sum_{j=1}^N w_{i,j,t-1} (r_{i,j,t} - r_{j,t}^B)$$

In the database from Brown et. al. (2008) they did not compute the returns for all single asset classes. Though one can compute the security selection return by rearranging the other formulas stated before:

$$R_{i,t}^S = R_{i,t} - R_{i,t}^B - R_{i,t}^T$$

$R_{i,t}^S$	security selection return
t	period
$w_{i,j,t-1}$	actual asset allocation policy weight in asset class j at the end of period t-1
$r_{j,j,t}$	return generated by a portfolio of securities for asset class j
$r_{j,t}^B$	buy-and-hold-return on the benchmark index in period t for asset class j
N	set of investable asset classes

The security selection return is the whole portfolio fund return minus the benchmark return minus the market timing return.

4.5. Results

4.5.1. Results for all funds

The results of the tests (by applying the formulas from the recent chapters) by Brown et. al. (2008) are summarised in the following table 8 "test results". As one can see, the largest part of the portfolio return is the benchmark return. The grand mean over all years from the excess return over the benchmark lies at 1.65%.

Year		R	R ^B	R ^T	R ^S	R-R ^B
2005	Mean	9.67	8.70	-0.58	1.55	0.97
	Std	3.19	2.14	1.40	2.52	2.68
2004	Mean	15.63	14.21	-0.43	1.86	1.43
	Std	4.07	2.21	1.49	3.08	3.28
2003	Mean	2.37	1.48	0.41	0.48	0.89
	Std	3.46	1.41	1.11	3.18	3.37
2002	Mean	-6.13	-9.19	0.72	2.33	3.05
	Std	4.15	3.11	2.16	4.05	4.41
2001	Mean	-3.42	-8.19	-0.40	5.18	4.77
	Std	6.23	3.00	2.19	6.05	6.15
2000	Mean	13.02	10.47	0.88	1.67	2.56
	Std	10.60	5.28	3.62	7.29	8.24
1999	Mean	10.85	12.11	0.28	-1.55	-1.27
	Std	4.83	2.04	1.72	4.63	4.91
1998	Mean	18.09	18.01	0.12	-0.04	0.08
	Std	3.82	2.56	2.11	3.76	3.63
1997	Mean	20.14	17.92	1.14	1.08	2.22
	Std	4.42	3.68	3.52	4.21	5.09
1996	Mean	17.35	14.58	0.27	2.50	2.77
	Std	4.13	2.91	3.03	4.23	3.68
1995	Mean	15.26	15.76	-0.65	0.14	-0.51
	Std	4.09	2.06	2.07	3.95	3.82
1994	Mean	3.39	-0.07	0.16	3.30	3.46
	Std	4.54	1.27	0.90	4.26	4.37
1993	Mean	13.46	11.82	0.23	1.41	1.64
	Std	4.01	1.52	1.27	4.05	4.23
1992	Mean	13.00	11.24	0.12	1.64	1.76
	Std	4.08	1.18	1.56	4.07	4.33
1991	Mean	6.77	5.83	0.29	0.65	0.94
	Std	4.31	1.36	2.04	4.41	4.10
Grand Mean		9.96	8.31	0.17	1.48	1.65

Table 10: Test results⁷¹

⁷¹ cp. Brown, Garlappi and Tiu (2008), page 42

4.5.2. Subdivided results

As argued before, especially the super endowments are different to the average endowment fund. Therefore Brown et. al. made the same analysis as before for sub samples, namely for large vs. small funds and for private vs. public funds. Especially at the large vs. small funds one can see clearly the difference in the excess return over the benchmark, whereas the large funds have an excess return of 2.51% (grand mean), the small funds have 0.88%. This clearly points out that larger funds have a better security selection ability. For private vs. public funds the difference is not clear, private funds show an excess return of 1.68% and public funds 1.53%.

		AUM q4 – AUM q1						Private – Public					
		R			R – R ^B			R			R – R ^B		
Year		q4	q1	Dif	q4	q1	Dif	Priv.	Pub.	Dif	Priv.	Pub.	Dif
2005	Mean	11.06	7.84	3.22	1.20	0.49	0.72	9.77	9.33	0.44	1.10	0.55	0.55
	t-stat	35.73	21.42	6.23	5.28	1.56	1.81	61.80	28.24	1.30	8.04	2.19	1.94
2004	Mean	16.85	13.60	3.25	1.99	0.92	1.07	15.65	15.56	0.09	1.48	1.25	0.22
	t-stat	68.03	22.89	5.92	8.96	1.97	2.34	76.11	39.61	0.22	9.00	3.83	0.64
2003	Mean	2.84	1.48	1.36	1.91	-0.54	2.45	2.51	1.89	0.62	1.04	0.38	0.66
	t-stat	9.06	3.48	2.54	6.22	-1.32	4.72	13.86	5.28	1.60	6.01	1.03	1.75
2002	Mean	-5.44	-6.63	1.19	4.45	1.34	3.11	-6.19	-5.95	-0.25	2.97	3.34	-0.37
	t-stat	-15.12	-13.00	1.93	12.41	2.78	5.15	-27.83	-12.97	-0.52	13.57	5.87	0.73
2001	Mean	-3.74	-3.45	-0.28	5.22	3.33	1.90	-3.41	-3.44	0.03	4.74	4.90	-0.16
	t-stat	-6.80	-5.05	-0.32	9.95	4.76	2.16	-10.73	-4.69	0.04	15.26	6.56	-0.22
2000	Mean	20.38	8.59	11.79	6.24	0.40	5.84	13.07	12.83	0.25	2.52	2.70	-0.18
	t-stat	16.16	12.75	7.04	7.06	0.60	4.73	22.00	12.43	0.19	5.46	3.33	-0.18
1999	Mean	11.47	10.14	1.33	-0.92	-1.53	0.61	10.84	10.89	-0.05	-1.27	-1.26	-0.01
	t-stat	18.75	23.66	1.68	-1.52	-3.38	0.77	39.94	22.44	-0.09	-4.63	-2.46	-0.02
1998	Mean	18.24	17.55	0.70	0.71	-0.50	1.21	18.13	17.96	0.16	0.17	-0.28	0.45
	t-stat	53.28	41.47	1.29	2.28	-1.22	2.39	81.86	44.54	0.34	0.83	-0.68	0.99
1997	Mean	21.28	18.83	2.45	2.88	1.64	1.23	20.17	20.02	0.15	2.25	2.11	0.15
	t-stat	46.63	46.31	3.90	5.75	3.30	1.73	81.26	44.58	0.29	8.08	3.74	0.25
1996	Mean	18.85	15.79	3.06	3.37	2.84	0.53	17.37	17.28	0.09	2.68	3.11	-0.43
	t-stat	43.44	34.81	4.85	8.37	6.56	0.89	71.64	35.56	0.16	12.97	6.30	-0.89
1995	Mean	15.97	14.07	1.90	0.40	-1.79	2.19	15.36	14.89	0.47	-0.37	-1.02	0.65
	t-stat	39.29	30.36	3.07	1.04	-4.29	3.86	62.53	33.11	0.90	-1.59	-2.43	1.33
1994	Mean	4.15	2.72	1.43	3.73	3.08	0.65	3.50	2.98	0.53	3.55	3.12	0.43
	t-stat	7.32	7.79	1.98	6.85	8.44	0.92	11.46	7.16	0.84	12.00	8.11	0.70
1993	Mean	14.98	12.5	2.63	2.75	0.82	1.93	13.45	13.52	-0.07	1.57	1.90	-0.33
	t-stat	46.22	22.59	4.41	7.76	1.41	3.00	50.96	32.73	-0.14	5.60	4.54	-0.58
1992	Mean	14.21	12.03	2.18	2.99	0.98	2.01	12.92	13.30	-0.38	1.73	1.87	-0.14
	t-stat	28.33	21.40	2.81	5.56	1.55	2.38	41.66	31.11	-0.58	5.28	4.00	-0.20
1991	Mean	6.05	7.92	-1.87	0.69	1.72	-1.03	6.91	6.15	0.76	1.09	0.30	0.79
	t-stat	14.00	9.73	-2.23	1.68	2.16	-1.27	19.26	11.74	0.97	3.17	0.61	1.06
Grand Mean		11.14	8.86	2.29	2.51	0.88	1.63	10.00	9.81	0.19	1.68	1.53	0.15

Table 11: Subdivided results⁷²

⁷² cp. Brown, Garlappi and Tiu (2008), page 43

Whereas the stated test tells that the benchmark return has the largest fraction on the overall return, no matter whether having a look on all endowments or only the large endowments. Further statistical tests, like computing the Spearman correlation index, generating a mimicking portfolio based on benchmark indices (which has been tried in many studies) or regress the returns said that asset allocation per se is not enough for an overall endowment success.⁷³ It is the active security selection that is much more important for high investment return achievements, whereas an overreliance on the passive asset allocation decision hinders the performance success.⁷⁴

⁷³ cp. Brown, Garlappi and Tiu (2008), page 16 et seqq.

⁷⁴ Ibbotson and Kaplan (2000) state a much higher importance for asset allocation, than Brown et. al. (2008)

5. Why are US endowment funds so successful?

As also argued by David Swensen in his book "Pioneering Portfolio Management", hedging the background risk is one of the central intention of a university endowment.⁷⁵ Dimmock (2009) made an analysis on the background risk and its implications on university endowment funds.⁷⁶ Therefore the first step is to define the term background risk: At universities background risk is understood to be the volatility of non-financial income. In the paper⁷⁷ the background risk is measured in two different ways:

- The first one is the time-series deviation from the growth rate and
- The second one is the permanent component of the growth rate of non-financial income.

The results of the study, no matter whether non-financial income is defined as total non-financial income or as income per full-time equivalent student, say that there is a significant negative correlation between the actual portfolio volatility and the background risk of the university endowment fund. In addition it says that universities with higher income volatility have portfolios with lower standard deviation.

Besides tested was the impact of background risk on the asset allocation of the fund. There is strong evidence that universities with higher background risk allocate more of their portfolio to fixed income and less to riskier asset classes as alternative assets, which can be explained due to the higher volatility and the illiquidity of the alternative asset class (especially of private equity and venture capital). So one can see that background risk has definitely an impact on the portfolio choice of a university endowment fund.

Overall, there exist a few assumptions why the large US endowment funds, which by the way are all members of the so-called Ivy League, always get richer and richer. The most important factors are the benefits from the economies of scale in investing, expertise and genuine skills.⁷⁸ Endowments in the US performed between 1992 and 2005 with a median growth rate of 7.4% per year and had a median return of 6.9%, the sample contained 1,300 US educational endowments. However, those figures are dominated by the super

⁷⁵ cp. Swensen (2000), page 14

⁷⁶ The study is based on NACUBO and NCES data until the year 2003, which makes the data comparable to the other studies used in my paper.

⁷⁷ cp. Dimmock (2009)

⁷⁸ cp. Lerner, Schoar and Wang (2008), page 0

endowments, because as of 2007 Yale and Harvard have grown to \$ 35 bn and \$ 22 bn in size.⁷⁹ These figures are largely driven by the investment returns, as they outperformed the S&P 500 Index in 2005 by 7.9%.

Some reasons why they are so successful might be that they have access to the best portfolio managers and that they are very well resourced. The Frontier Capital Management says that it is possible for smaller investors to rebuild the portfolio by applying a similar asset allocation, as described in the chapter "benefiting from the super endowment's asset allocation".⁸⁰ Though, Lerner, Schoar and Wang have a different opinion; they caution other institutional investors against simply copying the investment strategies of the super endowment funds. They point out that there is much more behind than a risky asset allocation, the super endowments have superior asset selection abilities beyond their endowment strategies. Furthermore they mention that the super endowments benefit from the superior investment committees, highly talented and skilled investment managers and a huge social network and knowledge base.⁸¹ By the way, the members of the active investment committee are mostly part of the university's alumni network, who worked together for many years. A further factor of success might be that the super endowments are always communicating with their peers and so they are kind of sharing their knowledge.⁸²

Due to the considerable size of the endowments, universities like Yale and Harvard can cope with losses, as other institutional investors could not, e.g. like the \$ 350 mn investment loss Harvard had to realize in 2007 on Sowood Capital Management.⁸³ Furthermore an important point is that the investment strategies of Yale and Harvard performed very well in history, does not mean that the future will show the same picture. As already stated before, also the university endowment funds are affected by the credit crunch. In the news especially the asset allocation and diversification of the super endowments, as Yale and Harvard, are debated. However, although the universities were hit by the credit crunch, they still show an above average performance compared to other (institutional) investors. Unfortunately now, during the financial turmoil, many important data is not yet available for a detailed analysis.

⁷⁹ cp. Lerner, Schoar and Wang (2008), page 2

⁸⁰ cp. Frontier Capital Management, page 1

⁸¹ cp. Lerner, Schoar and Wang (2008), page 2-3

⁸² cp. Lerner, Schoar and Wang (2008), page 15

⁸³ cp. Karmin and Zuckerman (2007)

Case Study

The YALE endowment fund

6. The structure of Yale's endowment fund⁸⁴

The Yale endowment, which is managed by the Yale Investment Office and not by a separate or external company, achieved over the last years considerable (mostly double-digit) investment returns. The chief investment officer is David Swensen, who started managing the Yale endowment in 1985 with a volume of \$ 1,3 bn.⁸⁵ Although the investment return in the last year lies only at 4.5%, from 2004 till 2008 they made an average annual return of 19.42%, they outperformed not only their benchmark, but also other institutional fund indices. According to the Yale endowment management, the substantial return is the consequence of a disciplined, diversified asset allocation policy and superior active portfolio management, with assistance of high capital market returns. However, also the Yale endowment feels the impact of the credit crunch, on December 16, President Levin said "Our best estimate of the Endowment's value today is \$ 17 billion, a decline of 25 percent since June 30, 2008", which includes already considerable writedowns. As one can see in the following figure, the Yale Endowment fund is allocated to different sub-categories, as mostly donors want a specific purpose for their gifts. The three largest parts (with the size of about one fourth) are professorships, teaching and lectureships, miscellaneous specific purposes and unrestricted funds. On the other side one can see how the operating budget revenue is split-up, where the largest part with 37% comes from the endowment return (which is in numbers \$ 850 million).

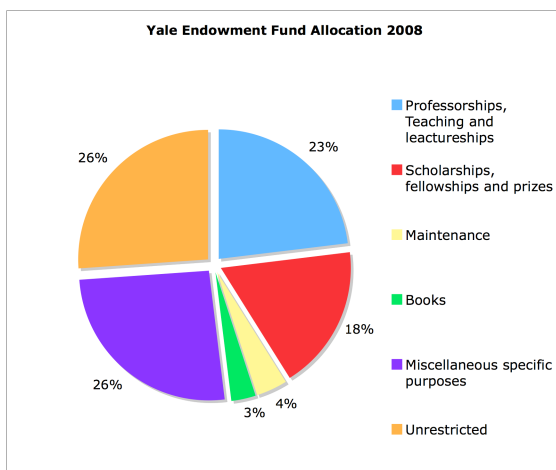


Figure 12: Yale Endowment Fund Allocation 2008⁸⁶

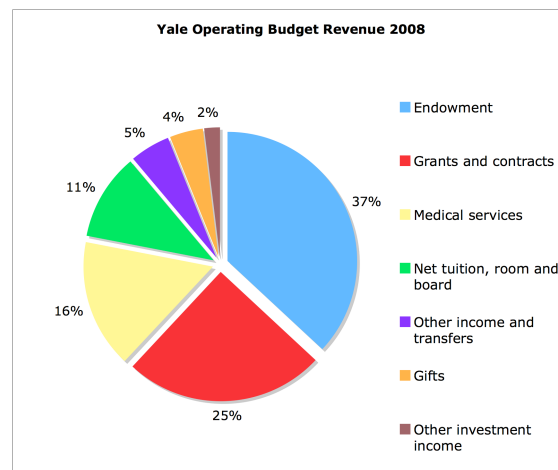


Figure 13: Yale Operating Budget Revenue 2008⁸⁷

⁸⁴ cp. The Yale Endowment annual report 2008

⁸⁵ cp. Handelsblatt (March 2009)

⁸⁶ cp. The Yale Endowment annual report 2008, page 4

⁸⁷ cp. The Yale Endowment annual report 2008, page 4

	Fiscal year				
	2008	2007	2006	2005	2004
Market value (in million \$)	22,869.7	22,530.2	18,030.6	15,224.9	12,747.2
Return	4.5%	28.0%	22.9%	22.3%	19.4%
Spending (in million \$)	849.9	684.0	616.0	567.0	502.0
Operating Budget Revenues (in million \$)	2,280.2	2,075.0	1,932.0	1,768.0	1,630.8
Endowment Percentage	37.3%	33.0%	31.9%	32.2%	30.8%
Asset Allocation (as of June 30)					
Absolute Return	25.1%	23.3%	23.3%	25.7%	26.1%
Domestic Equity	10.1%	11.0%	11.6%	14.1%	14.8%
Fixed Income	4.0%	4.0%	3.8%	4.9%	7.4%
Foreign Equity	15.2%	14.1%	14.6%	13.7%	14.8%
Private Equity	20.2%	18.7%	16.4%	14.8%	14.5%
Real Assets	29.3%	27.1%	27.8%	25.0%	18.8%
Cash	-3.9%	1.9%	2.5%	1.9%	3.5%

Table 12: Yale endowment overview 2004-2008⁸⁸

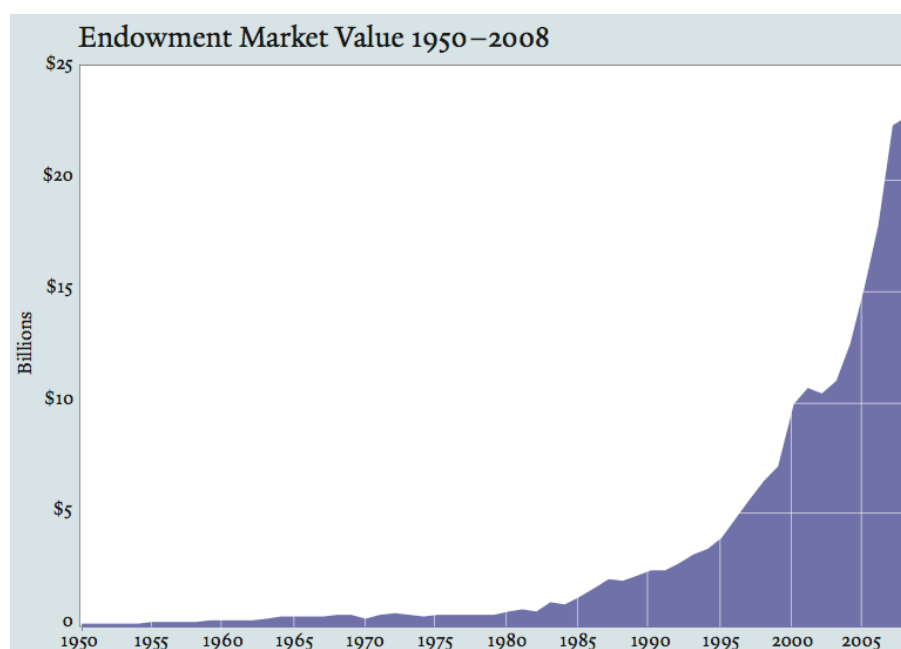


Figure 14: Yale endowment market value 1950-2008 (in billion \$)⁸⁹

⁸⁸ cp. The Yale Endowment annual report 2008, page 0

⁸⁹ cp. The Yale Endowment annual report 2008, page 0

6.1. Endowment purpose⁹⁰

According to David Swensen, the chief investment officer of the Yale university endowment fund, who wrote by the way the book "Pioneering Portfolio Management – An Unconventional Approach to Institutional Investment", endowments have the following purposes:

Endowments should give the university a greater (financial) independence by reducing the reliance on government grants, tuition and donations. Universities often rely on donations, which gives the donors kind of a right of co-determination and so they intervene in the day-to-day business of the university. The other possibility is a heavy reliance on tuition, which makes the university vulnerable in case of changing trends, as they have to attract enough students to their university.

Endowment funds should support the university with stability; the financial stability gives the university the possibility of spending more money on superior teaching and research environment. The university has so the possibility of spending resources to operation budgets and as the spending policy at Yale is clear defined, the university can plan in advance about the money available.

Endowment funds should ease educational quality, i.e. establishing a superior educational environment. The income of an endowment attracts better scholars, it provides superior facilities and it is pioneering research. According to David Swensen there is a high correlation of endowment size and institutional quality (the study relies on unpublished research by the Yale Investment Office). Universities with better-endowed organisations are scored higher in the U.S. News and World Report rankings.

Summarising, the endowment funds provide a good possibility for the university to gain financial stability and independence and it facilitates educational excellence.

⁹⁰ cp. Swensen (2009), page 9 et seqq.

6.2. Investment philosophy⁹¹

The investment philosophy of an investor defines his approach how to generate portfolio returns, by describing the most fundamental facts affecting the investment process. Generally how one can create investment returns can be subdivided in three parts, namely asset allocation return, market timing return (i.e. short-run deviation from the long-run target policy) and the security selection return (which I also described in the first part of the paper). It is the task of the portfolio management to maximize these returns, whereas the first step is to determine the portfolio asset allocation.

The role of asset allocation

Many investors say that the operative point of achieving high investment returns is the asset allocation. In the first part of my paper I state contrary arguments and also David Swensen argues with a study of Ibbotson and Kaplan (2000): "on average, policy accounted for a little more than all of total return"⁹² ... "approximately 90 percent of the variability of a fund's return across time is explained by the variability of policy returns"⁹³.

According to David Swensen it can be described as the following issue in institutional portfolio management: Portfolio managers usually hold more than one position in their portfolio and they do not favour applying aggressive trading strategies. They try to build-up broadly diversified portfolios and they avoid the appliance of market timing (i.e. the deviation from the long-run strategy). As they blank out the market timing return and the security selection return, the greatest part of the return has to be the asset allocation component.

It is obvious that the asset allocation decision plays a central role in the whole portfolio management investment process, nevertheless in the Yale endowment fund the two other components of the return are not neglected. As for example when talking about deviating in the short run from the long-run strategy, e.g. risk control requires to rebalance the portfolio regularly, so that the primary goals of the portfolio can be ensured.

The Yale endowment investment policy is combining informed market judgment with academic theory. The theoretic part is based on the mean-variance analysis from Harry Markowitz and James Tobin, who both worked on these topics at the Yale Cowles

⁹¹ cp. Swensen (2009), page 50 et seqq.

⁹² cp. Swensen (2009), page 51 and Ibbotson and Kaplan (2000), page 32

⁹³ cp. Swensen (2009), page 51 and Ibbotson and Kaplan (2000), page 29

Foundation. This theoretic analysis is combining expected returns, the variance and also the covariance of the different securities. They are using the mean-variance analysis for risk and return approximations among the different security possibilities.⁹⁴

It is a clear fact that fund managers try to increase their success by focusing on inefficient markets, as they have a high return potential. Furthermore one can gain from high dividends in illiquid investments, whereas this is only the right way for long-term investors and one has to keep in mind that investments in illiquid market is not a business for everyone. As university endowments have a de facto infinite investment horizon, this fact is also part of the Yale endowment investment philosophy.

An important task is to determine the different asset classes and also the target portfolio weights, which is definitely not the easiest part as asset class definitions are quite subjective and the distinctions are not that easy to find. Combining the quantitative analysis and the market judgment, outcomes the asset allocation.⁹⁵

⁹⁴ cp. The Yale Endowment annual report 2008, page 5

⁹⁵ cp. The Yale Endowment annual report 2008, page 5

7. Yale's asset allocation

In the following table one can see the actual and the target asset allocation for the Yale endowment fund (for the year 2009 the data is not yet available):

Asset class	June 2008 actual	June 2008 target	Educational Institution Mean
Absolute Return	25.1%	21.0%	21.7%
Domestic Equity	10.1%	10.0%	21.7%
Fixed Income	4.0%	4.0%	12.1%
Foreign Equity	15.2%	15.0%	20.3%
Private Equity	20.2%	21.0%	8.6%
Real Assets	29.3%	29.0%	13.7%
Cash	-3.9%	0.0%	1.9%

Figure 15: Yale asset allocation 2008⁹⁶

As one can see, the Yale asset allocation has a large amount in alternative assets. However, by overweighting one asset class one creates extraordinary risk to the portfolio, the key to success is diversification, i.e. with diversification the Yale endowment management is creating a more efficient portfolio at a given risk-level. This point is executed in Yale with the theoretical framework of Harry Markowitz and James Tobin. According to Markowitz diversification gives the investor kind of a "free lunch", that means that one can reduce the risk of the portfolio without reducing the expected return.⁹⁷

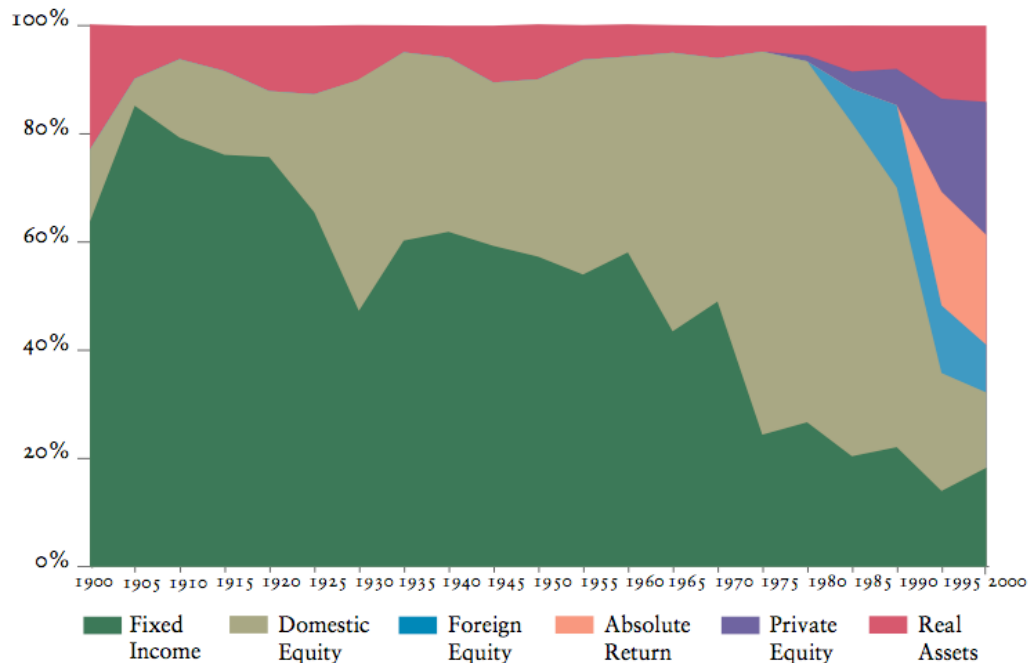
Worth mentioning is that Yale enjoys several advantages that other investors do not have, like the Yale endowment fund has tax-exempt status, what allows them to do frequent trading activities without tax influence on the gains (i.e. capital gains tax). Furthermore a large sophisticated investment team manages the fund on a day-to-day basis, giving them the possibility of a real-time rebalancing activity.⁹⁸

⁹⁶ cp. The Yale Endowment annual report 2008, page 5 and page 14

⁹⁷ cp. Swensen (2009), page 59

⁹⁸ cp. Swensen (2009), page 69 et seq.

Over the past decades the asset allocation changed from dependence to domestic marketable securities to non-traditional (alternative) assets. In the following figure one can see the changes in asset allocation of Yale from 1900 till 2000.



Notes: Data reflect book values from 1900 to 1949 and market values from 1950 to 2000. From 1900 to 1934, domestic equities include preferred stock holdings.

Figure 16: Yale's asset allocation from 1900 till 2000⁹⁹

Whereas in the 80ies about three quarter of the portfolio consisted of US stocks, bonds and cash, nowadays the target allocation for domestic marketable securities is only 14% and the other 86% stand for foreign equity, private equity, absolute return and real assets. The huge target allocations to alternative asset classes result from their high return potential and the possibility of bringing diversification to the portfolio. It is surprising that the rather traditional portfolio in history had higher volatility; the portfolio today has higher return expectations at lower volatility, which can be attributed to the less efficient pricing of alternative assets. A further important point is the long investment horizon of university endowment funds, as also described in the first part of my paper. Due to the long investment horizon the Yale endowment fund has the possibility of better exploiting illiquid and less efficient markets (as leveraged buyouts, venture capital, real estate or commodities).¹⁰⁰

⁹⁹ The Yale Endowment annual report 2000, page 46

¹⁰⁰ cp. The Yale Endowment annual report 2008, page 6

7.1. Absolute return¹⁰¹

In July 1990, the Yale university endowment fund became the first institutional investor that followed a strategy with absolute return as a separate asset class (at that time with a target allocation of 15%, whereas in 2008 the actual allocation to absolute return rose to about 25%).

About one half of the Yale endowment fund portfolio is committed to event-driven strategies relying on specific corporate events, as for example spin-offs, mergers or bankruptcy for achieving the target price. The second half of the portfolio achieves to the value-driven strategy, like hedged positions in assets or securities deviating from their underlying value.

The target allocation for absolute return is in Yale now 21%, which lies insignificantly below the average allocation from educational institutions (with 21.7%). According to Yale, absolute return strategies achieve a real return of 6.0% with a volatility of about 15.0% for the value-driven strategies and about 10.0% volatility for event-driven strategies. Over the past years absolute return investments achieved returns that are mostly independent from the overall market moves (i.e. absolute return shows a low correlation to domestic bond and stock markets), which is an advantage in insecure market situation.

Part of the Yale investment strategy is the alignment of interests between the investment manager and the investor. For this reason the absolute return asset class is structured with hurdle rates, performance-related incentive fees and clawback positions. Furthermore Yale invests considerable sums alongside Yale, what enables them to avoid the drawbacks of the principal-agency relationship.

¹⁰¹ cp. The Yale Endowment annual report 2008, page 8

7.2. Domestic equity¹⁰²

Domestic equity is usually overbalanced in the typical US institutional portfolio, as domestic equity stands for a large, liquid and well-researched market. Whereas the average university endowment fund invests about 22% in domestic equity, Yale has a target allocation of only 10% (which has been drastically reduced compared to the asset allocation 30 years ago). Although the domestic equity market is well-researched and efficient, the Yale endowment fund tries to outperform their benchmark, the Wilshire 5000 Index, with active management by a few percentage points annually.

In the following table one can see the dispersion of active management returns, which identifies the ability of maximizing the return of the security selection ability.

Asset Class	First Quartile	Median	Third Quartile	Range
US fixed income	7.4%	7.1%	0.5%	6.9%
US equity	12.1%	11.2%	1.9%	10.2%
International equity	10.5%	9.0%	4.0%	6.5%
US small-capitalization equity	16.1%	14.0%	4.8%	11.3%
Absolute return	15.6%	12.5%	7.1%	8.5%
Real estate	17.6%	12.0%	9.2%	8.4%
Leveraged buyouts	13.3%	8.0%	13.7%	-0.4%
Venture capital	28.7%	-1.4%	43.2%	-14.5%

Table 13: Dispersion of active management returns¹⁰³
*Asset returns by quartile, ten years ending on June 30, 2005.*¹⁰⁴

As the security selection is the key point for outperforming in the domestic equity market, Yale prefers portfolio managers with "exceptional bottom-up fundamental research capabilities". The managers are trying to find stocks that are cheap in relation to some indicators, like for example the book value, earnings or cash flow. For Yale it is important that the portfolio managers have a high integrity, a proper investment philosophy, strong

¹⁰² cp. The Yale Endowment annual report 2008, page 8 et seqq.

¹⁰³ cp. Swensen (2009), page 74

¹⁰⁴ Sources: Data for marketable securities are from Russell/Mellon. The absolute return, real estate, leveraged buyout and venture capital data are from Cambridge Associates. Real estate, leveraged buyout and venture capital data represent returns on funds formed between 1995 and 1999, excluding more recent funds so that immature investments will not bias results downward.

historical success, excellent organizations and also very important are long-lasting, competitive advantages.

7.3. Fixed income¹⁰⁵

The fixed income asset class is characteristic for stable income flows as it provides a higher sureness of nominal cash flows. Fixed income products show a low covariance to the other asset classes that are integrated in the endowment funds, so it is used amongst others as hedge against financial crisis or deflation. The educational mean for fixed income and cash lies at 14.0%, while Yale has a target allocation from only 4.0%. According to Yale the bonds have an expected real return of 2.0% with a volatility of 10.0%, using the Lehman Brothers 1-5 Year U.S. Treasury Index as portfolio benchmark.

The Yale endowment fund is definitely not that attracted to fixed income products as some other universities are, as the fixed income asset class has the lowest historical (and expected) returns from all asset classes in the portfolio. Furthermore it is already known that the government bond market is the most efficiently priced market, which does not offer many possibilities to beat the market. The Yale endowment fund manages the endowment bonds internally and not by external managers, as they are kind of sceptic against active fixed income strategies and a structured bond portfolio is part of their investment philosophy. They are adding consistently value to their bond portfolio, although they dislike market timing strategies, credit risk and call options.

7.4. Foreign equity¹⁰⁶

The foreign equity market gives the portfolio the possibility of a broad diversification to the global economy. Especially the emerging markets are presenting an attractive opportunity for high excess returns; with their rapidly growing economy they show according to Yale an expected real return of 8.0% at a risk level of 25.0%. By contrast, the developed equity market has an expected real return of 6.0% with a risk level of 20.0%.

With their active portfolio management strategy, Yale has a target allocation to foreign equity of 15%, which is split-up in the following three parts: Foreign equity in emerging

¹⁰⁵ cp. The Yale Endowment annual report 2008, page 9 et seqq.

¹⁰⁶ cp. The Yale Endowment annual report 2008, page 12

markets of 5.0%, foreign equity in developed countries of 6.0% and 4.0% are targeted to opportunistic foreign positions, with the expectation that the assets are in markets with the most compelling long-term perspectives, mainly China and India. As the foreign equity asset class is subdivided, they use a composite benchmark, which is composed as followed:

- Developed markets: Morgan Stanley Capital International (MSCI) Europe, Australasia and Far East Index
- Emerging markets: Morgan Stanley Capital International (MSCI) Emerging Markets Index
- Opportunistic investments: Higher Education Price Index plus 8 percent¹⁰⁷

As well as for domestic equity, the investment philosophy pursues also for foreign equity an active strategy to discover the market inefficiencies to generate returns. The approach concerning the portfolio management is also the same: Yale prefers for foreign equity managers with high bottom-up fundamental research capabilities. When Yale allocates the capital to their portfolio managers, the following facts are included in the decision:

- The country allocation for the foreign equity asset class
- The degree of confidence that Yale has in the manager and
- The proper asset size for the applied strategy

Furthermore, Yale tries to exploit the undervaluation in special countries, sectors and styles by distributing additional money and sometimes hiring new managers with the hope that they can take advantage of their specific know-how.

7.5. Private equity¹⁰⁸

The private equity asset class offers a pretty good long-term risk-adjusted return expectation, which goes along with the university's investment philosophy of continuously adding value to the portfolio by using the full capacity of market inefficiencies. In the Yale endowment fund private equity comprises investments in leveraged buy-outs and venture capital. All in one, private equity has a target allocation of 21.0%, which lies far above the educational mean of 8.6%. According to Yale private equity generates a real return of 11.2%, at the rather high risk level of 27.7%.

¹⁰⁷ The Higher Education Price Index for universities is comparable with the Consumer Price Index for households.

¹⁰⁸ cp. The Yale Endowment annual report 2008, page 13 et seqq.

David Swensen (2009) stated a quantitative model about expected return, standard deviation and expected growth for all asset classes. The findings are summarised in the following table:

	US Bonds	US Equity	Developed Equity	Emerging Equity	Absolute Return	Private Equity	Real Assets	Cash
Expected return	2.0%	6.0%	6.0%	8.0%	6.0%	12.0%	6.0%	0.0%
Standard deviation	10.0%	20.0%	20.0%	25.0%	10.0%	30.0%	15.0%	5.0%
Expected growth	1.5%	4.1%	4.1%	5.1%	5.5%	8.1%	4.9%	-0.1%

Table 14: Expected returns for all asset classes¹⁰⁹

Source: Yale University Investment Office. Quantitative model inputs rely on modified risk and return assumptions. Model data inflation adjusted using the Higher Education Price Index.

As past returns provide a good starting point for capital market assumptions, the quantitative model is based on the following historical data (which has been inflation adjusted by using the Higher Education Price Index):

	US Bonds	US Equity	Developed Equity	Emerging Equity	Absolute Return	Private Equity	Real Assets	Cash
Observations	80	80	36	21	17	25	25	80
Arithmetic return	2.5%	10.6%	8.3%	11.9%	9.9%	12.8%	6.2%	0.7%
Standard deviation	6.8%	22.4%	22.1%	30.0%	8.2%	23.1%	6.8%	4.0%
Growth rate	2.3%	8.2%	6.1%	8.1%	9.6%	10.9%	6.0%	0.6%

Table 15: Historical capital markets analysis¹¹⁰

As one can see from the both tables above, private equity has the highest historical returns and also the highest expected returns, with the highest volatility. Private equity has with 8.1% the highest expected growth rate among all asset classes. The Yale private equity program is one of the first of its kind and it is considered as among the best in the

¹⁰⁹ cp. Swensen (2009), page 110

¹¹⁰ cp. Swensen (2009), page 109

institutional investment community. Since the existence of the private equity asset class at Yale, the investments generated a return of 30.9% per annum.

The private equity investments of Yale are focusing on partnerships with firms, which give emphasis to a value-added approach for investing. Firms that go along with this principle work usually closely with portfolio companies to create more valuable entities as first-order and they rely only as second-order on financial engineering for creating their investment returns. For the investments of Yale in the private equity sector a long-term and also a close relationship is important (usually also a commitment of being the first of several is included). Furthermore they stay away from funds sponsored by financial institutions, as they want to eliminate interest conflicts.

7.6. Real assets¹¹¹

Real estate, oil, gas and timberland show similar characteristics namely that they are sensitive to inflationary forces, high and visible current cash flows and a good opportunity to discover and benefit from market inefficiencies. Furthermore real estate can present good return prospects, a good portfolio diversification and a hedge against unanticipated inflation. The Yale endowment fund has a target allocation for real assets of 29.3%, which lies significantly above the educational mean with 13.7%. According to the Yale university real assets generate a real return of 6.0%, at a risk level of 13.6%.

For the Yale University the real assets are very important in the portfolio as they provide a good possibility of broad diversification and furthermore they generate good returns and they provide relative stability during periods of public market turmoil. Since the year 1978 Yale has real assets in its portfolio and they achieved on average a return of 17.6% per annum.

However, real assets also have disadvantages like their illiquidity, the expensive and time-consuming process of transactions. Those are the reasons why it is not easy for the typical investor to invest into real assets. Yale emphasizes again and again in their investment philosophy that strong and long-term partnerships between the investments office and the investment managers are very important to them. As Yale has a large real assets contingent

¹¹¹ cp. The Yale Endowment annual report 2008, page 14

in their portfolio, during the last decade Yale played a critical role when it comes to the growth and development of more than a dozen organisations.

8. Yale's performance¹¹²

Over the last ten years the Yale endowment fund, the second largest endowment fund of the world, produced an average annual return of 11.8% (net of fees), what even outperformed the Harvard University. Those two universities have by far the largest endowment funds with together assets under management of about \$ 42.3 bn (at June 30, 2009, compared to \$ 60 bn one year before)¹¹³. Over the last ten years the Yale endowment fund added value of \$ 10.5 bn relative to its composite benchmark and even \$ 13.6 bn compared to the average return of a broad universe of college and university endowments. However, also the Yale University has been hit by the financial crisis, during the financial year 2009 the Yale endowment fund had to forfeit 24.6% of their endowment.

In the following figure one can see Yale's performance from 1998 till 2008 and how they outperformed their peers (starting in 1998 at \$ 1,000).

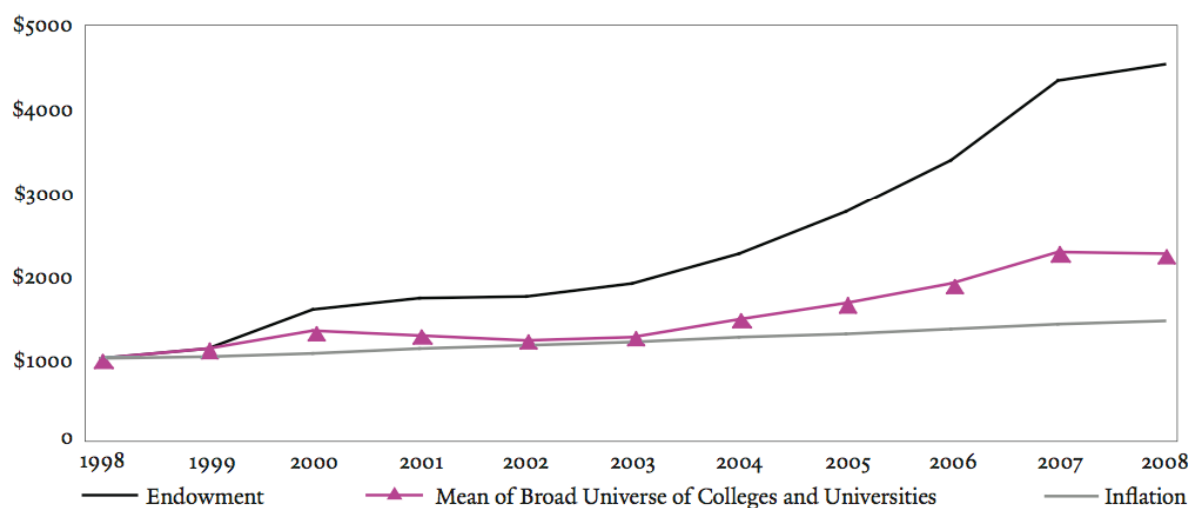


Figure 17: Yale's performance 1998-2008¹¹⁴

¹¹² cp. The Yale Endowment annual report 2008, page 20 et seqq. and . Yale Press Release, (22nd September 2009), "Yale University Releases Endowment Figures"

<http://opa.yale.edu/news/article.aspx?id=6899>

¹¹³ cp. 2008 NACUBO Endowment Study, © 2009 National Association of College and University Business Officers, All Institutions Listed by Fiscal Year 2008 Market Value of Endowment Assets with Percentage Change Between 2007 and 2008 Endowment Assets

¹¹⁴ The Yale Endowment annual report 2008, page 20

The absolute return from Yale's portfolio produced a per annum return of 12.0% over the last decade, which means an outperformance of 1.5% per year compared to the One-Year Constant Maturity Treasury plus 6.0%. The active benchmark of hedge fund manager has also been outranged by 1.9% per year. In the fiscal year 2009 the absolute return portfolio dropped 9.1%. The following figure shows a performance split-up to the separate asset classes, compared to an active and a passive benchmark (from 1998 till 2008):

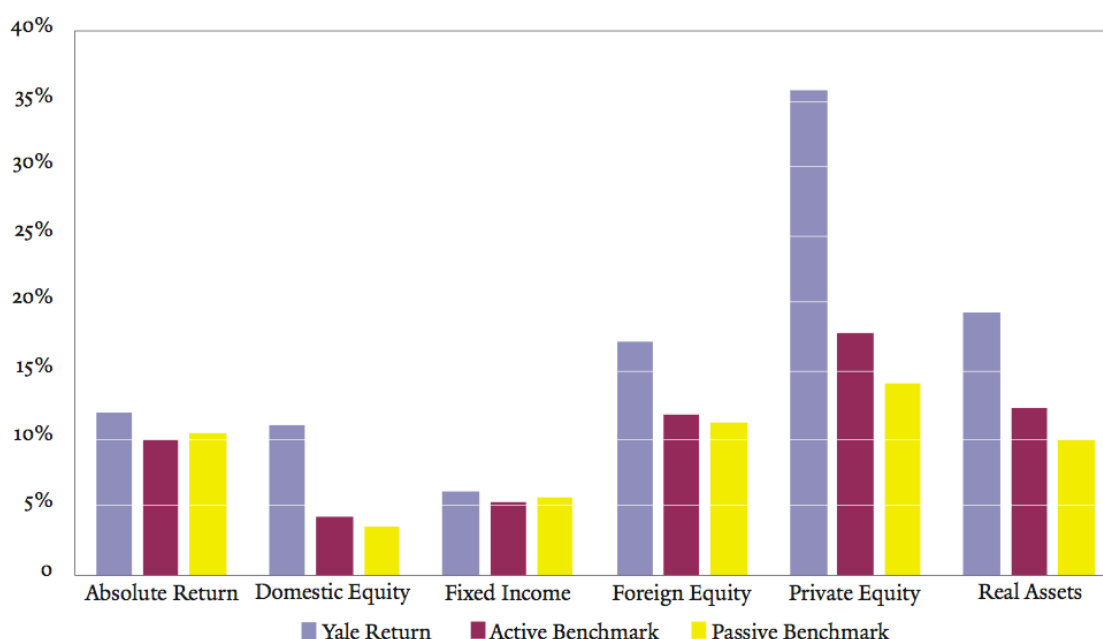


Figure 18: Yale performance split-up 1998-2008¹¹⁵

Asset class	Active benchmark	Passive benchmark
Absolute return	CSFB/Tremont Composite	1-year Constant Maturity Treasury + 6.0%
Domestic equity	Frank Russell Median Manager, U.S. Equity	Wilshire 5000
Fixed income	Frank Russell Median Manager, Fixed Income	Lehman Brothers 1-5 Year U.S. Treasury Index
Foreign equity	Frank Russell Median Manager Composite, Foreign Equity	Blend of MSCI EAFE Index, MSCI EMF Index, University Inflation + 8.0%
Private equity	Cambridge Associates Composite	University Inflation + 10.0%
Real assets	NCREIF and Cambridge Associates Composite	University Inflation + 6.0 %

Table 16: Yale's active and passive benchmarks¹¹⁶

¹¹⁵ The Yale Endowment annual report 2008, page 21

¹¹⁶ cp. The Yale Endowment annual report 2008, page 21

The last table shows the benchmarks used by the Yale endowment fund and also illustrated in the performance split-up graph. As one can see the outperformance in the private equity asset class is the highest as private equity earned over the last ten years on average 35.9% per annum and the benchmark, the University inflation index plus 10% earned on average 14.2%. The private equity asset class exists since 1973 in the Yale endowment fund portfolio and since then the average annual return is 30.9%. In the fiscal year 2009 the private equity asset class declined by 24.3%.

The domestic equity asset class returned for the last 10 years (ending in June 2008) a per annum return of 11.1%, whereas the Russell Median manager benchmark achieved a return of 6.6% p.a. According to the Yale endowment managers these above average returns were achieved through a high security selection ability. Also domestic equity was hit by the crisis and declined by 18.6% during the fiscal year 2009.

As already mentioned before, the fixed income part of the Yale endowment fund is managed by internal managers and they achieved over the last decade an annualized return of 6.2%, which means also an outperformance of their active and passive benchmark. According to the Yale University they achieved the superior returns because of clever security selection and having the ability to carry out illiquid investments, to incur material credit and option risk. The fixed income part of the Yale portfolio was the only profitable asset class in the fiscal year 2009 with a return on 5.1%. Herein before mentioned, it is not easy to simply mimic the Yale endowment fund portfolio as for example for single investors it would not be that easy possible to bear that risk or simply to invest in illiquid assets.

The foreign equity portfolio in the Yale endowment fund gained an annual return of 17.3% over the past ten years, outperforming the composite benchmark by 6.0% per year and the Russell Median Manager by 5.4%. According to the Yale University the excess return here is possible due to their good country allocation and the effective strategy from their active portfolio management. Foreign developed equities produced a loss of 14.4% during fiscal year 2009 and foreign emerging markets produced an even greater loss of 19.2%. Although the return was negative, the Yale University outperformed the benchmarks.

The last asset class are real assets; they achieved an annualized return of 19.4% over the last ten years, outperforming the active benchmark by 7.0% and the passive by 9.3% per year.

During the fiscal year 2009 real assets had the worst performance with a loss of 33.9% due to the existing market turmoil. According to the Yale endowment management, the excess return here is usually possible due to successful detection and exploitation of market inefficiencies and also the contemporary pursuit of investment strategies.

9. Yale's spending policy¹¹⁷

The spending policy of a university defines the compromise between how much money will be reinvested in the assets from the endowment fund and how much will be used for current operations. It is important that the spending policy is applied continuously and without deviations as otherwise the spending policy would not have any sense, that means that the spending rate will not be affected by the financial crisis and the university can be sure about their future cash flows.

The target spending rate of the Yale university stands on June 2008 at 5.25%. The Yale university applies a smoothing rule, which says that the endowment spending in a year is 80% of the previous year's spending and 20% of the targeted long-term spending rate is used to the market value from two years ago. For sure the spending amount is adjusted for the current inflation and there is furthermore an absolute limit, which says that the spending is not allowed to be smaller than 4.5% and not larger than 6.0% of the endowment's inflation-adjusted market value one year ago.

In the following figure one can see the spending growth from 1950 till 2008. In the year 1998 the operating budget in fiscal was \$ 218 million, whereas it rose up to \$ 850 million in the year 2008. The Yale university forecasted spending of \$ 1.16 billion from the endowment in 2008, which represents 44% of revenues.

¹¹⁷ cp. The Yale Endowment annual report 2008, page 15 et seqq.

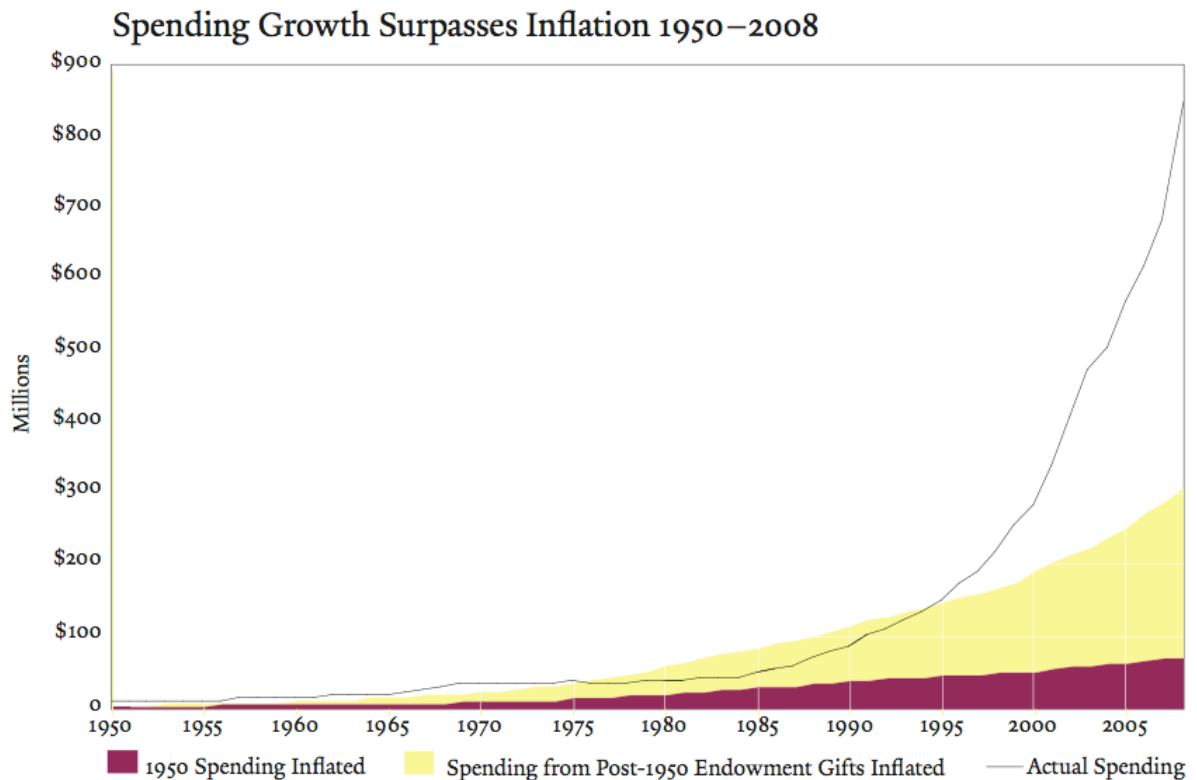


Figure 19: Spending growth 1950 – 2008¹¹⁸

On the one hand the spending policy at Yale wants to eliminate large fluctuations by implying the previous year's spending, which helps the university to make plans about their budget, as over the last 20 years annual changes in spending have been only a fourth as volatile as annual changes in the overall endowment fund asset value. On the other hand the Yale university tries to adjust the spending toward a long-term target spending level, which says that the spending rate will be sensitive to the overall endowment market value.

¹¹⁸ The Yale Endowment annual report 2008, page 15

10. Conclusion: University endowment funds using the example of the Yale endowment fund

Summarising, university endowment funds showed over the last years enviable performances, which many other investors tried to imitate by mimicking their asset allocation. As described in the first part of my paper, the asset allocation is progressive and always up-to-date, but there is more behind it than a successful asset allocation, so just mimicking the asset allocation is not all. The university endowment funds, like the Yale endowment, have a well-skilled investment team with excellent knowledge in security selection.

The Yale endowment fund is the second largest endowment fund in the world with a volume of about \$ 17 bn at the end of 2008. Although they had to cope with losses, like nearly all investors had to at that time during the financial crisis, the Yale endowment fund showed impressive returns in the past and in my opinion, they will also do so in the future. During the financial year 2009 the Yale endowment fund produced a negative return of 24.6%, however over the last 10 years they achieved a return of on average 11.8% per annum.

The Yale endowment fund has a well-thought-out investment philosophy and a progressive asset allocation with exposures to multiple asset classes. Not for nothing the asset allocation of the Yale endowment fund is copied and mimicked several times by other investors. But be careful, the asset allocation is not the only factor of success, there is more behind it than a successful asset allocation. The portfolio managers have high skills and knowledge in the financial sector and strategic security selection has a high proportion on their investment returns.

The existence of endowment funds provides the universities the possibility of financial stability and independence from donations and governmental support. In my opinion the concept of financing the universities operations by an endowment fund should also be distributed in Europe.

11. Annex

References

Bloomberg Markets, June 2009, "Colleges Flunk The Econ Test", 85-94

Bodie, Zvi, Alex Kane and Alan J. Marcus, 2008, "Investments", Eight Edition, McGraw-Hill/Irwin

Brown, Keith C., Lorenzo Garlappi and Cristian Tiu, 2008, "Does Asset Allocation Determine Portfolio Performance?: Evidence from University Endowment Funds", Working Paper

<http://www.mcombs.utexas.edu/faculty/keith.brown/Research/endowment.htm>

Commonfund, 2009, "Educational endowments' investment returns were -2.7% in FY 2008, foreshadowing later losses"

Dimmock, Stephen, 2007, "Portfolio Choice, Background Risk, and University Endowment Funds", Working Paper

http://www.bankofcanada.ca/en/conference_papers/workshop_july2007/dimmock2.pdf

Dimmock, Stephen, 2009, "Background Risk and University Endowment Funds", Working Paper

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=921910

Frontier Capital Management, 2007, "Investing Like the Harvard and Yale Endowment Funds"

http://www.frontiercm.com/downloads/knowledge_bank/Harvard%20and%20Yale.pdf

Handelsblatt, 11th March 2009, Ein Professor schlägt zurück (A professor is backfiring)

Ibbotson, R. G., and P. D. Kaplan, 2000, "Does Asset Allocation Policy Explain 40, 90, or 100 Percent of Performance?," Financial Analysts Journal, 56, 26–33.

Lerner, Josh, Antoinette Schoar, and Wan Wongsunwai, 2007, "Smart Institutions, Foolish Choices? The Limited Partner Performance Puzzle", Journal of Finance, 62, 731-764.

Lerner, Josh, Antoinette Schoar and Jialan Wang, 2008, "Secrets of the academy: The drivers of university endowment success", Nber Working Paper No. 14341, JEL No. G11.L3

Karmin, Craig, and Gergory Zuckerman, 2007, "Why Harvard is Smarting," Wall Street Journal (August 1), C1ff.

Mayer, Barbara, Thomas Pfeiffer and Astrid Reichel, 2005, "Zu Anforderungen und Ausgestaltungsprinzipien von Anreizsystemen aus agencytheoretischer Sicht", Betriebswirtschaftliche Forschung und Praxis, Vol. 57, Heft zu Personalcontrolling, page 12 to 29

NACUBO-Commonfund, 2008, "Endowment Study Follow-up Survey"

<http://www.nacubo.org:80/documents/research/NES2008Follow-upSurveyReport.pdf>

NACUBO endowment study, 2002, "All Institutions Ranked by Fiscal Year 2002 Market Value of Endowment Assets With Percent Change Between 2001 and 2002 Endowment Assets"

<http://www.nacubo.org:80/documents/research/FY02%20Institutional%20Listing.pdf>

NACUBO endowment study, 2003, " All Institutions Listed by Fiscal Year 2003 Market Value of Endowment Assets With Percent Change Between 2002 and 2003 Endowment Assets"

<http://www.nacubo.org:80/documents/research/FY03InstitutionListingForPress.pdf>

NACUBO endowment study, 2004, "Institutions Listed by Fiscal Year 2004 Market Value of Endowment Assets with Percent Change Between 2003 and 2004 Endowment Assets"

<http://www.nacubo.org:80/documents/research/FY04NESInstitutionsbyTotalAssetsforPress.pdf>

NACUBO endowment study, 2005, "Institutions Listed by Fiscal Year 2005 Market Value of Endowment Assets with Percent Change Between 2004 and 2005 Endowment Assets"

<http://www.nacubo.org/documents/about/FY05NESInstitutionsbyTotalAssets.pdf>

NACUBO endowment study, 2006, "Institutions Listed by Fiscal Year 2006 Market Value of Endowment Assets with Percent Change Between 2005 and 2006 Endowment Assets"

http://www.nacubo.org:80/documents/research/2006NES_Listing.pdf

NACUBO endowment study, 2007, "All Institutions Listed by Fiscal Year 2007 Market Value of Endowment Assets with Percent Change Between 2006 and 2007 Endowment Assets"

http://www.nacubo.org:80/Images/All%20Institutions%20Listed%20by%20FY%202007%20Market%20Value%20of%20Endowment%20Assets_2007%20NES.pdf

NACUBO endowment study, 2008, "All Institutions Listed by Fiscal Year 2008 Market Value of Endowment Assets with Percentage Change Between 2007 and 2008 Endowment Assets"

<http://www.nacubo.org:80/documents/research/NES2008PublicTable-AllInstitutionsByFY08MarketValue.pdf>

NACUBO endowment study, 2008, "Average Annual Calculated Spending Rates 2008-1999"

<http://www.nacubo.org:80/documents/research/NES2008PublicTable-SpendingRates.pdf>

Sender, Henny, 2007, "How a Gulf Petro-State Invests its Oil Riches," Wall Street Journal, (August 24), A1ff.

Seward, Zachary M., 2005, "Harvard's Billion-Dollar Man Departs"

http://www.forbes.com/2005/06/29/harvard-management-meyer-cx_zs_0629harvard1.html

Swensen, David F., 2000, "Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment", Free Press, New York

Swensen, David F., 2009, "Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment", Free Press, New York

The Guardian, December 2008, "Crisis blows £250m hole in university funding"

<http://www.guardian.co.uk/education/2008/dec/12/oxford-university-funding-credit-crunch>

The Yale Endowment Annual Report, 2000

http://www.yale.edu/investments/Yale_Endowment_00.pdf

The Yale Endowment Annual Report, 2008

http://www.yale.edu/investments/Yale_Endowment_08.pdf

Yale Press Release, 22nd September 2009, "Yale University Releases Endowment Figures"

<http://opa.yale.edu/news/article.aspx?id=6899>

I tried to find out all owners of image copyright and ask them for their affirmation for this paper. Anyhow, if there should have happen a copyright infringement, please inform me.

List of figures

Figure 1: Total AuM of US endowment funds vs. S&P 500 Index (absolute performance)	8
Figure 2: Total AuM of US endowment funds vs. S&P 500 Index (relative performance)	8
Figure 3: The typical endowment fund investment process	10
Figure 4: Excess returns in 2005 separated by school type	18
Figure 5: Mangement compensation	20
Figure 6: AA of Average US endowment funds	23
Figure 7: AA of US endowment funds with assets	23
Figure 8: Super Endowment's Asset Allocation	24
Figure 9: Super endowment asset allocation over time	24
Figure 10: Adjusted super endowment's asset allocation	26
Figure 11: Index tracking portfolio vs. classical	26
Figure 12: Yale Endowment Fund Allocation 2008	44
Figure 13: Yale Operating Budget Revenue 2008	44
Figure 14: Yale endowment market value 1950-2008 (in billion \$)	45
Figure 15: Yale asset allocation 2008	49
Figure 16: Yale's asset allocation from 1900 till 2000	50
Figure 17: Yale's performance 1998-2008	57
Figure 18: Yale performance split-up 1998-2008	58
Figure 19: Spending growth 1950 – 2008	61

List of tables

Table 1: Overview about the largest US endowment funds	7
Table 2: Average annual calculated spending rates, 1999-2008	13
Table 3: Differences between the average endowment and the Ivy League	16
Table 4: 10 year annualised returns by endowment fund size as of June 2006	22
Table 5: Index-tracking portfolio (hedged into GBP) vs. UK managed funds	26
Table 6: Return decomposition	28
Table 7: Overview NACUBO data from 1984 till 2005	32
Table 8: Benchmark definitions and calculations	34
Table 9: Benchmark correlations	35
Table 10: Test results	37
Table 11: Subdivided results	39
Table 12: Yale endowment overview 2004-2008	45
Table 13: Dispersion of active management returns	52
Table 14: Expected returns for all asset classes	55
Table 15: Historical capital markets analysis	55
Table 16: Yale's active and passive benchmarks	58

List of abbreviations

AA	Asset allocation
AuM	Assets under Management
c.p.	compare
e.g.	exempli gratia, for example
et seq.	and the following (page)
et seqq.	and the following (pages)
i.e.	id est, that is

English Abstract

University endowment funds present the possibility for the university to achieve stable investment returns for attaining financial stability and independence. Especially the largest endowment funds like Yale and Harvard have a progressive asset allocation to alternative asset classes and they have the status as role-model to other investors. The universities achieved over the last years mostly double-digit returns at much lower volatility than other investors. The secret of their success is not as easy to describe as someone might think. It is obvious that the asset allocation is part of their good investment returns, but there is more behind it than a modern asset allocation. The universities' portfolio managers have a high knowledge concerning financial markets and so they know what securities to choose (i.e. the security selection return). Mimicking the asset allocation by simply creating an index-tracking portfolio should be taken out with a pinch of salt. In the second part university endowment funds will be discussed using the example of the Yale university.

Deutscher Abstract

Universitätsfonds repräsentieren die Möglichkeit für Universitäten stabile Investmenterträge zu erhalten und somit finanzielle Unabhängigkeit zu erreichen. Speziell die zwei größten Universitätsfonds der Welt, die der Yale und Harvard Universität, haben eine sehr fortschrittliche Asset Allokation durch ihr Exposure zu alternativen Anlageklassen. Durch ihre Asset Allokation haben die Universitätsfonds Yale und Harvard die Rolle als Vorbild für andere Investoren erhalten. Sie haben in den letzten Jahren meist zweistellige Renditen erzielt, bei niedrigerer Volatilität als das klassische 50% Aktien und 50% Anleihen Portfolio.

Das Geheimnis ihres Erfolges ist nicht so leicht zu beschreiben, wie man auf den ersten Blick denkt. Die Asset Allokation hat natürlich einen großen Anteil daran, jedoch ist sie nicht alleine ausschlaggebend für so erfolgreiche Investments. Vielmehr ist es der erste Schritt in die richtige Richtung. Die Portfolio Managers der Universitätsfonds haben ein beträchtliches Wissen was die Finanzmärkte betrifft, seien es jetzt interne oder externe Portfolio Manager; sie wissen genau welche Einzeltitel sie auswählen müssen. Viele Investoren versuchen die Asset Allokation der Universitäten Yale und Harvard zu kopieren, dies sollte jedoch mit Vorsicht genossen werden.

Curriculum Vitae

General data

Name	Katrin Ramsebner
Date of birth	24 th of January 1985 at Wels
Citizenship	Austrian
Address	Arndtstraße 56/2/2/6, 1120 Wien
Telephone number	+43 650 44 01 003
Email address	katrin@ramsebner.net

Education

1991-1995	Elementary school Ried im Traunkreis (Upper Austria)
1995-1999	Grammar school Kirchdorf/Krems (Upper Austria)
1999-2004	Commercial academy for information technology management Kirchdorf/Krems (Upper Austria)
2004-2009	Studies of international business studies at the University of Vienna Main focus: International Management (Ao. Univ.-Prof. Mag. Dr. Josef Windsperger) Corporate Finance (O. Univ.-Prof. Mag. Dr. Josef Zechner)
01-06/2008	Erasmus study abroad at the Université Paris Dauphine (France)

Foreign languages

English	business fluent
Italian	good knowledge
French	good knowledge