Endowments and Alternatives: Diversification Matters

Authors:
Neil R. Peplinski, CFA
John Hanley, CFA

ABSTRACT

University endowments have been early adopters of alternatives within their investment portfolios. Analysis of historical endowment data illustrates larger endowments tend to implement greater alternative allocations compared to smaller endowments, while also realizing better investment performance in this component of the portfolio. This is often attributed to preferred access to deals and high quality hedge fund managers. However analysis suggests a large portion of this outperformance may be driven by the level of diversification within the alternatives sleeve. Focusing on diversification within the alternatives allocation illustrates a great deal of endowment performance can be achieved using not only illiquid indices but liquid indices as well. As such smaller endowments and correspondingly individual investors may be able to improve portfolio performance by matching the alternatives allocations of large endowments even if utilizing liquid index products for implementation.

INTRODUCTION

University endowments have been early adopters of alternative investment strategies within their investment portfolios. The extent of alternatives usage varies by endowment size as does the realized alternative investment performance. Analyzing historical asset allocation and return data provides some insight into potential drivers of performance differences between larger and smaller institutions. Utilizing index data to create sample alternative portfolios allows for further exploration of the role that asset allocation may play in these performance deviations, with the objective of determining whether smaller endowments as well as individual investors might benefit from implementing an alternative asset allocation breakdown that is more in line with larger funds.

ENDOWMENT USAGE OF ALTERNATIVES

Figure 1 illustrates the usage of alternatives by endowments of various sizes[1]. As shown, larger endowments tend to utilize greater alternative allocations, with the Fiscal Year 2015 average being 57% for institutions with assets greater than $1B. Smaller endowments have historically used substantially smaller allocations, as low as 11% for institutions with less than $25M in assets.

While usage of alternatives varies significantly across the group based on size, the historical realized returns of endowments over the last several years as illustrated in Figure 2 show much less disparity. Comparing the 7-year annualized return of 5.40% for small endowments to the 5.61% of the larger institutions reveals little difference. In fact when taken on a risk-adjusted basis, smaller endowments performed slightly better with a 7-Year Sharpe Ratio of 0.45 versus 0.41.

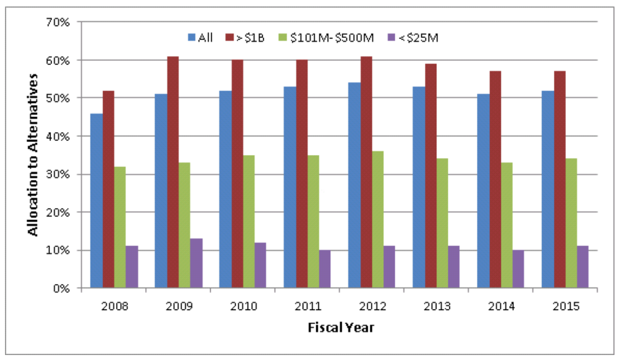

Figure 1: Endowment usage of alternatives (source: NACUBO).

However, this comparable overall investment performance appears to be largely driven by the strength in the broader public equity markets over the last several years. Focusing on the realized returns of just the alternatives sleeve, Figure 3 and Figure 4 show how larger institutions have experienced much better returns in this part of the portfolio.

To gain an understanding of why this performance variation might exist requires a deeper look into how endowments sub-allocate their respective alternative investments.

[1] *The NACUBO data include other size categories than those listed. For simplicity three size categories serve as the main illustrations. For an understanding of the number of size categories and number of institutions in each category see Appendix B.*

Net Annual Total Return						
Fiscal Year Ending 6/30	All	>$1B	$101M to $500M	<$25M	S&P 500 TR	US Agg TR
2009	-18.7%	-20.5%	-19.7%	-16.8%	-26.2%	6.0%
2010	11.9%	12.2%	11.9%	11.6%	14.4%	9.5%
2011	19.2%	20.1%	19.7%	17.6%	30.7%	3.9%
2012	-0.3%	0.8%	-0.7%	0.3%	5.4%	7.5%
2013	11.7%	11.7%	11.9%	11.7%	20.6%	-0.7%
2014	15.5%	16.5%	15.5%	15.5%	24.6%	4.4%
2015	2.4%	4.3%	2.0%	2.3%	7.4%	1.9%
5-Yr Ann.	9.44%	10.44%	9.40%	9.26%	17.34%	3.35%
Volatility (5-Yr)	8.38%	8.09%	8.75%	7.79%	10.96%	3.04%
Sharpe Ratio (5-Yr)	1.13	1.29	1.07	1.19	1.58	1.10
7-Yr Ann.	5.22%	5.61%	5.01%	5.40%	9.42%	4.59%
Volatility (7-Yr)	12.87%	13.61%	13.35%	11.94%	18.73%	3.42%
Sharpe Ratio (7-Yr)	0.41	0.41	0.38	0.45	0.50	1.34

Figure 2: Recent total portfolio returns of endowments (source: NACUBO, internal).

Average Return for Endowment Alternatives Sleeve						
Fiscal Year Ending 6/30	All	>$1B	$101M to $500M	<$25M	S&P 500 TR	US Agg TR
2009	-17.8%	*	*	*	-26.2%	6.0%
2010	7.5%	*	*	*	14.4%	9.5%
2011	14.1%	16.9%	15.4%	9.5%	30.7%	3.9%
2012	0.5%	3.1%	1.2%	-1.4%	5.4%	7.5%
2013	8.3%	10.6%	9.1%	4.8%	20.6%	-0.7%
2014	12.7%	17.5%	12.8%	11.8%	24.6%	4.4%
2015	1.1%	6.5%	2.5%	-6.5%	7.4%	1.9%
5-Yr Ann.	7.19%	10.78%	8.06%	3.41%	17.34%	3.35%
Volatility (5-Yr)	6.35%	6.32%	6.23%	7.59%	10.96%	3.04%
Sharpe Ratio (5-Yr)	1.13	1.70	1.29	0.45	1.58	1.10
7-Yr Ann.	3.24%	*	*	*	9.42%	4.59%
Volatility (7-Yr)	10.83%	*	*	*	18.73%	3.42%
Sharpe Ratio (7-Yr)	0.30	*	*	*	0.50	1.34

Figure 3: Return on the alternatives portion of endowment portfolios (source: NACUBO, Internal)[2].

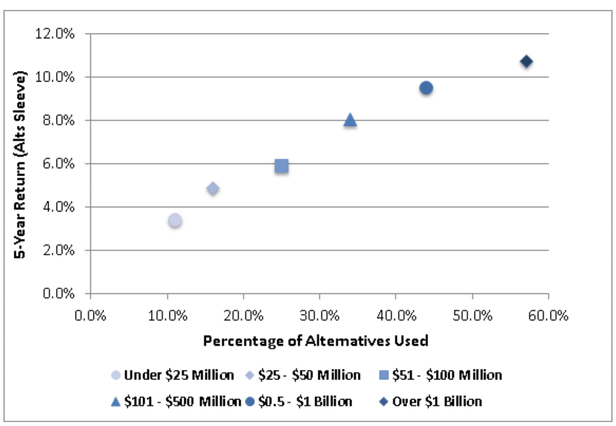

Figure 4: Alternative investment performance of endowments of various sizes (source: NACUBO, internal).

[2] *Return data by endowment size not available prior to 2011.*

ALLOCATIONS WITHIN THE ALTS SLEEVE

Figure 5 highlights the breakdown of alternative asset allocations for endowments. Note this does not represent the entire portfolio allocation, but simply the relative allocations across various alternative categories within the alternatives portion of the overall portfolio.

	Total Institutions						
Type of Investment	'09	'10	'11	'12	'13	'14	'15
Private Equity	22	25	24.8	25.8	23.8	23.5	20.8
Venture Capital	8	7	7.8	7.8	8.68	9.8	11.2
ABS Return	44	42	38.8	36.8	38.9	37.3	40
Natural Resources	13	15	15.8	15.8	14.3	15.7	15
Real-Estate	13	11	12.8	13.8	14.3	13.7	13.1
TOTAL	100	100	100	100	100	100	100

Figure 5: Percent relative allocation to various alternative categories (source: NACUBO)[3].

Figure 6 illustrates the category breakdown (grouping private equity and venture capital together into the PE/VC category) for Fiscal Year 2015 for various size endowments.

From the chart it is clear that in 2015 larger endowments tended to be more balanced in allocations across private equity (PE/VC), absolute return strategies (ABS Return) and real assets (Natural Resources and Real-Estate). In contrast, smaller institutions tended to be more heavily concentrated in absolute return strategies and relatively underweight in the private equity space. While not illustrated here, this pattern is not limited to just 2015 but in fact spans the entire data set (see Appendix B for additional details). This discrepancy becomes even more apparent with decreasing endowment size. This is most likely attributable to their limited investment opportunities and the need for greater liquidity. For an endowment that has $25M or less in assets, for example, it could be relatively more difficult to assemble a diversified allocation to direct illiquid private equity deals than a larger institutions might experience. Correspondingly, it is much easier to access absolute return strategies which are readily available in liquid format.

Whether these allocation differences are responsible for the relative performance differences highlighted in Figure 3 is a little harder to isolate. Certainly if the allocations across the different alternative categories were the same for the various size endowments, then performance differences would most likely be attributed

[3] *NACUBO data also include "Distressed Debt" and "Alternatives not broken out" categories. These tend to be small and for simplicity allocations to these groups have been spread across the other five categories listed. "Natural Resources" includes "Commodities and Managed Futures".*

to individual investment selection. However, that is not the case here.

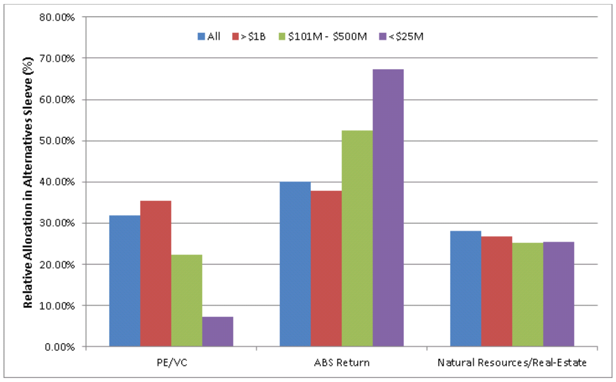

Figure 6: Allocations to various alternative categories for endowments of various sizes for FY 2015 (source: NACUBO, internal).

USING INDEX BLENDS TO PROXY

One way to explore the impacts of asset allocation on the differing returns illustrated in Figure 3 is to see if it is possible to approximate endowment returns using related indices. Figure 7 below lists two set of indices, one consisting of relatively illiquid components (or at least indices not directly selected with liquidity in mind) and one comprising liquid indices. The indices were selected as proxy exposures for the categories listed in Figure 5.

Using these indices and historical data on alternative allocations, it is possible to create index portfolio returns for comparison to the actual reported performance. Figure 8, for example, illustrates how the actual reported returns compare to returns for a theoretical portfolio using the indices from Figure 7 and the allocations shown in Figure 5 (rebalanced annually).

While not a perfect replacement for the actual returns, both the illiquid and liquid index portfolios are comparable to the reported performance as measured by R-squared and slope. Repeating this analysis for other size groupings leads to Figure 9, Figure 10 and Figure 11.

As illustrated, the index proxy returns also track the investment performance of the various size groupings reasonably well. From this observation, it is therefore reasonable to postulate that a great deal of the outperformance in the alternative sleeve for larger endowments may actually be driven by asset allocation. As such, it may be possible for smaller endowments, and by extension individual investors, to improve portfolio performance by adjusting their allocations within their alternatives solutions to better match those of the larger endowments such as listed in Figure 6.

Category	Illiquid Proxies	
	Index	***Symbol***
Private Equity	Cambridge U.S. PE Index	*
Venture Capital	Cambridge U.S. VC Index	*
ABS Return	HFRI Fund Weighted Composite Index	HFRIFWI
Nat Resources	HFRI EH: Sector - Energy/Basic Materials Index	HFRISEN
Real-Estate	Cambridge Real-Estate Index	*

Category	Liquid Proxies	
	Index	***Symbol***
Private Equity	Thomson Reuters Private Equity Buyout Index	TRPEI
Venture Capital	Thomson Reuters Venture Capital Index	TRVCI
ABS Return	Morningstar US OE Market Neutral (1/3)	*
	Morningstar US OE Multicurrency (1/3)	*
	Morningstar US OE Long-Short Equity (1/3)	*
Nat Resources	S&P North American Natural Resources Sector TR Index	SPGINRTR
Real-Estate	Dow Jones Equity REIT Total Return Index	REIT

Figure 7: Index proxies for alternatives categories.

Average Return for Alternative Sleeve			
All Endowments			
Fiscal Year Ending 6/30	**Actual**	**Illiquid Proxy**	**Liquid Proxy**
2009	-17.8%	-19.7%	-14.3%
2010	7.5%	10.1%	15.9%
2011	14.1%	18.7%	25.5%
2012	0.5%	-2.0%	1.9%
2013	8.3%	9.2%	12.1%
2014	12.7%	16.5%	20.5%
2015	1.1%	5.1%	1.7%
5-Yr Ann.	7.2%	9.2%	11.9%
Volatility (5-Yr)	6.3%	8.5%	10.8%
Sharpe Ratio (5-Yr)	1.13	1.09	1.11
7-Yr Ann.	3.2%	4.7%	8.3%
Volatility (7-Yr)	10.8%	13.1%	13.6%
Sharpe Ratio (7-Yr)	0.30	0.36	0.61
Slope	1.00	1.19	1.22
R-Sq	1.00	0.98	0.94

Figure 8: Illustration of index proxy returns (source: NACUBO, Internal).

Average Return for Alternative Sleeve			
>$1B			
Fiscal Year Ending 6/30	**Actual**	**Illiquid Proxy**	**Liquid Proxy**
2009	*	-20.2%	-14.7%
2010	*	10.0%	16.9%
2011	16.9%	19.2%	26.9%
2012	3.1%	-1.7%	2.4%
2013	10.6%	9.4%	12.9%
2014	17.5%	17.0%	21.5%
2015	6.5%	6.0%	2.8%
5-Yr Ann.	10.8%	9.7%	12.9%
Volatility (5-Yr)	6.3%	8.5%	11.0%
Sharpe Ratio (5-Yr)	1.70	1.15	1.17
Slope	1.00	1.31	1.67
R-Sq	1.00	0.96	0.93

Figure 9: Illustration of index proxy returns for endowments >$1B in assets (source: NACUBO, Internal).

Average Return for Alternative Sleeve			
$101M - $500M			
Fiscal Year Ending 6/30	Actual	Illiquid Proxy	Liquid Proxy
2009	*	-17.5%	-12.7%
2010	*	10.0%	11.6%
2011	15.4%	16.9%	20.5%
2012	1.2%	-3.2%	0.1%
2013	9.1%	8.7%	10.2%
2014	12.8%	14.9%	17.3%
2015	2.5%	3.4%	-0.1%
5-Yr Ann.	8.1%	7.9%	9.3%
Volatility (5-Yr)	6.2%	8.3%	9.5%
Sharpe Ratio (5-Yr)	1.29	0.96	0.97
Slope	1.00	1.29	1.52
R-Sq	1.00	0.95	0.99

Figure 10: Illustration of index proxy returns for endowments $101M-$500M in assets (source: NACUBO, Internal).

Average Return for Alternative Sleeve			
<$25M			
Fiscal Year Ending 6/30	Actual	Illiquid Proxy	Liquid Proxy
2009	*	-18.0%	-14.3%
2010	*	9.0%	11.2%
2011	9.5%	15.8%	17.5%
2012	-1.4%	-4.7%	-1.9%
2013	4.8%	7.2%	8.3%
2014	11.8%	12.6%	13.5%
2015	-6.5%	-0.2%	-4.6%
5-Yr Ann.	3.4%	5.9%	6.2%
Volatility (5-Yr)	7.6%	8.6%	9.6%
Sharpe Ratio (5-Yr)	0.45	0.69	0.65
Slope	1.00	0.99	1.21
R-Sq	1.00	0.78	0.92

Figure 11: Illustration of index proxy returns for endowments <$25M in assets (source: NACUBO, Internal).

CONCLUSION

It is generally understood that endowments utilize alternative investment strategies as a significant component of overall portfolio construction. Reviewing historical portfolio data also illustrates larger endowments tend to utilize greater alternative allocations, while also achieving better investment performance from their alternative investments. Analysis into the specific alternative asset allocation used by endowments reveals that larger institutions tend to be more balanced across private equity/venture capital, absolute return, and natural resources & real-estate categories compared to smaller funds, which tend to be more concentrated in absolute return strategies and underweight private equity and venture capital exposures. Utilizing index data and historical alternative asset allocation breakdowns to create index proxy portfolios suggests this differing asset allocation between large and small endowments may be largely responsible for the corresponding performance differences. As such, it may be possible for smaller endowments, and by extension individual investors, to improve portfolio performance by adjusting their allocations within their alternatives solutions to better match those of the larger endowments.

IMPORTANT DISCLOSURES

an investment-management fee, the incurrence of which would have the effect of decreasing historical performance results. Economic factors, market conditions, and investment strategies will affect the performance of any portfolio and there are no assurances that it will match or outperform any particular benchmark.

The S&P 500 Total Return Index (S&P 500 TR) is a capitalization weighted index of 500 stocks designed to measure the performance of the broad domestic economy. The total return index included the effects of dividends.

The Lehman Aggregate Bond Total Return Index (US Agg TR) is an aggregate bond index that includes government securities, mortgage-backed securities, asset-backed and corporate securities.

Cambridge U.S. Private Equity (PE) Index is an end-to-end calculation based on data compiled from U.S. private equity funds (buyout, growth equity, private equity energy and mezzanine funds), including fully liquidated partnerships.

Cambridge U.S. Venture Capital (VC) Index is an end-to-end calculation based on data compiled from U.S. venture capital funds including early stage, late & expansion stage, multi-stage, venture debt funds, and fully liquidated partnerships.

Cambridge Real-Estate Index is end-to-end calculation based on data compiled from real estate funds, (opportunistic and value-added real estate funds) including fully liquidated partnerships.

HFRI Fund Weighted Composite Index is a global, equal-weighted index of over 2,000 single-manager funds that report to HFR Database. Constituent funds report monthly net of all fees performance in US Dollar and have a minimum of $50 Million under management or a twelve (12) month track record of active performance. The HFRI Fund Weighted Composite Index does not include Funds of Hedge Funds.

HFRI EH: Sector – Energy/Basic Materials Index is comprised of Sector - Energy/Basic Materials strategies which employ investment processes designed to identify opportunities in securities in specific niche areas of the market in which the Manager maintains a level of expertise which exceeds that of a market generalist in identifying companies engaged in the production & procurement of inputs to industrial processes, and implicitly sensitive to the direction of price trends as determined by shifts in supply and demand factors, and implicitly sensitive to the direction of broader economic trends. Sector - Energy/Basic Materials strategies typically maintain a primary focus in this area or expect to maintain in excess of 50% of portfolio exposure to these sectors over a various market cycles.

Thomson Reuters Venture Capital Research Index measures the aggregate gross returns of the US venture capital industry by tracking the performance of individual US venture capital-backed private companies, which are not available for public investment, using Thomson Reuters Private Company Data and is published quarterly.

Thomson Reuters Venture Capital Index is an investable index designed to track the Thomson Reuters Venture Capital Research Index using liquid securities rather than investing directly in VC firms. Published daily and computed at the close of each trading day, the index provides immediate information about movements in the VC universe.

Thomson Reuters Private Equity Buyout Research Index is a comprehensive index that leverages the Thomson Reuters private equity investment database, analyzing over 8,000 US private equity companies. It is a measure of PE buyout returns gross of fees and tracks the gross performance of the US PE buyout industry through a comprehensive aggregation of company values.

Thomson Reuters Private Equity Buyout Index is an investable index designed to track the Thomson Reuters Private Equity Buyout Research Index using liquid securities rather than investing directly in PE firms. Published daily and computed at the close of each trading day, the index provides immediate information about movements in the PE universe.

S&P North American Natural Resources Sector Total Return Index provides investors with a benchmark that represents U.S. traded securities that are classified under the GICS® energy and materials sector excluding the chemicals industry and steel sub-industry.

Dow Jones Equity REIT Total Return Index is comprised of real-estate investment trusts (REITs) that directly own all or part of the properties in their portfolios. Dividend payouts have been added to the price changes.

Morningstar US OE Market Neutral is the simple average of open-end funds in the Morningstar Market

Neutral category. Funds in this category attempt to reduce systematic risk created by factors such as exposures to sectors, market-cap ranges, investment styles, currencies, and/or countries. They try to achieve this by matching short positions within each area against long positions. These strategies are often managed as beta-neutral, dollar-neutral, or sector-neutral. A distinguishing feature of funds in this category is that they typically have low beta exposures (< 0.3 in absolute value) to market indexes such as MSCI World. In attempting to reduce systematic risk, these funds put the emphasis on issue selection, with profits dependent on their ability to sell short and buy long the correct securities.

Morningstar US OE Multicurrency is the simple average of open-end funds in the Morningstar Multicurrency category. Funds in this category invest in multiple currencies through the use of short-term money market instruments; derivative instruments including and not limited to forward currency contracts, index swaps, and options; and cash deposits. These funds include both systematic currency traders and discretionary traders.

Morningstar US OE Long-Short Equity is the simple average of open-end funds in the Morningstar Long-Short Equity category. Funds in this category hold sizeable stakes in both long and short positions in equities, exchange traded funds, and related derivatives. Some funds that fall into this category will shift their exposure to long and short positions depending on their macro outlook or the opportunities they uncover through bottom-up research. At least 75% of the assets are in equity securities or derivatives, and funds in the category will typically have beta values to relevant benchmarks of between 0.3 and 0.8 over a three-year period.

NACUBO: The National Association of College and University Business Officers (NACUBO) is a membership organization representing more than 2,500 colleges, universities, and higher education service providers across the country and around the world.

ABOUT THE AUTHORS

***Neil Peplinski, CFA**, is the Chairman, Chief Investment Officer and Co-founder of Cedar Capital. With over 20 years of professional experience, Neil is responsible for research, investment analysis and the development/oversight of new investment strategies and models. Prior to co-founding Cedar Capital, he served as a portfolio manager and quantitative analyst for Allstate Investments. Neil earned a MBA with High Honors from The University of Chicago Booth School of Business, a MSEE from The University of Michigan and a BSEE from The Michigan Technological University.*

***John Hanley, CFA** is a Senior Product Specialist for Cedar Capital. John works to support the firm with in depth analysis and research on investment products. John is focused on the Tactical Equity Income strategy and Currency Strategy and also examines how non-traditional investments can be utilized in investment portfolios. Prior to joining Cedar Capital in 2012, John worked at Northern Trust and the Chicago Board Options Exchange. John earned a BA from Roosevelt University.*

APPENDIX A: DEFINITIONS

Sharpe Ratio: A ratio developed by William F. Sharpe defined as return above the risk-free rate divided by standard deviation. It is meant to provide a risk-adjusted measure of investment performance. Higher Sharpe Ratio is better, all else being equal. When comparing investment approaches using the Sharpe Ratio it is important to use the same risk-free rate in both calculations.

Volatility: A statistical measure of the dispersion of returns for a given security or market index. Volatility can either be measured by using the standard deviation or variance between returns from that same security or market index. It is generally accepted, the higher the volatility, the riskier the security.

R-squared: R-squared indicates how much of the composite portfolio's fluctuations are attributable to movements of its benchmark.

APPENDIX B: SUPPLEMENTAL DATA

Number of Instituions in Study (Source: NACUBO)

FY	All	>$1B	$501M to $1B	$101M to $500M	$51M to $100M	$25M to $50M	<$25M
2009	842	52	60	219	164	137	210
2010	850	60	66	226	169	145	184
2011	823	73	66	251	162	134	137
2012	831	68	71	250	164	128	150
2013	835	82	70	261	166	125	131
2014	832	91	77	262	168	125	109
2015	812	94	77	261	167	117	96

Figure 12: Number of endowments included in NACUBO study (source: NACUBO).

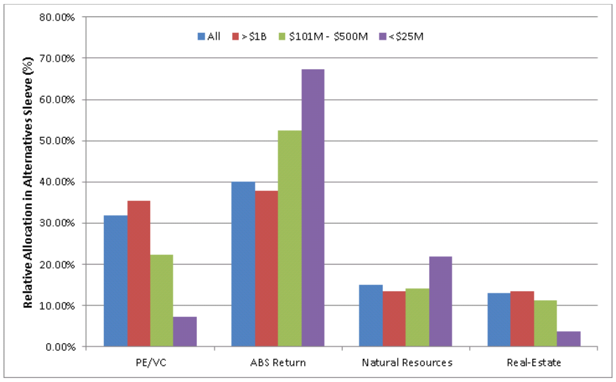

Figure 13: Allocations to various alternative categories for endowments of various sizes for FY 2015 before combining real-assets (source: NACUBO, internal).

	>$1B						
Type of Investment	**'09**	**'10**	**'11**	**'12**	**'13**	**'14**	**'15**
Private Equity	23	26	26.8	26.8	26.4	23.5	22.1
Venture Capital	9	8	8.8	8.8	9.49	11.2	13.3
ABS Return	41	39	34.8	33.8	34.9	34	37.9
Natural Resources	13	15	15.8	15.8	14.6	16.5	13.3
Real-Estate	14	12	13.8	14.8	14.6	14.7	13.3
TOTAL	100	100	100	100	100	100	100

Figure 14: Percent relative allocation to various alternative categories for endowments with greater than $1B in assets. (source: NACUBO)

	$101M - $500M						
Type of Investment	**'09**	**'10**	**'11**	**'12**	**'13**	**'14**	**'15**
Private Equity	18	18	18.8	19.8	18.8	17	17.1
Venture Capital	6	5	4.8	5.8	7.06	7.88	5.29
ABS Return	55	56	53.8	50.8	51.2	50.3	52.4
Natural Resources	13	14	14.8	14.8	12.9	13.9	14.1
Real-Estate	8	7	7.8	8.8	10	10.9	11.2
TOTAL	100	100	100	100	100	100	100

Figure 15: Percent relative allocation to various alternative categories for endowments with assets between $101M and $500M. (source: NACUBO)

	<$25M						
Type of Investment	**'09**	**'10**	**'11**	**'12**	**'13**	**'14**	**'15**
Private Equity	10.6	11.8	9.4	8.8	10.9	2	3.64
Venture Capital	6.6	6.8	5.4	5.8	1.82	2	3.64
ABS Return	59.6	60.8	61.4	62.8	56.4	62	67.3
Natural Resources	9.6	11.8	13.4	15.8	20	22	21.8
Real-Estate	13.6	8.8	10.4	6.8	10.9	12	3.64
TOTAL	100	100	100	100	100	100	100

Figure 16: Percent relative allocation to various alternative categories for endowments with less and $25M assets. (source: NACUBO)