



ENDOWMENT MODELING **AND ALTERNATIVES**

HOW TO DESIGN AND IMPLEMENT A PROPERLY CONSTRUCTED ALTS SLEEVE - 1 CE CREDIT

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At Cedar Capital, we believe in the benefits of incorporating properly developed alternatives components into overall portfolio construction. For the most effective use of alternatives within a portfolio, attention must be given to the underlying asset allocation within the alternatives sleeve. Without a diversified mix of alternative asset classes, performance of the alternatives portion of a portfolio may fall short of expectations.

THIS PRESENTATION WILL COVER:

- Overview of endowment data and usage of alternatives across various size endowments
- Comparison of larger versus smaller endowments particularly with regards to asset allocation within the alternatives sleeve
- Replication of alternative sleeves utilizing indices as a roadmap for more intelligent alternative asset allocation

KEY OBSERVATIONS:

- Larger endowments use more alternatives and have realized better alternatives performance
- The better performance appears largely driven by asset allocation versus specific investment selection



Endowments serve as the starting point for analysis of alternatives usage within portfolios. The National Association of College and University Business Officers (NACUBO) provides valuable data through surveys across the endowment universe.

Fiscal Year Ending 6/30/	Number of Institutions in Study						
	All	>\$1 B	\$501 M to \$1 B	\$101 M to \$500 M	\$51 M to \$100 M	\$25 M to \$50 M	<\$ 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
2016	805	91	75	264	163	121	91
2017	809	97	82	275	157	113	85
2018	800	104	84	283	154	103	72

- Detailed data going back several years for over 800 endowments
- Overall portfolio performance
- Performance of various sub-components (i.e. Alternatives Sleeve)
- Asset allocation details

Source: NACUBO

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WHY **ALTERNATIVES?**



WHY ALTERNATIVES?

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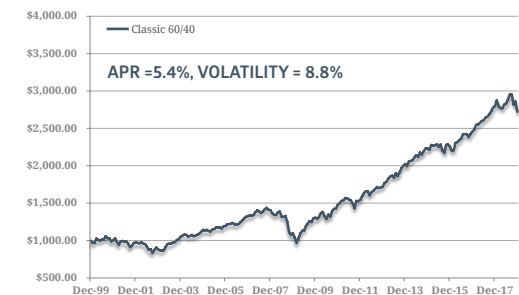
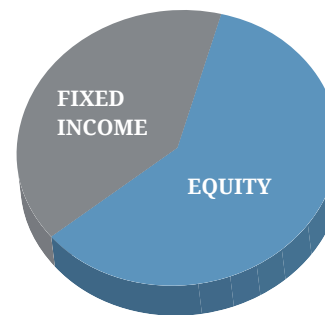
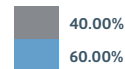
Hypothetical example - for illustrative purposes only

Alternative investments, which represent non-traditional risk categories, have the potential to reduce the risk and/or improve the return of an overall portfolio.

EACH BUILDING BLOCK HAS A ROLE IN PORTFOLIO CONSTRUCTION

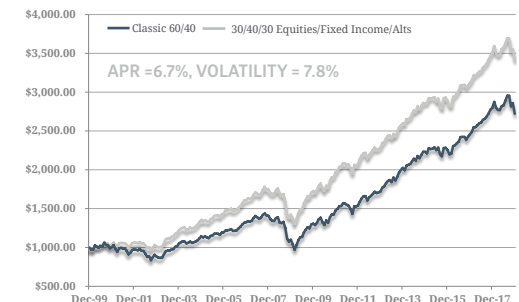
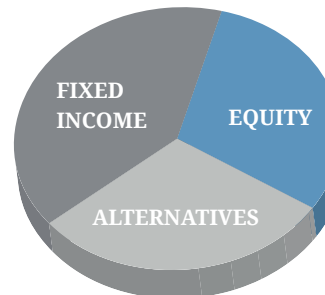
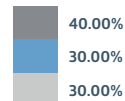
STRATEGIC —
stick close to benchmark
but seek to offer some
outperformance where
possible

1.) Start with a
traditional
60/40 portfolio



ALTERNATIVES —
provide non-traditional
risk exposures; modeled
after large endowment
alternatives
sub-allocations

2.) ADD an alternative
allocation. A liquid
version designed to
proxy large endowment
alternative allocations



Data: 31 Dec 1999 - 31 Dec 2018. Source: Bloomberg, Morningstar, Internal.

Past performance is not a guarantee of future results. An investment cannot be made directly in an index. Equity is represented by the S&P 1500 TR Index. Fixed Income is represented by the Barclays US Aggregate Bond TR Index. Alternatives are represented by: 5% Thomson Reuters Venture Capital Index, 5% Thomson Reuters Private Equity Buyout Index, 10% Credit Suisse Global Macro Index, 5% S&P North American Natural Resources TR Index, and 5% Dow Jones Equity REIT TR Index. Please see posterior disclosures for additional information.

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ALTERNATIVE USAGE BY ENDOWMENTS

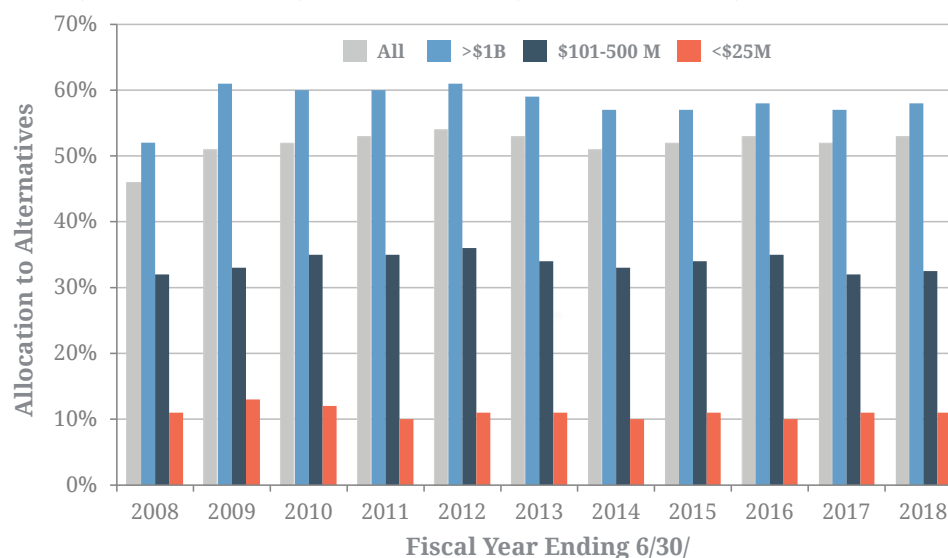
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Allocation to Alternative Strategies							
Fiscal Year Ending 6/30/	All	>\$1 B	\$501 M to \$1 B	\$101 M to \$500 M	\$51 M to \$100 M	\$25 M to \$50 M	<\$25 M
2008	46%	52%	42%	32%	23%	17%	11%
2009	51%	61%	43%	33%	22%	18%	13%
2010	52%	60%	45%	35%	24%	17%	12%
2011	53%	60%	46%	35%	23%	18%	10%
2012	54%	61%	48%	36%	24%	19%	11%
2013	53%	59%	45%	34%	23%	20%	11%
2014	51%	57%	44%	33%	24%	18%	10%
2015	52%	57%	44%	34%	25%	16%	11%
2016	53%	58%	45%	35%	24%	17%	10%
2017	52%	57%	42%	32%	22%	17%	11%
2018	53%	58%	41%	33%	22%	16%	11%

KEY OBSERVATIONS:

- Larger endowments have consistently used a greater amount of alternatives
- Alternatives: Everything that's not public equities, fixed income or short-term securities/cash

Source: NACUBO. Alternative investment products involve a high degree of risk. Alternative investment performance can be volatile and an investor could lose a substantial portion of their investment. Diversification does not ensure profit or protect against loss. Please see posterior disclosures for additional information.



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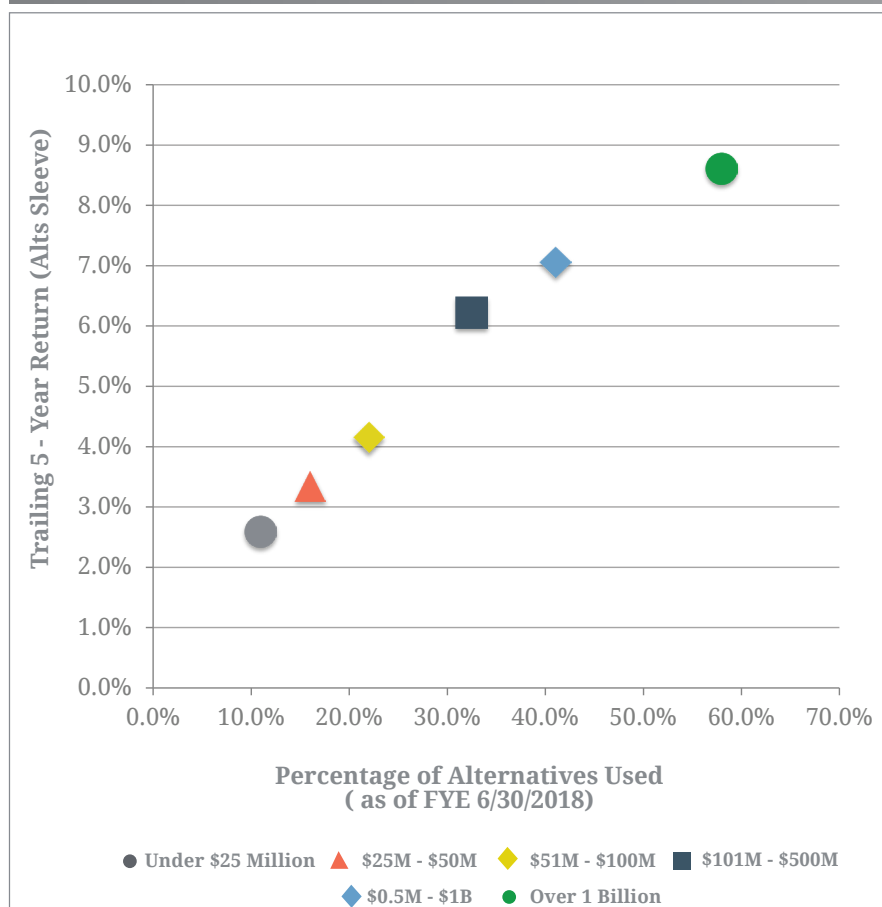
ALTERNATIVE PERFORMANCE BY ENDOWMENTS

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Average Return for Endowment Alternatives Sleeve

Fiscal Year Ending 6/30/	All	>\$1 B	\$101 M to \$500 M	<\$25 M	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%
2016	-1.4%	-1.1%	-0.9%	-0.6%	4.0%	6.0%
2017	7.8%	9.8%	8.3%	4.7%	17.9%	-0.3%
2018	8.3%	11.2%	9.0%	4.5%	14.4%	-0.4%
Trailing 5-yr APR	5.57%	8.61%	6.23%	2.60%	13.42%	2.27%
Trailing 5-yr Volatility	5.74%	6.81%	5.47%	6.81%	8.23%	2.84%
Trailing 5-yr Sharpe Ratio	0.97	1.26	1.14	0.38	1.63	0.80
Trailing 7-yr APR	5.22%	8.08%	5.90%	2.33%	13.23%	2.57%
Trailing 7-yr Volatility	5.24%	6.04%	5.05%	5.87%	8.02%	3.35%
Trailing 7-yr Sharpe Ratio	1.00	1.34	1.17	0.40	1.65	0.77

Alternative Investment Performance of Various Size Endowments



KEY OBSERVATIONS:

- Larger endowments also have better returns from the alternatives (so double plus, use more AND get better returns)

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SUB-ALLOCATION TO ALTERNATIVES VARIES

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Total Institutions						
FY Ending 6/30/	Private Equity	Venture Capital	ABS Return	Natural Resources	Real-Estate	Total
2009	22%	8%	44%	13%	13%	100%
2010	25%	7%	42%	15%	11%	100%
2011	25%	7.8%	39%	16%	13%	100%
2012	26%	8%	37%	16%	14%	100%
2013	24%	9%	39%	14%	14%	100%
2014	24%	10%	37%	16%	14%	100%
2015	21%	11%	40%	15%	13%	100%
2016	22%	12%	39%	14%	12%	100%
2017	22%	13%	38%	15%	13%	100%
2018	22%	14%	37%	16%	12%	100%

\$101M - \$500M						
FY Ending 6/30/	Private Equity	Venture Capital	ABS Return	Natural Resources	Real-Estate	Total
2009	18%	6%	55%	13%	8%	100%
2010	18%	5%	56%	14%	7%	100%
2011	19%	5%	54%	15%	8%	100%
2012	20%	6%	51%	15%	9%	100%
2013	19%	7%	51%	13%	10%	100%
2014	17%	8%	50%	14%	11%	100%
2015	17%	5%	52%	14%	11%	100%
2016	17%	9%	49%	14%	11%	100%
2017	18%	6%	49%	15%	12%	100%
2018	19%	8%	47%	14%	12%	100%

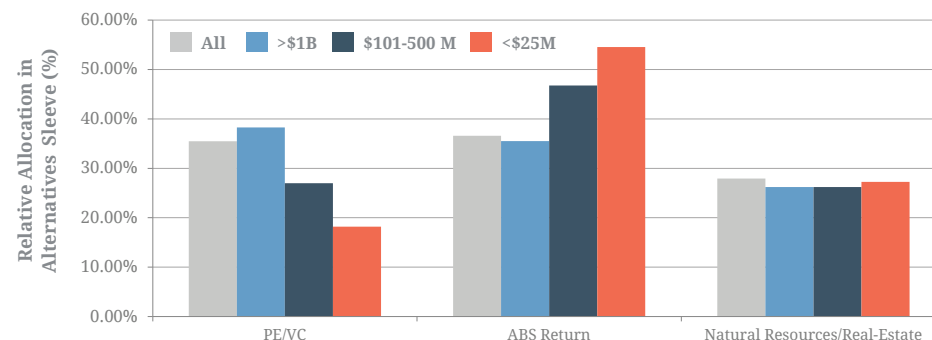
>\$1B						
FY Ending 6/30/	Private Equity	Venture Capital	ABS Return	Natural Resources	Real-Estate	Total
2009	23%	9%	41%	13%	14%	100%
2010	26%	8%	39%	15%	12%	100%
2011	27%	9%	35%	16%	14%	100%
2012	27%	9%	34%	16%	15%	100%
2013	26%	10%	35%	15%	15%	100%
2014	24%	11%	34%	16%	15%	100%
2015	22%	13%	38%	13%	13%	100%
2016	22%	13%	36%	15%	13%	100%
2017	23%	14%	37%	15%	12%	100%
2018	22%	17%	36%	15%	11%	100%

<\$25M						
FY Ending 6/30/	Private Equity	Venture Capital	ABS Return	Natural Resources	Real-Estate	Total
2009	11%	7%	60%	10%	14%	100%
2010	12%	7%	61%	12%	9%	100%
2011	9%	5%	61%	13%	10%	100%
2012	9%	6%	63%	16%	7%	100%
2013	11%	2%	56%	20%	11%	100%
2014	2%	2%	62%	22%	12%	100%
2015	4%	4%	67%	22%	4%	100%
2016	12%	2%	62%	22%	2%	100%
2017	11%	2%	66%	11%	11%	100%
2018	9%	9%	55%	18%	9%	100%

KEY OBSERVATIONS:

- Larger endowments more balanced alternative allocations vs. smaller endowments which are overweight (relatively) Absolute Return strategies

Source: NACUBO. Allocations may not sum to 100% due to rounding. 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."



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IS ALLOCATION THE **MAIN DRIVER?**



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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

MAIN POINTS:

- Attempt to replicate endowment returns utilizing index data (isolating asset allocation from specific investment selection)
- Explore both illiquid and liquid indices (is there a significant illiquidity premium?)

It is not possible to invest directly in an index. Indexes are unmanaged and do not reflect the deduction of fees or other expenses. Historical performance results for market indices and/or categories generally do not reflect the deduction of transaction and/or custodial charges or the deduction of 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. Please see posterior disclosures for additional information.

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IS ALLOCATION THE MAIN DRIVER?

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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%	19.0%	25.5%
2012	0.5%	-2.0%	1.9%
2013	8.3%	9.0%	12.1%
2014	12.7%	16.5%	20.5%
2015	1.1%	5.1%	1.7%
2016	-1.4%	-0.1%	2.6%
2017	7.8%	9.0%	11.9%
2018	8.3%	11.5%	16.0%
Trailing 5-yr APR	5.6%	8.3%	10.3%
Trailing 5-yr Volatility	5.7%	6.3%	8.2%
Trailing 5-yr Sharpe Ratio	0.97	1.32	1.25
Trailing 7-yr APR	5.2%	6.8%	9.3%
Trailing 7-yr Volatility	5.2%	6.5%	7.5%
Trailing 7-yr Sharpe Ratio	1.00	1.05	1.23
Slope	1.00	1.18	1.22
R-Sq	1.00	0.97	0.94
Correlation	1.00	0.99	0.97

- Index portfolios look similar to actual endowment performance of the alternatives sleeve

Source: NACUBO, Bloomberg, Internal. It is not possible to invest directly in an index. Indexes are unmanaged and do not reflect the deduction of fees or other expenses. Historical performance results for market indices and/or categories generally do not reflect the deduction of transaction and/or custodial charges or the deduction of 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. Please see posterior disclosures for additional information.

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IS ALLOCATION THE MAIN DRIVER?

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Average Return for Alternative Sleeve				Average Return for Alternative Sleeve				Average Return for Alternative Sleeve			
>\$1 B				\$101 M - \$500 M				<\$25 M			
Fiscal Year Ending 6/30/	Actual	Illiquid Proxy	Liquid Proxy	Fiscal Year Ending 6/30/	Actual	Illiquid Proxy	Liquid Proxy	Fiscal Year Ending 6/30/	Actual	Illiquid Proxy	Liquid Proxy
2009	*	-20.2%	-14.7%	2009	*	-17.4%	-12.7%	2009	*	-18.0%	-14.3%
2010	*	10.0%	16.9%	2010	*	9.9%	11.6%	2010	*	9.0%	11.2%
2011	16.9%	19.5%	26.9%	2011	15.4%	17.1%	20.5%	2011	9.5%	15.9%	17.5%
2012	3.1%	-1.7%	2.4%	2012	1.2%	-3.2%	0.1%	2012	-1.4%	-4.7%	-1.9%
2013	10.6%	9.2%	12.9%	2013	9.1%	8.5%	10.2%	2013	4.8%	7.1%	8.3%
2014	17.5%	16.9%	21.5%	2014	12.8%	14.9%	17.3%	2014	11.8%	12.5%	13.5%
2015	6.5%	6.0%	2.8%	2015	2.5%	3.4%	-0.1%	2015	-6.5%	-0.2%	-4.6%
2016	-1.1%	0.0%	2.9%	2016	-0.9%	-0.5%	2.1%	2016	-0.6%	-2.0%	-1.0%
2017	9.8%	8.9%	12.3%	2017	8.3%	8.6%	8.3%	2017	4.7%	8.2%	6.0%
2018	11.2%	11.7%	17.2%	2018	9.0%	10.4%	12.0%	2018	4.5%	9.3%	11.7%
Trailing 5-yr APR	8.6%	8.6%	11.1%	Trailing 5-yr APR	6.2%	7.2%	7.7%	Trailing 5-yr APR	2.6%	5.4%	4.9%
Trailing 5-yr Volatility	6.8%	6.3%	8.4%	Trailing 5-yr Volatility	5.5%	6.0%	7.1%	Trailing 5-yr Volatility	6.8%	6.3%	7.8%
Trailing 5-yr Sharpe Ratio	1.26	1.37	1.32	Trailing 5-yr Sharpe Ratio	1.14	1.20	1.08	Trailing 5-yr Sharpe Ratio	0.38	0.86	0.62
Trailing 7-yr APR	8.1%	7.1%	10.1%	Trailing 7-yr APR	5.9%	5.9%	7.0%	Trailing 7-yr APR	2.3%	4.2%	4.4%
Trailing 7-yr Volatility	6.0%	6.5%	7.7%	Trailing 7-yr Volatility	5.1%	6.4%	6.7%	Trailing 7-yr Volatility	5.9%	6.5%	7.1%
Trailing 7-yr Sharpe Ratio	1.34	1.10	1.30	Trailing 7-yr Sharpe Ratio	1.17	0.92	1.04	Trailing 7-yr Sharpe Ratio	0.40	0.64	0.61
Slope	1.00	1.11	1.34	Slope	1.00	1.20	1.30	Slope	1.00	1.07	1.26
R-Sq	1.00	0.92	0.86	R-Sq	1.00	0.94	0.93	R-Sq	1.00	0.77	0.87
Correlation	1.00	0.96	0.93	Correlation	1.00	0.97	0.96	Correlation	1.00	0.88	0.94

- Tracking across various size endowments
- Asset allocation is a driver
- Dataset somewhat limited (no actual returns for various sized endowments prior to 2011)

Source: NACUBO, Bloomberg, Internal. It is not possible to invest directly in an index. Indexes are unmanaged and do not reflect the deduction of fees or other expenses. Historical performance results for market indices and/or categories generally do not reflect the deduction of transaction and/or custodial charges or the deduction of 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. Please see posterior disclosures for additional information.

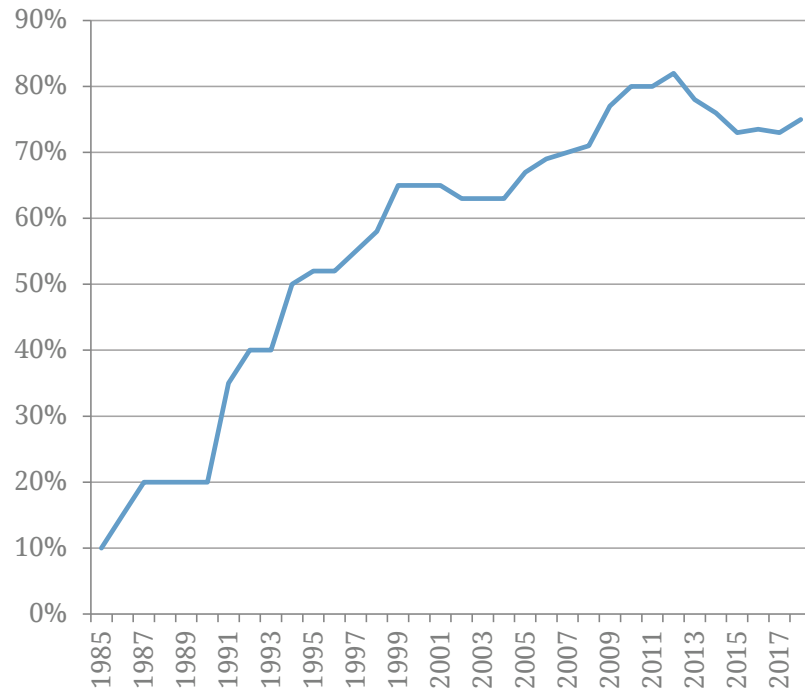
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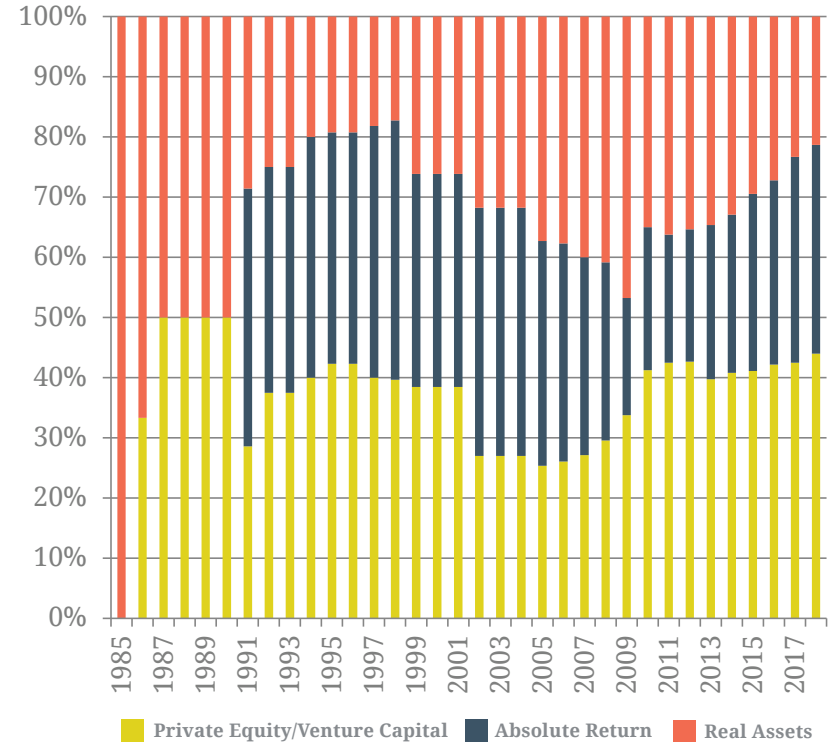
FOCUS ON “TOP ENDOWMENT”

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Yale Allocation to Alternatives



Yale Alternative Sleeve Asset Allocation



- Significant usage of alternatives, with >70% for last 10 years
- Balanced mix of real assets, private equity and absolute return
- 2018: 44.0% PE/VC, 34.7% Absolute Return, 21.3% Real Assets
- No significant swings since introducing ABS in early '90's

Source: <http://investments.yale.edu/endowment-update/>. The natural resources asset class was create 30 Jun 2011 and real assets was changed to real estate. For illustrative purposes only. Yale Endowment target allocations are presented to illustrate an example of a large endowment's target asset allocations; these may differ from actual allocations. The allocations presented are not representative of any strategy's allocation. Please see posterior disclosures for additional information.

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FOCUS ON “TOP ENDOWMENT”

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Yale Target Allocations									Returns				
Fiscal Year Ending 6/30/	US Equity	US Bonds	Foreign Equity	PE	VC	ABS	Natural Resources	Real Estate	Liquid Proxy	Illiquid Proxy	Yale	S&P 500 TR	Agg
1998	20.0%	10.0%	12.0%	16.1%	6.9%	25.0%	5.0%	5.0%	17.3%	19.6%	18.0%	28.8%	10.5%
1999	15.0%	10.0%	10.0%	17.5%	7.5%	23.0%	8.5%	8.5%	31.2%	17.1%	12.2%	20.1%	3.1%
2000	15.0%	10.0%	10.0%	17.5%	7.5%	23.0%	8.5%	8.5%	19.3%	36.9%	41.0%	9.6%	4.6%
2001	15.0%	10.0%	10.0%	17.5%	7.5%	23.0%	8.5%	8.5%	-0.9%	-4.7%	9.2%	-13.9%	11.2%
2002	15.0%	10.0%	12.0%	11.9%	5.1%	26.0%	10.0%	10.0%	-3.1%	-5.4%	0.7%	-17.2%	8.6%
2003	15.0%	7.0%	15.0%	11.9%	5.1%	26.0%	10.0%	10.0%	5.8%	2.6%	8.8%	0.8%	10.4%
2004	15.0%	8.0%	14.0%	11.9%	5.1%	26.0%	10.0%	10.0%	18.1%	17.5%	19.4%	20.5%	0.3%
2005	14.0%	5.0%	14.0%	11.9%	5.1%	25.0%	12.5%	12.5%	13.0%	17.2%	22.3%	8.1%	6.8%
2006	12.0%	4.0%	15.0%	12.6%	5.4%	25.0%	13.0%	13.0%	15.1%	19.7%	22.9%	9.6%	-0.8%
2007	11.0%	4.0%	15.0%	13.3%	5.7%	23.0%	14.0%	14.0%	20.2%	23.2%	28.0%	20.1%	6.1%
2008	10.0%	4.0%	15.0%	14.7%	6.3%	21.0%	14.5%	14.5%	-5.1%	-0.4%	4.5%	-12.7%	7.1%
2009	7.0%	4.0%	11.0%	18.2%	7.8%	15.0%	18.0%	18.0%	-24.3%	-24.9%	-24.6%	-26.6%	6.0%
2010	7.0%	4.0%	9.0%	23.1%	9.9%	19.0%	14.0%	14.0%	20.2%	9.4%	8.9%	15.7%	9.5%
2011	7.0%	4.0%	9.0%	23.8%	10.2%	17.0%	9.0%	20.0%	29.4%	21.7%	21.9%	32.4%	3.9%
2012	6.0%	4.0%	8.0%	24.5%	10.5%	18.0%	7.0%	22.0%	4.0%	0.2%	4.7%	3.8%	7.5%
2013	6.0%	5.0%	11.0%	21.7%	9.3%	20.0%	8.0%	19.0%	14.0%	10.7%	12.5%	21.5%	-0.7%
2014	6.0%	5.0%	13.0%	21.7%	9.3%	20.0%	8.0%	17.0%	21.3%	17.9%	20.2%	25.2%	4.4%
2015	4.0%	8.5%	14.5%	21.0%	9.0%	21.5%	8.5%	13.0%	2.3%	4.5%	11.5%	7.3%	1.9%
2016	4.0%	7.5%	15.0%	15.0%	16.0%	22.5%	7.5%	12.5%	2.5%	-1.0%	3.4%	2.1%	6.0%
2017	4.0%	7.5%	15.5%	14.0%	17.0%	25.0%	7.0%	10.0%	15.1%	10.0%	11.3%	18.5%	-0.3%
2018	3.0%	6.5%	15.5%	15.0%	18.0%	26.0%	6.5%	9.5%	15.7%	10.1%	12.3%	14.8%	-0.4%
APR									10.0%	8.9%	12.1%	7.8%	5.0%
Volatility									12.9%	14.5%	12.7%	15.8%	3.9%
Correlation									77.0%	95.0%	100.0%	66.8%	-22.7%
Sharpe Ratio									0.78	0.62	0.95	0.49	1.26

- Matching Yale’s target asset allocation but with index proxies (both illiquid and liquid) shows can capture good portion of Yale performance

Source: <http://investments.yale.edu/endowment-update/>. The natural resources asset class was create 30 Jun 2011 and real assets was changed to real estate. For illustrative purposes only. Yale Endowment target allocations are presented to illustrate an example of a large endowment’s target asset allocations; these may differ from actual allocations. The allocations presented are not representative of any strategy’s allocation. US Equity is represented by the Russell 3000 TR Index. US Bonds are represented by the Barclays US Aggregate Bond TR Index. Foreign Equity is represented by the MSCI ACWI Ex-US TR Index. Alternative indices for the Illiquid and Liquid Proxies are listed on slide 10. Please see posterior disclosures for additional information.

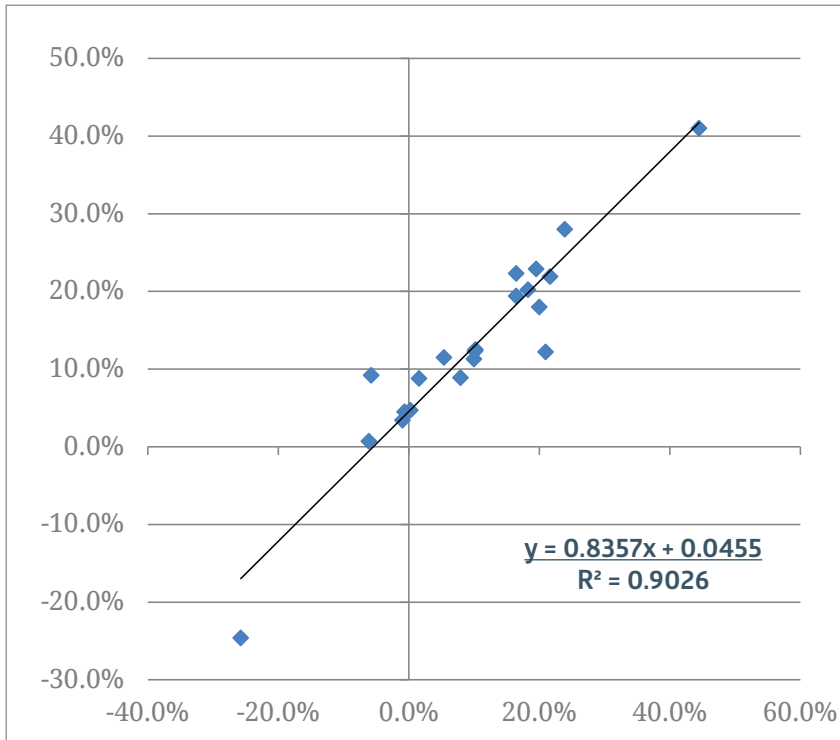
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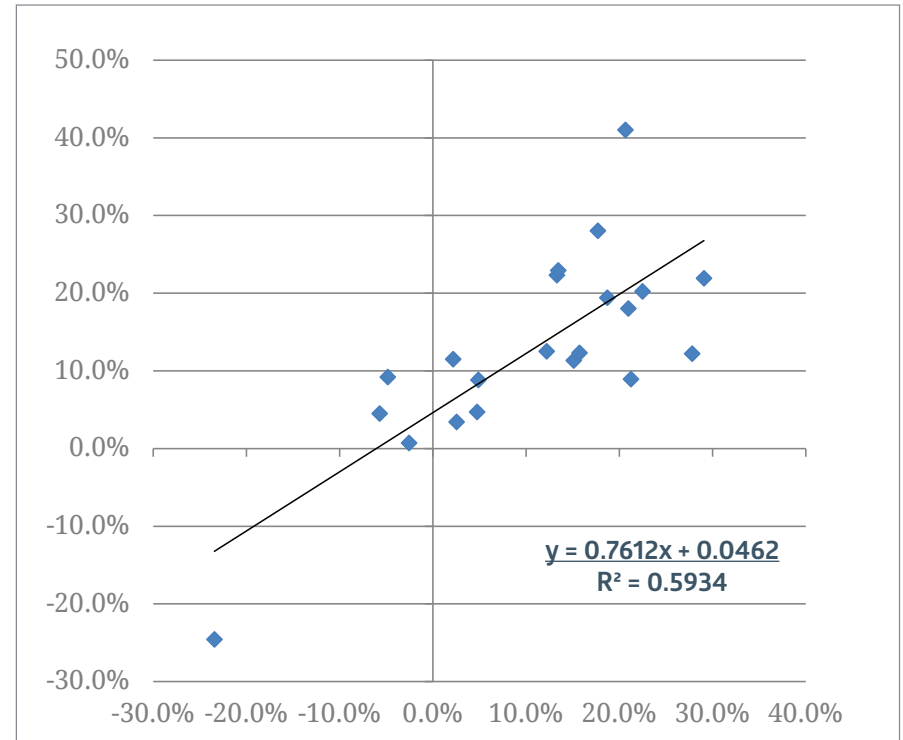
FOCUS ON “TOP ENDOWMENT”

CEDARCAPITAL

Yale Approx. Using Illiquid Proxies



Yale Approx. Using Liquid Proxies



- Illiquid indices provide good fit overall
- Liquid indices have adequate fit. More research to be done regarding selection of liquid indices (i.e. are there better liquid indices out there that track the illiquid counterparts?)
- Good overall roadmap for modeling endowments

Source: <http://investments.yale.edu/endowment-update/>.

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HOW TO **IMPLEMENT**



PERIODIC TABLE OF INDEX RETURNS

CEDARCAPITAL

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
BEST	Natural Resources 23.68%	Natural Resources 26.16%	Natural Resources 29.12%	Natural Resources 41.22%	Bonds 5.24%	Private Equity 74.46%	Private Equity 24.34%	Real Estate 14.26%	Venture Capital 20.67%	Venture Capital 48.82%	Venture Capital 25.12%	Venture Capital 23.19%	Natural Resources 31.45%	Venture Capital 55.83%	Venture Capital 8.52%
	Private Equity 23.15%	Real Estate 20.06%	Private Equity 23.99%	Venture Capital 27.37%	Real Estate -6.46%	Venture Capital 54.74%	NASDAQ 18.02%	Private Equity 8.32%	Private Equity 20.40%	Private Equity 42.61%	Private Equity 20.60%	Real Estate 13.33%	S&P 500 11.96%	Private Equity 31.52%	Real Estate 6.72%
	World Equities 15.23%	World Equities 10.84%	World Equities 20.95%	Real Estate 15.84%	Hedge Funds -21.37%	NASDAQ 45.32%	S&P 500 15.06%	Bonds 7.84%	NASDAQ 17.45%	NASDAQ 40.12%	NASDAQ 14.75%	NASDAQ 6.96%	NASDAQ 8.87%	NASDAQ 29.64%	Bonds 0.01%
	Real Estate 14.48%	Hedge Funds 7.49%	Real Estate 16.59%	World Equities 11.66%	Venture Capital -32.61%	Natural Resources 35.47%	Real Estate 13.11%	Venture Capital 2.40%	World Equities 16.13%	S&P 500 32.39%	S&P 500 13.69%	Private Equity 6.71%	Private Equity 8.59%	World Equities 23.97%	NASDAQ -2.84%
	Venture Capital 12.43%	S&P 500 4.91%	S&P 500 15.79%	NASDAQ 10.55%	S&P 500 -37.00%	World Equities 34.63%	World Equities 12.67%	S&P 500 2.11%	S&P 500 16.00%	World Equities 22.80%	Real Estate 11.81%	S&P 500 1.38%	Real Estate 7.97%	Natural Resources 21.98%	Hedge Funds -3.48%
	S&P 500 10.88%	Bonds 2.43%	Hedge Funds 10.39%	Hedge Funds 10.25%	Natural Resources -38.58%	S&P 500 26.46%	Venture Capital 11.06%	NASDAQ -0.83%	Real Estate 10.54%	Real Estate 10.99%	Bonds 5.97%	Bonds 0.55%	World Equities 7.86%	S&P 500 21.83%	S&P 500 -4.38%
	NASDAQ 9.16%	Private Equity 2.17%	NASDAQ 10.28%	Bonds 6.97%	NASDAQ -40.03%	Hedge Funds 11.47%	Natural Resources 10.51%	Hedge Funds -5.72%	Natural Resources 6.60%	Hedge Funds 8.96%	World Equities 4.16%	Hedge Funds -0.27%	Bonds 2.65%	Hedge Funds 7.74%	World Equities -9.42%
	Hedge Funds 6.86%	NASDAQ 2.17%	Venture Capital 8.45%	Private Equity 5.50%	Private Equity -42.10%	Bonds 5.93%	Bonds 6.54%	World Equities -7.35%	Hedge Funds 4.79%	Natural Resources 0.96%	Hedge Funds 3.37%	World Equities -2.36%	Hedge Funds 0.51%	Real Estate 6.96%	Private Equity -11.88%
WORST	Bonds 4.34%	Venture Capital -5.07%	Bonds 4.33%	S&P 500 5.49%	World Equities -42.20%	Real Estate -16.86%	Hedge Funds 5.70%	Natural Resources -15.22%	Bonds 4.22%	Bonds -2.02%	Natural Resources -10.18%	Natural Resources -24.50%	Venture Capital 0.37%	Bonds 3.54%	Natural Resources -12.57%

Venture Capital	Thomson Reuters Venture Capital Index
Private Equity	Thomson Reuters Private Equity Buyout Index
Hedge Funds	HFRI Fund of Funds Composite Index
NASDAQ	NASDAQ Composite Index
World Equities	MSCI ACWI Index
Bonds	Barclays Capital U.S. Aggregate Bond Index
Real Estate	NCREIF Property Index
Natural Resources	S&P Global Natural Resources Index
S&P 500	S&P 500 Index

Source: Bloomberg. As of 12/31/2018.

Past performance is no guarantee of future results. The information provided is for illustrative purposes only and is not representative of the performance of any particular investment. It is not possible to invest directly in an index. Indexes are unmanaged and index returns do not reflect fees, expenses, or sales charges. Please see the posterior disclosures for index definitions.

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HOW MUCH ALTERNATIVE EXPOSURE SHOULD BE USED?

Large Endowments typically allocate over half to alternatives.¹ Investors may seek balance between seeking out excess returns and managing risks, and various types of alternative products can be used to address these issues specifically.

- Conservative investors may gravitate towards lower allocations
- Growth-oriented investors may gravitate towards considerably larger allocations
- Less benchmark-focused investors can mimic endowment allocations

HOW TO ALLOCATE TO ALTERNATIVES?

By properly combining both the goals of return enhancement and return diversification within the alternative sleeve, it can be possible to both improve return and lower volatility, which may result in a better overall portfolio construction.

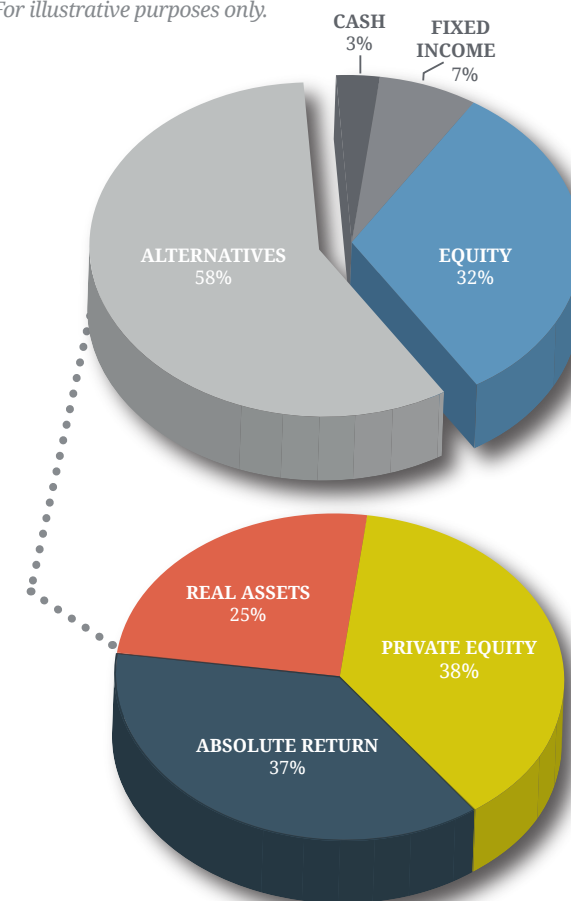
TYPES OF ALTERNATIVES AND GOALS

- Absolute Return – diversification of return streams
- Real Assets – inflation protection, diversification, and cash flow
- Private Equity – enhanced returns

Alternative investment products involve a high degree of risk. Alternative investment performance can be volatile and an investor could lose a substantial portion of their investment. Diversification does not ensure profit or protect against loss. Please see posterior disclosures for additional information. ¹Alternatives include the following: private equity, marketable alternative strategies, venture capital, private equity real estate (non-campus), energy and natural resources, distressed debt and other investments. Asset classes further classified by Cedar Capital. ²Allocations represent a dollar-weighted average. ³Endowment allocations are presented to illustrate examples and are not representative of any strategy's current allocations. Source: National Association of College and University Business Officers and Commonfund Institute, Fiscal Year 2018.

Large Endowment Allocations^{1,2,3}

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Past performance is not a guarantee of future results. As with any investment, there is a potential for profit as well as the possibility of loss. Alternative investment products involve a high degree of risk. Alternative investment performance can be volatile and an investor could lose a substantial portion of their investment. Actual results could differ materially from those anticipated.

It is not possible to invest directly in an index. Indexes are unmanaged and do not reflect the deduction of fees, expenses, or sales charges. Indices were chosen that Cedar Capital deems representative of broad traditional and alternative asset classes. Performance for total return indexes reflects the reinvestment of dividends and capital gains.

Allocations and performance are provided for illustrative purposes only. The allocations and performance shown are hypothetical and do not represent an actual account or the results of any actual trading. The information presented is published index data. Certain of the index data presented contain performance prior to the index launch date. All information for an index prior to its launch date is backtested, based on the methodology that was in effect on the launch date. Backtested performance, which is hypothetical and not actual performance, is subject to inherent limitations because it reflects application of an index methodology and selection of index constituents in hindsight. Based on publicly available information, Cedar Capital has determined that the following indices contain pre-inception index data: the Thomson Reuters Venture Capital Index, launched October 2012; the Thomson Reuters Private Equity Buyout Index, launched December 2013; the S&P Global Natural Resources Index, launched May 2008; and the Dow Jones Commodity Index, launched October 2011. Other indices may also contain pre-inception index data.

Historical performance results for market indices and/or categories generally do not reflect the deduction of transaction and/or custodial charges or the deduction of 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.

SLIDE 5 - WHY ALTERNATIVES?

The hypothetical performance information presented represents published index data from December 31, 1999 to the period ending September 30, 2015. The performance is provided for informational purposes only to simulate historical performance had the asset allocation strategy been available over the relevant time period. Actual performance may be materially lower than that of the hypothetical illustrations.

INDEX DESCRIPTIONS

The Barclays US Aggregate Bond Total Return Index is an index designed to provide a measure of the performance of the U.S. investment grade bonds market, which includes investment grade U.S. Government bonds, investment grade corporate bonds, mortgage pass through-securities and asset-backed securities that are publicly offered for sale in the United States.

The 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.

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The **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.

The **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.

The **Credit Suisse Global Macro Hedge Fund Index** is a subset of the Credit Suisse Hedge Fund Index that measures the aggregate performance of dedicated short bias funds. Global macro funds typically focus on identifying extreme price valuations and leverage is often applied on the anticipated price movements in equity, currency, interest rate and commodity markets. Managers typically employ a top-down global approach to concentrate on forecasting how political trends and global macroeconomic events affect the valuation of financial instruments. Profits can be made by correctly anticipating price movements in global markets and having the flexibility to use a broad investment mandate, with the ability to hold positions in practically any market with any instrument. These approaches may be systematic trend following models, or discretionary.

The **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.

The **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.

The **HFRI Fund of Funds Composite Index** is a broad market measure of the hedge fund industry, which includes the performance of over 500 hedge fund-of-funds.

The **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.

The **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.

The **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.

The **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.

The **MSCI ACWI Index** is an index which captures large and mid cap representation across 23 developed and emerging market countries.

The **MSCI ACWI ex USA Net Total Return Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets excluding the US.

The **NASDAQ Composite Index** is a market-capitalization weighted index of the more than 3,000 common equities listed on the NASDAQ stock exchange. The composition of the NASDAQ Composite is heavily weighted towards information technology companies.

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The **NCREIF Property Index** is a quarterly time series composite total rate of return measure of investment performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only.

The **Russell 3000 TR Index** measures the performance of the largest 3,000 companies representing approximately 98% of the investable U.S. equity market.

The **S&P 1500 Total Return Index** is a total return market capitalization weighted index designed to provide a broad measure of the U.S. equity market performance. The S&P Composite 1500® combines three leading indices, the S&P 500®, the S&P MidCap 400®, and the S&P SmallCap 600® to cover approximately 90% of the U.S. market capitalization.

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 includes the effects of dividends.

The **S&P Global Natural Resources Index** is an index which included 90 of the largest publicly traded companies in natural resources and commodities businesses that meet specific investability requirements, offering investors diversified and investable equity exposure across three primary commodity-related sectors: agribusiness, energy, and metals and mining.

The **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.

The **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.

The **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.

The **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.

The **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.

DEFINITIONS

APR (Annual Percentage Rate): the annual rate that is achieved by an investment over a period of time.

Correlation: A statistical measure of how two securities move in relation to each other.

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.

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

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. Commonly, the higher the volatility.

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