



## Endowments Quarterly

A Look at Asset Allocation and Total Returns  
for US Endowments and Foundations

Third Quarter 2016

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The Cambridge Associates US endowment and foundation universe includes colleges and universities, cultural and environmental institutions, health care institutions, independent schools, and other endowed nonprofit institutions as well as foundations. This report provides asset allocation and return analyses for 417 US endowments and foundations that participated in our quarterly survey. The average market value of participating long-term investment portfolios was \$1.1 billion. The median value was \$264.3 million.

### Examining Returns

The mean return of the US endowment and foundation universe was 3.7% for the quarter ended September 30, 2016.<sup>1</sup> Trailing one-year returns averaged 7.6%. Returns for the trailing one-year period ranged from 10.4% at the 5th

<sup>1</sup> Returns are reported on a net of fees basis for 99% of the US endowment and foundation universe.

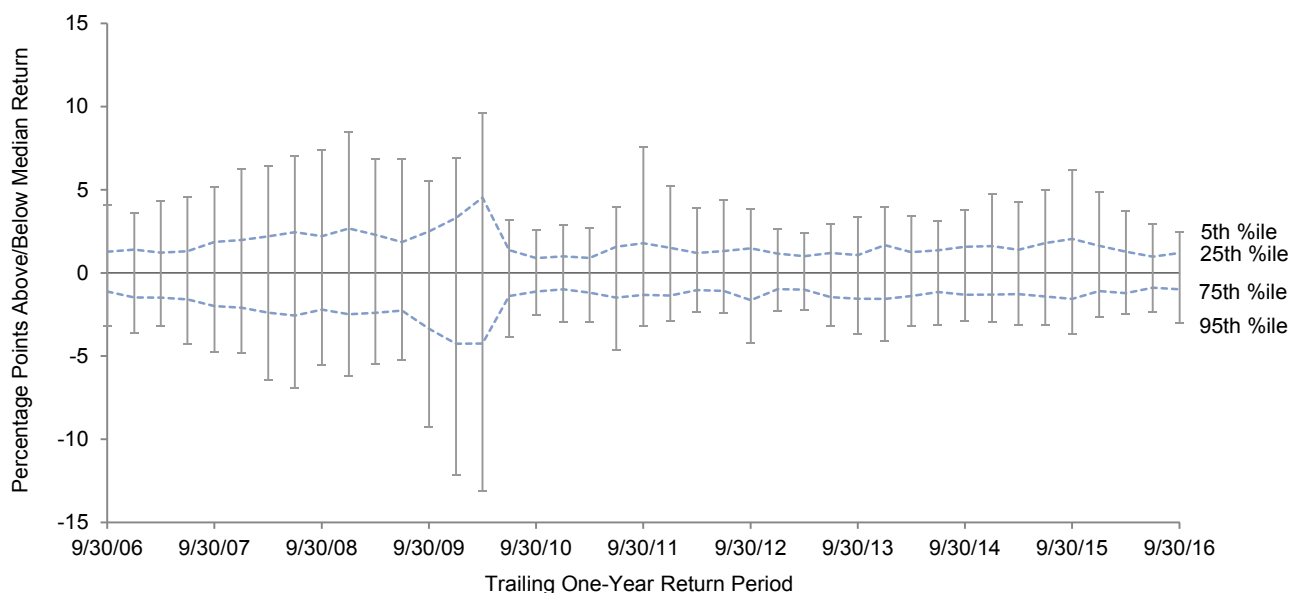
percentile to 4.6% at the 95th percentile. The range of returns for the most recent one-year period is narrower than most other trailing one-year periods from the last decade.

Per the Consumer Price Index, the rate of inflation was 0.2% for third quarter 2016 and 1.5% for the trailing one-year period. Adjusting nominal returns to reflect inflation, the average real return for US endowments and foundations falls to 3.6% and 6.1% for third quarter 2016 and the trailing one-year period, respectively.

**Risk-Adjusted Performance.** Investors spend much time and effort analyzing the returns of their portfolios. Measuring risk is just as important, however, as investors should only take risks for which they are compensated and should recognize whether any incremental return they have earned is simply the result of their having taken more risk.

### Dispersion of Trailing One-Year Returns Relative to the Median Return

Periods Ended Third Quarter 2006 – Third Quarter 2016 • Constant Universe of 363 Endowments and Foundations



Source: Endowment and foundation data as reported to Cambridge Associates LLC.

Notes: The median return is scaled to zero for each period. The outer tick marks and dotted lines represent their respective percentiles' variance from the median.

Risk-adjusted performance, as measured by the Sharpe ratio,<sup>2</sup> averaged 1.25 for the trailing five-year period, ranging from 1.84 to 0.88 after removing outliers that make up the top and bottom 5% of the universe. Relative to a pair of simple 70/30 portfolio benchmarks,<sup>3</sup> the average Sharpe ratio of respondents slightly exceeded the portfolio containing a global benchmark for the equity component (1.21), but was lower than the portfolio containing a US benchmark for the equity component (1.71).

### Trailing One-Year Results

Asset allocation is a key contributor to the total return that a portfolio earns. Exhibit 8 explores this relationship and illustrates how general asset allocation structures vary across the four performance quartiles of the overall participant group. In this exhibit, each institution's asset allocation was averaged across the beginning and ending points for the trailing one-year period. The four quartiles in the heat map table represent the average of the institutions within each quartile.

The chart of index returns in Exhibit 8 provides the context of the market environment for the period. Private investment indexes are pooled horizon internal rates of return (IRRs) net of fees, expenses and carried interest, while public indexes are time-weighted returns. Included alongside the private benchmark IRRs are public market returns on a modified public market equivalent basis (mPME). The CA

<sup>2</sup> The Sharpe ratio is the most common approach to measuring risk-adjusted performance. It shows how much return above the risk-free rate (T-bills) the investor has earned per unit of risk (defined as the standard deviation of returns). The higher the Sharpe ratio, the more the investor has been compensated for each unit of risk taken.

<sup>3</sup> The global equity benchmark is the MSCI All Country World Index and the US equity benchmark is the Russell 3000® Index. Bonds are represented by the Bloomberg Barclays Government/Credit Bond Index.

Modified Public Market Equivalent (mPME) replicates private investment performance under public market conditions and allows for an appropriate comparison of private and public market returns.<sup>4</sup> The mPME analysis evaluates what return would have been earned had the dollars invested in private investments been invested in the public market index instead. Each of the private strategies displayed in the chart underperformed the mPME reference index for the trailing one-year period.

The extent of diversification across equities was a key distinction between top and bottom performers for the trailing one-year period. Endowments and foundations that posted a trailing one-year return in the top quartile had the highest average allocation to US equities (25.5%) and global ex US developed equities (18.3%), and the lowest average allocation to PE/VC (3.9%). In contrast, those in the bottom-performing quartile had the lowest average allocations to US equities (16.7%) and global ex US developed equities (12.5%), and the highest average allocation to PE/VC (13.7%). Other notable differences in asset allocation between the top and bottom quartile of performers were observed in bonds, hedge funds, and real assets.

**One-Year Attribution.** While asset allocation is a key driver of performance, it does not fully explain the variation of returns that are reported across different institutions. The execution or implementation of an asset allocation strategy also contributes to the total returns that portfolios earn. While we do not have the level of detailed data that is neces-

<sup>4</sup> Under the CA mPME methodology, the public index's shares are purchased and sold according to the private fund cash flow schedule, with distributions calculated in the same proportion as the private fund, and mPME NAV is a function of mPME cash flows and public index returns.

sary to perform a precise attribution analysis, our data do allow us to conduct an estimated analysis that can help illuminate the main drivers of performance for the trailing one-year period.

Exhibit 9 illustrates the results of an estimated attribution analysis based on the one-year return and beginning fiscal year asset allocation of 408 endowments and foundations that provided sufficient data. The portion of the mean participant return that can be attributed to asset allocation is calculated using a blend of representative asset class benchmarks weighted according to each institution's asset allocation. The return from other factors is calculated by subtracting the mean asset allocation return from the mean participant return. This "other" portion of returns is principally driven by implementation or execution decisions, which can include active management and manager selection.<sup>5</sup>

The attribution analysis estimates that essentially all of the mean trailing one-year total return for the participant group could be explained by asset allocation. US equities, which returned 15.0% and had the highest allocation among the detailed asset classes, had the greatest impact of all the asset class return contributors (3.1%). Private oil & gas/natural resources was the only negative asset class return contributor (-0.1%). This category represented only 1.9% of the mean portfolio and returned -4.0% for the trailing one-year period.

A breakdown of the attribution data into the four performance quartiles of the overall

group highlights the different experiences among institutions (Exhibit 10). The model estimates that each performance quartile posted a positive mean asset class return for the trailing one-year period. The top performance quartile had the highest mean asset class return (8.9%) while the bottom performance quartile had the lowest (6.2%). However, the model also estimates that implementation decisions were responsible for some of the dispersion in performance between top and bottom performers. On average, the top quartile of performers added 0.8% through implementation decisions while the bottom quartile lost value (-0.8%).

#### **A Note on Performance Reporting**

**Methodologies.** The methodology by which private investment returns are reported can have an impact on peer performance statistics, particularly for trailing one-year periods and shorter. Most participants with private investment allocations in this study reported their trailing one-year private investment returns on a partial basis. Under this method, only three quarters of private returns are incorporated for the trailing one-year period. As September 30 valuations become available, third quarter returns will be restated to reflect actual private performance. The lagged basis was the second most frequently used methodology for institutions with private investment allocations. For these investors, the trailing one-year return included four quarters of private investment performance (July 1, 2015 to June 30, 2016).

The key difference between these two methodologies is the extra quarter of private investment performance incorporated into the lagged basis methodology. For the trailing one-year return, that extra quarter was third quarter 2015, a quarter in which most private investment benchmarks reported negative performance, as

<sup>5</sup> This model assumes that flows to and from investment managers take place on the last day of the fiscal year. In addition, the analysis uses a standard set of asset class benchmarks that may be more or less representative of the asset allocation policy across different institutions. Therefore, the portion of returns from other factors may also include some residual/unattributable asset allocation effects.

displayed in the chart below. A portfolio using the lagged methodology would likely report a lower trailing one-year return relative to that calculated using the partial methodology. The impact of using the lagged basis methodology relative to the partial basis methodology will depend on each institution's allocation to the various private strategies, as well as its investment return within these strategies.

### Cambridge Associates Private Investment Index Returns

	One Quarter End-to-End Pooled Return (%)				
	Q3	Q4	Q1	Q2	Q3
	2015	2015	2016	2016	2016
US Private Equity	-1.5	0.5	0.2	4.0	NA
US Venture Capital	-0.4	1.6	-3.2	0.6	NA
Real Estate	1.7	2.5	2.2	1.5	NA
Natural Resources	-8.2	-8.2	-1.9	6.6	NA

Lagged Basis     Partial Basis

Source: Cambridge Associates LLC.

Note: NA indicates data were not available.

### Trailing Ten-Year Results

As noted earlier, asset allocation can be a factor in the variation in returns reported across the participant group. While the analysis of asset allocation structures on a one-year basis is informative, this short-term analysis can lead to different results from one period to the next as market conditions shift. To investigate the impact of asset allocation policies on long-term investment performance, an analysis of data over an extended period is most suitable. Exhibit 11 breaks the participant group down into four quartiles based on the trailing ten-year investment return. Each institution's asset allocation was averaged across the 11 September 30 periods that fell from 2006 to 2016. The four quartiles in the heat map table represent the average of the institutions within each quartile.

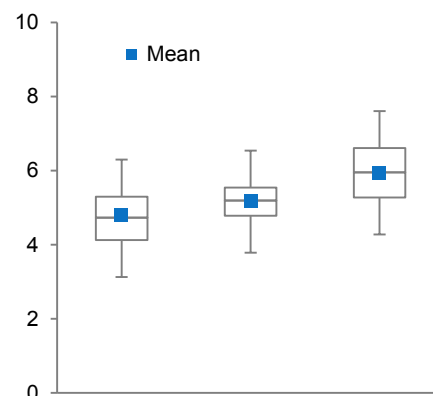
Among the asset class benchmarks, most private investment strategies outperformed their public market counterparts on an mPME basis over the past ten years. Accordingly, the top quartile of performers over the ten-year period reported the highest average allocation to illiquid private investments, while the bottom quartile reported the lowest average allocation to these strategies. Institutions that place significant emphasis on peer performance statistics should note the distinction in average asset allocation policies between top and bottom performers, particularly among private investments.

The figure on the next page breaks participants into three subgroups based on each institution's trailing ten-year average allocation to private investments. The median ten-year return for portfolios with an allocation of over 15% to private investments was 6.0%, approximately 130 basis points higher than the median return reported by portfolios with little to no private investment allocation. The distribution of returns for the three subgroups shows a wide range of results, a disclaimer that portfolios with high allocations to private investments can underperform the overall peer group, while those with low private investment allocations can outperform. However, these ten-year analyses show that allocations to private investments generally are a key factor in a portfolio's relative performance within the overall participant group over the long-term. Institutions that benchmark peer performance should consider the subgroup median that aligns with their own private investment allocation as an alternative or complement to the peer medians that they already use.



**Ten-Year Attribution.** The attribution model also points to an outperforming asset allocation structure for the top performance quartile over the last decade. However, the model also suggests that implementation decisions were responsible for most of the dispersion in performance between top and bottom performers over this long-term period. Exhibit 12 shows that the top performance quartile had a mean asset class return of 4.9%, approximately 0.8 percentage points higher than the bottom performance quartile. The top performance quartile also added another 1.6% through implementation decisions, while the bottom performance quartile effectively added no value (0.1%) through active management of the portfolio. ■

**Range of Ten-Year Returns by Private Investment Allocation**  
As of September 30, 2016 • Percent (%)



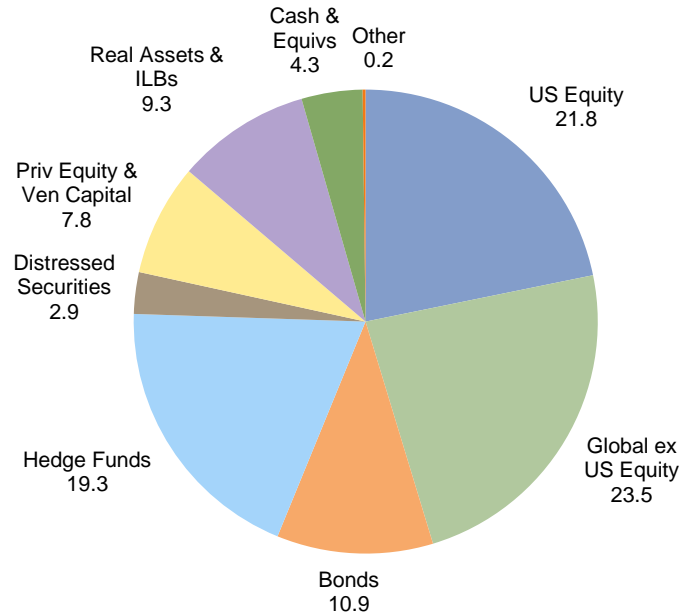
	Private Investment Allocation		
	Under 5%	5%–15%	Over 15%
5th Percentile	6.2	6.3	7.4
25th Percentile	5.3	5.5	6.6
Median	4.7	5.2	6.0
75th Percentile	4.1	4.8	5.3
95th Percentile	3.6	4.1	4.5
Mean	4.8	5.2	5.9
<i>n</i>	57	80	79

Source: Endowment and foundation data as reported to Cambridge Associates LLC.

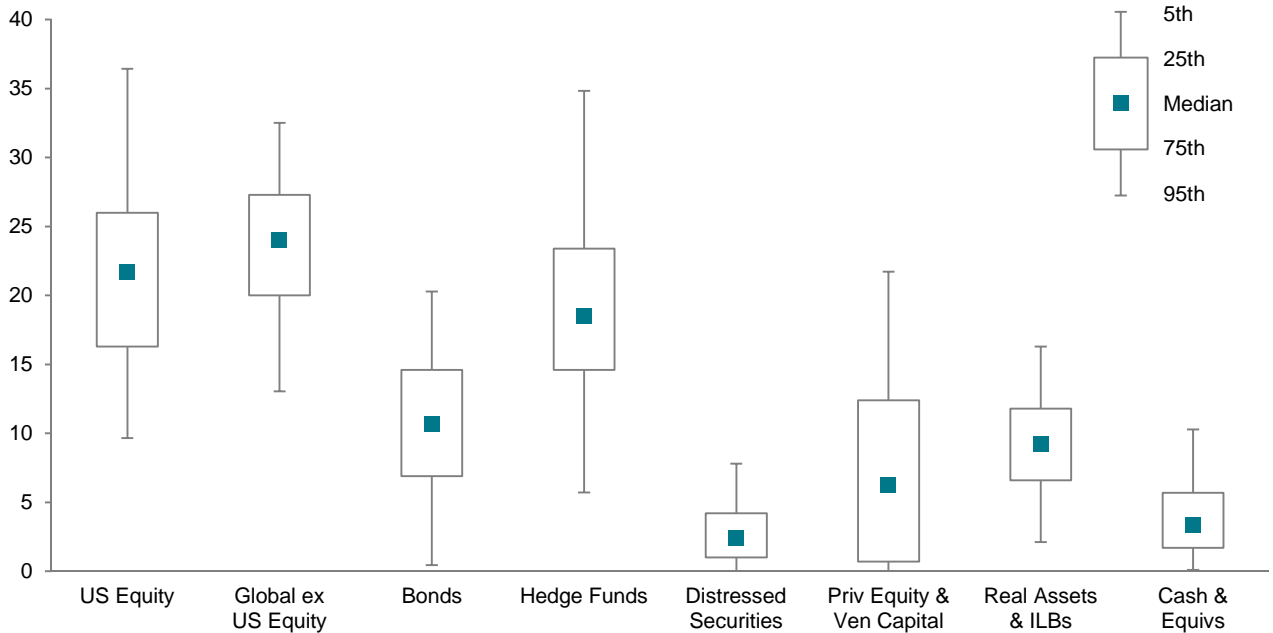
Notes: Each institution's private investment allocation represents the mean for the 11 September 30 periods from 2006 to 2016. Returns are annualized.

**Exhibit 1**  
**Asset Allocation Snapshot: US Endowments and Foundations**  
 As of September 30, 2016 • Percent (%)

**Mean Asset Allocation (n = 417)**

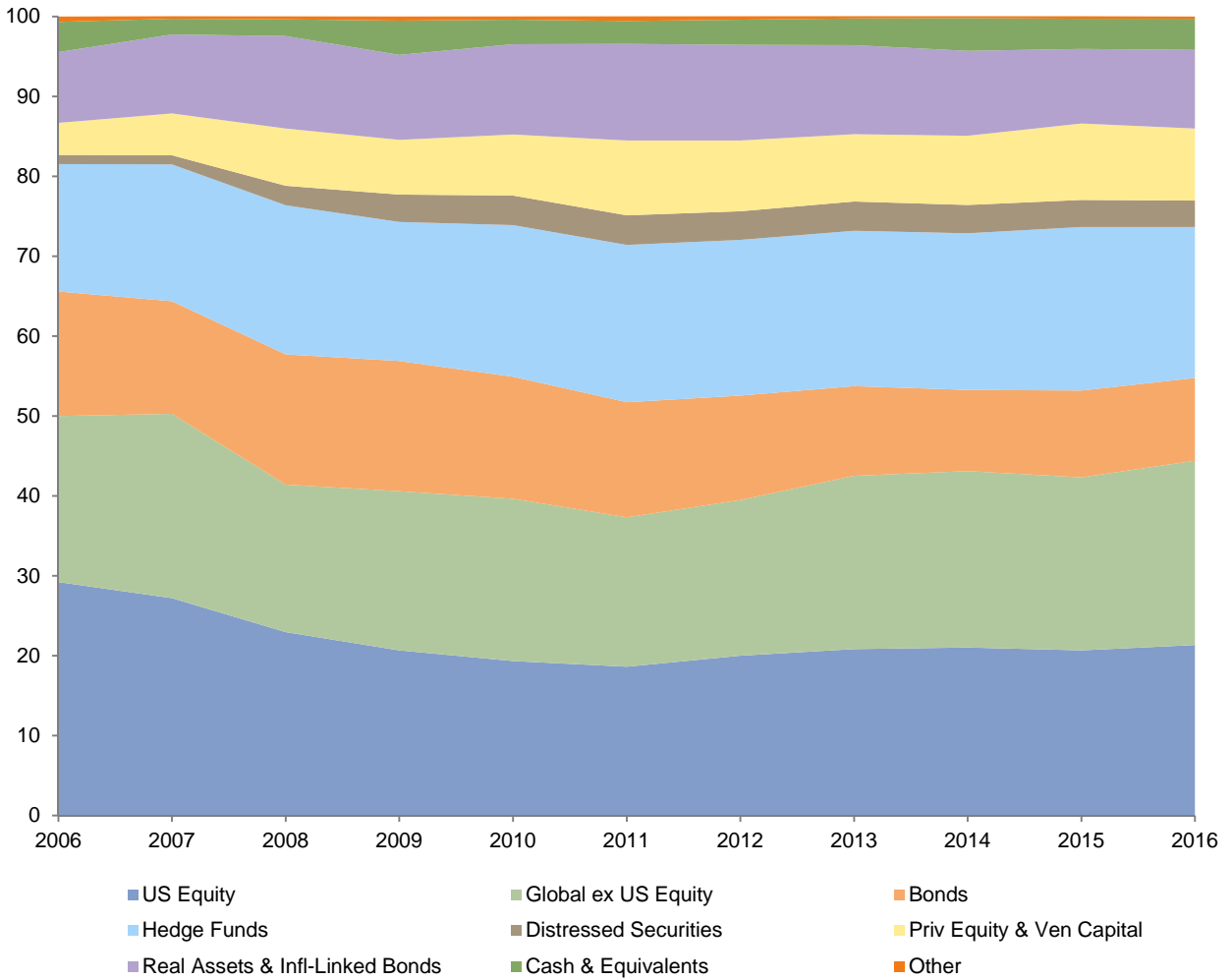


**Distribution by Asset Class: Asset Allocation (n = 417)**



Source: Endowment and foundation data as reported to Cambridge Associates LLC.

**Exhibit 2**  
**Historical Mean Asset Allocation Trends: US Endowments and Foundations**  
 Years Ended September 30 • Percent (%)



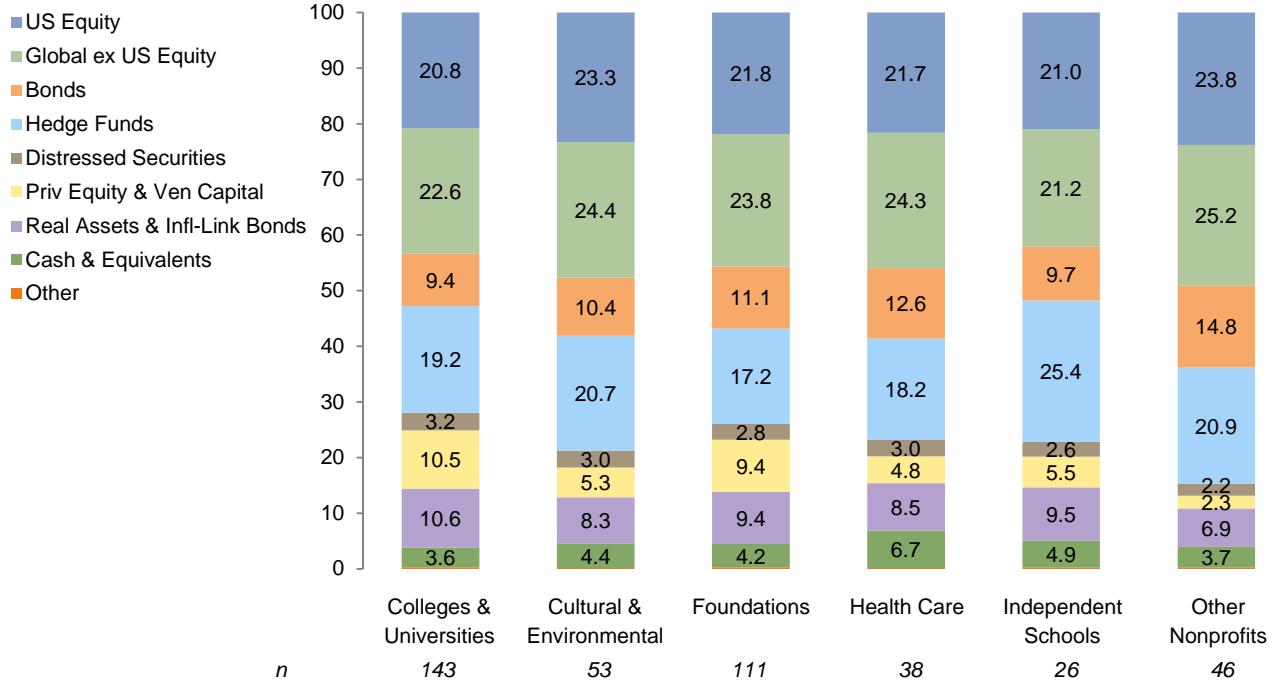
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
US Equity	29.2	27.2	22.9	20.7	19.3	18.6	20.0	20.8	21.0	20.7	21.3
Global ex US Equity	20.8	23.1	18.5	19.9	20.3	18.7	19.5	21.7	22.1	21.7	23.1
<i>Developed Markets</i>	16.3	17.4	14.3	14.5	14.2	13.1	13.0	14.8	14.8	14.9	15.6
<i>Emerging Markets</i>	4.5	5.7	4.2	5.4	6.1	5.5	6.5	6.9	7.3	6.8	7.5
Bonds	15.6	14.1	16.3	16.3	15.3	14.4	13.0	11.2	10.1	10.9	10.3
Hedge Funds	16.0	17.1	18.7	17.4	18.9	19.7	19.5	19.5	19.6	20.4	18.9
Distressed Securities	1.1	1.1	2.5	3.4	3.7	3.7	3.6	3.7	3.6	3.4	3.3
Priv Equity & Ven Capital	4.0	5.3	7.2	6.9	7.6	9.4	8.8	8.4	8.7	9.6	9.0
Real Assets & Infl-Linked Bonds	8.9	9.9	11.5	10.6	11.3	12.1	12.0	11.1	10.6	9.3	9.8
Cash & Equivalents	3.8	2.0	2.1	4.3	3.1	2.9	3.1	3.3	4.1	3.8	3.9
Other	0.7	0.3	0.4	0.5	0.4	0.6	0.4	0.3	0.2	0.3	0.3

Source: Endowment and foundation data as reported to Cambridge Associates LLC.

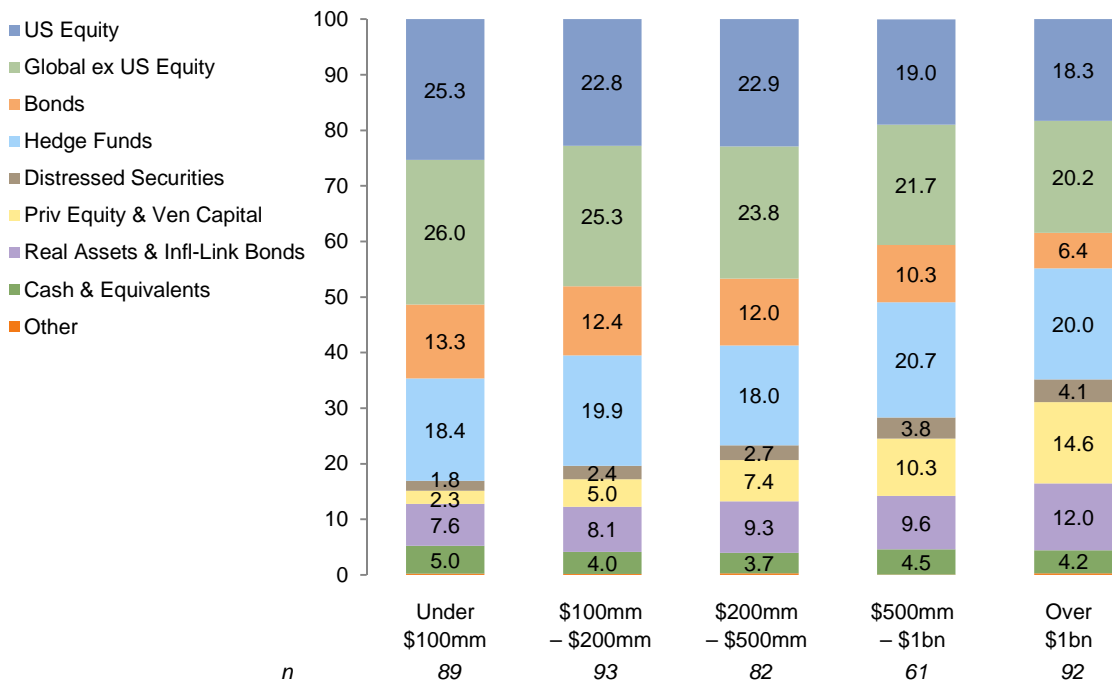
Note: The table represents 216 US endowments and foundations that provided asset allocation data for each year from 2006 to 2016.

**Exhibit 3**  
**Summary Asset Allocation: US Endowments and Foundations**  
 As of September 30, 2016 • Percent (%)

**By Peer Group**



**By Asset Size**



Source: Endowment and foundation data as reported to Cambridge Associates LLC.

**Exhibit 4**  
**Detailed Asset Allocation by Peer Group: US Endowments and Foundations**  
 As of September 30, 2016 • Percent (%)

	Colleges & Universities (n = 143)		Cultural & Environmental (n = 53)		Foundations (n = 111)		Health Care (n = 38)		Independent Schools (n = 26)		Other Nonprofits (n = 46)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<b>US Equity</b>	<b>20.8</b>	<b>20.6</b>	<b>23.3</b>	<b>22.3</b>	<b>21.8</b>	<b>22.0</b>	<b>21.7</b>	<b>23.7</b>	<b>21.0</b>	<b>19.4</b>	<b>23.8</b>	<b>24.8</b>
<b>Global ex US Equity</b>	<b>22.6</b>	<b>22.8</b>	<b>24.4</b>	<b>25.3</b>	<b>23.8</b>	<b>23.9</b>	<b>24.3</b>	<b>24.9</b>	<b>21.2</b>	<b>19.7</b>	<b>25.2</b>	<b>25.3</b>
Developed Markets	15.1	15.1	16.5	17.1	16.0	16.7	17.4	17.0	14.7	14.0	17.8	17.9
Emerging Markets	7.6	7.5	7.9	8.4	7.8	8.0	6.9	7.3	6.5	5.7	7.4	7.5
<b>Bonds</b>	<b>9.4</b>	<b>9.6</b>	<b>10.4</b>	<b>10.6</b>	<b>11.1</b>	<b>10.9</b>	<b>12.6</b>	<b>13.0</b>	<b>9.7</b>	<b>10.4</b>	<b>14.8</b>	<b>14.4</b>
US Bonds	7.8	8.2	8.9	8.6	9.8	10.0	10.5	10.6	8.6	8.5	12.2	11.0
Developed Markets ex US	0.8	0.0	0.3	0.0	0.5	0.0	0.7	0.0	0.3	0.0	0.9	0.3
Emerging Markets	0.5	0.0	0.6	0.0	0.5	0.0	0.8	0.0	0.5	0.0	1.0	0.7
High-Yield Bonds	0.4	0.0	0.6	0.0	0.4	0.0	0.7	0.0	0.3	0.0	0.6	0.0
<b>Hedge Funds</b>	<b>19.2</b>	<b>18.8</b>	<b>20.7</b>	<b>20.2</b>	<b>17.2</b>	<b>17.2</b>	<b>18.2</b>	<b>17.9</b>	<b>25.4</b>	<b>28.4</b>	<b>20.9</b>	<b>18.1</b>
Long/Short Hedge Funds	8.7	8.6	9.1	8.5	7.9	7.5	8.6	8.1	13.0	12.0	10.0	8.7
Absolute Return (ex Distressed)	10.5	10.4	11.6	10.6	9.3	8.7	9.5	9.6	12.5	10.7	11.0	9.6
<b>Distressed Securities</b>	<b>3.2</b>	<b>2.6</b>	<b>3.0</b>	<b>2.8</b>	<b>2.8</b>	<b>2.6</b>	<b>3.0</b>	<b>2.0</b>	<b>2.6</b>	<b>1.7</b>	<b>2.2</b>	<b>1.9</b>
Hedge Fund Structure	1.8	1.4	2.0	1.9	1.6	1.4	2.2	1.6	1.2	1.2	1.6	1.6
Private Equity Structure	1.3	0.9	1.0	0.4	1.2	0.6	0.8	0.0	1.4	0.7	0.6	0.0
<b>Private Equity &amp; Venture Capital</b>	<b>10.5</b>	<b>10.2</b>	<b>5.3</b>	<b>3.4</b>	<b>9.4</b>	<b>7.8</b>	<b>4.8</b>	<b>2.2</b>	<b>5.5</b>	<b>5.3</b>	<b>2.3</b>	<b>0.0</b>
Non-Venture Private Equity	5.3	4.7	2.6	1.7	3.7	2.6	2.3	0.9	3.0	1.9	0.8	0.0
Venture Capital	4.4	3.6	2.1	0.4	4.6	2.6	2.0	0.6	1.8	1.3	1.1	0.0
Other Private Investments	0.8	0.0	0.7	0.0	1.1	0.2	0.5	0.0	0.7	0.0	0.4	0.0
<b>Real Assets &amp; Infl-Linked Bonds</b>	<b>10.6</b>	<b>10.2</b>	<b>8.3</b>	<b>8.7</b>	<b>9.4</b>	<b>9.4</b>	<b>8.5</b>	<b>8.6</b>	<b>9.5</b>	<b>8.5</b>	<b>6.9</b>	<b>7.5</b>
Private Real Estate	2.6	2.1	1.2	0.3	2.2	1.1	1.7	0.4	2.1	0.3	0.5	0.0
Public Real Estate	0.6	0.0	0.5	0.0	0.4	0.0	0.6	0.0	0.2	0.0	0.7	0.0
Commodities	0.7	0.0	0.8	0.0	1.0	0.0	0.6	0.1	0.7	0.2	0.9	0.5
Inflation-Linked Bonds	0.5	0.0	0.7	0.0	0.3	0.0	0.5	0.3	0.4	0.0	0.5	0.0
Private Oil & Gas/Natural Resources	2.8	2.4	1.6	0.4	2.0	1.4	1.3	0.1	2.4	1.8	0.7	0.0
Timber	0.3	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.0	0.0
Public Energy/Natural Resources	3.1	3.0	3.4	3.0	3.3	2.7	3.7	3.6	3.7	2.7	3.5	3.7
<b>Cash &amp; Equivalents</b>	<b>3.6</b>	<b>3.1</b>	<b>4.4</b>	<b>3.6</b>	<b>4.2</b>	<b>3.3</b>	<b>6.7</b>	<b>3.4</b>	<b>4.9</b>	<b>3.7</b>	<b>3.7</b>	<b>3.2</b>
<b>Other Assets</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>0.1</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>

Source: Endowment and foundation data as reported to Cambridge Associates LLC.

**Exhibit 5**  
**Detailed Asset Allocation by Asset Size: US Endowments and Foundations**

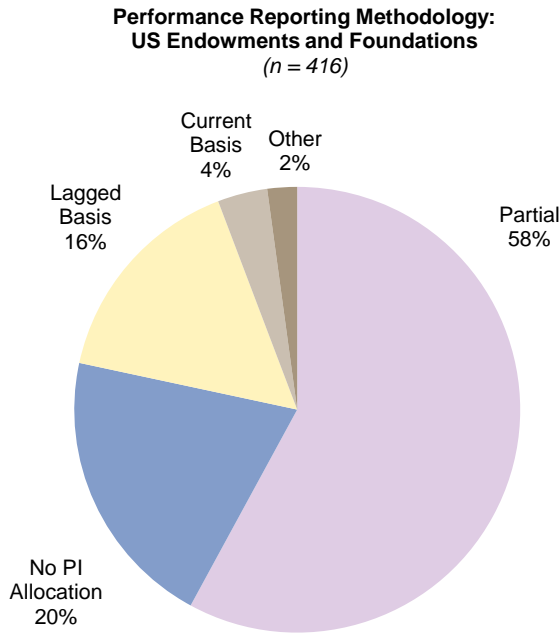
As of September 30, 2016 • Percent (%)

	All Endow & Foundation (n = 417)		Under \$100mm (n = 89)		\$100mm to \$200mm (n = 93)		\$200mm to \$500mm (n = 82)		\$500mm to \$1bn (n = 61)		Over \$1bn (n = 92)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<b>US Equity</b>	<b>21.8</b>	<b>21.7</b>	<b>25.3</b>	<b>25.7</b>	<b>22.8</b>	<b>22.5</b>	<b>22.9</b>	<b>22.4</b>	<b>19.0</b>	<b>19.1</b>	<b>18.3</b>	<b>16.1</b>
<b>Global ex US Equity</b>	<b>23.5</b>	<b>24.0</b>	<b>26.0</b>	<b>27.1</b>	<b>25.3</b>	<b>25.5</b>	<b>23.8</b>	<b>24.0</b>	<b>21.7</b>	<b>22.3</b>	<b>20.2</b>	<b>20.2</b>
Developed Markets	16.0	16.1	18.7	19.1	17.4	17.5	16.0	16.4	14.3	14.6	13.0	12.8
Emerging Markets	7.5	7.7	7.3	7.6	7.9	8.2	7.8	7.7	7.3	7.3	7.2	6.9
<b>Bonds</b>	<b>10.9</b>	<b>10.7</b>	<b>13.3</b>	<b>12.9</b>	<b>12.4</b>	<b>13.0</b>	<b>12.0</b>	<b>11.4</b>	<b>10.3</b>	<b>10.1</b>	<b>6.4</b>	<b>6.6</b>
US Bonds	9.2	9.0	11.5	11.3	10.5	10.9	10.5	10.2	8.7	8.9	4.9	5.1
Developed Markets ex US	0.6	0.0	0.6	0.0	0.5	0.0	0.5	0.0	0.6	0.0	0.7	0.0
Emerging Markets	0.6	0.0	0.7	0.0	0.9	0.4	0.6	0.0	0.5	0.0	0.3	0.0
High-Yield Bonds	0.5	0.0	0.5	0.0	0.5	0.0	0.4	0.0	0.4	0.0	0.4	0.0
<b>Hedge Funds</b>	<b>19.3</b>	<b>18.5</b>	<b>18.4</b>	<b>17.2</b>	<b>19.9</b>	<b>19.2</b>	<b>18.0</b>	<b>18.5</b>	<b>20.7</b>	<b>20.0</b>	<b>20.0</b>	<b>18.5</b>
Long/Short Hedge Funds	8.9	8.4	10.0	9.0	9.3	8.9	7.1	6.7	8.8	8.2	9.3	9.0
Absolute Return (ex Distressed)	10.4	10.0	8.5	6.9	10.6	10.2	10.9	10.4	11.9	10.9	10.7	10.5
<b>Distressed Securities</b>	<b>2.9</b>	<b>2.4</b>	<b>1.8</b>	<b>1.7</b>	<b>2.4</b>	<b>2.0</b>	<b>2.7</b>	<b>2.7</b>	<b>3.8</b>	<b>3.6</b>	<b>4.1</b>	<b>3.3</b>
Hedge Fund Structure	1.8	1.4	1.3	1.2	1.6	1.2	1.5	1.4	2.2	1.9	2.3	1.9
Private Equity Structure	1.1	0.5	0.4	0.0	0.8	0.4	1.1	0.7	1.6	1.2	1.8	1.2
<b>Private Equity &amp; Venture Capital</b>	<b>7.8</b>	<b>6.2</b>	<b>2.3</b>	<b>0.0</b>	<b>5.0</b>	<b>3.1</b>	<b>7.4</b>	<b>6.2</b>	<b>10.3</b>	<b>9.5</b>	<b>14.6</b>	<b>14.4</b>
Non-Venture Private Equity	3.6	2.5	0.9	0.0	1.8	0.7	3.4	2.7	5.2	4.3	7.2	7.5
Venture Capital	3.4	1.6	0.8	0.0	2.0	0.4	3.2	2.3	4.4	3.1	6.8	5.3
Other Private Investments	0.8	0.0	0.6	0.0	1.1	0.1	0.8	0.4	0.7	0.2	0.6	0.0
<b>Real Assets &amp; Infl-Linked Bonds</b>	<b>9.3</b>	<b>9.2</b>	<b>7.6</b>	<b>7.8</b>	<b>8.1</b>	<b>8.5</b>	<b>9.3</b>	<b>9.4</b>	<b>9.6</b>	<b>9.4</b>	<b>12.0</b>	<b>11.8</b>
Private Real Estate	2.0	0.9	0.7	0.0	0.8	0.0	1.8	1.1	2.0	1.8	4.5	4.3
Public Real Estate	0.5	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.8	0.0	0.4	0.0
Commodities	0.8	0.0	1.1	0.4	0.9	0.6	0.8	0.0	0.5	0.0	0.7	0.0
Inflation-Linked Bonds	0.5	0.0	0.5	0.0	0.6	0.2	0.4	0.0	0.3	0.0	0.5	0.0
Private Oil & Gas/Natural Resources	2.0	1.3	0.7	0.0	1.2	0.4	1.8	1.7	2.6	2.4	4.1	3.8
Timber	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.4	0.0
Public Energy/Natural Resources	3.3	3.0	4.1	4.3	4.3	4.1	3.7	3.2	3.2	2.9	1.3	0.2
<b>Cash &amp; Equivalents</b>	<b>4.3</b>	<b>3.3</b>	<b>5.0</b>	<b>3.3</b>	<b>4.0</b>	<b>3.1</b>	<b>3.7</b>	<b>3.1</b>	<b>4.5</b>	<b>3.7</b>	<b>4.2</b>	<b>3.5</b>
<b>Other Assets</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>0.3</b>	<b>0.0</b>	<b>0.1</b>	<b>0.0</b>	<b>0.3</b>	<b>0.0</b>

Source: Endowment and foundation data as reported to Cambridge Associates LLC.

**Exhibit 6**  
**Performance Reporting Methodologies: US Endowments and Foundations**

As of September 30, 2016 • Methods Used to Account for Performance of Private Investments in Trailing One-Year Return



**By Asset Size**

	Current Basis	Partial Basis	Lagged Basis	Other	No PI Allocation
Under \$100mm	—	51%	—	—	49%
<i>n</i>		45			44
\$100mm to \$200mm	—	73%	—	—	27%
<i>n</i>		67			25
\$200mm to \$500mm	1%	79%	5%	2%	12%
<i>n</i>	1	65	4	2	10
\$500mm to \$1bn	8%	64%	13%	7%	8%
<i>n</i>	5	39	8	4	5
Over \$1bn	10%	27%	59%	3%	1%
<i>n</i>	9	25	54	3	1

**Current Basis**

Total investment pool return for the trailing-one year period includes marketable asset performance and private investment performance for October 1, 2015, to September 30, 2016.

Marketable Assets			
4Q15	1Q16	2Q16	3Q16
Private Investments			

**Partial Basis**

Total investment pool return for the trailing one-year period includes marketable asset performance for October 1, 2015, to September 30, 2016. Private investment portion of the investment pool reflects actual performance for October 1, 2015, to June 30, 2016, and a flat return (0%) for July 1, 2016, to September 30, 2016.

Marketable Assets			
4Q15	1Q16	2Q16	3Q16
Actual Return			0%
Private Investments			

**Lagged Basis**

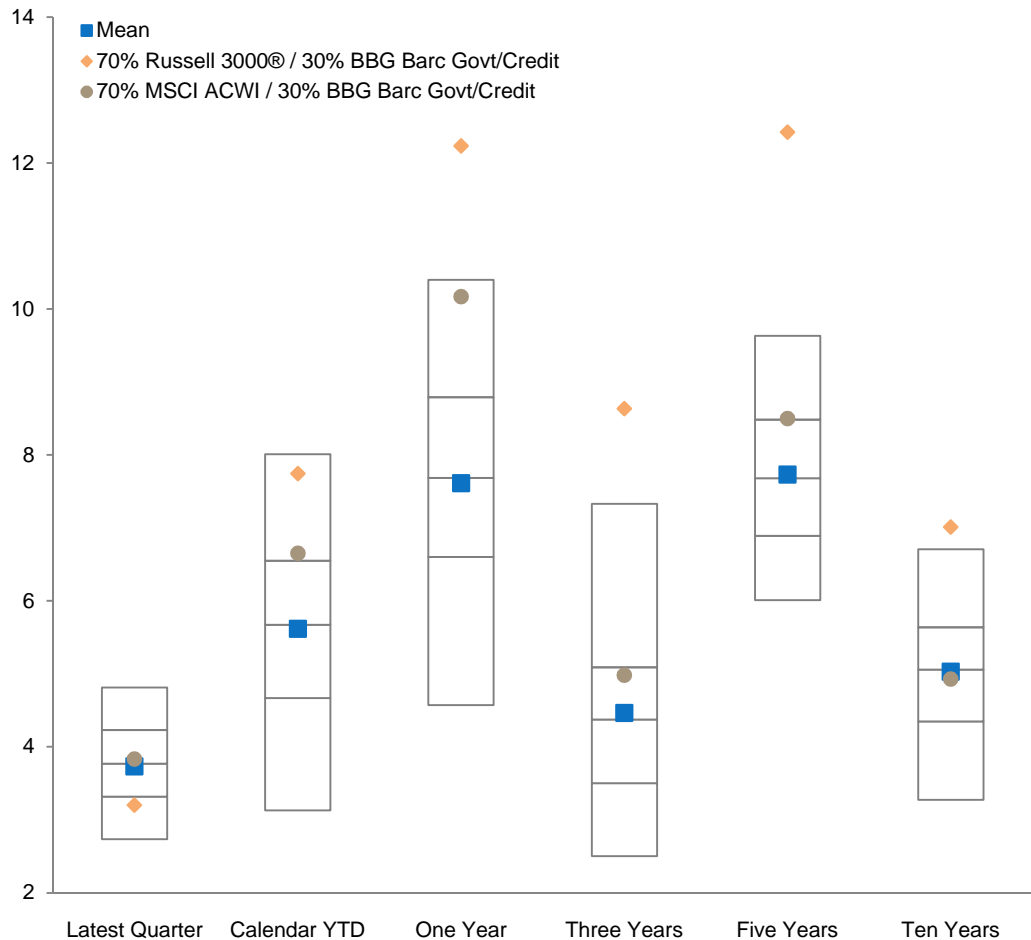
Total investment pool return for the trailing one-year period includes marketable asset performance for October 1, 2015, to September 30, 2016, and private investment performance for July 1, 2015, to June 30, 2016.

Marketable Assets				
3Q15	4Q15	1Q16	2Q16	3Q16
Private Investments				

Source: Endowment and foundation data as reported to Cambridge Associates LLC.

Notes: Private investments include total allocation to non-venture private equity, venture capital, distressed securities (private equity structure), private oil & gas/natural resources, timber, private real estate, and other private investments. Institutions with no significant private investment allocations (<1% of their total investment portfolios) are reflected in the No PI Allocation category in the pie graph and table by asset size.

**Exhibit 7**  
**Nominal Return Percentiles: US Endowments and Foundations**  
 Period Ended September 30, 2016 • Percent (%)

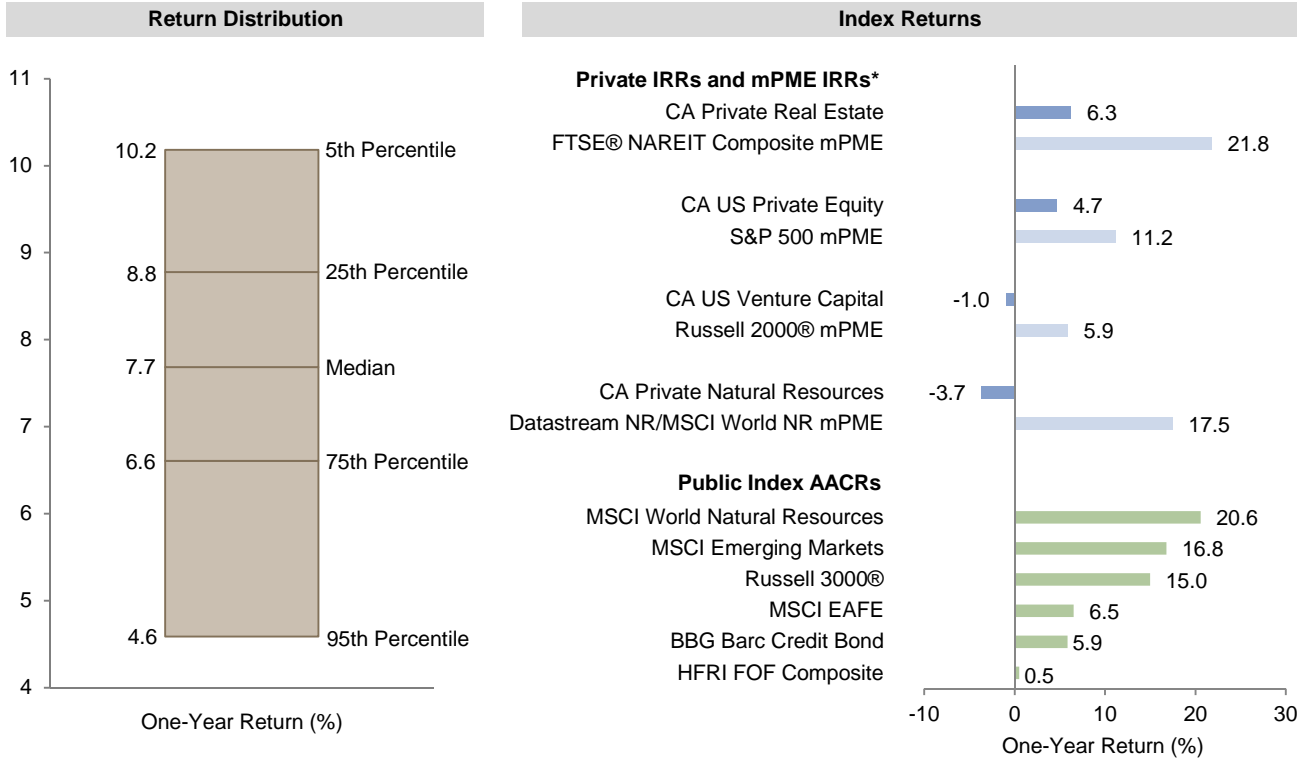


	Latest Quarter	Calendar YTD	One Year	Three Years	Five Years	Ten Years
5th Percentile	4.8	8.0	10.4	7.3	9.6	6.7
25th Percentile	4.2	6.5	8.8	5.1	8.5	5.6
Median	3.8	5.7	7.7	4.4	7.7	5.1
75th Percentile	3.3	4.7	6.6	3.5	6.9	4.3
95th Percentile	2.7	3.1	4.6	2.5	6.0	3.3
Mean	3.7	5.6	7.6	4.5	7.7	5.0
<i>n</i>	417	416	416	412	404	373
70% Russell 3000® / 30% BBG Barc Govt/Credit	3.2	7.7	12.2	8.6	12.4	7.0
70% MSCI ACWI / 30% BBG Barc Govt/Credit	3.8	6.7	10.2	5.0	8.5	4.9

Sources: Endowment and foundation data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., Frank Russell Company, and MSCI Inc. MSCI data provided "as is" without any express or implied warranties.  
 Notes: Three-, five-, and ten-year returns are annualized. The 70/30 simple portfolio benchmarks are calculated assuming rebalancing occurs on the final day of each quarter.

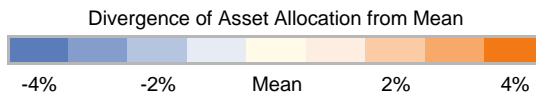


**Exhibit 8**  
**One-Year Asset Allocation of Top and Bottom Performers: US Endowments and Foundations**  
 As of September 30, 2016



**Mean Asset Allocation by Performance Quartile (%): September 30, 2015 to September 30, 2016**

Quartile	US Equity	DM ex US Equity	EM Equity	Bonds	Hedge Funds	Dist Sec	PE & VC	Private RA	Public RA & ILBs	Cash	Other
Top Quartile	25.5	18.3	7.7	14.0	15.8	1.9	3.9	2.3	6.8	3.7	0.2
2nd Quartile	23.8	16.7	7.7	12.1	19.7	2.8	5.4	2.4	5.5	3.6	0.2
3rd Quartile	19.6	15.0	7.0	10.6	21.3	3.8	9.0	4.7	4.2	4.7	0.2
Bottom Quartile	16.7	12.5	6.3	8.0	24.3	3.4	13.7	7.4	2.9	4.5	0.3
E&F Universe Mean	21.4	15.6	7.2	11.2	20.3	3.0	8.0	4.2	4.9	4.1	0.2



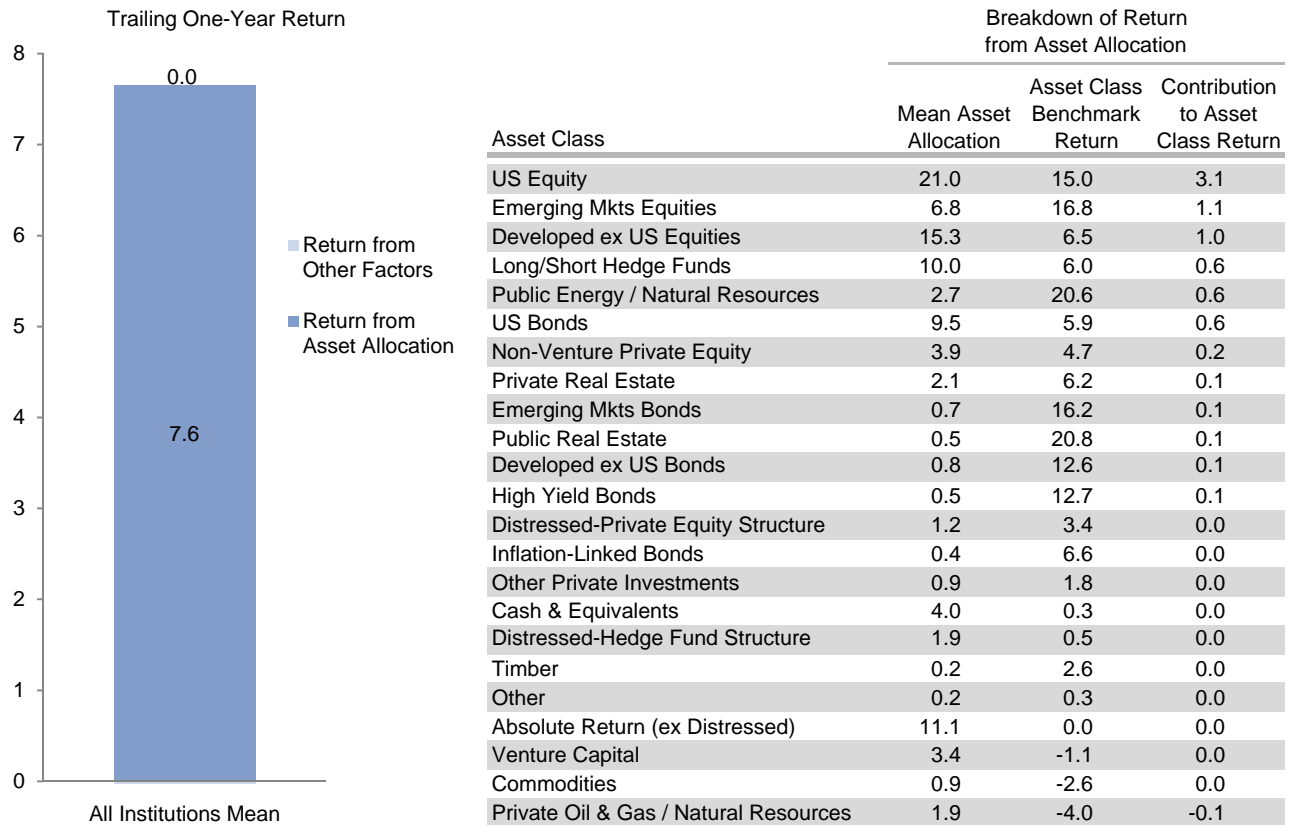
Sources: Endowment and foundation data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., Cambridge Associates LLC, Frank Russell Company, FTSE International Limited, Hedge Fund Research, Inc., MSCI Inc., the National Association of Real Estate Investment Trusts, Standard & Poor's, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: CA US endowment and foundation universe performance quartiles are based on the trailing one-year return as of September 30, 2016. Mean allocations are for the 2015 and 2016 September 30 periods. Analysis includes data for 408 institutions.

\* Private indexes are pooled horizon IRRs, net of fees, expenses, and carried interest. The CA Modified Public Market Equivalent (mPME) replicates private investment performance under public market conditions. The public index's shares are purchased and sold according to the private fund cash flow schedule, with distributions calculated in the same proportion as the private fund, and mPME NAV is a function of mPME cash flows and public index returns. Private benchmark IRRs and mPME IRRs are for the period 10/1/15 to 6/30/16.

**Exhibit 9**  
**One-Year Return Attribution Analysis: US Endowments and Foundations**

As of September 30, 2016 • Percent (%)

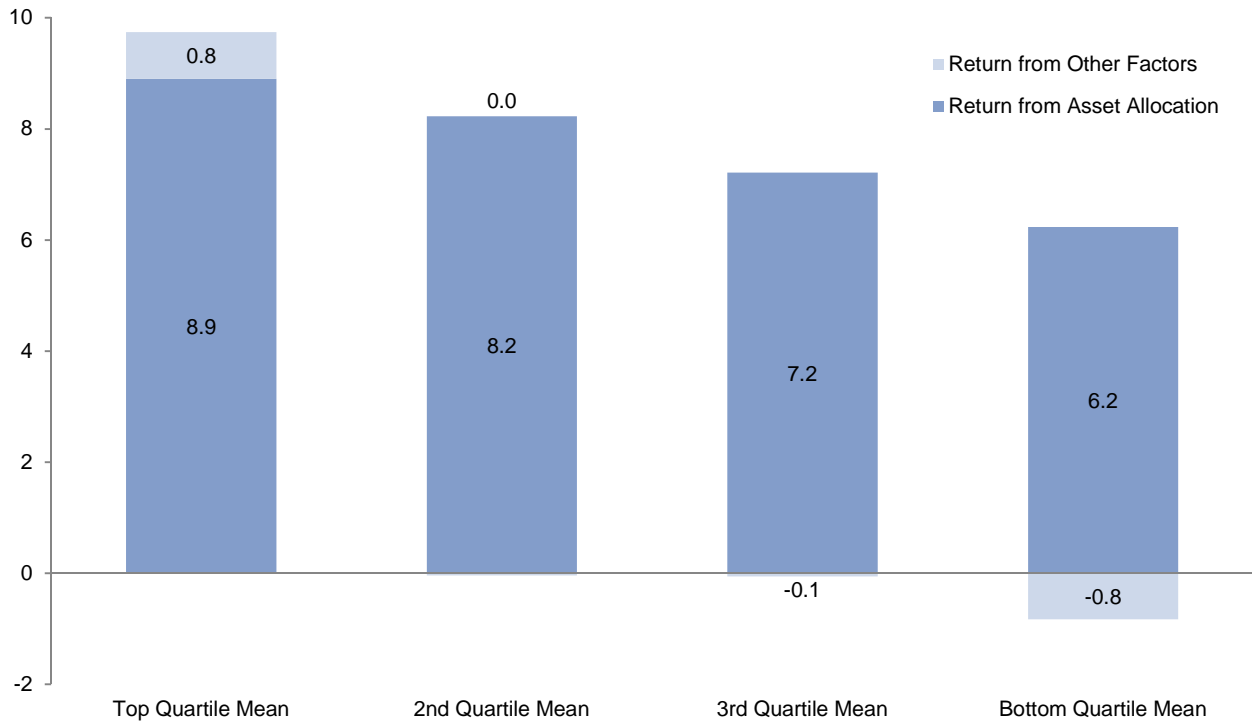


Sources: Endowment and foundation as reported to Cambridge Associates LLC. Index data provided by Barclays, Bloomberg L.P., BofA Merrill Lynch, Cambridge Associates LLC., Citigroup Global Markets, Frank Russell Company, FTSE International Limited, Hedge Fund Research, Inc., J.P. Morgan Securities, Inc., MSCI Inc., National Association of Real Estate Investment Trusts, and the National Council of Real Estate Investment Fiduciaries. MSCI data provided "as is" without any express or implied warranties. Notes: Includes data for 408 institutions that provided beginning fiscal year asset allocation. Mean asset allocation is as of September 30, 2015. The sum of the contribution to asset class return for all categories in the table equals the amount of the total return that was explained by asset allocation. To be consistent with the methodology in which private investment returns are incorporated into the total portfolio composite calculation, private investment benchmark returns are linked quarterly end-to-end returns.

**Exhibit 10**

**One-Year Return Attribution Analysis by Performance Quartile: US Endowments and Foundations**

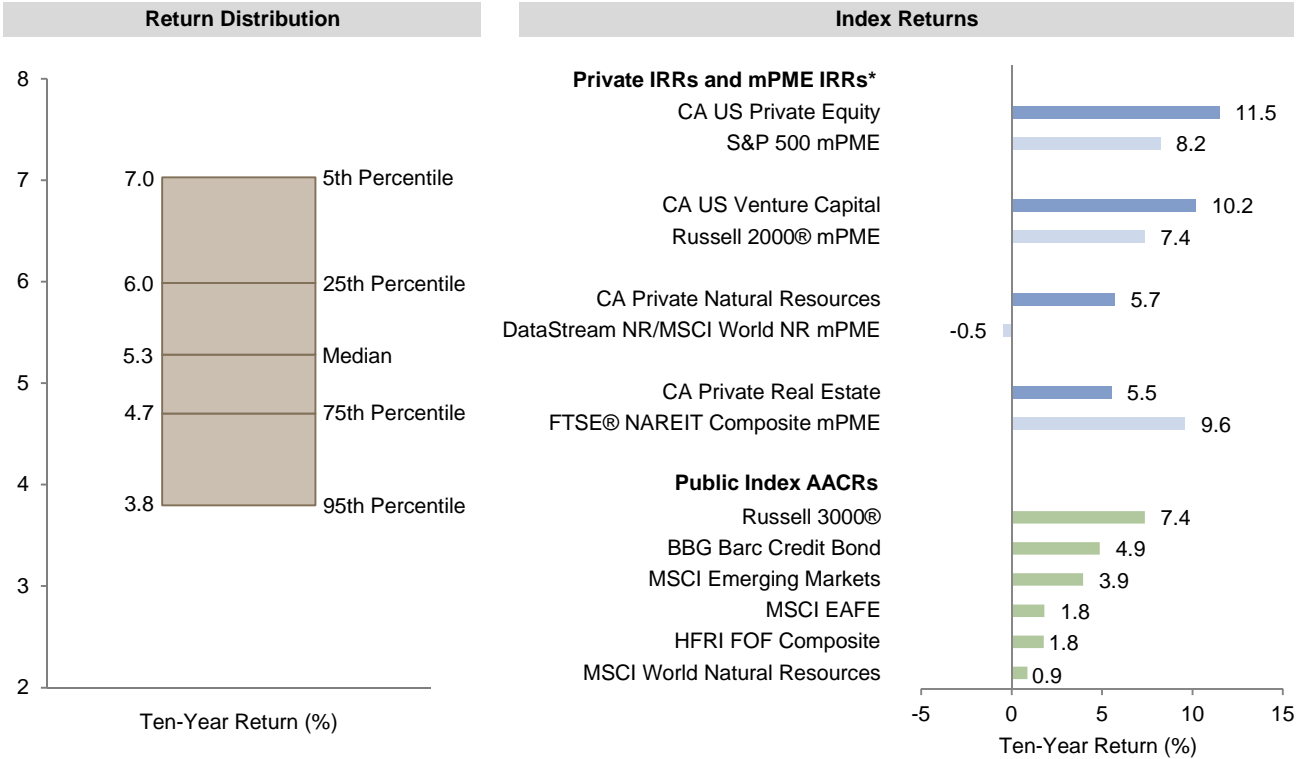
As of September 30, 2016 • Percent (%)



Source: Endowment and foundation data as reported to Cambridge Associates LLC.

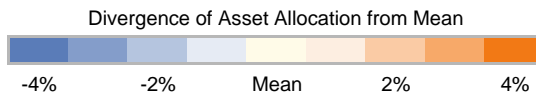
Note: Includes data for 408 institutions that provided beginning fiscal year asset allocation.

**Exhibit 11**  
**Ten-Year Asset Allocation of Top and Bottom Performers: US Endowments and Foundations**  
 As of September 30, 2016



**Mean Asset Allocation by Performance Quartile (%): September 30, 2006 to September 30, 2016**

Quartile	US Equity	DM ex US Equity	EM Equity	Bonds	Hedge Funds	Dist Sec	PE & VC	Private RA	Public RA & ILBs	Cash	Other
Top Quartile	19.5	12.3	6.2	9.4	19.7	3.8	13.0	8.6	3.9	3.6	0.2
2nd Quartile	22.1	14.0	6.2	11.9	20.6	3.3	8.1	4.9	5.2	3.2	0.6
3rd Quartile	23.0	16.3	5.9	14.6	17.9	2.8	5.5	3.2	7.3	3.1	0.4
Bottom Quartile	23.3	16.6	5.9	17.9	16.6	2.1	4.2	2.6	7.0	3.3	0.5
E&F Universe Mean	22.0	14.8	6.0	13.4	18.7	3.0	7.7	4.8	5.8	3.3	0.4

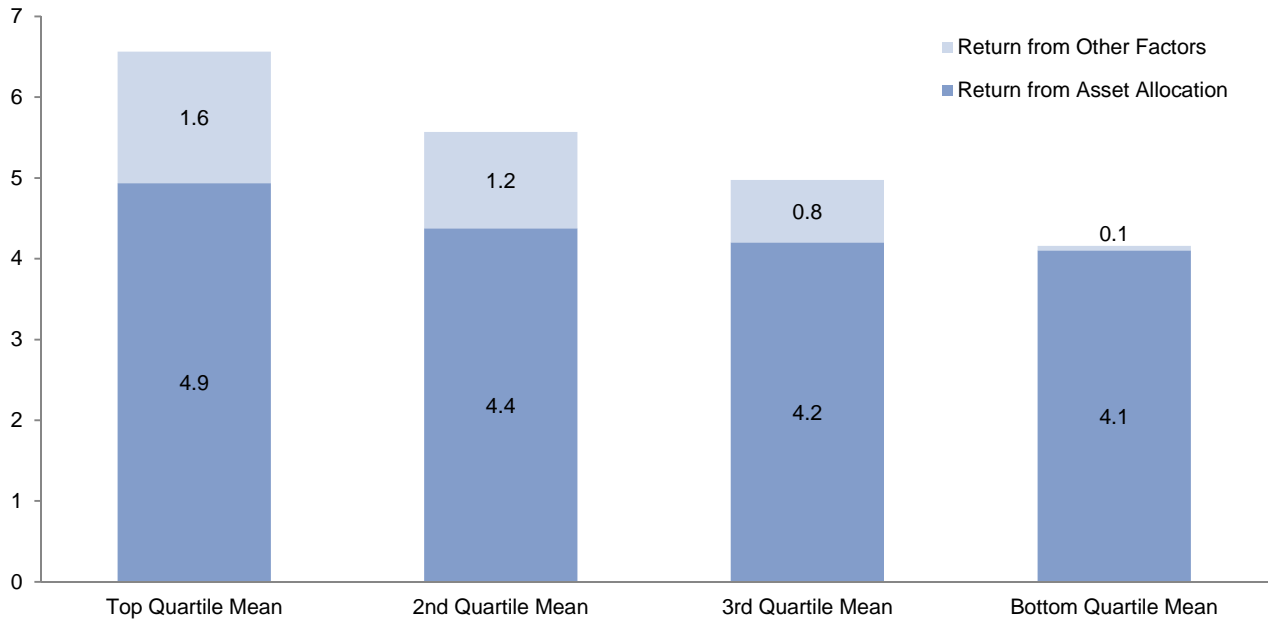


Sources: Endowment and foundation data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., Cambridge Associates LLC, Frank Russell Company, FTSE International Limited, Hedge Fund Research, Inc., MSCI Inc., the National Association of Real Estate Investment Trusts, Standard & Poor's, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: CA US endowment and foundation universe performance quartiles are based on the trailing ten-year return as of September 30, 2016. Mean allocations are for the 11 September 30 periods from 2006 to 2016. Analysis includes data for 216 institutions.

\* Private indexes are pooled horizon IRRs, net of fees, expenses, and carried interest. The CA Modified Public Market Equivalent (mPME) replicates private investment performance under public market conditions. The public index's shares are purchased and sold according to the private fund cash flow schedule, with distributions calculated in the same proportion as the private fund, and mPME NAV is a function of mPME cash flows and public index returns. Private benchmark IRRs and mPME IRRs are for the period 10/1/06 to 6/30/16.

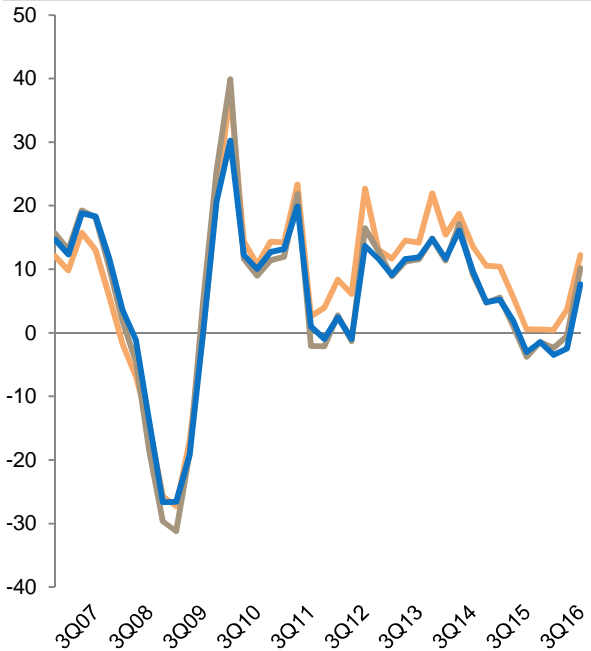
**Exhibit 12**  
**Ten-Year Attribution Analysis by Performance Quartile: US Endowments and Foundations**  
 As of September 30, 2016 • Percent (%)



Source: Endowment and foundation data as reported to Cambridge Associates LLC.  
 Note: Includes data for 216 institutions.

**Exhibit 13**  
**Nominal Returns Over Time: US Endowments and Foundations**  
 Periods Ended Fourth Quarter 2006 – Third Quarter 2016 • Percent (%)

**Rolling One-Year AACR**



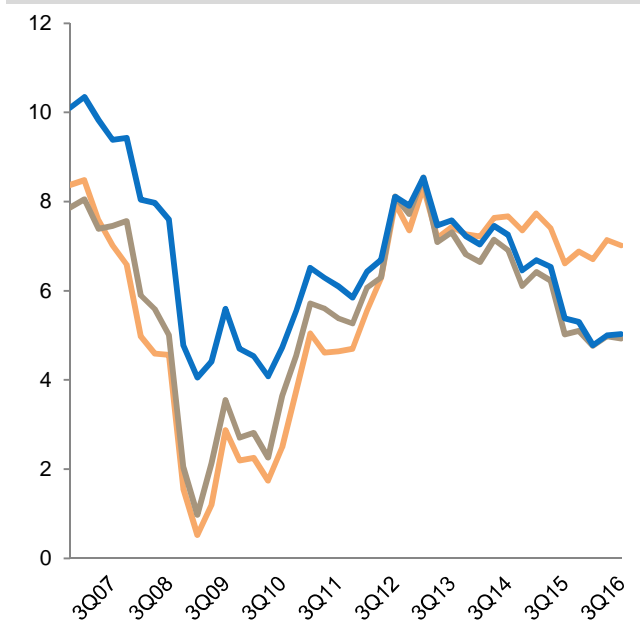
**Rolling Three-Year AACR**



**Rolling Five-Year AACR**



**Rolling Ten-Year AACR**



— 70/30 Russell 3000® / BBG Barc Govt/Credit — 70/30 MSCI ACWI / BBG Barc Govt/Credit — US Endows & Fdns

Sources: Endowment and foundation data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., Frank Russell Company, and MSCI Inc. MSCI data provided "as is" without any express or implied warranties.

Note: The 70/30 simple portfolio benchmarks are calculated assuming rebalancing occurs on the final day of each quarter.

## Exhibit 14

## Nominal Total Return Summary by Peer Group: US Endowments and Foundations

Periods Ended September 30, 2016 • Percent (%)

	Latest Quarter	Calendar YTD	Average Annual Compound			
			One Year	Three Years	Five Years	Ten Years
<b>Colleges &amp; Universities</b>						
5th Percentile	4.6	7.8	9.9	7.4	9.7	6.7
25th Percentile	4.1	6.4	8.5	5.6	8.8	5.8
75th Percentile	3.4	4.5	6.3	4.0	7.4	4.5
95th Percentile	2.9	3.2	4.4	2.9	6.3	3.6
Mean	3.7	5.4	7.3	4.9	8.1	5.2
Median	3.7	5.5	7.2	4.6	8.0	5.2
<i>n</i>	143	143	143	142	141	135
<b>Cultural &amp; Environmental</b>						
5th Percentile	4.8	7.8	10.6	6.4	9.7	6.4
25th Percentile	4.4	6.8	9.2	5.1	8.7	5.7
75th Percentile	3.4	4.9	7.2	3.6	7.2	4.5
95th Percentile	2.8	3.9	6.4	2.7	6.1	3.2
Mean	3.8	5.8	8.2	4.5	7.8	5.0
Median	3.9	5.8	7.8	4.5	7.7	5.2
<i>n</i>	53	53	53	53	53	50
<b>Foundations</b>						
5th Percentile	5.2	8.2	11.0	7.9	9.8	7.0
25th Percentile	4.2	6.6	9.1	5.1	8.6	6.0
75th Percentile	3.2	4.7	6.6	3.6	7.0	4.5
95th Percentile	2.6	3.2	4.8	2.7	6.1	3.2
Mean	3.7	5.7	7.8	4.7	7.8	5.1
Median	3.7	5.7	7.8	4.5	7.7	5.1
<i>n</i>	111	111	111	109	104	92
<b>Health Care</b>						
5th Percentile	4.8	7.5	9.7	5.8	8.8	6.3
25th Percentile	4.3	6.6	8.6	4.5	8.1	5.4
75th Percentile	3.5	4.7	6.5	2.8	6.3	4.1
95th Percentile	2.8	3.3	5.0	1.9	5.8	3.5
Mean	3.8	5.6	7.5	3.8	7.2	4.7
Median	3.9	5.5	7.6	3.9	7.2	4.8
<i>n</i>	38	38	38	38	38	36
<b>Independent Schools</b>						
5th Percentile	4.5	7.8	9.7	5.5	9.2	6.8
25th Percentile	4.0	6.4	8.7	4.6	8.0	5.6
75th Percentile	3.1	4.1	5.7	3.3	6.4	4.4
95th Percentile	1.1	2.2	3.8	3.1	4.9	3.0
Mean	3.1	5.3	7.1	4.0	7.1	5.0
Median	3.5	5.6	7.3	4.0	7.0	5.2
<i>n</i>	26	26	26	26	26	25
<b>Other Nonprofits</b>						
5th Percentile	4.6	8.0	9.8	5.0	9.2	5.5
25th Percentile	4.3	7.0	8.8	4.1	7.8	5.1
75th Percentile	3.4	5.3	7.2	3.0	6.5	4.1
95th Percentile	2.9	4.0	5.7	2.4	5.2	3.4
Mean	3.9	6.0	7.9	3.6	7.1	4.5
Median	4.0	6.1	8.1	3.5	7.0	4.5
<i>n</i>	46	45	45	44	42	35

Source: Endowment and foundation data as reported to Cambridge Associates LLC.

## Exhibit 15

## Nominal Total Return Summary by Asset Size: US Endowments and Foundations

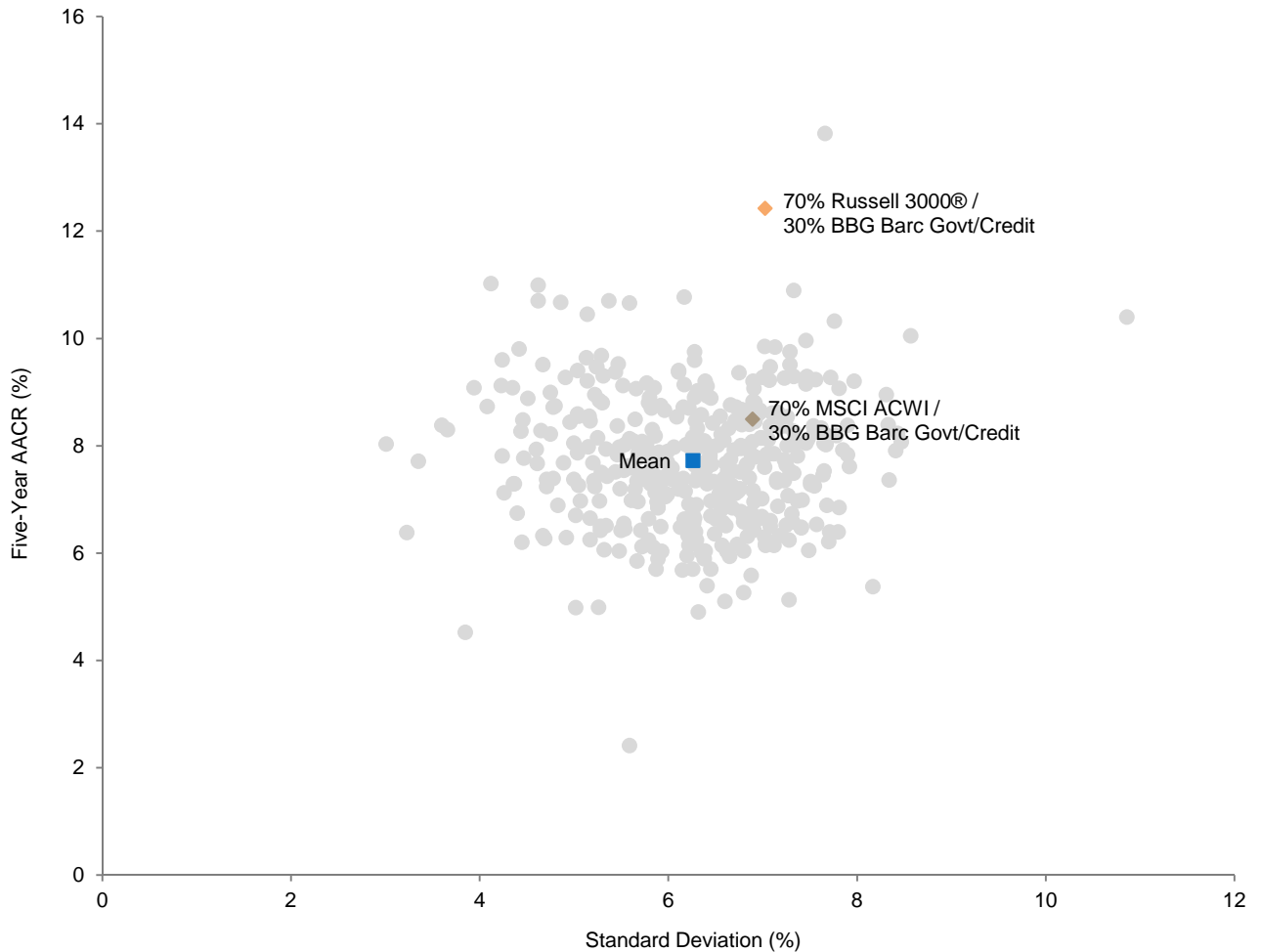
Periods Ended September 30, 2016 • Percent (%)

	Latest Quarter	Calendar YTD	Average Annual Compound			
			One Year	Three Years	Five Years	Ten Years
<b>Under \$100 Million</b>						
5th Percentile	4.9	8.2	11.1	5.2	9.3	6.1
25th Percentile	4.4	6.9	9.3	4.5	8.1	5.1
75th Percentile	3.4	5.5	7.5	3.1	6.4	3.8
95th Percentile	2.7	3.9	5.9	2.4	5.4	2.8
Mean	3.9	6.2	8.5	3.8	7.3	4.4
Median	3.9	6.2	8.5	3.6	7.0	4.3
<i>n</i>	89	89	89	86	83	73
<b>\$100 Million to \$200 Million</b>						
5th Percentile	4.7	7.7	9.8	5.1	8.8	6.0
25th Percentile	4.2	6.7	8.9	4.4	7.8	5.2
75th Percentile	3.5	5.2	6.9	2.9	6.5	4.1
95th Percentile	3.0	3.7	5.7	2.3	5.8	3.2
Mean	3.8	5.8	7.9	3.7	7.2	4.6
Median	3.9	5.9	7.8	3.8	7.2	4.6
<i>n</i>	93	92	92	91	91	83
<b>\$200 Million to \$500 Million</b>						
5th Percentile	4.7	8.2	10.6	5.9	9.2	6.5
25th Percentile	4.1	6.8	9.1	4.7	8.4	5.5
75th Percentile	3.4	5.1	7.1	3.8	7.2	4.4
95th Percentile	2.9	3.8	5.6	2.9	6.3	3.7
Mean	3.7	5.9	8.0	4.4	7.8	5.0
Median	3.7	5.8	7.8	4.3	7.7	5.0
<i>n</i>	82	82	82	82	80	76
<b>\$500 Million to \$1 Billion</b>						
5th Percentile	4.7	7.2	9.9	6.4	9.7	6.6
25th Percentile	4.0	6.0	8.4	5.3	8.3	5.6
75th Percentile	3.1	4.4	6.1	4.1	7.4	4.8
95th Percentile	2.8	3.0	4.5	3.0	6.0	4.1
Mean	3.7	5.2	7.1	4.6	7.9	5.3
Median	3.7	5.3	7.0	4.5	7.9	5.2
<i>n</i>	61	61	61	61	58	55
<b>Over \$1 Billion</b>						
5th Percentile	5.0	7.4	9.3	8.2	10.5	7.3
25th Percentile	4.2	5.8	7.6	6.8	9.2	6.5
75th Percentile	3.2	3.9	5.5	4.8	7.8	5.1
95th Percentile	2.4	2.5	3.7	3.7	6.4	4.4
Mean	3.6	4.9	6.6	5.8	8.5	5.8
Median	3.7	4.8	6.8	5.6	8.6	5.8
<i>n</i>	92	92	92	92	92	86

Source: Endowment and foundation data as reported to Cambridge Associates LLC.



**Exhibit 16**  
**Standard Deviation and Sharpe Ratio: US Endowments and Foundations**  
 Five Years Ended September 30, 2016



	AACR (%)	Standard Deviation (%)	Sharpe Ratio
5th Percentile	9.6	7.7	1.84
25th Percentile	8.5	7.0	1.37
75th Percentile	6.9	5.6	1.04
95th Percentile	6.0	4.5	0.88
Mean	7.7	6.3	1.25
Median	7.7	6.3	1.20
<i>n = 404</i>			
70% Russell 3000® / 30% BBG Barc Govt/Credit	12.4	7.0	1.71
70% MSCI ACWI / 30% BBG Barc Govt/Credit	8.5	6.9	1.21

Sources: Endowment and foundation data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., Frank Russell Company, and MSCI Inc. MSCI data provided "as is" without any express or implied warranties. Sharpe ratio calculated using data from BofA Merrill Lynch.

Notes: This exhibit includes only those institutions that have provided trailing quarterly returns. The 70/30 simple portfolio benchmarks are calculated assuming rebalancing occurs on the final day of each quarter.

**Absolute Return:** The use of different strategies (e.g., global macro, market neutral, open mandate) to produce a positive return regardless of the direction and fluctuation of capital markets. Common techniques include using arbitrage, derivatives, futures, leverage, options, short selling, and unconventional assets.

**Bonds (Fixed Income):** Includes long-term promissory notes that cannot be exchanged for other assets, government bonds, preferred stocks, structured debt, and derivatives where bonds are the underlying assets. Generally earn interest paid semiannually and are repaid at the principal (par) value. Does not include mortgage real estate.

**Cash & Equivalents:** Highly liquid, virtually risk-free assets with maturities of less than one year (e.g., certificates of deposit, commercial paper, nonconvertible bonds, and Treasury bills). Manager-held discretionary cash is included in the asset class category for which that manager's strategy is classified (with the exception of multi-strategy funds in which assets are allocated across multiple asset classes).

**Commodities:** Diversified baskets of fully collateralized, long-only, commodity futures contracts. Includes funds whose value is based on the spot price of a commodity.

**Developed Markets:** Markets within countries with an established economic infrastructure.

**Distressed Securities:** Securities of companies that are currently in default, bankruptcy, financial distress, or a turnaround situation.

**Emerging Markets:** Typically includes countries that have an underdeveloped or developing infrastructure with significant potential for economic growth and increased capital markets participation by foreign investors.

**Emerging Markets Debt:** Debt instruments of emerging markets countries and issuers, including US\$-denominated and local currency bonds.

**Emerging Markets Equity:** Equity securities of emerging markets countries; considered emerging even if the equity market is fully functional and well regulated.

**Equities:** Ownership positions in companies that can be traded in public markets. Often produce current income, which is paid in the form of quarterly dividends. The holders' claims are subordinate to the claims of preferred stockholders and bondholders. Includes convertible bonds if they are held as an opportunistic means of eventually acquiring a company's stock. Also includes futures, options, rights, and warrants where the underlying assets are equities.

**Faculty Mortgages:** Homeownership loans issued by an institution to faculty or staff.

**High-Yield Bonds:** Bonds regarded, on balance, as predominantly speculative with respect to capacity to pay interest and repay principal in accordance with the terms of the obligation. Typically, these bonds have a credit rating of BB or lower and pay higher yields because they are more risky than investment-grade bonds. Also includes collateralized bond obligations (CBOs).

**Inflation-Linked Bonds:** Fixed coupon bonds that earn interest paid semi-annually on inflation-adjusted principal.

**Long/Short Hedge Funds:** Portfolios with long positions in undervalued companies and short positions in overvalued companies to capture the disparity in prospective returns, while maintaining a low level of overall market risk.

**Long-Term Investment Portfolio:** The group of assets that an institution deems best represents its investment policies and endowment asset allocation and returns. These assets should be subject to frequent market valuation and may include operating funds. Pooled income funds and charitable remainder trusts should be excluded if the investment strategy varies from the institution's asset allocation policy. Assets that cannot be fairly valued such as artwork, copyrights, and patents should also be excluded.

**Non-Venture Private Equity:** Through negotiation or tender offer, a takeover of a majority percentage of a company's equity with the purpose of acquiring its assets and operations. Includes leveraged buyouts (LBOs).

**Other Assets:** Should only include assets that cannot be classified as one or more of the other asset classes.

**Other Private Investments:** Includes funds that are invested across multiple private investments and cannot be allocated to a single asset class. Includes multi-strategy fund-of-fund and secondary-market private investments.

**Private Investments:** Investments that are not traded in the public market including, but not limited to, leveraged buyouts, venture capital, private real estate, private distressed securities, and private energy and natural resources.

**Private Oil & Gas/Natural Resources:** Funds created to invest in the exploration or development of energy-related reserves and natural resources.

**Private Real Estate:** Includes ownership positions in land and buildings as well as private operating companies. May also include equity-like investments in mortgages or land leases that include substantial participation in revenues and capital appreciation. Does not include equity

mortgages such as collateralized mortgage obligations (CMOs), mortgage-backed securities, publicly traded REITs, or other public real estate.

**Public Energy/Natural Resources:** Includes marketable energy funds and natural resources.

**Public Real Estate:** Includes REITs and other public real estate equity such as umbrella partnership REITs (UPREITs) and other public operating companies (REOCs).

**Real Returns:** The real, or inflation-adjusted, rate of return for a given investment is calculated by dividing the nominal total return by the appropriate deflator for the same time period. Throughout this report, the measure used for this purpose is the Consumer Price Index (CPI). Note that simply subtracting CPI from the nominal total return does not result in an accurate computation of real total return. The formula is:

$$\frac{1 + \text{Nominal Total Return}}{1 + \text{CPI}} - 1 = \frac{\text{Real}}{\text{Total Return}}$$

**Sharpe Ratio:** The excess return, or the return over the risk-free rate, on a portfolio divided by the total volatility as measured by the standard deviation of the portfolio. The most common approach to measuring risk-adjusted performance is by the Sharpe ratio, which shows how much return above the risk-free rate (T-bills) the investor has earned per unit of risk (defined as standard deviation of returns). The higher the Sharpe ratio (assuming the ratio is above zero), the more the investor has been compensated for each unit of risk taken. The ratio is a measure of reward relative to total volatility. The formula is:

$$\frac{R_p - R_f}{S_p} = \text{Sharpe Ratio}$$

Where:

$R_p$  is the arithmetic average of composite quarterly returns,

$R_f$  is the arithmetic average of T-bill (risk-free) quarterly returns, and

$S_p$  is the quarterly standard deviation of composite quarterly returns.

**Standard Deviation:** The standard deviation of a portfolio's return is used as a measure of its total risk (measured by variability of returns). It is a measure of the extent to which returns vary from their average. The larger the standard deviation, the wider the range of likely returns and the greater the risk implicit in the portfolio.

**Timber:** Funds created to invest in timber-related business. Usually limited partnerships.

**Total Return:** The sum of income earned and appreciation, both realized and unrealized, for a specified period of time. Preferred method of calculation uses time-weighted cash flows.

**Traditional Assets:** Includes US equities, non-US equities (including emerging markets), US investment-grade bonds, non-dollar bonds, high-yield bonds, emerging markets debt, and all cash and cash equivalents.

**Venture Capital:** Investments in private securities of new companies or companies considered to be in the early stages of growth; these investments may have high risk and the potential for high return. ■