



Annual Analysis of Cultural and Environmental
Institution Investment Pool Returns:
Fiscal Year 2016

Annual Analysis of Cultural and
Environmental Institution
Investment Pool Returns:
Fiscal Year 2016

Grant Steele | Elizabeth Cheever

Introduction	1
Investment Portfolio Returns	2
Portfolio Asset Allocation	21
Investment Management Structures	28
Payout from the Long-Term Investment Portfolio	35
Notes on the Data	39
Glossary	41
Participants	45
Figures	
1. Summary of Investment Portfolio Returns	2
2. Summary of Long-Term Investment Portfolio Return Percentiles by Asset Size	3
3. Dispersion of Participants' Asset Class Returns: Marketable Investments (One-Year)	4
4. Dispersion of Participants' Asset Class Returns: Private Investments (One-Year)	5
5. Public Equity: Median Participant Return Versus Index Returns	6
6. Private Equity: Median Participant Return Versus Index Returns	6
7. Private Real Assets: Median Participant Return Versus Index Returns	7
8. Public Real Assets: Median Participant Return Versus Index Returns	7
9. Hedge Funds: Median Participant Return Versus Index Returns	8
10. Bonds: Median Participant Return Versus Index Returns	8
11. Analysis of Top and Bottom Quartile Performers: One-Year Asset Allocation	10
12. Attribution Analysis	11
13. Attribution Analysis by Performance Quartile	12
14. Rolling Five-Year Average Annual Compound Returns	13
15. Dispersion of Participants' Asset Class Returns: Marketable Investments (Trailing Five- and Ten-Year)	14
16. Dispersion of Participants' Asset Class Returns: Private Investments (Trailing Five- and Ten-Year)	14
17. Real Total Portfolio Return Objectives	15
18. Range of Out/Underperformance of Total Return Versus Policy Portfolio Benchmark	16
19. Frequently Used Components of Policy Portfolio Benchmarks: Public and Private Equity	18
20. Frequently Used Components of Policy Portfolio Benchmarks: Bonds and Hedge Funds	19
21. Risk/Return and Sharpe Ratio	20

22. Asset Allocation Distribution by Asset Class	21
23. Summary Asset Allocation by Asset Size	22
24. Historical Mean Asset Allocation Trends	23
25. Changes in Target Asset Allocation	24
26. Uncalled Capital Committed to Private Investment Funds	26
27. Private Investment Program Cash Flow	27
28. Number of External Managers and Investment Vehicles	29
29. Trend in Number of External Managers	30
30. Dispersion in Number of Managers for Selected Asset Classes	31
31. Externally Managed Investment Pool Holdings by Strategy	32
32. Portfolio Implementation: Private Investments and Hedge Funds	33
33. Portfolio Implementation: Traditional Equities and Bonds	34
34. Cumulative Dollar Growth After Inflation, Net Flows, and Spending	35
35. Net Flow Rate Comparison	36
36. Spending Policy Types	37
37. Long-Term Investment Portfolio Support of Operations	38

Annual Analysis of Cultural and Environmental Institution Investment Pool Returns

This report summarizes portfolio returns, asset allocation, investment manager structures, and net flow data for 54 cultural and environmental institutions for the fiscal year ended June 30, 2016.

The 54 participants in this study reported long-term investment portfolio (LTIP) assets as of June 30, 2016, totaling \$23.2 billion. The LTIP size of participants ranged from \$32.6 million to \$6.3 billion. The mean LTIP size was \$429.9 million and the median was \$167.7 million. Nineteen institutions reported LTIP assets greater than \$300 million, and they controlled 83% of the aggregate LTIP assets.

This year's report takes a closer look at additional portfolio attributes and investor trends relevant to cultural and environmental institutions. Included are exhibits on asset class returns, performance attribution, risk analytics, and policy portfolio benchmarking. We also highlight private investment programs and their impact on portfolio liquidity. Our section on investment management structures reviews the use of external managers by asset class and details portfolio implementation techniques. The report's final section includes exhibits covering net flow rates and the LTIP's support of operations.

Investment Portfolio Returns

Returns in Fiscal Year 2016

Fiscal year 2016 was a down year for most cultural and environmental institutions as few asset classes offered strong investment performance for the year ended June 30, 2016. Broad-based market indexes for US equities were just slightly positive, while those for global ex US equities were down by double-digits. Private equity did not generate the robust performance that

it has produced over the last few years, and most hedge funds reported negative returns. Real assets were mixed, with real estate producing strong returns but natural resources-related investments again posting negative performance. Bonds were a bright spot, but represented only a small portion of the portfolio for most participants.

The mean nominal total return earned by participating institutions was -2.5% in fiscal year 2016 (Figure 1). With inflation (as measured by the Consumer Price

Figure 1. Summary of Investment Portfolio Returns
Years Ended June 30, 2016 • Percent (%)

Nominal Total Returns				
	Average Annual Compound Nominal Return			
	1 Year	3 Years	5 Years	10 Years
Responding Institutions				
High	2.3	7.4	7.4	6.6
Low	-6.9	2.6	2.5	2.4
Mean	-2.5	4.8	4.9	4.9
Median	-2.7	4.7	4.8	5.1
<i>n</i>	54	54	54	50
Mean After Spending	-7.2	-0.2	-0.2	0.0
<i>n</i>	29	19	17	6
Benchmarks				
70% Russell 3000® / 30% BBG Barc Govt/Credit	3.6	9.1	9.6	7.1
70% MSCI ACWI / 30% BBG Barc Govt/Credit	-0.5	5.6	5.3	5.0
Real Total Returns				
	Average Annual Compound Real Return			
	1 Year	3 Years	5 Years	10 Years
Responding Institutions				
High	1.3	6.2	6.0	4.8
Low	-7.8	1.5	1.1	0.6
Mean	-3.5	3.7	3.5	3.1
Median	-3.7	3.6	3.4	3.3
<i>n</i>	54	54	54	50
Mean After Spending	-8.1	-1.3	-1.5	-1.7
<i>n</i>	29	19	17	6
Benchmarks				
70% Russell 3000® / 30% BBG Barc Govt/Credit	2.6	8.0	8.1	5.3
70% MSCI ACWI / 30% BBG Barc Govt/Credit	-1.5	4.5	3.9	3.2

Sources: Cultural and environmental institutions 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.

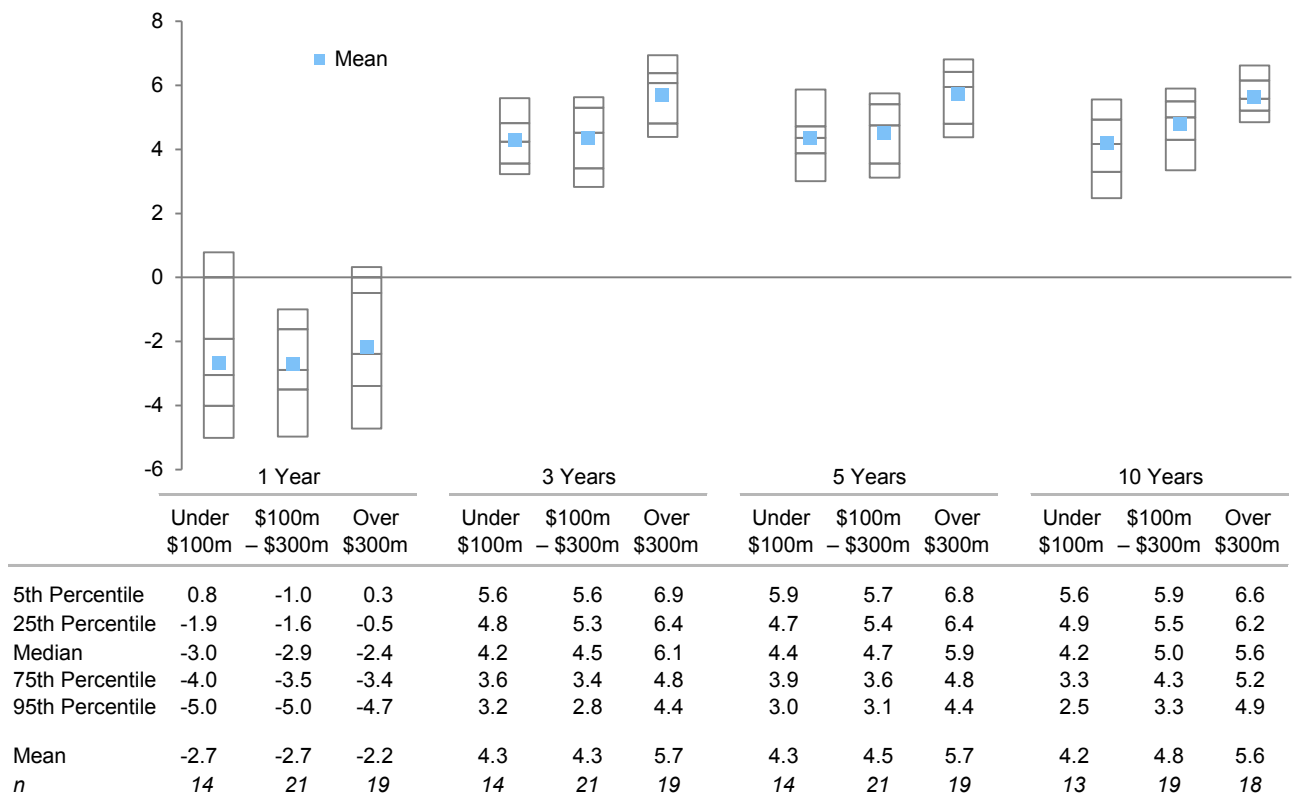
Notes: Three-, five-, and ten-year returns are annualized. Real returns are adjusted for inflation as measured by the Consumer Price Index.

Index) at 1.0% for the year, the mean real return for all respondents is adjusted to -3.5%. There was little difference in trailing one-year returns when the participant group is broken out into three broad asset size groups. Participants with assets over \$300 million reported the highest average nominal return (-2.2%) (Figure 2). Institutions with assets between \$100 million and \$300 million reported an average return of -2.7%, which matched the return reported by those with assets under \$100 million (-2.7%). Throughout this section, we will explore the factors that contributed to differences in investment performance among institutions.

Figure 3 displays the range of participant returns across marketable asset classes for fiscal year 2016, while Figure 4 shows the same information for private investment asset classes. The marketable asset class returns are reported as time-weighted returns while the private investment data are horizon internal rates of return (IRR).¹ The charts that follow in this section provide fiscal year 2016 median performance for the participant group across these asset classes alongside returns for relevant indexes (all index returns are in USD terms).

¹ A time-weighted return (TWR) captures the total return earned over time on the initial investment and eliminates the impact of future cash flows. TWRs are appropriate where the investor controls the timing of cash flows. An IRR extracts a return from a cash flow stream composed of the beginning net asset value (NAV) for the time horizon, all inflows and outflows within the period, and the final NAV of the period. IRRs are more appropriate for investments where the fund managers control the decisions of when to call and return capital.

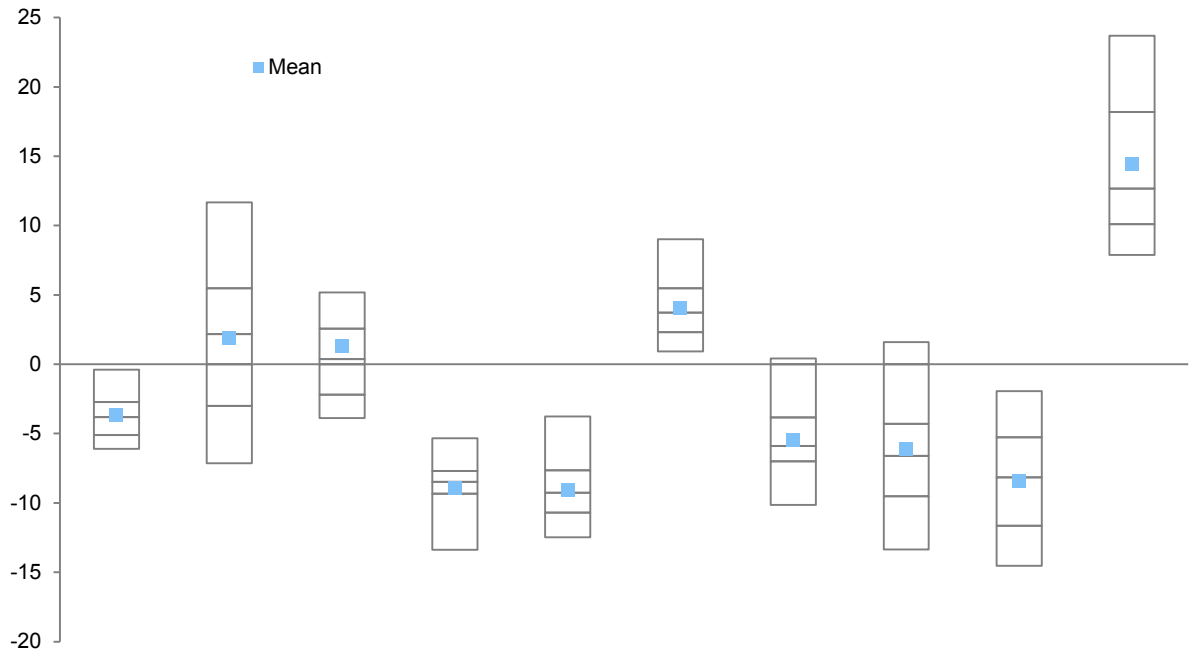
Figure 2. Summary of Long-Term Investment Portfolio Return Percentiles by Asset Size
Years Ended June 30, 2016 • Percent (%)



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Note: Three-, five-, and ten-year returns are annualized.

Figure 3. Dispersion of Participants' Asset Class Returns: Marketable Investments (One-Year)
Trailing One-Year as of June 30, 2016



	Public Equity ¹	Global Equity ²	US Equity	DM ex US Equity	EM Equity	Bonds	Hedge Funds	Public Real Assets ³	Commodities and Natural Resources	Public Real Estate
5th Percentile	-0.4	11.7	5.2	-5.3	-3.8	9.0	0.4	1.6	-1.9	23.7
25th Percentile	-2.7	5.5	2.6	-7.7	-7.6	5.5	-3.8	-4.3	-5.3	18.2
Median	-3.8	2.2	0.4	-8.5	-9.3	3.7	-5.9	-6.6	-8.2	12.7
75th Percentile	-5.1	-3.0	-2.2	-9.3	-10.7	2.3	-7.0	-9.5	-11.6	10.1
95th Percentile	-6.1	-7.1	-3.9	-13.4	-12.5	0.9	-10.1	-13.4	-14.5	7.9
Mean	-3.7	1.9	1.3	-8.9	-9.0	4.1	-5.4	-6.1	-8.4	14.4
<i>n</i>	48	28	48	46	47	46	46	43	42	7

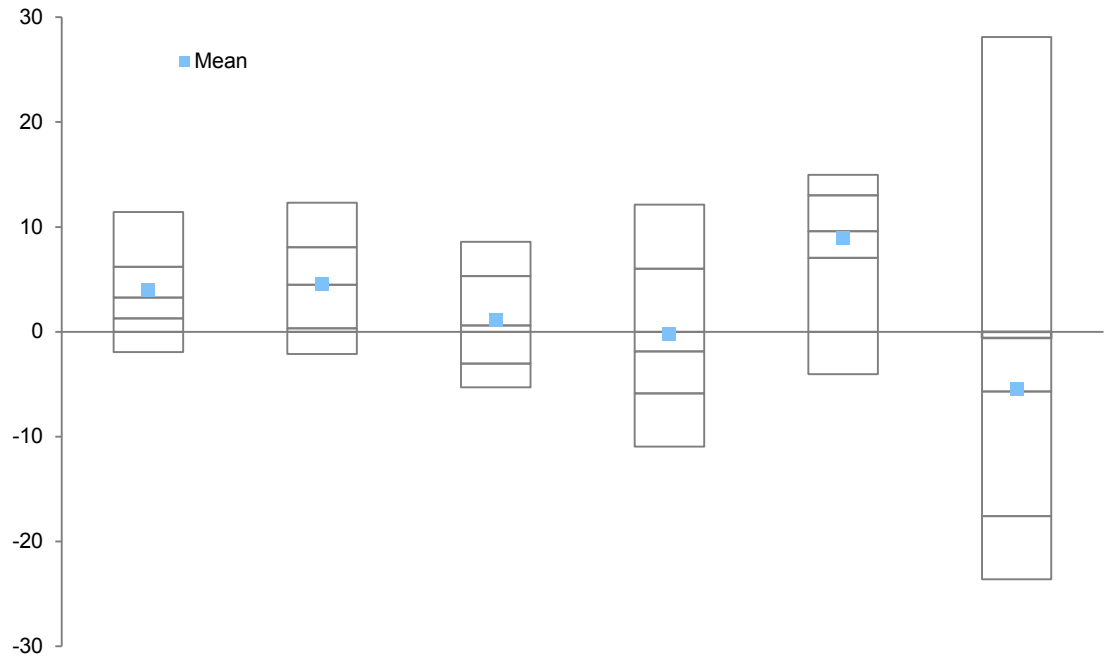
Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

¹ Public equity is a composite of global equity, US equity, developed markets ex US equity, and emerging markets equity.

² Global equity includes only investment vehicles that have a mandate to invest in US and international markets.

³ Public real assets is a composite of public real estate, commodities and natural resources, and inflation-linked bonds.

Figure 4. Dispersion of Participants' Asset Class Returns: Private Investments (One-Year)
Trailing One-Year as of June 30, 2016



	Private Equity ¹	Non-Venture Private Equity ²	Venture Capital	Private Real Assets ³	Private Real Estate	Private Natural Resources
5th Percentile	11.4	12.3	8.6	12.1	15.0	28.1
25th Percentile	6.2	8.1	5.3	6.0	13.0	-0.6
Median	3.3	4.5	0.6	-1.9	9.6	-5.7
75th Percentile	1.3	0.3	-3.0	-5.9	7.1	-17.6
95th Percentile	-1.9	-2.1	-5.3	-10.9	-4.0	-23.6
Mean	3.9	4.5	1.1	-0.3	8.9	-5.5
<i>n</i>	30	30	23	27	22	24

Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Note: Private investment return statistics are reported as horizon internal rates of return (IRRs).

¹ Private equity is a composite of non-venture private equity and venture capital.

² Non-venture private equity also includes distressed securities that are invested through a private investment vehicle.

³ Private real assets is a composite of private real estate and private natural resources.

Public Equity. Public equities represent a significant portion of the portfolio for most institutions in this study.² Consequently, the performance of global equity markets is usually a key indicator of which direction endowment returns are trending. The median total public equity return among participants for fiscal year 2016 was -3.8% (Figure 5).

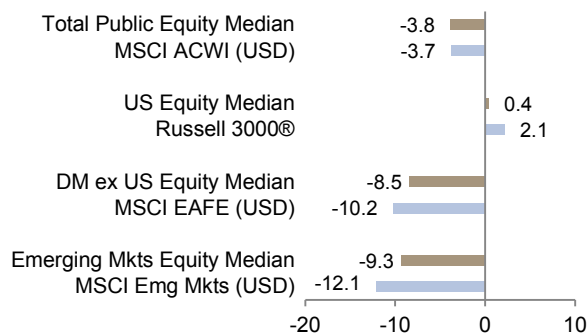
US equities, represented by the Russell 3000® Index, returned just 2.1% (Figure 5) in fiscal year 2016. Institutions in this study generally fared poorly versus this benchmark, with the median participant return at 0.4%. Performance among institutions varied from 5.2% at the 5th percentile to -3.9% at the 95th percentile (Figure 3).

For global ex US equities, institutions fared better on a relative basis versus the broad-based market indexes. The median participant return for global ex US developed equities was -8.5%, compared to -10.2% for the MSCI EAFE Index (Figure 5). In emerging markets, the median participant return was -9.3%, nearly 300 bps higher than the MSCI Emerging Markets Index. The size of the

² On average, public equities accounted for 47% of the investment portfolio among participating institutions.

Figure 5. Public Equity: Median Participant Return Versus Index Returns

Trailing One-Year as of June 30, 2016 • Percent (%)



Sources: Cultural and environmental institutions data as reported to Cambridge Associates LLC. Index data are provided by Frank Russell Company and MSCI Inc. MSCI data provided "as is" without any express or implied warranties.

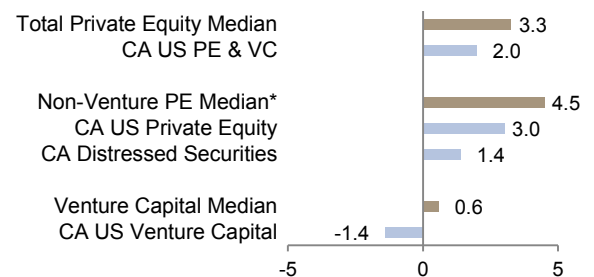
range of returns among participants for both composites was similar to that of US equities (Figure 3).

Private Equity. After several years of strong performance, private equity returns settled in at a more modest level in fiscal year 2016. The trailing one-year IRR for the Cambridge Associates US Private Equity and Venture Capital Index was 2.0%, the lowest return for a fiscal year since 2009. Among participants, the median IRR for the private equity composite was 3.3% (Figure 6). On a more granular level, the median IRR among participants was 4.5% for non-venture private equity and just 0.6% for venture capital (Figure 6).

While returns among private equity funds have varied considerably historically, the range of composite IRRs among participants was narrower in fiscal year 2016 than the previous two years in which we have gathered this data. The range of total private equity IRRs from the 5th percentile to 95th percentile was 13 percentage points (ppts) in 2016 compared to 27 ppts in 2015. For the subcategories of both non-venture private equity and venture capital, the range of IRRs in fiscal year 2016 was 14 ppts (Figure 4).

Figure 6. Private Equity: Median Participant Return Versus Index Returns

Trailing One-Year as of June 30, 2016 • Percent (%)



Sources: Cambridge Associates LLC and cultural and environmental institutions data as reported to Cambridge Associates LLC.

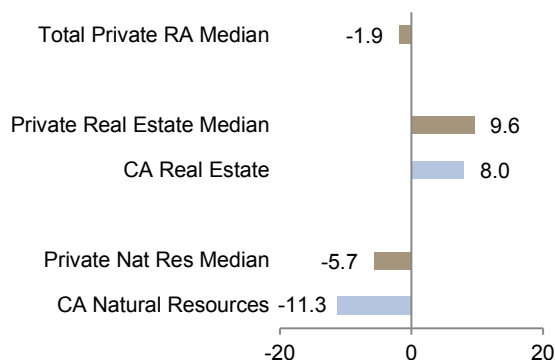
* Non-venture private equity also includes distressed securities that are invested through a private investment vehicle.

Real Assets. Real assets consists of a diversified group of investments, including commodities, natural resources, real estate, and inflation-linked bonds. Returns for these substrategies were mixed in fiscal year 2016. Real estate and inflation-linked bonds produced positive returns while natural resources and commodities were in the red.

Natural resources and real estate are broken out between public and private investments. Analysis of index returns for private real estate and private natural resources using the CA Modified Public Market Equivalent (mPME) shows that the private strategies underperformed the reference public indexes substantially for 2016 (Figure 11).³ The median IRR among participants for private real estate and natural resources was 9.6% and -5.7% respectively (Figure 7). The median IRR for the overall private real assets composite fell between these two returns (-1.9%), reflecting the nearly equal

³ Under the CA mPME methodology, the public index's share 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. The mPME analysis evaluates what return would have been earned had the dollars invested in private investments been invested in the public market instead.

Figure 7. Private Real Assets: Median Participant Return Versus Index Returns
Trailing One-Year as of June 30, 2016 • Percent (%)



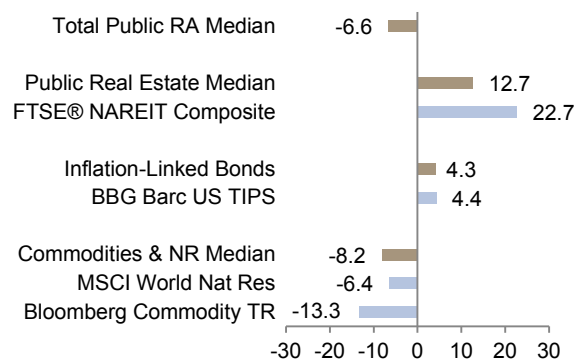
Sources: Cultural and environmental institutions data as reported to Cambridge Associates LLC. Index data are provided by Cambridge Associates LLC.
Note: Private investment return statistics are reported as horizon internal rates of return (IRRs).

median asset allocation for each category among participants.

In public real assets, allocations among participants tend to be weighted more heavily toward natural resources and commodities. Consequently, median performance for the public real assets composite (-6.6%) was driven primarily by these strategies (Figure 8). The median participant returns for real estate (12.7%) and inflation-linked bonds (4.3%) were positive but negative for natural resources and commodities (-8.2%).

The varying asset mixes across the diverse sub-strategies of these composites contributed to a wide range in returns reported across participants. The range of private real assets returns from the 5th percentile to 95th percentile was 23 ppts (Figure 4). The range of public real assets returns was 15 ppts (Figure 3). For both composites, institutions at the top end of the return distribution had the highest proportional allocations to the outperforming real estate asset classes.

Figure 8. Public Real Assets: Median Participant Return Versus Index Returns
Trailing One-Year as of June 30, 2016 • Percent (%)

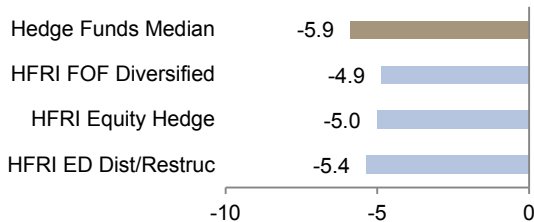


Sources: Cultural and environmental institutions data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., Cambridge Associates LLC, FTSE International Limited, and MSCI Inc. MSCI data provided "as is" without any express or implied warranties.

Hedge Funds. Many hedge funds again posted disappointing returns in fiscal year 2016. The median hedge fund composite return among participants was -5.9% (Figure 9) in fiscal year 2016. Just four of 46 participants reported a positive return for their hedge fund composite in 2016. On an index basis, diversified funds-of-funds that invest across a variety of strategies returned -4.9%, followed closely by equity-oriented hedge funds (-5.0%).

Figure 9. Hedge Funds: Median Participant Return Versus Index Returns

Trailing One-Year as of June 30, 2016 • Percent (%)

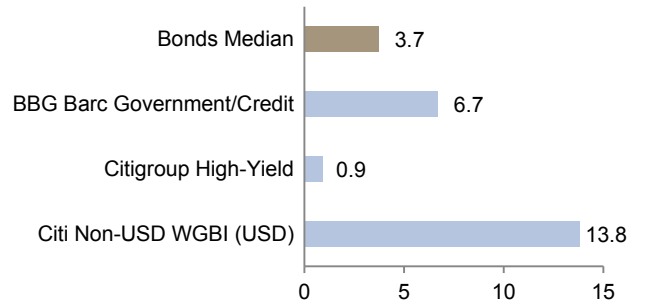


Sources: Cultural and environmental institutions data as reported to Cambridge Associates LLC. Index data are provided by Hedge Fund Research, Inc.

Bonds. Major bond market indexes posted strong performance in fiscal year 2016. The Bloomberg Barclays Government/Credit Bond Index returned 6.7% while the Citigroup Non-US World Government Bond Index performed even better (13.8%). However, the median return among participants (3.7%) significantly underperformed both benchmarks (Figure 10).

Figure 10. Bonds: Median Participant Return Versus Index Returns

Trailing One-Year as of June 30, 2016 • Percent (%)



Sources: Cultural and environmental institutions data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., and Citigroup Global Markets.

Analysis of Top and Bottom Performers in 2016

Many factors contribute to investor returns, including asset allocation policy and the implementation of that policy. In addition, varying performance measurement methodologies may impact the peer performance statistics reported in this study.

Asset Allocation. The importance of an asset allocation mix and its contributions to performance cannot be overstated. Figure 11 breaks the participant group into four quartiles based on fiscal year 2016 investment performance. 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 greatest disparity between top and bottom performers continues to be the way in which the overall equity portfolio was allocated. Institutions that posted a trailing one-year return in the top quartile had the highest average allocation to PE/VC (8.5%). Those in the bottom quartile of performers reported an average allocation of 2.7%. The second quartile of performers reported the lowest average allocation to public equities, while the bottom quartile of performers had the highest average allocation.

Attribution. Although 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

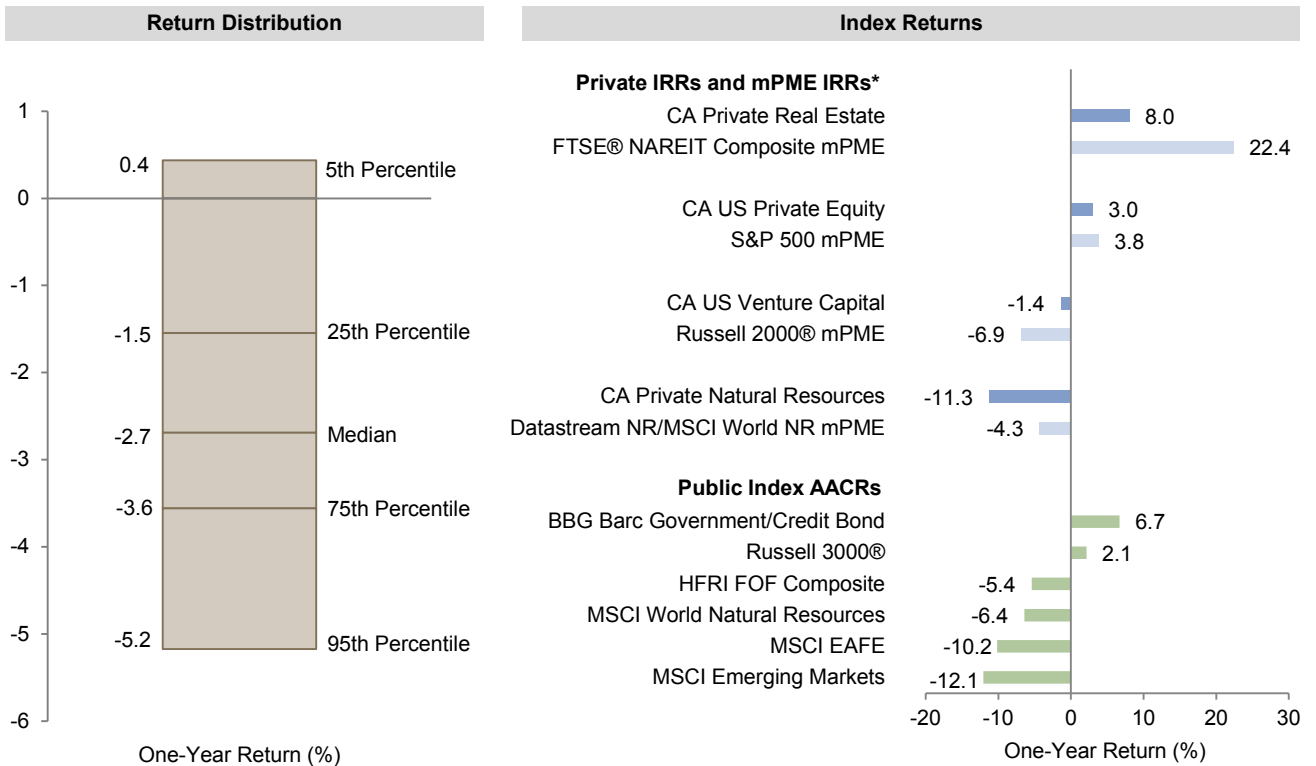
necessary to perform a precise attribution analysis, our data do allow us to conduct an estimated analysis that can help illuminate the main drivers of performance for fiscal year 2016.

Figure 12 illustrates the results of an analysis based on the one-year return and beginning fiscal year asset allocation of the respondents. The darker shading on the bar chart represents the portion of the mean participant return that can be attributed to asset allocation and is calculated using a blend of representative asset class benchmarks weighted according to each institution's asset allocation. The lighter shading of the bar is calculated by subtracting the mean asset allocation return from the mean participant return and is the portion of the total return that cannot be explained by asset allocation. This "other" portion of returns is principally driven by implementation or execution decisions, which can include active management and manager selection.⁴

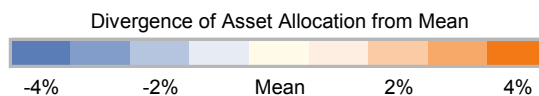
The analysis estimates that nearly all of the mean total return for the participant group could be explained by asset allocation in fiscal year 2016. US bonds made the largest positive contribution to the mean asset class return while global ex US equities made the largest overall contributions on the negative end. Each category's contribution to the mean asset class return is a function of its benchmark return as well as the participant group's average allocation to the category (Figure 12).

⁴ 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.

Figure 11. Analysis of Top and Bottom Quartile Performers: One-Year Asset Allocation
As of June 30, 2016



Mean Asset Allocation by Performance Quartile (%): June 30, 2015 to June 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	23.4	14.3	6.9	9.6	19.0	3.5	8.5	5.3	3.8	5.7	0.0
2nd Quartile	19.3	15.1	8.0	10.4	24.1	3.7	7.1	3.3	5.1	3.4	0.5
3rd Quartile	21.7	18.3	7.8	11.6	19.6	3.1	4.0	1.8	7.6	4.3	0.2
Bottom Quartile	28.5	17.0	7.2	10.2	23.9	2.1	2.7	0.8	4.7	2.8	0.1
All C&E Mean	23.3	16.2	7.5	10.4	21.6	3.1	5.6	2.8	5.3	4.0	0.2



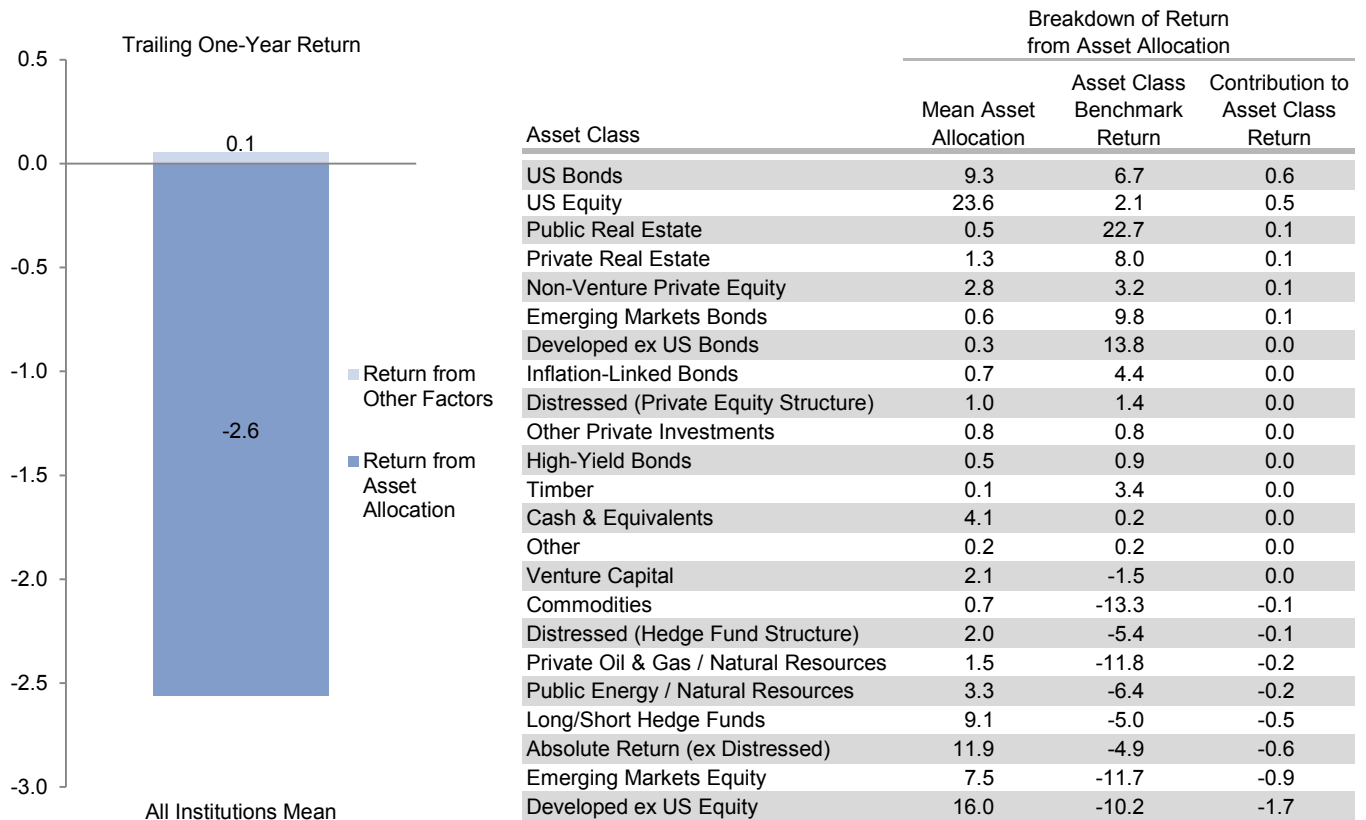
Sources: Cultural and environmental institutions data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., Cambridge Associates LLC, Frank Russell Company, FTSE International Limited, Hedge Fund Research, Inc., MSCI Inc., the National Association of Real Estate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

Notes: Performance quartiles are based on the trailing one-year return as of June 30, 2016. Mean allocations are for the 2015 and 2016 June 30 periods. Analysis includes data for 54 cultural and environmental institutions.

* Private indexes are pooled horizon IRRs, net of fees, expenses, and carried interest. 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 flows and public index returns. Private benchmark IRRs and mPME IRRs are for the period of 7/1/15 to 6/30/16.



Figure 12. Attribution Analysis
As of June 30, 2016 • Percent (%)



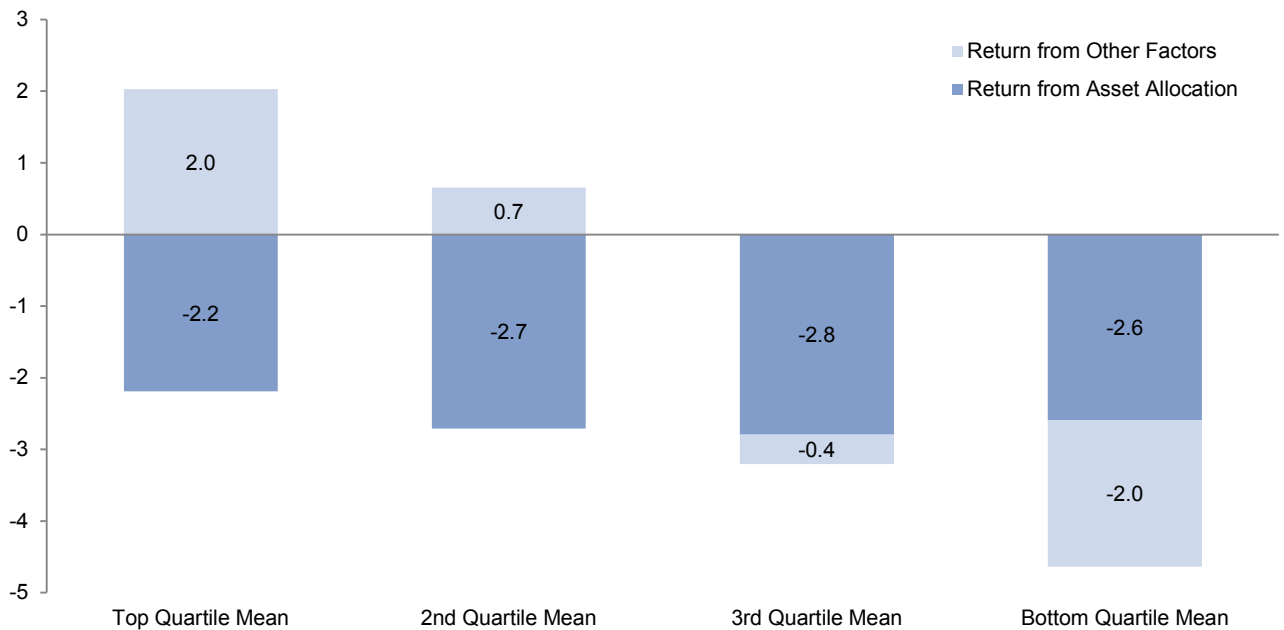
Sources: Cultural and environmental institutions data as reported to Cambridge Associates LLC. Index data are provided by Barclays, Bloomberg L.P., Citigroup Global Markets, Frank Russell Company, FTSE International Limited, Hedge Fund Research, Inc., MSCI Inc., and the National Association of Real Estate Investment Trusts. MSCI data provided "as is" without any express or implied warranties.

Notes: Includes data for 54 institutions that provided beginning fiscal year asset allocation. Mean asset allocation in the table is as of June 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.

While the average data for the overall peer group shows factors other than allocation had a negligible impact on returns in fiscal year 2016, a breakdown of the data in the four performance quartiles tells a different story (Figure 13). The model indicates that it was implementation decisions rather than asset allocation that drove most of the dispersion in returns across the peer group.

The mean asset class return was nearly identical across the top three quartiles of performers. However, the disparity among quartiles was significant in the portion of return attributable to other factors, with the top quartile producing by far the highest average return from this area.

Figure 13. Attribution Analysis by Performance Quartile
Trailing One-Year Return as of June 30, 2016 • Percent (%)



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.
Note: Includes data for 54 institutions that provide beginning fiscal year asset allocation.

Long-Term Returns

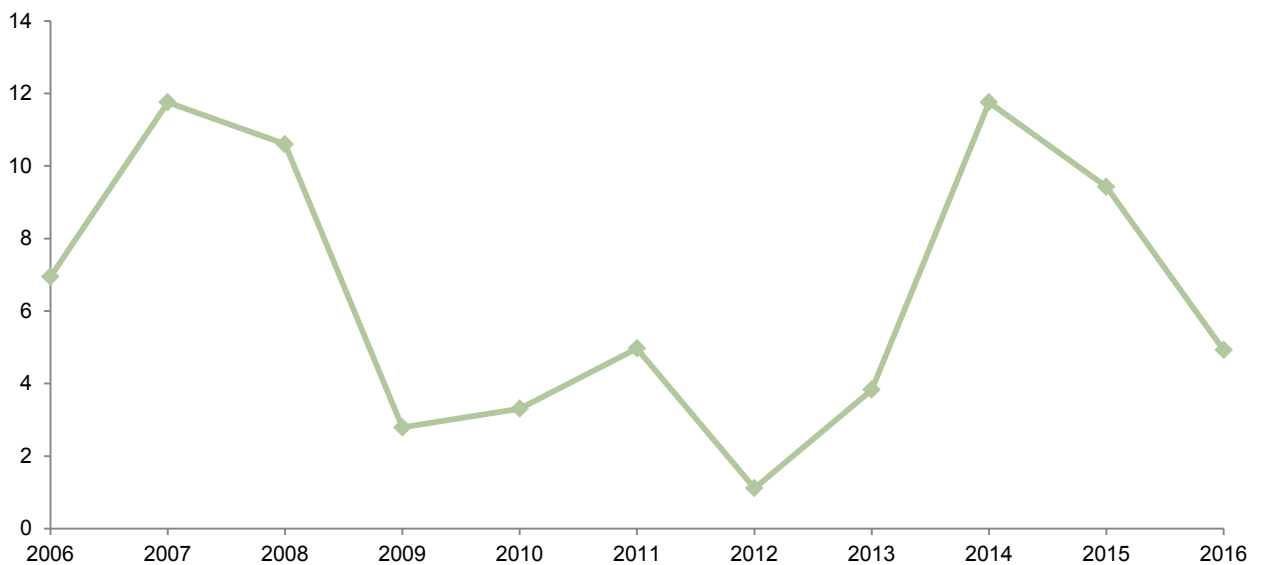
The mean average annual compound return (AACR) was 4.9% for the five-year period ending June 30, 2016 (Figure 1). Institutions with assets greater than \$300 million reported the highest average five-year return (5.7%) (Figure 2). The average return for the most recent five-year period is considerably lower compared to the prior two rolling five-year periods (Figure 14). However, this year's average rolling five-year return was higher than those ending fiscal years 2009 through 2013, periods that included the steep market declines from the 2008–09 global financial crises.

The mean nominal AACR for the ten-year period was 4.9% (Figure 1), with the largest portfolios again reporting the highest mean return (5.6%) (Figure 2). The ranges of asset class returns across the entire participant group for the trailing five- and ten-year periods are listed in Figures 15 and 16.

To maintain purchasing power for an endowment,⁵ institutions must achieve a real return that offsets the average effective spending rate over the long-term. For the institutions that provided a long-term real return objective, the most common figure reported was 5%. Eight institutions reported an objective higher than 5% and two reported objectives below 5% (Figure 17). Through the trailing five- and ten-year periods ending June 30, 2016, the average real return after spending was -1.5% and -1.7%, respectively (Figure 1). Only four of 17 respondents reported a real return after spending above 0% for the trailing five-year period. For the trailing ten-year period, only one of six institutions reported an after spending real return above 0%. These statistics are troubling as they demonstrate that most endowments have lost purchasing

⁵ In this instance, endowment refers to a single fund with no future inflows. An LTIP, which is a collection of multiple endowments and other long-term funds, can use inflows to maintain purchasing power even if the pool's long-term real return is lower than the spending rate.

Figure 14. Rolling Five-Year Average Annual Compound Returns
Years Ended June 30 • Percent (%)



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Note: Analysis includes data for 42 institutions that provided returns for the last 15 years.

Figure 15. Dispersion of Participants' Asset Class Returns: Marketable Investments (Trailing Five- and Ten-Year)
As of June 30, 2016

	Public Equity ¹	Global Equity ²	US Equity	DM ex US Equity	EM Equity	Bonds	Hedge Funds	Public Real Assets ³	Commodities and Natural Resources	Public Real Estate
Trailing Five-Year										
5th Percentile	8.2	11.7	14.7	5.5	0.2	4.5	6.0	1.3	-3.1	12.6
25th Percentile	7.3	11.3	12.6	4.4	-1.2	3.9	3.9	-2.9	-5.7	11.7
Median	6.3	9.6	11.2	3.0	-2.2	3.3	3.4	-5.9	-6.8	8.6
75th Percentile	5.6	8.8	10.4	2.3	-3.7	2.2	2.8	-6.9	-8.3	7.7
95th Percentile	4.5	3.8	8.6	1.5	-5.6	1.5	0.9	-9.6	-10.3	7.1
Mean	6.4	9.3	11.5	3.2	-2.4	3.0	3.4	-4.9	-6.9	9.5
<i>n</i>	48	19	48	45	44	44	45	38	36	6
Trailing Ten-Year										
5th Percentile	7.4	10.8	9.0	5.8	6.9	6.8	6.8	2.4	0.2	3.3
25th Percentile	5.9	10.3	7.7	4.7	4.7	6.0	5.1	0.6	-0.1	3.3
Median	5.4	9.6	7.2	3.8	4.4	5.2	4.1	-0.8	-1.1	3.3
75th Percentile	4.5	9.0	6.7	2.7	3.7	4.5	3.5	-1.3	-1.8	3.3
95th Percentile	3.3	7.6	5.5	1.5	2.2	3.7	2.2	-2.5	-3.4	3.3
Mean	5.3	9.5	7.3	3.7	4.5	5.2	4.2	-0.3	-1.3	3.3
<i>n</i>	45	8	43	35	22	38	35	15	13	1

Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

¹ Public equity is a composite of global equity, US equity, developed markets ex US equity, and emerging markets equity.

² Global equity includes only investment vehicles that have a mandate to invest in US and international markets.

³ Total public real assets is a composite of public real estate, commodities, and inflation-linked bonds.

Figure 16. Dispersion of Participants' Asset Class Returns: Private Investments (Trailing Five- and Ten-Year)
As of June 30, 2016

	Total Private Equity ¹	Non-Venture Private Equity ²	Venture Capital	Total Private Real Assets ³	Private Real Estate	Private Natural Resources
Trailing Five-Year						
5th Percentile	22.8	23.7	19.8	12.8	17.1	4.7
25th Percentile	14.0	13.7	16.1	8.5	13.1	2.3
Median	11.9	11.9	14.0	6.3	12.5	-2.3
75th Percentile	10.8	10.7	10.2	1.2	10.0	-6.5
95th Percentile	7.5	6.7	2.8	-7.5	7.7	-10.0
Mean	13.5	13.1	12.7	4.6	11.4	-1.9
<i>n</i>	30	30	22	25	21	19
Trailing Ten-Year						
5th Percentile	14.2	13.9	15.1	8.2	7.1	12.3
25th Percentile	11.3	11.2	12.7	6.5	5.9	7.0
Median	9.8	9.5	11.6	2.8	3.4	3.0
75th Percentile	9.4	9.2	8.4	0.0	1.6	0.8
95th Percentile	7.6	7.4	2.1	-4.8	-7.0	-3.8
Mean	10.3	10.1	10.4	2.5	2.3	3.9
<i>n</i>	23	21	14	16	10	11

Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

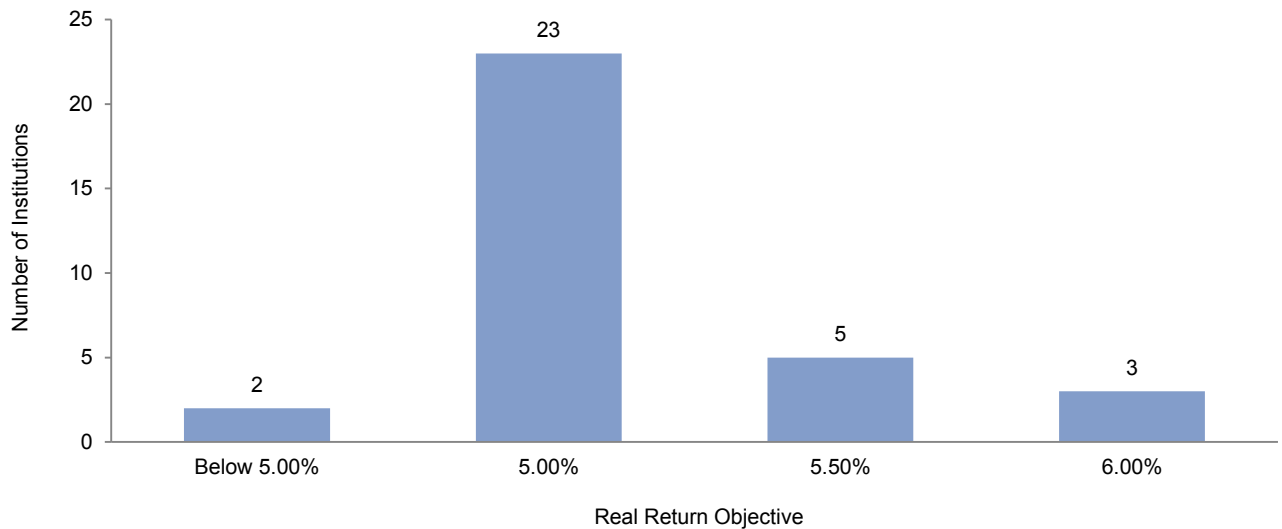
Note: Private investment return statistics are reported as internal rates of return (IRRs).

¹ Total private equity is a composite of non-venture private equity and venture capital.

² Non-venture private equity also includes distressed securities that are invested through a private investment vehicle.

³ Total private real assets is a composite of private real estate and private natural resources.

Figure 17. Real Total Portfolio Return Objectives
As of June 30, 2016



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.
Note: Graph includes data for 33 institutions that provided a real total portfolio return objective.

power over the last ten years and struggled to maintain intergenerational equity at current spending levels. Institutions will need to reconsider their spending rates if this trend continues into the future.

Relative Returns: Simple Portfolio Benchmark. US equities and bonds have been among the top-performing marketable investments over the past ten years. Consequently, portfolios that have diversified across these asset classes have considerably lagged a simple 70/30 benchmark that uses a US index for the equity component.⁶ The average return for institutions in this study underperformed this simple benchmark by 220 basis points (bps) for the trailing ten-year period (Figure 1). Institutions fared better against a 70/30 benchmark that uses a global equity index.

However, the mean participant return still slightly underperformed this benchmark over the ten-year period.

These simple benchmarks help evaluate the decision to adopt the endowment model of investing where the portfolio is allocated across a diverse set of mostly equity-oriented investments, including non-traditional illiquid assets. While in retrospect, diversification among the marketable asset classes did not benefit institutions over the trailing ten-year period, another key tenet of the endowment model was a boon to investment performance over this period. Institutions that had the highest allocations to illiquid private investments generally produced the best returns over the last decade.

⁶ Among institutions in this study, the mean combined allocation to global ex US equities, hedge funds, and public natural resources and commodities was 52%.

Policy Portfolio Benchmarks

Relative Returns. Benchmarking is all about answering the question, “how are we doing?” in ways that are both accurate and relevant to the objectives of the portfolio being measured. While performance results of peers can be informative, they are not necessarily the most effective benchmark to evaluate an institution’s investment performance. Each nonprofit institution has its own unique blend of investment objectives, constraints, and risk tolerances. Therefore, investment policies will vary within a peer group, leading to different asset allocation structures for institutions that may otherwise be considered worthy peers.⁷

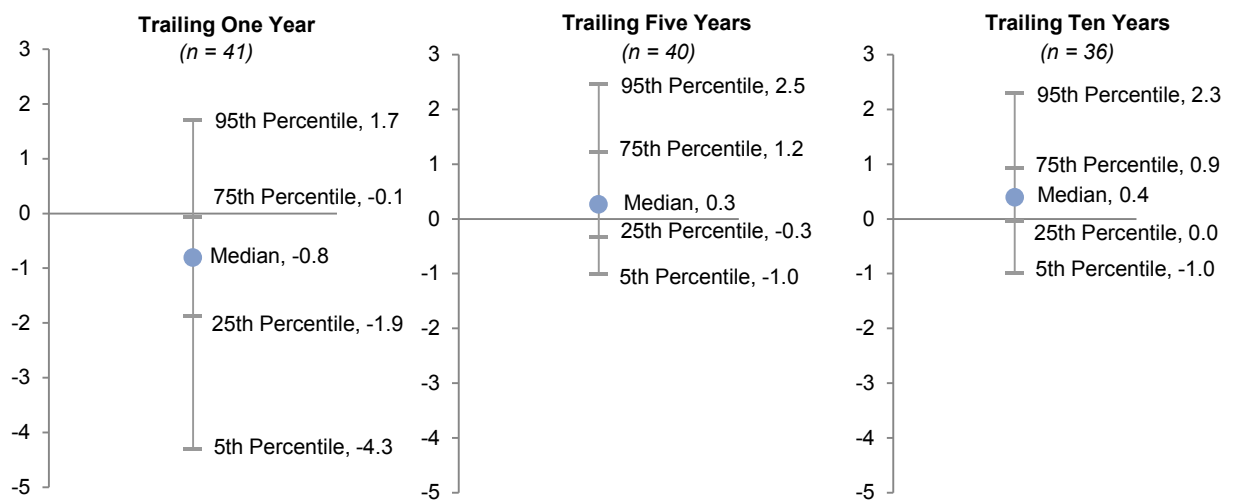
The comparison of an institution’s return to its policy portfolio benchmark is a better measure for determining whether a port-

folio is being successfully managed against its target investment policy. The policy benchmark is typically a blend of indexes that represent the desired portfolio risk exposures without any expression of more active alternatives. In certain asset classes such as hedge funds and private investments, there are often no investable proxies, and other benchmark types are used.

Over 75% of participating institutions (31 of 41) underperformed their policy portfolio benchmark in fiscal year 2016. The median difference between the total portfolio return and the policy benchmark among all institutions was -0.8 ppts (Figure 18). Most institutions fared better versus their policy benchmark over the longer time horizon. The median difference between the total portfolio AACR and the benchmark was 0.3 ppts for the trailing five year period and 0.4 ppts for the trailing ten-year period.

⁷ For a more in-depth discussion on the appropriate uses of peer data, please see William Prout et al., “Finding the Proper Perspective for Peer Comparisons,” Cambridge Associates Research Report, 2016.

Figure 18. Range of Out/Underperformance of Total Return Versus Policy Portfolio Benchmark
As of June 30, 2016 • Percentage Points



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.
Note: Data points represent the difference between the total portfolio return and the policy portfolio benchmark return.



Policy Portfolio Benchmark

Components. Over 93% of the respondents (43 of 46) that provided a policy portfolio benchmark use a detailed, asset class–specific benchmark to evaluate the performance of the total portfolio. The other three institutions that provided data use a simple benchmark, which typically incorporates a broad-based equity market index and a bond index weighted in proportion to the overall risk profile of the portfolio.

For those that use a detailed policy portfolio benchmark, the components of the benchmark should align with the asset classes or role-in-portfolio categories stated in the portfolio’s asset allocation policy. Since policy allocations can be set at varying levels of granularity, approaches to benchmarking vary among institutions. One area where this is noticeable is in public and private equities, where 14% of institutions use a single index to benchmark their entire equity allocation (Figure 19). This method is appropriate where there is a broad target allocation to equity stated in the policy and there is discretion in choosing the strategies to fill out that allocation.⁸ The remaining 86% of institutions assign separate indexes for public and private equities and based on geographic orientation.

Where separate indexes were reported for public equities based on geographic orientation, the Russell 3000® Index was cited by 70% of institutions for US equities, 72% of institutions used a blend of the MSCI EAFE and MSCI Emerging Markets indexes to measure global ex US equities

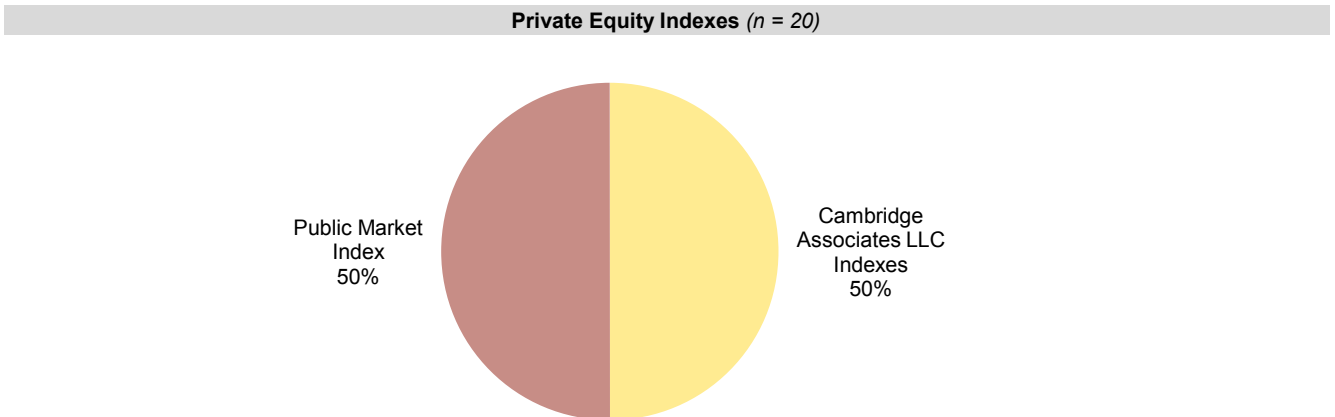
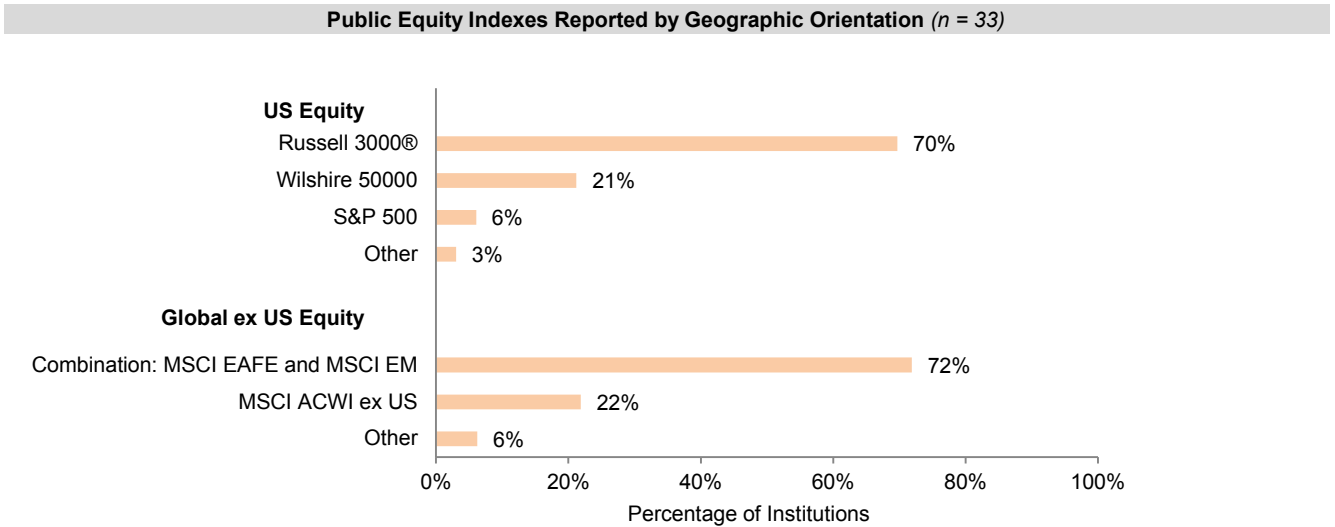
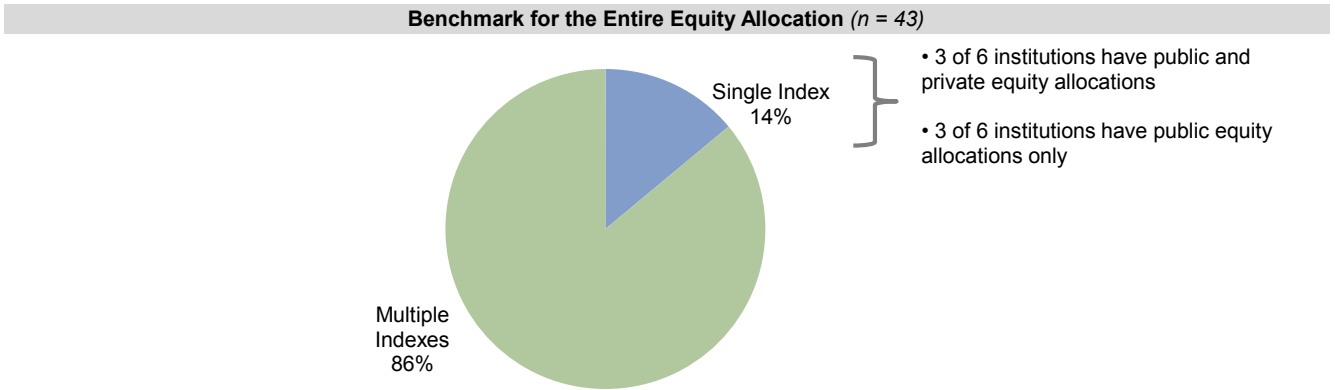
(Figure 19). This approach is appropriate for institutions that have separate targets to developed markets ex US and emerging markets, particularly if the targets are out of proportion to the weightings of the MSCI ACWI ex US Index.

For institutions that benchmark private equity and venture capital separately from public equity, 50% use the Cambridge Associates LLC Private Equity and Venture Capital indexes (Figure 19). The other half of institutions used a public market index, with half of those adding a prespecified percentage or premium (ranging from 2% to 4%) to the index return. The choice of the public indexes reported by institutions varies widely and should be representative of the private equity program’s exposure and geographic orientation.

The use of solely the Bloomberg Barclays Aggregate Bond Index was the most common benchmarking approach for bonds and was reported by 46% of institutions (Figure 20). However, many institutions use unique index combinations to better reflect their underlying bond exposure. Benchmarks should depend on whether allocations are made domestically or globally as well as the type of issuer (sovereign versus corporate or both). Most respondents use an HFRI index for hedge funds, with the Fund of Funds Composite Index reported by 40% of institutions. For real assets, benchmark combinations are unique across most participants due to the wide variety of strategies under this category.

⁸ Even in such cases where the target allocation to equity is not broken out by substrategies, there is typically a liquidity policy that sets limits on the proportion of the portfolio that can be invested in illiquid private investments.

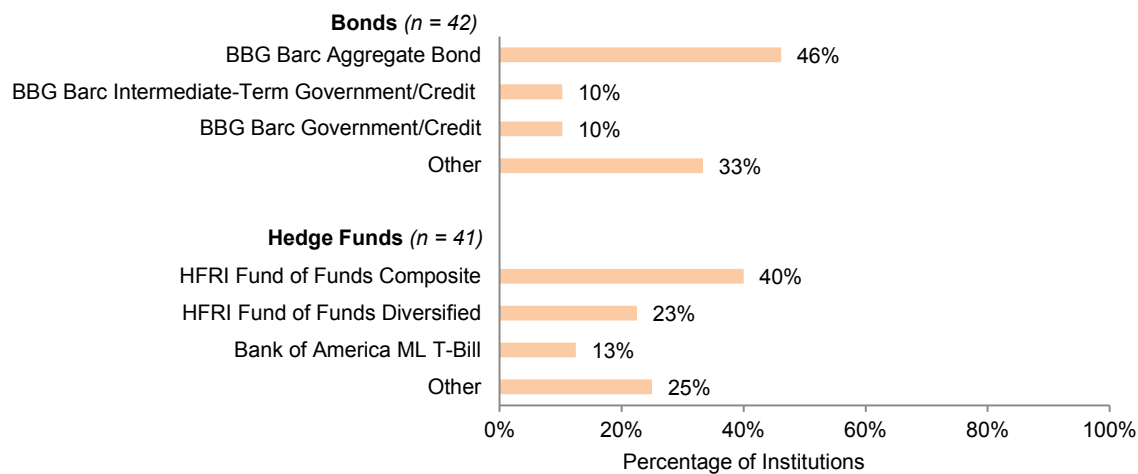
Figure 19. Frequently Used Components of Policy Portfolio Benchmarks: Public and Private Equity
As of June 30, 2016



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.



Figure 20. Frequently Used Components of Policy Portfolio Benchmarks: Bonds and Hedge Funds
As of June 30, 2016



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Risk-Adjusted Performance

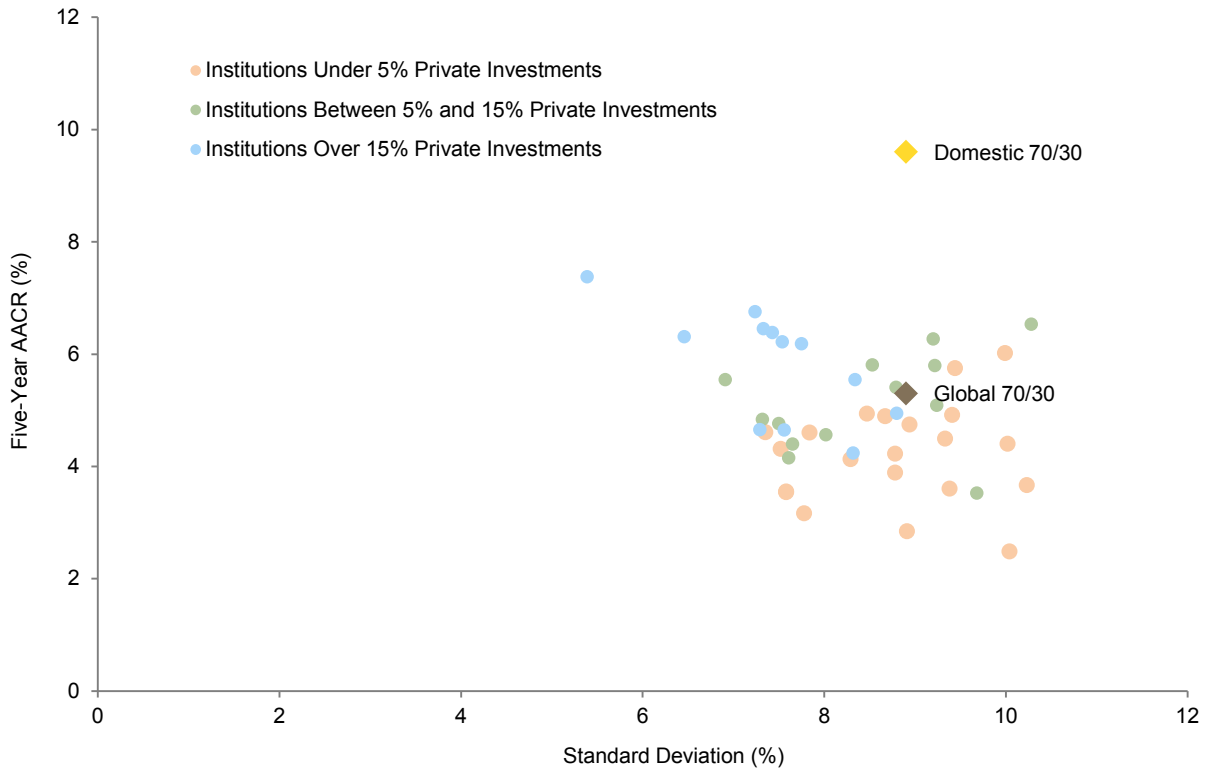
Risk adjusted performance is important to evaluate as it measures the total return relative to the total amount of risk taken by the portfolio. The most common approach to measuring risk-adjusted performance is by the Sharpe ratio, which shows how much return above the risk-free rate (T-bills) the investor has earned per unit of risk (defined as the standard deviation of returns). The higher the Sharpe ratio, the more the investor has been compensated for each unit of risk taken.

Risk-adjusted performance comparisons can be complicated when portfolios have significant allocations to private investments. The frequency and timing of private investment valuations can artificially dampen the standard deviation for the returns of these assets. Thus, a portfolio with high allocations to private investments can yield a lower volatility statistic that does not fully represent the amount of risk it has actually taken.

For this reason, we have split institutions out into subcategories in Figure 21 based on their allocations to private investments.

Institutions that had an allocation of 15% or more to private investments over the last five years reported an average Sharpe ratio of 0.81, significantly higher than that of the other subgroups with smaller private allocations. While the magnitude of the differences in average Sharpe ratios is partly a function of this group's higher average five-year return, it is also attributable to the group's lower average standard deviation.

Figure 21. Risk/Return and Sharpe Ratio
Five Years Ended June 30, 2016



	All Institutions	By Private Investment Allocation			70/30 Benchmarks	
		Under 5%	5% – 15%	Over 15%	Domestic	Global
Five-Year AACR	4.9	4.2	5.1	5.8	9.6	5.3
Standard Deviation	8.1	8.8	8.5	7.5	8.9	8.9
Sharpe Ratio	0.65	0.51	0.63	0.81	1.07	0.61
<i>n</i>	46	21	13	12		

Sources: Cultural and environmental institution 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: Analysis includes only institutions that provided underlying quarterly returns and asset allocation for the last five years. Each institution's private investment allocation represents the mean for the six June 30 periods from 2011 to 2016. The Domestic 70/30 benchmark is composed of 70% Russell 3000® / 30% Bloomberg Barclays Government/Credit and the Global 70/30 benchmark is composed of 70% MSCI ACWI / 30% Bloomberg Barclays Government/Credit.

Portfolio Asset Allocation

2016 Asset Allocation

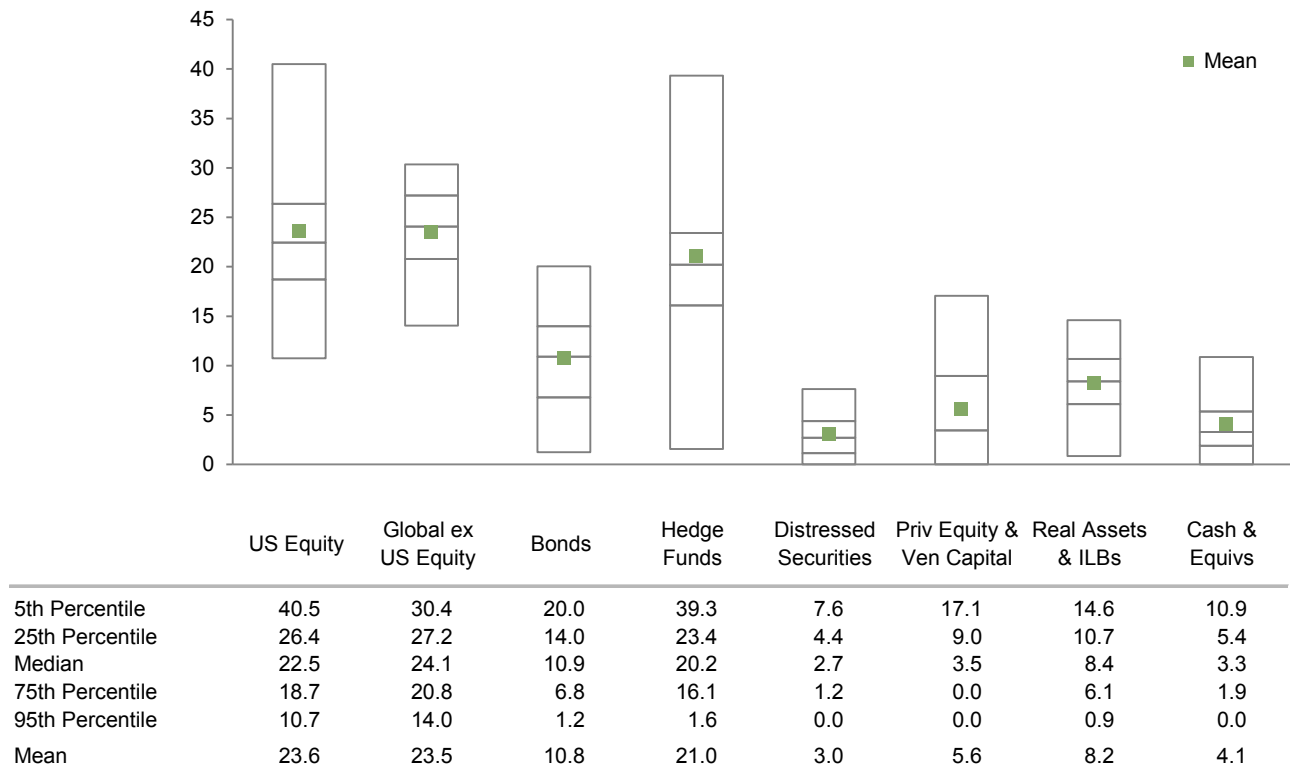
Close to half (47%) of the average LTIP consisted of public equities at June 30, 2016. On average, allocations to global ex US equities (23.5%) were comparable to US equities allocations (23.6%). Portfolios had significant exposure to alternative assets, with 21.0% allocated to hedge funds and 5.6% allocated to private equity/venture capital, on average. Another 3.0% was allocated on average to distressed securities, which are invested through either a hedge fund or private equity-type investment vehicle. Real assets, which consist of a diversified group of public and private assets, made up 8.2% of portfolios, on

average. Average allocations to bonds and cash were 10.8% and 4.1%, respectively (Figure 22).

As Figure 23 shows, allocations to these broad asset classes vary considerably. A key factor in the variation of asset allocations continues to be the total value of assets under management. Portfolios with asset sizes under \$100 million continue to maintain higher allocations to public equities and bonds, while those with assets over \$300 million have the highest allocations to private investments. Also displayed is a more granular view of allocations within each broad asset class.

Figure 22. Asset Allocation Distribution by Asset Class

As of June 30, 2016 • Percent (%) • n = 54



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Figure 23. Summary Asset Allocation by Asset Size

As of June 30, 2016 • Percent (%)

	Under \$100mm (n = 14)		\$100mm to \$300mm (n = 21)		Over \$300mm (n = 19)	
	Mean	Median	Mean	Median	Mean	Median
US Equity	25.1	26.1	23.6	22.7	22.4	18.8
Global ex US Equity	25.8	26.7	25.6	26.0	19.4	21.7
Developed Markets	17.7	18.7	17.8	17.5	12.8	13.9
Emerging Markets	8.2	8.4	7.8	7.9	6.5	7.1
Bonds	14.0	12.6	11.5	11.9	7.5	6.8
US Bonds	11.5	12.1	9.9	9.0	7.0	6.1
Developed ex US Bonds	0.6	0.3	0.3	0.0	0.1	0.0
Emerging Markets Bonds	0.9	0.3	0.9	0.4	0.2	0.0
High-Yield Bonds	1.0	0.0	0.5	0.0	0.3	0.0
Hedge Funds	21.2	19.7	20.6	20.1	21.4	20.3
Long/Short Hedge Funds	12.1	10.6	8.8	9.2	7.2	5.8
Absolute Return (ex Distressed)	9.1	8.9	11.8	10.4	14.2	12.6
Distressed Securities	1.4	1.8	2.7	2.4	4.6	4.3
Hedge Fund Structure	1.1	0.9	1.7	1.3	3.0	2.0
Private Equity Structure	0.3	0.0	0.9	0.3	1.7	0.9
Private Equity & Venture Capital	1.1	0.0	4.1	1.6	10.6	9.0
Venture Capital	0.2	0.0	1.8	0.0	3.8	2.0
Non-Venture Private Equity	0.6	0.0	1.6	0.5	5.6	5.5
Other Private Investments	0.3	0.0	0.7	0.0	1.2	0.8
Real Assets & Infl-Linked Bonds	7.9	8.6	7.2	7.8	9.7	8.7
Private Real Estate	0.1	0.0	0.4	0.0	3.1	2.1
Public Real Estate	1.1	0.0	0.3	0.0	0.4	0.0
Commodities	1.1	1.1	1.0	0.4	0.2	0.0
Inflation-Linked Bonds	1.0	0.9	1.1	0.4	0.2	0.0
Private Oil & Gas/Natural Resources	0.0	0.0	1.0	0.0	3.2	2.3
Timber	0.0	0.0	0.0	0.0	0.3	0.0
Public Energy/Natural Resources	4.6	4.8	3.4	2.7	2.3	1.9
Cash & Equivalents	3.4	3.1	4.6	3.2	4.1	3.5
Other	0.0	0.0	0.1	0.0	0.3	0.0

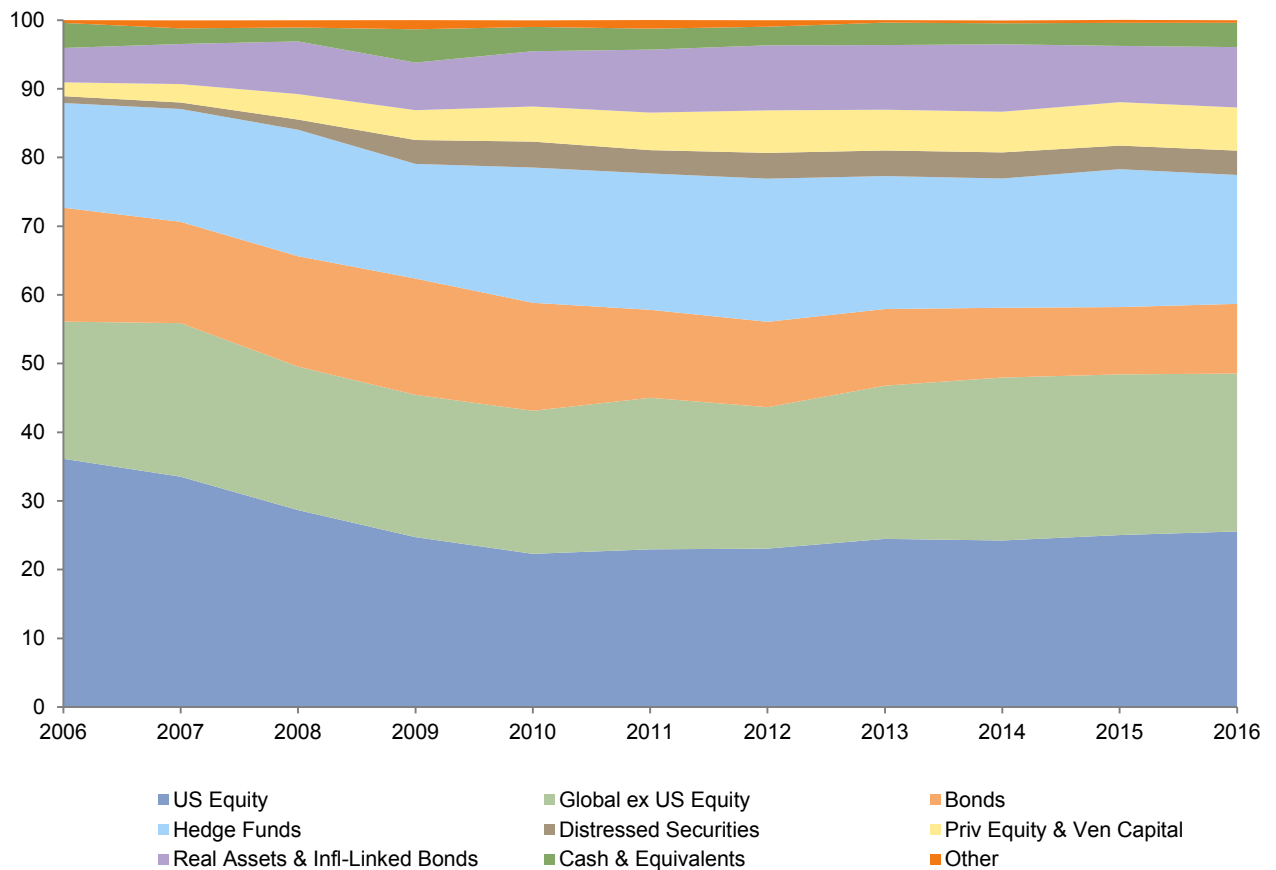
Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Historical Asset Allocation

Average allocations to some of the broad asset class categories at the end of fiscal year 2016 look considerably different than those reported a decade ago (Figure 24). The largest change in average allocations was to US equities, which decreased by 10.5 ppts from 2006 to 2016. The biggest increase was to private equity and venture

capital, where the average allocation rose by 4.3 ppts. In both cases, the greatest extent of the changes occurred during the first few years of the decade.

Figure 24. Historical Mean Asset Allocation Trends
 Years Ended June 30 • Percent (%)



	Constant Universe											All Inst
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2016
US Equity	36.1	33.5	28.7	24.7	22.3	23.0	23.1	24.5	24.2	25.0	25.6	23.6
Global ex US Equity	20.0	22.4	20.9	20.7	20.8	22.1	20.6	22.3	23.7	23.4	23.0	23.5
<i>Developed Markets</i>	16.5	17.6	16.0	16.0	15.4	15.9	14.3	15.7	16.8	16.3	16.1	16.0
<i>Emerging Markets</i>	3.4	4.7	4.9	4.7	5.4	6.2	6.3	6.6	6.9	7.1	6.9	7.5
Bonds	16.6	14.8	16.1	16.9	15.7	12.8	12.4	11.2	10.2	9.8	10.1	10.8
Hedge Funds	15.2	16.4	18.4	16.7	19.7	19.9	20.8	19.4	18.8	20.1	18.8	21.0
Distressed Securities	1.0	0.9	1.5	3.5	3.8	3.4	3.8	3.7	3.8	3.4	3.5	3.0
Priv Equity & Ven Capital	2.0	2.7	3.7	4.3	5.1	5.5	6.2	5.9	5.9	6.3	6.3	5.6
Real Assets & Infl-Linked Bonds	5.0	5.8	7.7	6.9	8.0	9.2	9.5	9.4	9.8	8.2	8.8	8.2
Cash & Equivalents	3.7	2.3	2.0	4.9	3.5	3.1	2.7	3.3	3.1	3.4	3.5	4.1
Other	0.4	1.2	1.0	1.3	1.0	1.3	0.9	0.4	0.4	0.4	0.4	0.2

Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Notes: Constant universe represents 24 institutions that provided asset allocation data for each year from 2006 to 2016. All institutions represents 54 institutions that provided 2016 data.

Target Asset Allocation

While long-term asset allocation trends clearly show how investment policies have evolved over time, one-year changes in actual allocations can be influenced by factors such as asset returns and rebalancing flows. Using shorter-term data can be misleading in determining whether institutions are altering their long-term asset allocation policies. An analysis of target asset allocations is more suitable for such an evaluation.

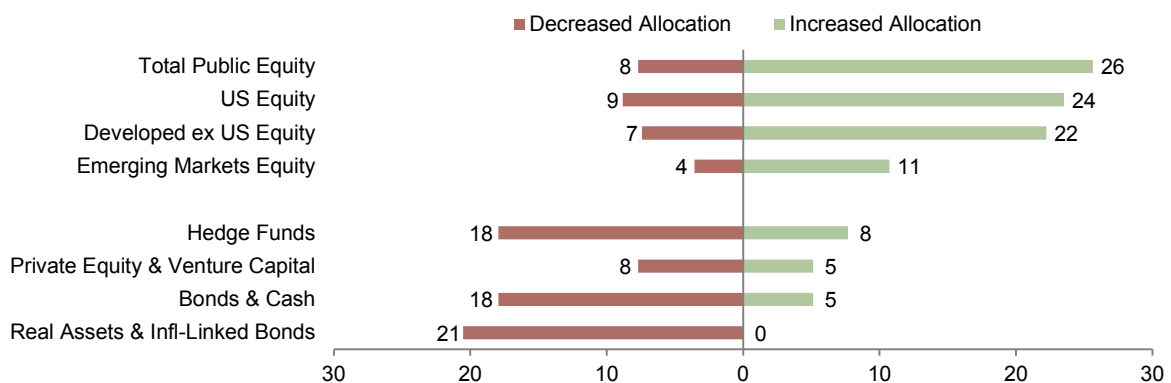
Most survey participants (46 of 54) provided target asset allocation data for fiscal year 2016. Institutions construct their target asset allocation mix under different frameworks. Of the 46 institutions that provided target asset allocation data, 82% reported data using the traditional asset allocation-centered structure. The remaining institutions reported data using other frameworks, including role-in-portfolio. Under the role-in-portfolio framework, targets are set to broad categories based on the roles

that certain investments are expected to play in the portfolio (e.g., growth, deflation-hedging, diversifier).

Our trend analysis on this topic focuses on institutions that reported under the traditional asset allocation-centered framework. As shown in Figure 25, many institutions are increasing the equity exposure in their portfolio. The proportion of institutions that reported increases to public equity was more than triple the proportion that lowered targets, with nearly the entire differential a result of changes to US equity and global ex US developed equity targets. Among the other broad asset class categories, the proportion of institutions lowering their hedge fund target (18%) was more than twice the proportion that reported increases. Meanwhile, as in the prior year, the proportion of institutions lowering their targets to bonds and real assets was considerably higher than the proportion that increased their target allocation.

Figure 25. Changes in Target Asset Allocation

June 30, 2015 – June 30, 2016 • Percentage of Institutions Increasing or Decreasing Targets



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Notes: Figure represents data for 39 cultural and environmental institutions that provided target asset allocation data for 2015 and 2016. Real assets includes targets to both public and private assets.

Private Investments and Uncalled Capital Commitments

One of the core principles of the endowment model is the use of private investments that, in part due to their illiquid nature, offer the potential for higher long-term returns than those of public equities. Participating institutions, particularly those with larger asset sizes, continue to allocate a significant portion of their portfolios to private investments.⁹ The average allocation to private investments for all participants was 9.5%, while those with portfolios greater than \$300 million had an average allocation of 18.9%.

Investors should be mindful of the liquidity implications of investing in and funding a private investment program. Uncalled capital represents a commitment of capital to be funded in the future. While annual spending distributions usually represent the biggest liquidity need of a portfolio, institutions with private investment programs must also consider the potential impact of uncalled capital commitments.

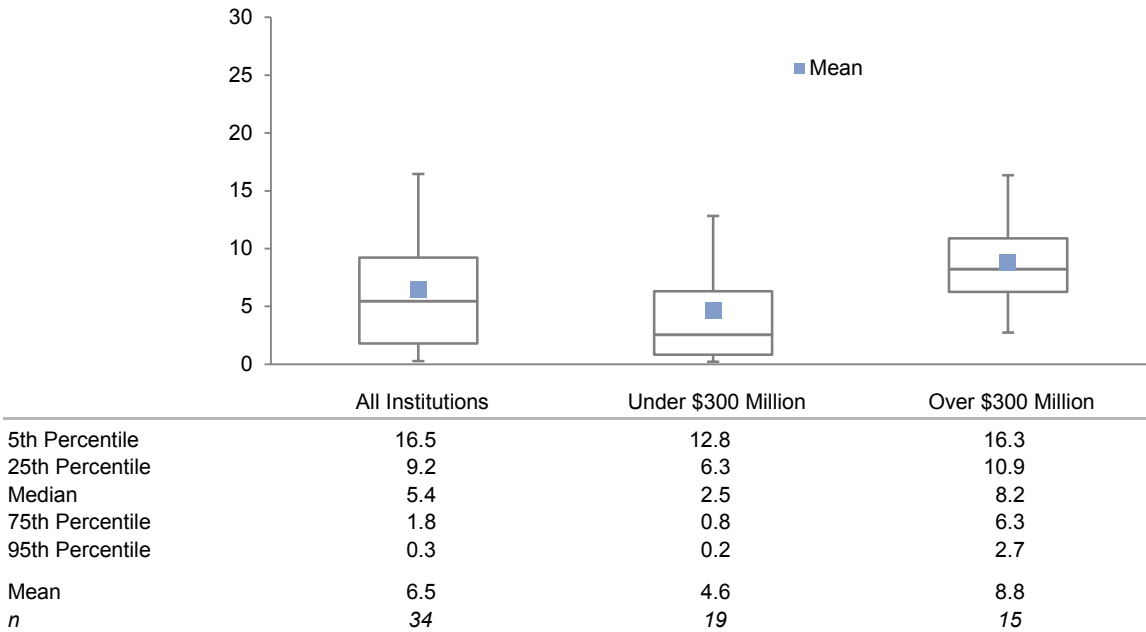
For participants with private investment programs, uncalled capital commitments as a percentage of the total LTIP value averaged 6.5% at the end of fiscal year 2016 (Figure 26). Institutions with larger asset sizes tend to have a higher ratio of uncalled capital commitments to the total LTIP value. For those with asset sizes greater than \$300 million, uncalled capital commitments represented an average of 8.8% of their total LTIP value (ranging from 2.7% to 16.3%, excluding outliers).

Larger portfolios also tend to have a higher ratio of uncalled capital commitments to the LTIP's total liquid assets, which exclude hedge funds and private investments. For institutions with asset sizes greater than \$300 million, uncalled capital commitments represented an average of 13.8% of their total liquid assets. For institutions with asset sizes under \$300 million, the average was 5.1% (Figure 26).

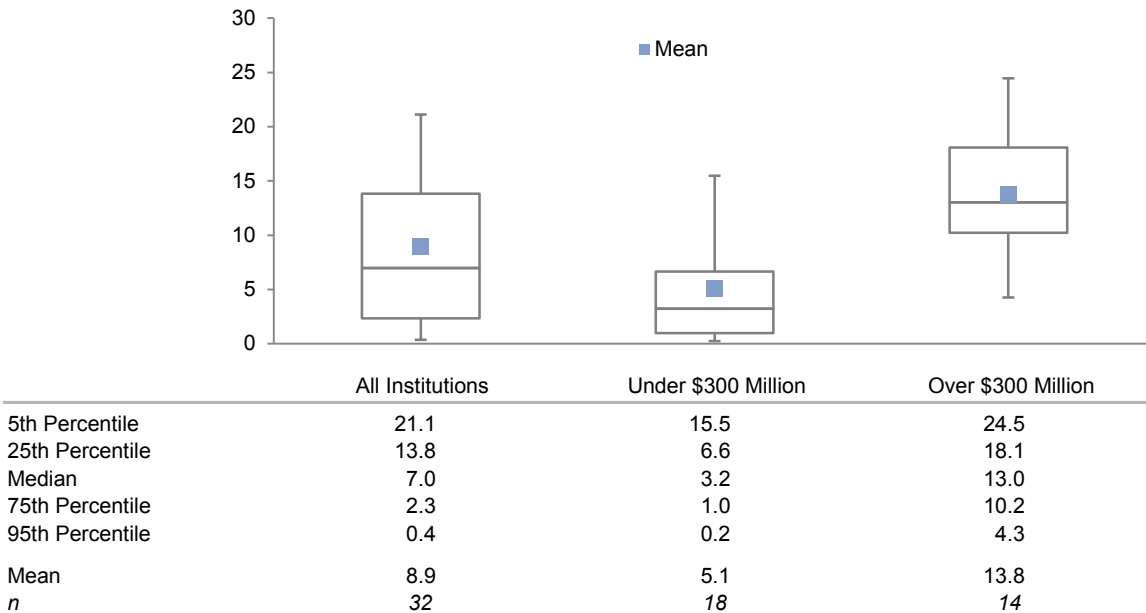
⁹ Private investments include private equity, venture capital, private distressed securities, private real estate, private oil & gas/natural resources, and timber.

Figure 26. Uncalled Capital Committed to Private Investment Funds
As of June 30, 2016 • Percent (%)

Uncalled Capital Commitments as a Percentage of the Total LTIP



Uncalled Capital Commitments as a Percentage of the LTIP's Liquid Assets

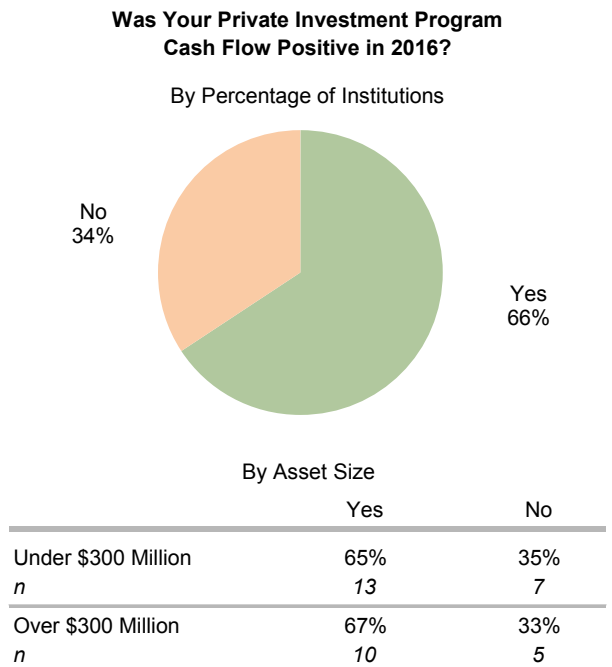


Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Notes: Uncalled capital is the amount committed, but not yet paid in, to private investment funds. Liquid assets consist of all LTIP assets excluding hedge funds and private investments. Private investments include non-venture private equity, venture capital, distressed securities (private equity structure), private oil & gas/natural resources, private real estate, and timber. Two institutions have been excluded from the liquid assets analysis, as they are extreme outliers.

As the ratios of unfunded capital commitments to assets rise, the potential liquidity risks associated with funding future capitals can increase as well. In recent years, these risks have been mitigated for most institutions due to the self-funding nature of private investment program cash flows. In 2016, 66% of participants reported that their private investment programs were cash flow positive, meaning the amount of fund distributions was higher than paid-in capital calls (Figure 27). For participants whose private investment fund distributions are not enough to offset new capital calls (34%), the remaining funding of capital calls has to come from cash reserves or other liquidity sources, which could include proceeds from sales of other investment assets in the LTIP.

Figure 27. Private Investment Program Cash Flow
As of June 30, 2016 • n = 35



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Note: Private investment fund programs were considered cash flow positive if fund distributions were higher than paid-in capital calls in 2016.

Investment Management Structures

Number of External Managers

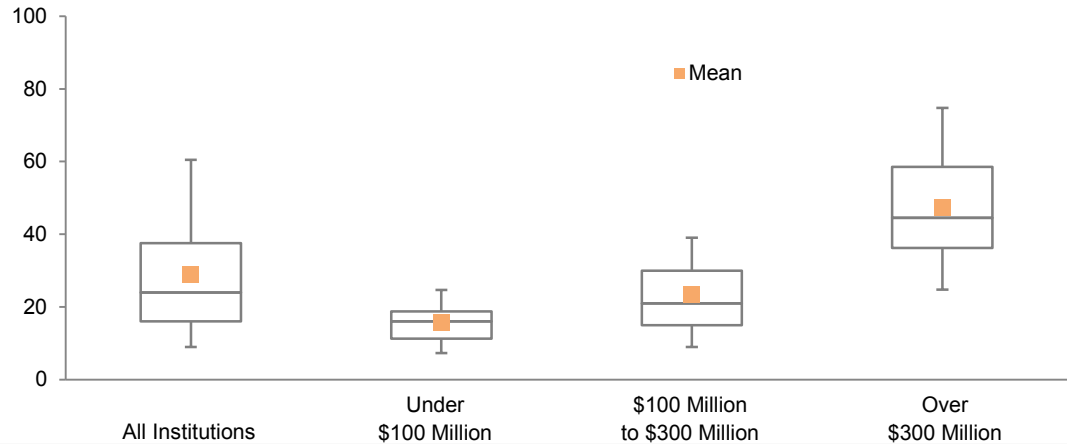
Many factors contribute to the number of managers employed within an investment portfolio. The scale of total assets under management is a primary factor, as portfolios with more assets generally spread their assets across a greater number of managers. On average, institutions with assets over \$300 million employed 47 external investment managers in 2016 (Figure 28). In contrast, portfolios with assets between \$100 million and \$300 million had an average of 23 managers, while portfolios with assets under \$100 million reported even fewer (16). The number of investment vehicles is higher than the number of managers for each peer group, mainly because of the allocation of capital across multiple funds of the same investment manager in private investment asset classes. For institutions that have provided historical data, the average number of external managers has trended higher over the last five years across all asset size groups, with the exception of institutions under \$100 million (Figure 29).

Even within the asset size groups, the range of managers employed can be wide. Within the smallest portfolios, the number of managers employed at the 5th percentile (25) is more than three times the number used at the 95th percentile (7) (Figure 28). For portfolios over \$300 million, there are 75 managers employed at the 5th percentile compared to 25 at the 95th percentile. Much of the variation can be attributed to

the management of alternative asset classes. As Figure 30 shows, the dispersion in the number of alternative asset managers employed, particularly within private investments, is much wider than that of the more traditional equity and bond asset classes. Further detail on these and other asset classes are provided for the three broad asset size groups in Figure 31.

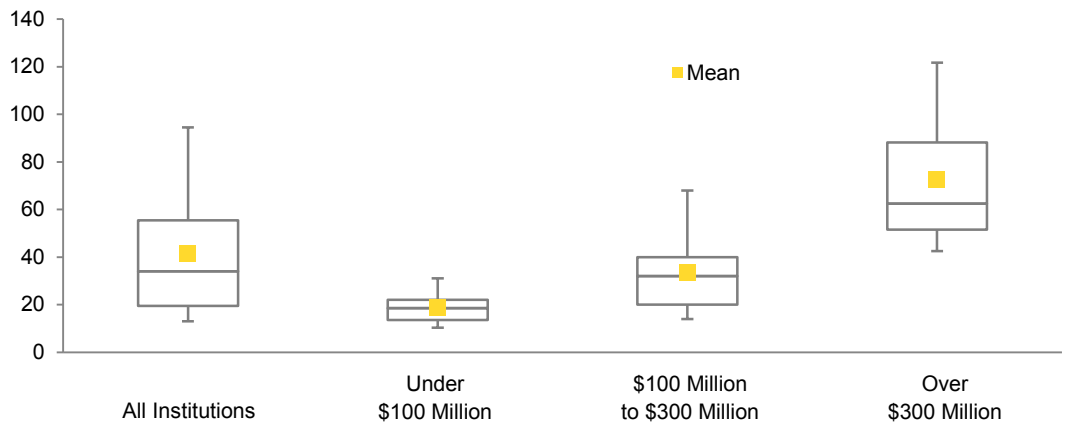
Figure 28. Number of External Managers and Investment Vehicles
As of June 30, 2016

External Managers



	All Institutions	Under \$100 Million	\$100 Million to \$300 Million	Over \$300 Million
5th Percentile	61	25	39	75
25th Percentile	38	19	30	59
Median	24	16	21	45
75th Percentile	16	11	15	36
95th Percentile	9	7	9	25
Mean	29	16	23	47
<i>n</i>	51	14	21	16

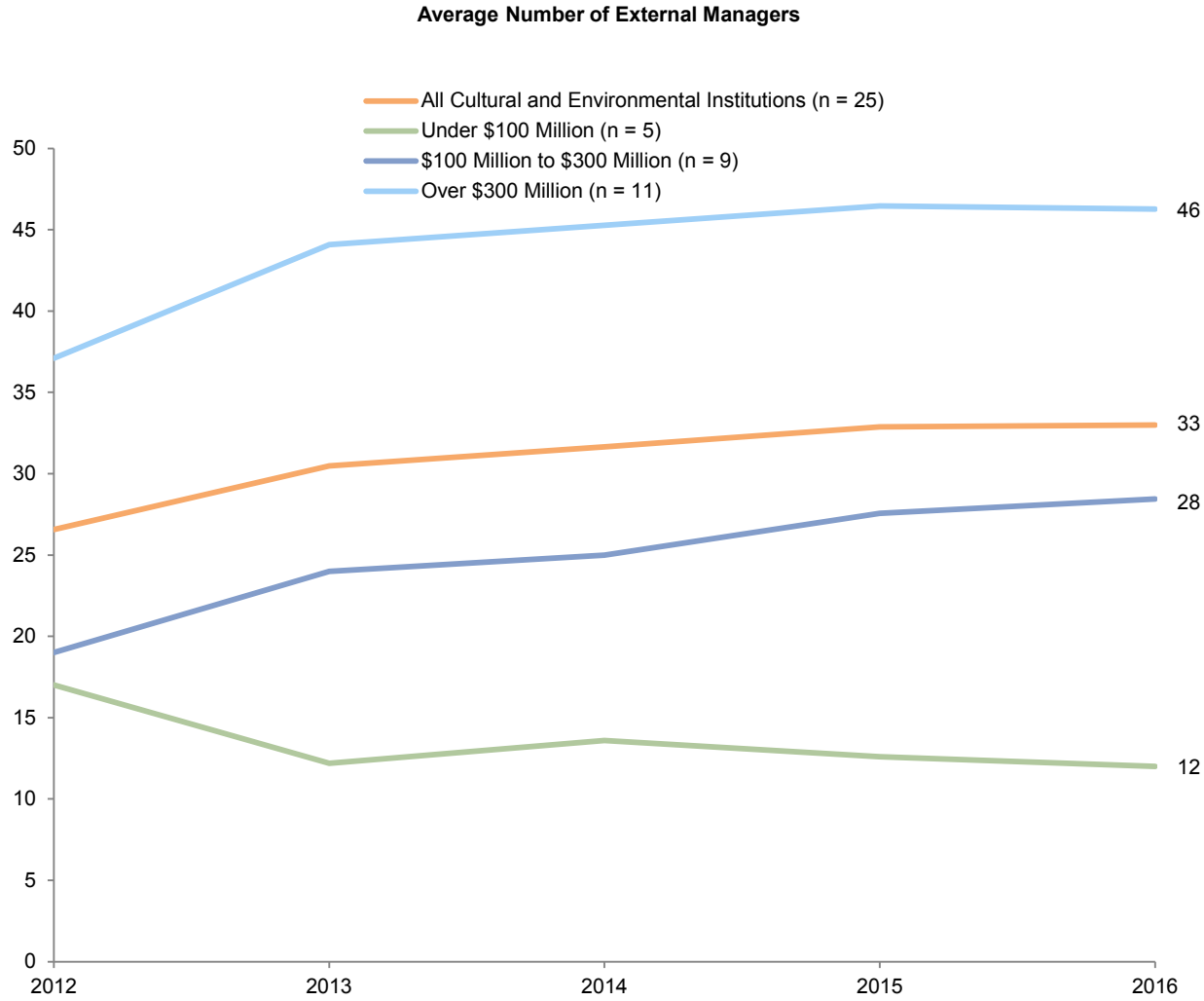
Investment Vehicles



	All Institutions	Under \$100 Million	\$100 Million to \$300 Million	Over \$300 Million
5th Percentile	95	31	68	122
25th Percentile	56	22	40	88
Median	34	19	32	63
75th Percentile	20	14	20	52
95th Percentile	13	10	14	43
Mean	42	19	33	73
<i>n</i>	51	14	21	16

Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.
Note: Funds-of-funds are counted as one separate investment manager and investment vehicle.

Figure 29. Trend in Number of External Managers
Years Ended June 30

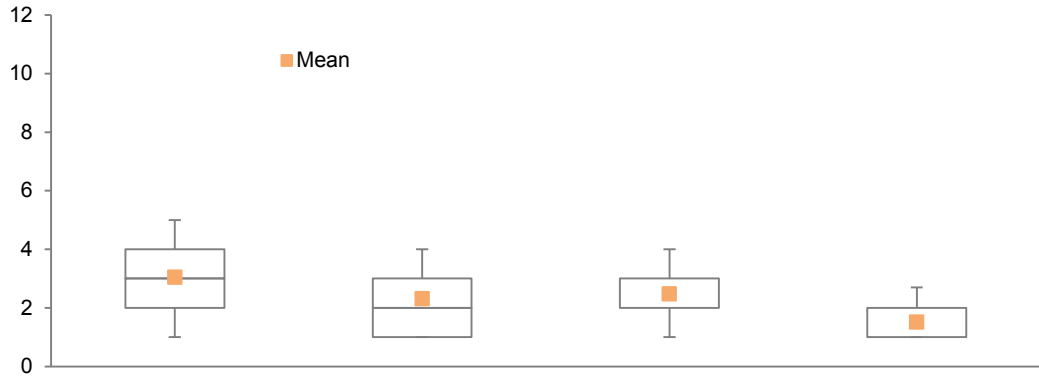


Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.



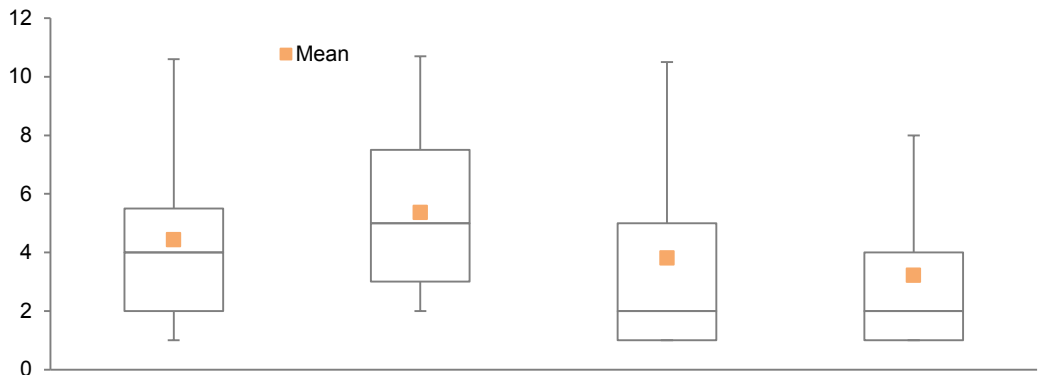
Figure 30. Dispersion in Number of Managers for Selected Asset Classes
As of June 30, 2016

Traditional Asset Classes



	US Equity	DM ex US Equity	Emerging Markets Equity	US Bonds
5th Percentile	5	4	4	3
25th Percentile	4	3	3	2
Median	3	2	2	1
75th Percentile	2	1	2	1
95th Percentile	1	1	1	1
Mean	3	2	2	2
<i>n</i>	49	48	48	47

Alternative Asset Classes



	Long/Short Hedge Funds	Abs Return Hedge Funds	Private Equity	Venture Capital
5th Percentile	11	11	11	8
25th Percentile	6	8	5	4
Median	4	5	2	2
75th Percentile	2	3	1	1
95th Percentile	1	2	1	1
Mean	4	5	4	3
<i>n</i>	35	47	31	27

Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Notes: Only those institutions with an allocation to the specific asset class have been included. Funds-of-funds are counted as one manager.

Figure 31. Externally Managed Investment Pool Holdings by Strategy
As of June 30, 2016

Strategy	Under \$100 Million			\$100 Million to \$300 Million			Over \$300 Million		
	Average Number of			Average Number of			Average Number of		
	Managers	Vehicles	<i>n</i>	Managers	Vehicles	<i>n</i>	Managers	Vehicles	<i>n</i>
Traditional Equity									
Global Equity	3	3	6	2	2	12	3	3	13
US Equity	3	3	14	3	3	21	4	4	14
Developed ex US Equity	2	2	13	2	3	21	3	3	14
Emerging Markets Equity	2	2	13	2	3	21	3	3	14
Traditional Bonds									
Global Bonds	1	1	7	1	1	9	1	1	3
US Bonds	1	2	13	2	2	20	2	2	14
Emerging Markets Bonds	--	--	0	1	1	4	--	--	0
High-Yield Bonds	1	1	3	1	1	3	--	--	0
Hedge Funds									
Long/Short Hedge Funds	4	5	6	4	4	14	5	6	15
Absolute Return (ex Dist Securities)	3	3	12	5	6	19	8	8	16
Distressed Securities									
Distressed (Hedge Fund Structure)	1	1	2	2	2	9	2	2	12
Distressed (Private Equity Structure)	1	1	3	2	5	10	3	5	15
Private Investments									
Non-Venture Private Equity	1	2	4	2	4	11	6	11	16
Venture Capital	1	1	2	2	3	9	4	10	16
Other Private Investments	2	3	2	2	2	10	2	3	15
Real Assets & ILBs									
Private Real Estate	1	2	2	2	2	5	4	7	16
Public Real Estate	1	1	4	1	1	3	1	1	4
Commodities	1	1	4	1	1	5	1	1	2
Inflation-Linked Bonds (TIPS)	1	1	2	1	1	5	1	1	1
Private Oil & Gas / Natural Resources	1	1	1	2	4	8	4	8	16
Timber	--	--	0	1	1	2	1	1	3
Public Energy/Natural Resources	2	2	8	2	2	14	2	2	12
Diversified (Multi-Strategy) RA	1	1	6	1	1	6	1	1	2
Cash (Dedicated Cash Managers Only)	1	1	6	1	2	14	1	1	9
Tactical Asset Allocation	1	1	1	1	1	5	1	1	1

Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

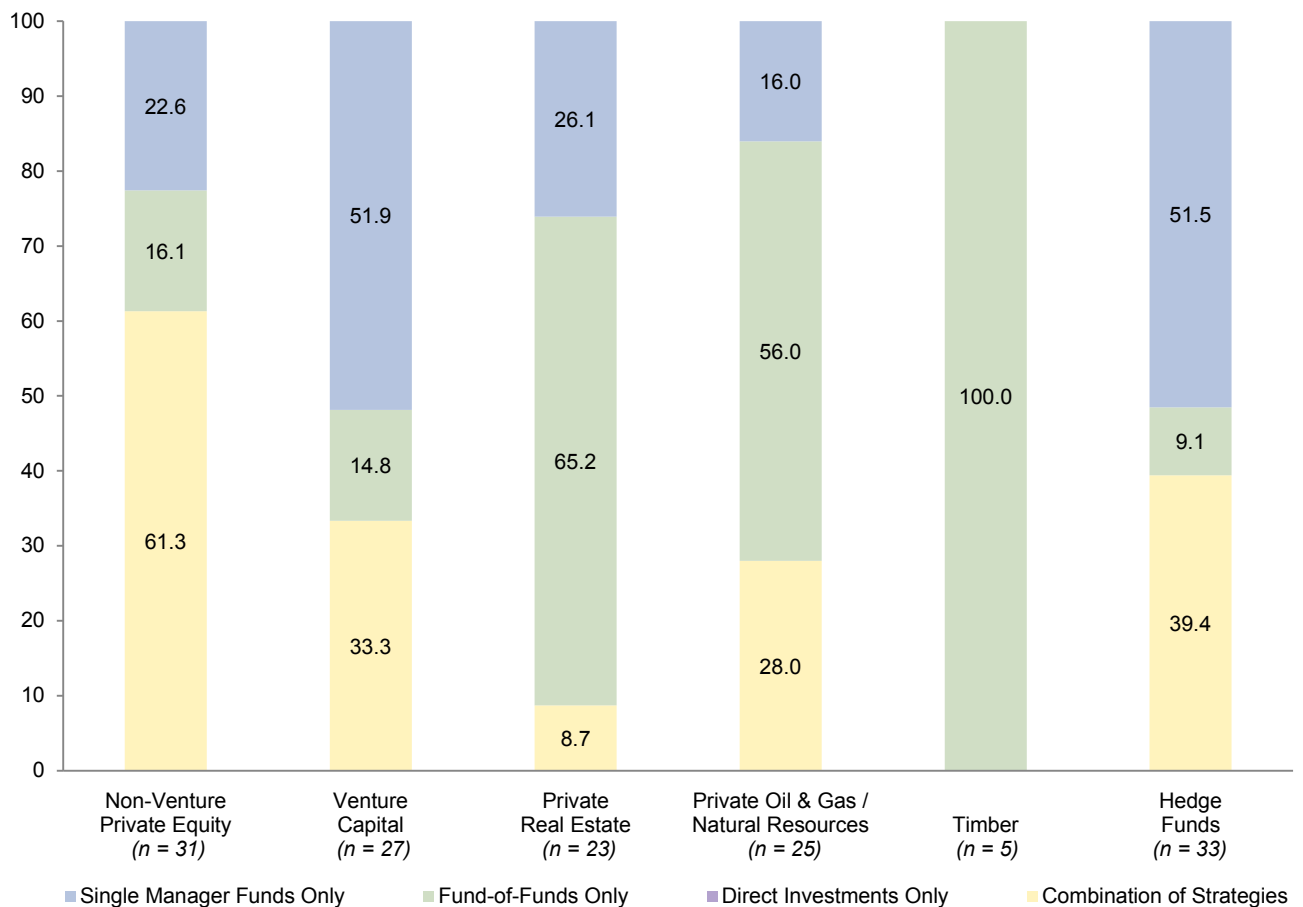
Notes: *n* indicates the number of institutions that are included in the average number of managers and average number of vehicles. Only those institutions with an allocation to the specific asset class are included in each category. As a result, the sum of the individual asset classes will not equal the true total average of managers and vehicles.

Asset Class Implementation

Alternative Assets. The majority of participants (52%) have constructed a hedge fund program that solely uses single manager funds, while just 9% rely only on funds-of-funds. The remaining participants (39%) employ a combination of single manager funds and funds-of-funds (Figure 32). The use of a combination of strategies was most common for the implementation of non-venture private equity, while the use of only fund-of-funds was most prevalent

in private real estate and natural resources. A sole reliance upon single manager funds was most prevalent in venture capital (52%). Smaller portfolios generally employ more funds-of-funds managers than larger portfolios in all alternative asset classes, which is not surprising given the typically high minimum investments for alternative asset funds.

Figure 32. Portfolio Implementation: Private Investments and Hedge Funds
As of June 30, 2016 • Percent (%)



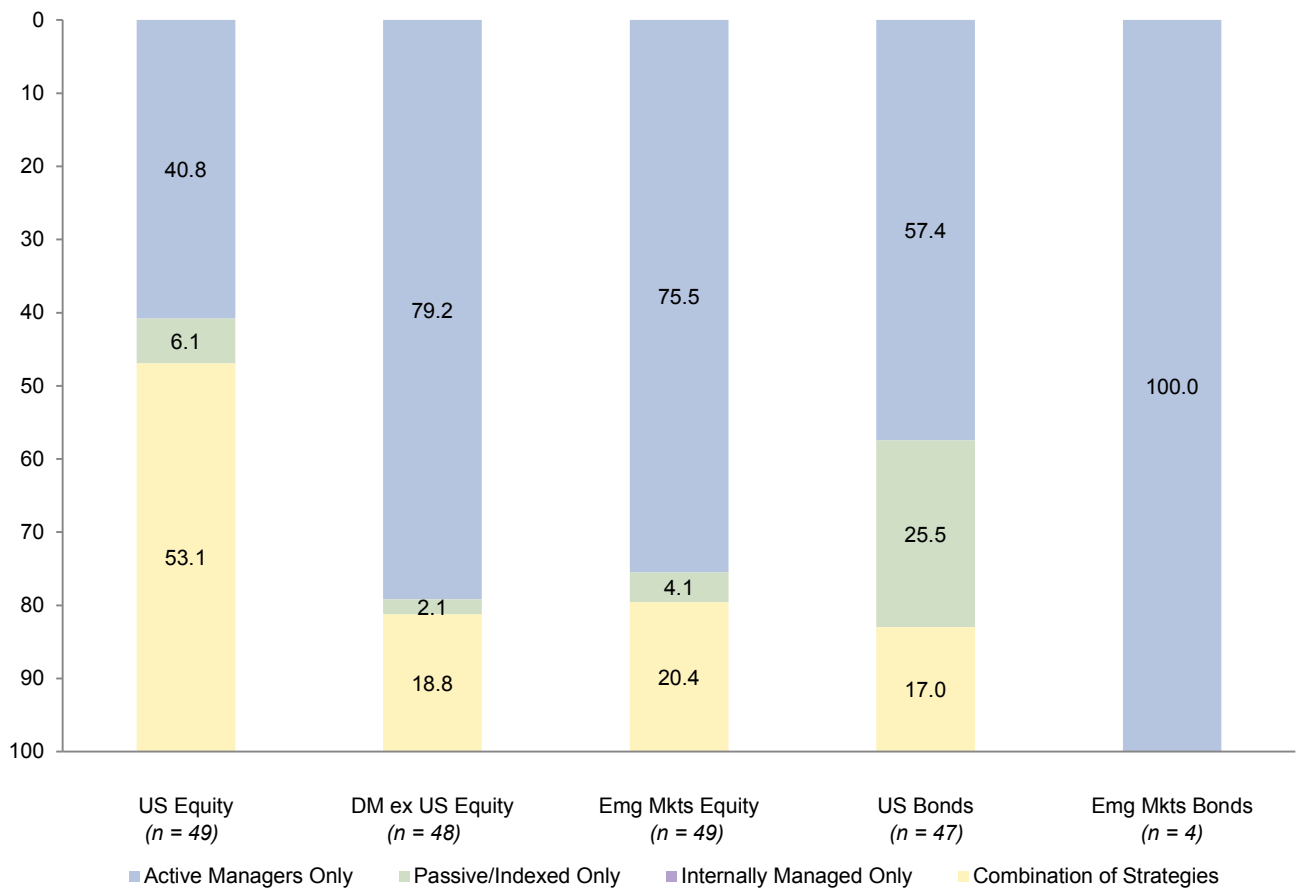
Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Note: *n* represents the number of institutions that provided the portfolio implementation for each asset class.

Public Equities and Bonds. Of the institutions that provided implementation data on traditional asset classes, 41% used active managers for all of their US equity allocation (Figure 33). 53% of the US equity allocation was implemented through a combination of strategies, including active management, passive, and internal management. For global ex US equities, developed

markets and emerging markets allocations were achieved solely through active managers for 79% and 76% of respondents, respectively. For bonds, a majority of respondents used only active managers for their total allocation to US markets (57%), and 100% of respondents used active managers only for emerging markets.

Figure 33. Portfolio Implementation: Traditional Equities and Bonds
As of June 30, 2016 • Percent (%)



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.
Note: n represents the number of institutions that provided the portfolio implementation for each asset class.



Payout from the Long-Term Investment Portfolio

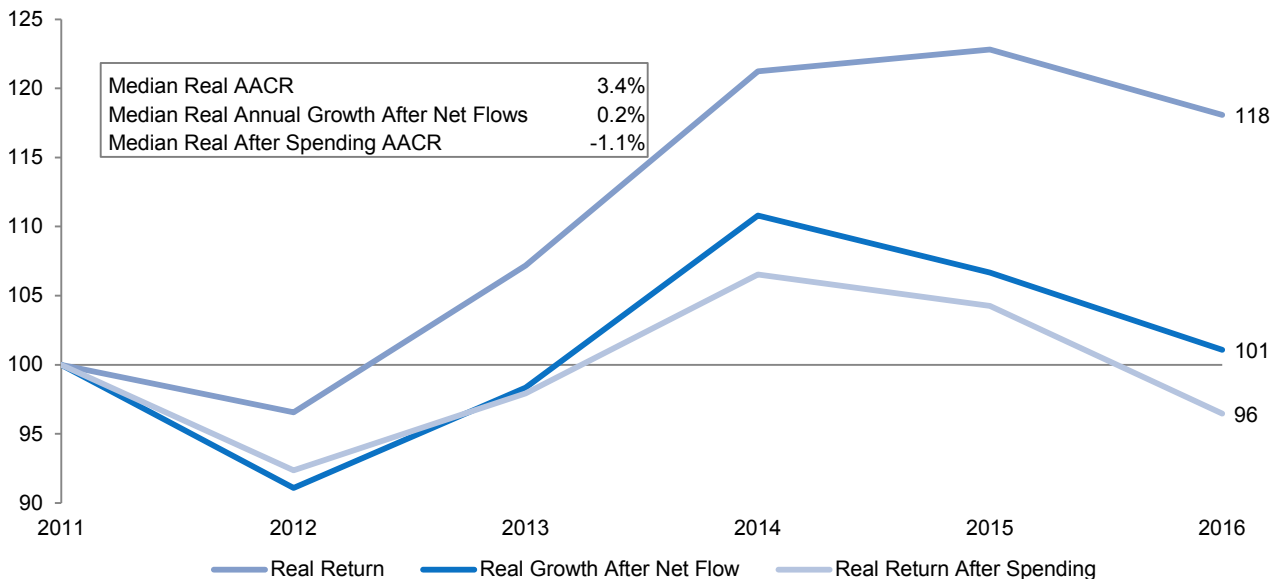
Net Flow Rate

Traditionally, endowment health has been evaluated in terms of investment performance and endowment spending or payout rate. A key objective has been to achieve real investment returns that exceed the average annual payout rate over the long term. Figure 34 is based on median data for the group of participants that provided returns, LTIP market values, and spending rates over the last five years. Using median investment performance and starting with an initial investment of \$100 in 2011, the portfolio would have grown to \$118 in real dollars by the end of fiscal year 2016. After deducting the annual endowment spending

policy distribution from real investment performance, the investment would have fallen to \$96, eroding purchasing power by nearly 4%. This approach omits an important part of the picture: the LTIP is also driven by inflows that come in as gifts, and other funds designated for long-term investment.

The combination of the total inflows and outflows for the LTIP constitutes the net flow rate. In the same figure, the actual value of the investment, which incorporates both real investment performance and net flows, is tracked by the middle line and grew by 1% over the five-year period. Because of the steady inflow from gifts and other additions that most institutions experienced, the actual growth in the portfolio was higher than growth based on returns

Figure 34. Cumulative Dollar Growth After Inflation, Net Flows, and Spending
 Years Ended June 30 • Base Year 2011 = \$100 • n = 15



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

Notes: To limit the impact of outliers, median data are used for each statistic in this exhibit. The median real annual growth after net flows represents the actual growth in the long-term investment portfolio's market value adjusted for inflation.

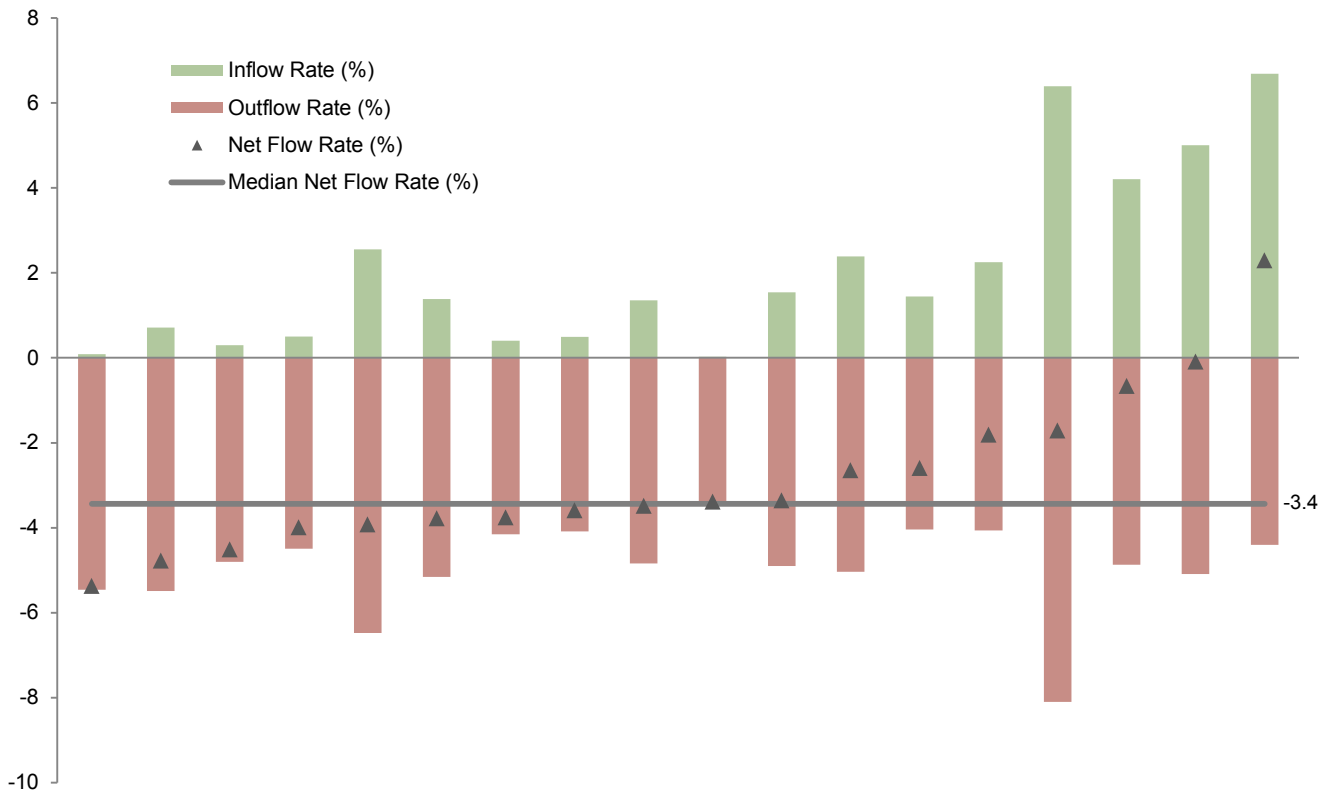


after spending only. Since maintaining the purchasing power of existing endowment gifts is a key objective in endowment management, the traditional return after spending statistic should not be dismissed. However, this statistic can understate the actual extent of asset growth. By incorporating real investment performance with the overall net flow rate, an institution can better evaluate the trajectory of the LTIP’s role in the institution’s business model.

additions for the majority of respondents (Figure 35). In addition, real investment performance for 2016 was negative for all but three institutions. As a result, the vast majority of participants (48 of 54) saw the real market value of their LTIP decline over the fiscal year.

The median net flow rate (-3.4%) for participants in fiscal year 2016 was negative, meaning the amount of withdrawals from the portfolio surpassed the amount of

Figure 35. Net Flow Rate Comparison
Fiscal Year 2016 • n = 18



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.
Notes: See Appendix Exhibit 8 for a listing of the net flow rates for all institutions.



Spending Policies

An institution's spending policy serves as a bridge that links the LTIP and the enterprise. The spending policy should be designed to balance the needs of current and future generations of stakeholders, with the goals of providing appropriate levels of support to operations and preserving, or even growing, endowment purchasing power.¹⁰

The majority (79%) of responding institutions continue to use a market value–based rule, which dictates spending a percentage of a moving average of endowment market values (Figure 36). This rule type emphasizes purchasing power preservation by linking the spending distribution amount directly to the endowment's market value.

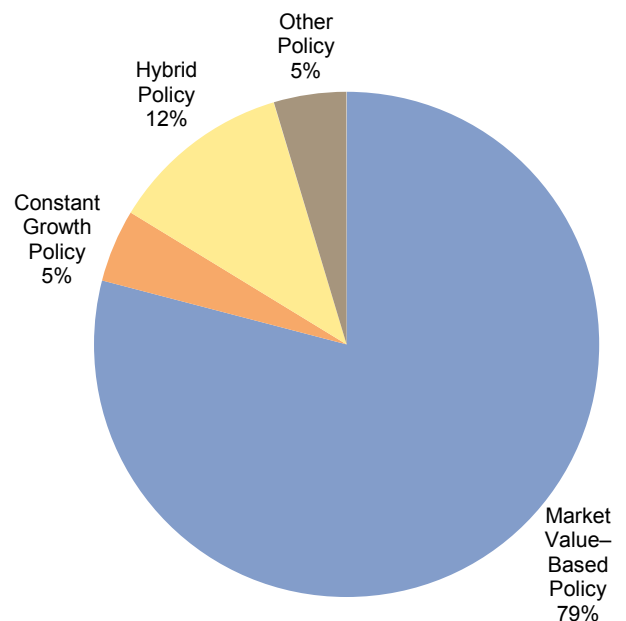
For institutions using a market value–based rule, a primary component of the spending calculation is the target spending rate. To preserve the purchasing power of an endowment, the target spending rate must align with the long-term real investment return. While the current low return environment is spurring many institutions to re-evaluate their spending policies, most respondents that use this rule type have maintained the same target spending rate over the last several years. All institutions left their target rate unchanged in fiscal year 2016 compared to 2015, and looking back further over the last four years, 75% of institutions have made no changes to their target spending rate.

The next most common spending rule type is the hybrid policy, which was used

by 12% of institutions. A hybrid spending policy blends the more predictable spending element of a constant growth policy with the asset preservation principle of a market value–based policy and allows an institution to set the appropriate mix that best meets its needs. The rule is expressed as a weighted average of a constant growth rule and a percentage-of-market-value (or average market value over a period of time) rule.

The third most common spending rule type is a constant growth rule, which was cited by 5% of institutions. This rule type increases the prior year's spending amount by a measure of inflation and/or a pre-specified percentage. Institutions tend to use this rule type when the endowment is a significant source of operating revenue and

Figure 36. Spending Policy Types
Fiscal Year 2016 • n = 43



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.

¹⁰ For a more in-depth discussion on this topic please see William Prout et al., "Spending Policy Practices," Cambridge Associates Research Report, 2016.

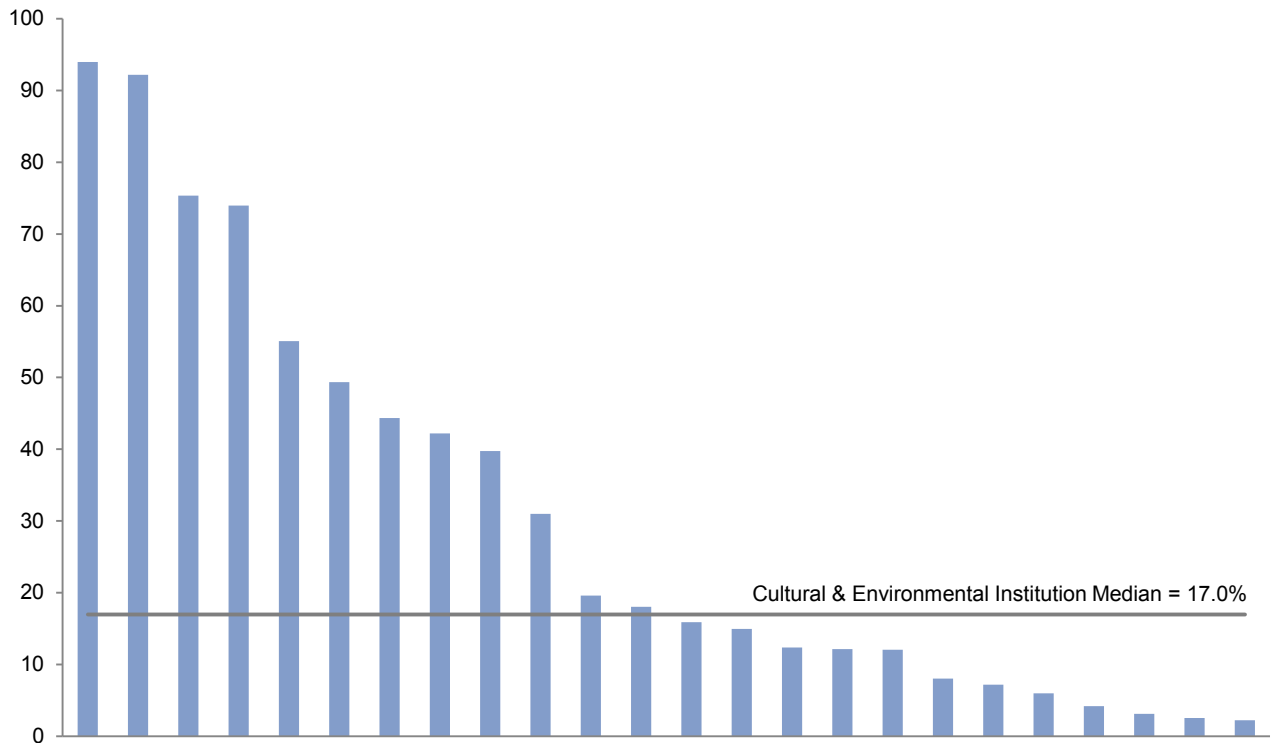
volatility in annual spending distributions is less tolerable. While the strict application of a constant growth rule produces predictable spending, most institutions using this rule type impose a spending cap and floor based on a percentage of the endowment’s market value, or a moving average of market values. Spending collars essentially transform the constant growth rule to a market value–based rule in times of significant endowment growth or contraction to avoid a complete disconnect between spending and the endowment market value.

The remaining 5% of participants use a rule where the mechanics of the spending policy are unique to those respective institutions.

LTIP Support of Operations

Cultural and environmental institutions rely on endowment and gifts to fund a portion of their operating budgets. For the 24 institutions that provided data, the median support of operations from the LTIP was 17.0% in fiscal year 2016 (Figure 37). The extent of support varied widely, from one institution relying on the investment portfolio to cover just over 2% of expenses on one end of the spectrum, to a couple institutions that rely almost fully on the portfolio payout to cover expenses on the other end of the spectrum. ■

Figure 37. Long-Term Investment Portfolio Support of Operations
Fiscal Year 2016 • n = 24



Source: Cultural and environmental institutions data as reported to Cambridge Associates LLC.
Note: LTIP support of operations is the proportion of the operating budget that is funded from LTIP payout.



Data Collection and Results

This report includes data for 54 cultural and environmental institutions. All participants provided investment pool data as of June 30, 2016. The notation of n denotes the number of institutions included in each analysis.

In Exhibits 11 and 12, asset classes are represented by the following benchmark indexes: US equity, Russell 3000®; developed markets ex US equity, MSCI EAFE; emerging markets equity, MSCI Emerging Markets; US bonds, Bloomberg Barclays Government/Credit Bond Index; developed markets ex US bonds, Citigroup Non-US Dollar World Government Bond Index; emerging markets bonds, JP Morgan Emerging Markets Bond Index; high-yield bonds, Citigroup High-Yield Market Index; long/short hedge funds, HFRI Equity Hedge; absolute return hedge funds, HFRI Fund of Funds Diversified Index; distressed securities (hedge fund structure), HFRI Event-Driven Distressed/Restructuring Index; distressed securities (private equity structure), Cambridge Associates LLC US Distressed Securities Index®; venture capital, Cambridge Associates LLC US Venture Capital Index®; non-venture private equity, Cambridge Associates LLC US Private Equity Index®; other private investments, blend of 50% Cambridge Associates LLC US Venture Capital Index® and 50% Cambridge Associates LLC US Private Equity Index®; private real estate, Cambridge Associates LLC Real Estate Index; public real estate, FTSE® NAREIT Index; commodities, Bloomberg Commodity Total Return Index; inflation-linked bonds, Bloomberg Barclays Capital US TIPS Index; private oil & gas/natural

resources, Cambridge Associates LLC Private Natural Resources Index; timber, NCREIF Timberland Index; public energy/natural resources, MSCI World Natural Resources Index; and cash & equivalents, BofA Merrill Lynch 91-Day Treasury Bill Index.

Calculation of the Real Rate of Return

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 the report, the deflation measure used for this purpose is the Consumer Price Index. Note that simply subtracting the deflator from the nominal total return does not result in an accurate computation of real total return. The formula is:

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

Calculation of the Return After Spending

The rate of return after spending for a given investment is calculated by dividing the total return by the effective spending rate for the time period. The effective spending rate is the dollar amount of spending (endowment spending policy distribution and other annual appropriations) for a fiscal year as a percentage of the beginning market value of assets. The effective spending rate does not include investment management fees that are netted out of returns. Note that simply subtracting the effective spending rate from the total return does not result in an accurate

computation of total return after spending.
The formula is:

$$\frac{1 + \text{Total Return}}{1 + \text{Spending Rate}} - 1 = \text{Total Return After Spending}$$

Calculation of the Sharpe Ratio

The Sharpe ratio 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, 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.

Blended Portfolio Benchmarks

Throughout the report, 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).
Co-Investments	A direct investment made into a company alongside a general partner that originates the transaction.
Commodities	Diversified baskets of fully collateralized, long-only, commodity futures contracts.
Developed Markets	Markets within countries that have an established economic infrastructure.
Distressed Securities	Securities of companies that are currently in default, bankruptcy, financial distress, or a turnaround situation.
Effective Spending Rate	The dollar amount of spending as a percentage of the beginning market value of assets. Spending amount includes the endowment spending policy distribution and other annual appropriations. It does not include investment management fees that are netted out of returns.
Emerging Markets	Typically includes countries that have an underdeveloped or developing economic 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 USD-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.
Externally Managed Assets	Assets, including pooled assets, managed by individuals or firms outside an institution.
Fund-of-Funds	A fund that invests in a collection of underlying funds.
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 funds-of-funds and secondary market private investments.
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).
Single Manager Fund	A fund in which the fund manager makes the investment decisions for the assets/securities/companies held within the fund.
Solo Investments	A direct investment made into a company in which the institutional investor originates and invests in a transaction, which is not associated with a manager in the investor's portfolio.
Spending Rule	The guideline an institution uses to determine annual distributions from its endowment (e.g., spend all income, spend 5% of three-year moving average market value, increase spending by 5% each year).
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 rates of return.

Traditional Assets	Include 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.

Atlanta Historical Society
The Vivian Beaumont Theater, Inc.
Boston Athenaeum
Boston Symphony Orchestra Inc.
The Brookings Institution
California Academy of Sciences
Chemical Heritage Foundation
The Children's Museum of Indianapolis
Conner Prairie Foundation
Cypress Lawn Endowment Care Trust
The Edison Institute
The Evergreens Cemetery
Fallon Paiute-Shoshone Tribe
The Frick Collection
Isabella Stewart Gardner Museum
The J. Paul Getty Trust
Jeremy and Hannelore Grantham Environmental Trust
Hagley Museum and Library
Linda Hall Library Trusts
Honolulu Museum of Art
Huntington Library and Art Gallery
Indianapolis Museum of Art Inc.
Institute for Advanced Study
Institute of International Education
JFK Library Foundation
Kennedy Center for the Performing Arts
Longwood Gardens, Inc.
Mashantucket Pequot Tribal Nation Endowment Trust
Metropolitan Museum of Art
Minnesota Orchestral Association
Museum of Fine Arts, Boston
Museum of Fine Arts, Houston
Museum of Modern Art
Museum of Science, Boston
National Gallery of Art
National Wildlife Federation
New York Philharmonic
The New York Public Library
New York Public Radio
NPR Foundation
Philadelphia Museum of Art
Ravinia Festival Association
Scenic Hudson Land Trust Inc.
The School of American Ballet
Seattle Art Museum
Smithsonian Institution
The Trustees of Reservations
United Negro College Fund
WGBH Educational Foundation
White House Historical Association - Endowment Trust
Wildlife Conservation Society
The Henry Francis duPont Winterthur Museum, Inc.
WNET
World Wildlife Fund Inc.

Copyright © 2017 by Cambridge Associates LLC. All rights reserved.

This report may not be displayed, reproduced, distributed, transmitted, or used to create derivative works in any form, in whole or in portion, by any means, without written permission from Cambridge Associates LLC ("CA"). Copying of this publication is a violation of US and global copyright laws (e.g., 17 U.S.C. 101 et seq.). Violators of this copyright may be subject to liability for substantial monetary damages. The information and material published in this report is nontransferable. Therefore, recipients may not disclose any information or material derived from this report to third parties, or use information or material from this report, without prior written authorization. This report is provided for informational purposes only. The information presented is not intended to be investment advice. Any references to specific investments are for illustrative purposes only. The information herein does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction. Some of the data contained herein or on which the research is based is current public information that CA considers reliable, but CA does not represent it as accurate or complete, and it should not be relied on as such. Nothing contained in this report should be construed as the provision of tax or legal advice. Past performance is not indicative of future performance. Broad-based securities indexes are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly in an index. Any information or opinions provided in this report are as of the date of the report, and CA is under no obligation to update the information or communicate that any updates have been made. Information contained herein may have been provided by third parties, including investment firms providing information on returns and assets under management, and may not have been independently verified.

Cambridge Associates, LLC is a Massachusetts limited liability company with offices in Arlington, VA; Boston, MA; Dallas, TX; Menlo Park, CA; and San Francisco, CA. Cambridge Associates Fiduciary Trust, LLC is a New Hampshire limited liability company chartered to serve as a non-depository trust company, and is a wholly-owned subsidiary of Cambridge Associates, LLC. Cambridge Associates Limited is registered as a limited company in England and Wales No. 06135829 and is authorised and regulated by the Financial Conduct Authority in the conduct of Investment Business. Cambridge Associates Limited, LLC is a Massachusetts limited liability company with a branch office in Sydney, Australia (ARBN 109 366 654). Cambridge Associates Asia Pte Ltd is a Singapore corporation (Registration No. 200101063G). Cambridge Associates Investment Consultancy (Beijing) Ltd is a wholly owned subsidiary of Cambridge Associates, LLC and is registered with the Beijing Administration for Industry and Commerce (Registration No. 110000450174972).