## Callan

**December 31, 2016** 

City of Milwaukee Employes' Retirement System

Investment Measurement Service Quarterly Review

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## Callan



Fourth Quarter 2016

This "Preview" contains excerpts from the upcoming *Capital Market Review* (CMR) newsletter, which will be published in several weeks.

## **Markets Trumped**

## U.S. EQUITY | Lauren Mathias, CFA

The **S&P 500 Index** notched a +3.82% return for the fourth quarter after reaching an all-time high (2,239) just days before the end of 2016. Even more impressive was the return from small-capitalization companies (**Russell 2000 Index**: +8.83%), as was the divergence between value and growth across the size spectrum (**Russell 1000 Value Index**: +6.68% vs. **Russell 1000 Growth Index**: +1.01%; **Russell 2000 Value Index**: +14.07% vs. **Russell 2000 Growth Index**: +3.57%).

Continued on pg. 2

## A Depressing Dollar

### NON-U.S. EQUITY | Irina Sushch

During the final quarter of 2016, foreign developed and emerging markets floundered in U.S. dollar terms despite hearty local returns. Donald Trump's election drove U.S. stocks to record highs, as investors reacted positively to his business-friendly stances on taxes, trade, and regulations. The U.S. dollar hit a multi-year high versus the euro and the yen and appreciated roughly 7% compared to a basket of currencies.

That broad-based dollar strength detracted from overseas returns for U.S. investors. The **MSCI ACWI ex USA Index** was down 1.25% for the quarter (but up 4.93% in local currency). As in the previous quarter, the defensive-oriented sectors dragged

Continued on pg. 3

## **Broad Market Quarterly Returns**



Source: Bloomberg Barclays, Merrill Lynch, MSCI, Russell Investment Group

## **Treacherous Treasuries**

### U.S. FIXED INCOME | Rufash Lama

The U.S. bond market experienced a tumultuous fourth quarter, triggered by the unexpected election results and strong economic data, among other factors. The **Bloomberg Barclays U.S. Aggregate Bond Index** dropped 2.98%, while the **Bloomberg Barclays High Yield Index** rose 1.75%. But the year ended on an upbeat note, with the Aggregate up 2.65% and the High Yield Index delivering equity-like returns at 17.13%.

The yield curve rose following the presidential election and an upward revision for third quarter GDP to 3.5%, the highest

Continued on pg. 4

## **Big League Yields**

### NON-U.S. FIXED INCOME | Kyle Fekete

The U.S. dollar skyrocketed against a trade-weighted basket of currencies on the back of the November U.S. election and higher U.S. interest rates. Investment strategies with foreign currency exposure faced strong headwinds as the **Bloomberg Barclays Global Aggregate ex-US** fell 10.26% (-1.86% on a hedged basis).

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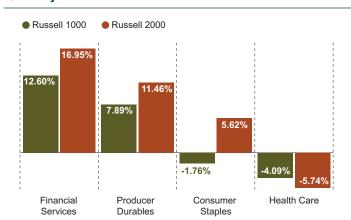
## **U.S. Equity: Markets Trumped**

Continued from pg. 1

The market in the fourth quarter was trumped by politics as the incoming Trump administration promised to lower personal and corporate income taxes, decrease business and environmental regulation, and increase infrastructure spending. Investors appeared to approve; November saw the highest monthly return of the quarter (+3.70%). Other tailwinds furthered the frenzy, including upwardly revised third quarter GDP (to 3.5%), subdued initial jobless claims, unemployment at the lowest level in nine years (4.6%), average wage growth of 2.9% in December, and a surging U.S. dollar; home and automobile prices hit all-time highs, as did consumer confidence. In light of the progress, the Fed Funds rate was increased in December to a range of 0.50%-0.75%. There are still pockets of uncertainty, however; across the pond the European Central Bank continued quantitative easing and back at home a Trump government could mean higher debt and subsequently inflation. Sentiment is nonetheless revved up, at least for now.

U.S. equity was the preferred market globally; small cap particularly benefited from Trump-fueled enthusiasm. Micro and small capitalization companies outpaced mid and large cap stocks (Russell Microcap Index: +10.05%, Russell 2000 Index: +8.83%, Russell Midcap Index: +3.21%, and Russell 1000 Index: +3.83%). Value regained its lead over growth in all capitalizations; the dispersion in style returns was broad

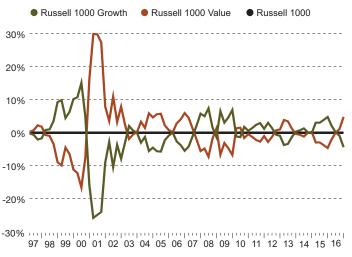
#### **Quarterly Performance of Select Sectors**



Source: Russell Investment Group

### **Rolling One-Year Relative Returns**

(vs. Russell 1000)



Source: Russell Investment Group

across market capitalizations, with the widest (1,050 bps) in small cap (Russell 2000 Value minus Russell 2000 Growth)—the most since the technology bubble burst in 2001.

Sector performance reflected the style shift; the best-performing sectors in the S&P 500 during the quarter were value-oriented, including Financials (+21.10%), Energy (+7.28%), and Materials (+4.70%). Within Financials, banks did especially well, benefiting from both an increase in interest rates and talk of deregulation. The Organization of Petroleum Exporting Countries (OPEC) agreed on oil production cuts in the quarter, boosting energy stocks. In general companies with lower leverage and higher operating margins and return on equity were preferred. The growth-oriented, momentum areas of the market declined, including Health Care (-4.00%) and Consumer Staples (-2.02%). The new Real Estate sector, representing 2.9% of the S&P 500, finished the quarter down 4.41% as these investments tend to move in the opposite direction of interest rates.

U.S. equity valuations were elevated; the S&P 500 Index Forward P/E was 16.9x at the end of the year versus the 25-year average of 15.9x. In this environment active managers were challenged; outflows from this group have totaled over \$1 trillion since 2005. However, a future with more volatility, lower returns, and higher interest rates would favor active management.

## Non-U.S. Equity: A Depressing Dollar

Continued from pg. 1

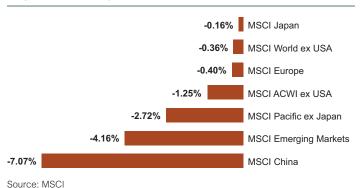
down returns (Consumer Staples: -10.09%, Health Care: -8.08%, REITs: -7.90%, Utilities: -7.19%). The interest rate-sensitive sectors helped limit the damage (Energy: +8.32%, Financials: +6.84%).

In dollar-denominated results, emerging markets (MSCI Emerging Markets Index: -4.16%) trailed their developed peers (MSCI World ex USA Index: -0.36%, MSCI EAFE Index: -0.71%). The MSCI ACWI ex USA Value Index (+3.29%) fared much better than the MSCI ACWI ex USA Growth Index (-5.72%). Small cap stocks joined growth and emerging market stocks at the bottom of the barrel (MSCI ACWI ex USA Small Cap Index: -3.52%). Despite multiple headwinds, the MSCI ACWI ex USA Index ended the year up 4.50%.

The European Central Bank announced that it would extend its bond purchase program, although it plans to lower investments from €80 billion to €60 billion per month. The unemployment rate in the euro zone declined to 9.8%, the lowest since July 2009. Consumer prices ticked up 0.6% year-over-year in November, and GDP was on track to increase at a 0.4%-0.5% pace from 0.3% in the third quarter, based on early indications ahead of the release of the official figures in early 2017. Against this backdrop, the **MSCI Europe Index** rose 5.44% in the fourth quarter and 7.23% during the year for local investors; however, in U.S. dollar terms, the Index was essentially flat for the quarter and year (-0.40% for both periods). Italy (+10.75%) led the pack during the quarter, while Belgium (-11.80%)

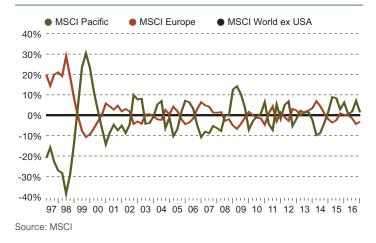
### Regional Quarterly Performance

(U.S. Dollar)



### **Rolling One-Year Relative Returns**

(vs. MSCI World ex USA, USD hedged)



brought up the rear. Across the euro zone, economically sensitive Financial (+11.45%) and Energy (+11.16%) stocks posted healthy returns, while defensively-oriented REIT (-9.96%) and Utility (-9.40%) stocks faltered.

In Southeast Asia and the Pacific, Japan's stimulus measures boosted returns for local investors (+14.99%). But the dollar hit a 14-year high versus the yen, hammering returns for U.S. investors (-0.16%). New Zealand had a rough quarter (-10.88%), although it closed out the year up 18.37%. Australia was the only country in the region to end the quarter in the black, up 0.69% (and +11.45% for the year), buoyed by rebounding commodity prices and higher interest rates. The **MSCI Pacific Index** slumped 1.03% for the quarter, but rose for the year (+4.18%).

Despite the MSCI Emerging Markets Index's decline during the quarter, it jumped a robust 11.19% during 2016, buttressed by strengthening commodity prices as well as reform efforts and accommodative monetary policies in several countries. Russia, up 18.56% in the quarter and 54.82% for the year, and Brazil, up 2.05% in the quarter and 66.24% for the year, benefited richly from rising prices for oil and industrial commodities. China fell during the quarter (-7.07%) but ended the year essentially flat (+0.90%). Most emerging Asian markets gained ground during the year (MSCI EM Asia: +6.14%), despite a rough fourth quarter (-6.06%), driven by economic reform and technology stocks. Mexico dropped 7.88% for the quarter and 9.16% for the year, hurt by peso weakness and Trump's election.

## **U.S. Fixed Income: Treacherous Treasuries**

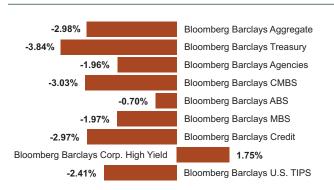
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quarterly increase in two years. Yields rose across the maturity spectrum. The benchmark 10-year Treasury note showed the biggest change, ending the quarter at 2.45% (an increase of 85 bps). Yields on the 5-year and 30-year finished at 1.93% and 3.07%, respectively.

Markets entered 2016 expecting four rate hikes, but the Fed increased the Federal Funds rate only once, by 25 bps to a range of 0.50%-0.75% in December. As a result of rising yields, returns across the broad fixed income sector were negative for the quarter. Tax-exempt municipal bonds and Treasuries dropped 3.62% and 3.84%, respectively. On a duration-adjusted basis, Treasuries underperformed credit securities by 156 bps. Long Treasuries were hit particularly hard, falling 11.67%.

Spreads tightened during the quarter. Investment-grade corporate spreads over comparable Treasuries tightened 42 bps and ended the year at 123 bps—a stark contrast to the first half of the year, in which spreads had widened up to 214 bps in February. Corporates declined 2.8% for the quarter, but generated a strong return (+6.11%) for the year. On a duration-adjusted basis, long credit outperformed intermediate credit by 330 bps. Despite a slow start, high yield corporates made a powerful comeback to end the year on a strong note; they delivered 407 bps of excess returns for the quarter. Mortgage-backed securities (MBS), plagued by rate volatility and elevated prepayment concerns, fell 1.97% for the quarter (but were up 1.67% for the year) and

**Fixed Income Index Quarterly Returns** 



Source: Bloomberg Barclays

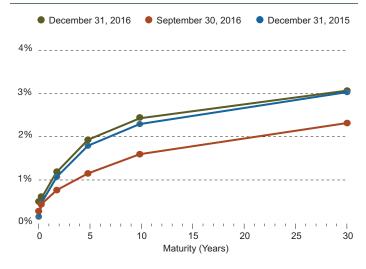
underperformed duration-matched Treasuries by 39 bps. Asset-backed securities (ABS) were off 0.70% for the quarter but up 2.03% for the year. Commercial mortgage-backed securities (CMBS) experienced a similar divergence, falling 3.03% in the quarter but rising 3.32% over the year.

In 2016, U.S. corporations set a milestone with new high yield and investment-grade issuances that totaled \$1.5 trillion. The municipal bond market also set a record with new offerings totaling \$445 billion.

### **Historical 10-Year Yields**



### **U.S. Treasury Yield Curves**



Source: Bloomberg

## Non-U.S. Fixed Income: Big League Yields

## Continued from pg. 1

Continuing 2016's anti-establishment geopolitical theme, Italians voted against reforms proposed by the government, leading to Italian President Matteo Renzi's resignation. In December, European Central Bank President Mario Draghi announced the extension of its stimulus program out to December 2017; however, the bond buying will be dialed back to €60 billion per month, down from €80 billion. The ECB stressed that it is not "tapering" the stimulus program (i.e., reducing purchases to zero) and it stands ready to ramp up purchases again should it see fit. The quantitative easing program reached approximately €1.7 trillion in 2016, and should top €2.2 trillion by the end of 2017.

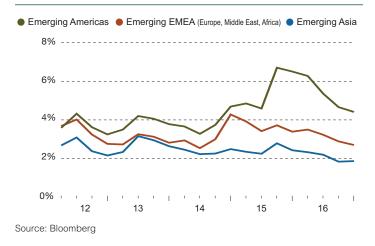
Yields on the 10-year German bund increased to 0.21%, 224 bps below that of the 10-year Treasury. The U.S./German 10-year debt spread reached the widest it's been since 1990. The euro declined 6.14% against the dollar.

The Bank of England (BOE) took a wait-and-see approach ahead of the uncertainty surrounding the Brexit process. The BOE elected to hold the benchmark rate at 0.25% and maintain the same rate of bond purchasing, saying the sterling's recent appreciation against the euro may curtail inflation. The U.K. 10-year yield jumped 49 bps to 1.24% and the sterling declined 4.9% against the dollar. Changes to Japan's monetary policy were also put on hold as the unemployment rate reached a healthy level and a weakened yen stood poised to boost potential earnings growth. The Bank of Japan upheld its pledge to keep the yield of 10-year Japanese debt near 0%; its yield settled at 0.05%. Set off by the U.S. presidential election, the yen dropped 13%.

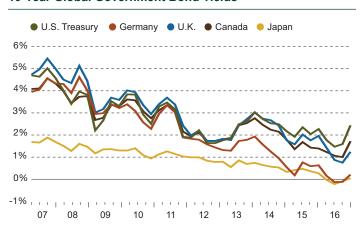
Emerging market debt weakened and underperformed developed markets. The local currency-denominated **JP Morgan GBI-EM Global Diversified Index** fell 6.09%. The USD-denominated **JPM EM Global Diversified Index** fell 4.02%. Turkey and Mexico were among the worst performers in both

### **Emerging Spreads Over Developed**

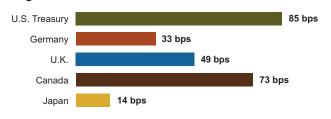
(By Region)



#### 10-Year Global Government Bond Yields



#### Change in 10-Year Yields from 3Q16 to 4Q16



Source: Bloomberg

indices. However, emerging market sovereign debt proved to be one of the strongest asset classes in 2016, gaining roughly 10% in both JP Morgan indices, benefiting from the tailwind of increased commodity prices.

## **Investment Manager Asset Allocation**

The table below contrasts the distribution of assets across the Fund's investment managers as of December 31, 2016, with the distribution as of September 30, 2016.

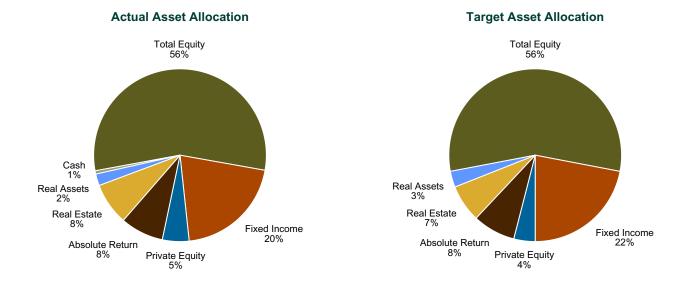
## **Asset Distribution Across Investment Managers**

	December 31,	2016	September 30	, 2016
	Market Value	Weight	Market Value	Weight
Total Domestic Equity	\$1,262,812,288	25.90%	\$1,255,617,513	25.74%
Northern Trust Global	496,913,959	10.19%	483,496,098	9.91%
Cornerstone Investment Partners	169,225,209	3.47%	174,360,576	3.57%
Polen Capital Management	162,461,031	3.33%	173,446,777	3.55%
Earnest Partners LLC	125,134,431	2.57%	127,856,412	2.62%
Dimensional Fund Advisors Inc.	212,747,086	4.36%	201,274,475	4.13%
		1.98%		1.95%
CastleArk Management	96,330,572	1.90%	95,183,176	1.95%
otal Global Equity	\$483,086,605	9.91%	\$493,785,833	10.12%
BlackRock Global Alpha Tilts	295,204,256	6.06%	295,337,198	6.05%
MFS Investment Management	187,882,349	3.85%	198,448,635	4.07%
otal International Equity	\$970,597,215	19.91%	\$981,508,726	20.12%
AQR Emerging Markets	101,834,998	2.09%	104,074,187	2.13%
Brandes Investment Partners	396,005,669	8.12%	391,921,338	8.03%
William Blair & Company	279,012,493	5.72%	295,035,454	6.05%
Dimensional Fund Advisors Inc.	193,744,054	3.97%	190,477,748	3.90%
otal Fixed Income	\$999,262,202	20.50%	\$1,027,144,263	21.05%
BlackRock US Debt Idx Fd	357,800,280	7.34%	121,246,285	2.49%
BlackRock Intermediate Agg	=		247,525,195	5.07%
Reams Asset Management	306.582.790	6.29%	315,124,926	6.46%
Loomis, Sayles & Company, L.P.	334,879,133	6.87%	343,247,857	7.04%
atal Drivata Facility	¢244.707.400	4.000/	\$222.20F.077	4.500/
otal Private Equity	\$241,767,198	4.96%	\$223,305,977	4.58%
Abbott Capital Management 2010	26,975,702	0.55%	26,305,398	0.54%
Abbott Capital Management 2011	40,482,237	0.83%	38,358,844	0.79%
Abbott Capital Management 2012	23,512,380	0.48%	20,978,293	0.43%
Abbott Capital Management 2013	17,712,043	0.36%	15,125,437	0.31%
Abbott Capital Management 2014	13,643,957	0.28%	11,674,514	0.24%
Abbott Capital Management 2015	4,487,302	0.09%	3,681,372	0.08%
Abbott Capital Management 2016	961,175	0.02%	709,379	0.01%
Mesirow V	67,199,032	1.38%	66,891,354	1.37%
Mesirow VI	22,539,298	0.46%	19,543,889	0.40%
NB Secondary Opp Fund III	15,804,548	0.32%	13,306,162	0.27%
Private Advisors	8,449,523	0.17%	6,731,335	0.14%
bsolute Return	\$392,561,950	8.05%	\$380,676,454	7.80%
Allianz SA 1000	108,985,976	2.24%	105,797,044	2.17%
Newton	88,770,705	1.82%	92,991,182	1.91%
UBS A & Q	194,805,269	4.00%	181,888,227	3.73%
Real Assets	\$107,494,737	2.20%	\$108,476,923	2.22%
Principal DRA	107,494,737	2.20%	108,476,923	2.22%
otal Real Estate	\$387,388,715	7.95%	\$392,267,801	8.04%
Real Estate	387,388,715	7.95%	392,267,801	8.04%
otal Cach	\$20,202,024	0.62%	¢16 170 504	0.33%
otal Cash	\$30,203,021		\$16,179,584	
Cash	30,203,021	0.62%	16,179,584	0.33%



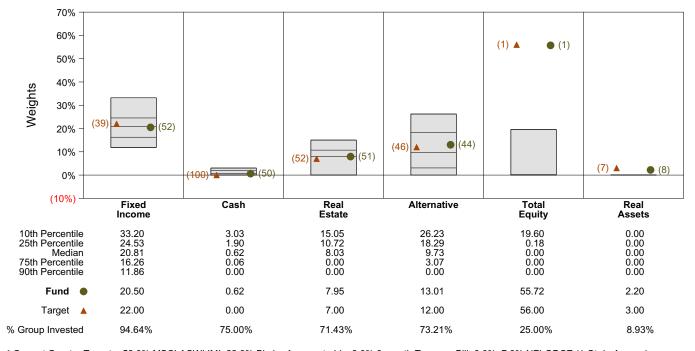
# Actual vs Target Asset Allocation As of December 31, 2016

The top left chart shows the Fund's asset allocation as of December 31, 2016. The top right chart shows the Fund's target asset allocation as outlined in the investment policy statement. The bottom chart ranks the fund's asset allocation and the target allocation versus the CAI Public Fund Sponsor - Large (>1B).



	\$000s	Weight		Percent	\$000s
Asset Class	Actual	Actual	Target	Difference	Difference
Total Equity	2,716,496	55.7%	56.0%	(0.3%)	(13,601)
Fixed Income	999,262	20.5%	22.0%	(1.5%)	(73,276)
Private Equity	241,767	5.0%	4.0%	`1.0%´	`46,760
Absolute Return	392,562	8.1%	8.0%	0.1%	2,548
Real Estate	387,389	7.9%	7.0%	0.9%	46,127
Real Assets	107,495	2.2%	3.0%	(0.8%)	(38,760)
Cash	30,203	0.6%	0.0%	`0.6%	`30,203
Total	4.875.174	100.0%	100.0%		

## Asset Class Weights vs CAI Public Fund Sponsor - Large (>1B)



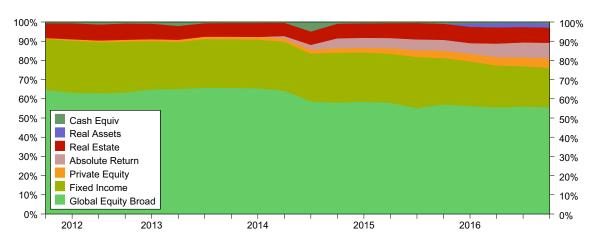
<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate Idx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark.



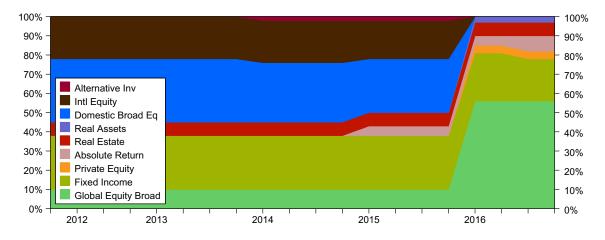
## **Actual vs Target Historical Asset Allocation**

The Historical asset allocation for a fund is by far the largest factor explaining its performance. The charts below show the fund's historical actual asset allocation, the fund's historical target asset allocation, and the historical asset allocation of the average fund in the CAI Public Fund Sponsor Database.

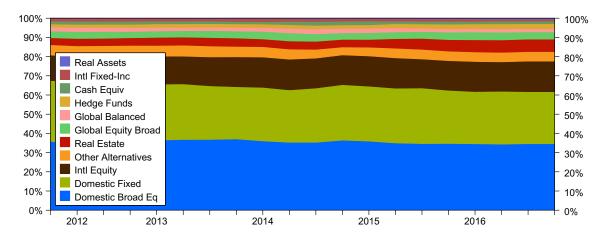
### **Actual Historical Asset Allocation**



### **Target Historical Asset Allocation**



### Average CAI Public Fund Sponsor Database Historical Asset Allocation



<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate Idx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark.



## Total Fund Period Ended December 31, 2016

### **Investment Philosophy**

The Public Fund Sponsor Database consists of public employee pension total funds including both Callan Associates client and surveyed non-client funds. Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% BB Barclays Aggregate Idx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark.

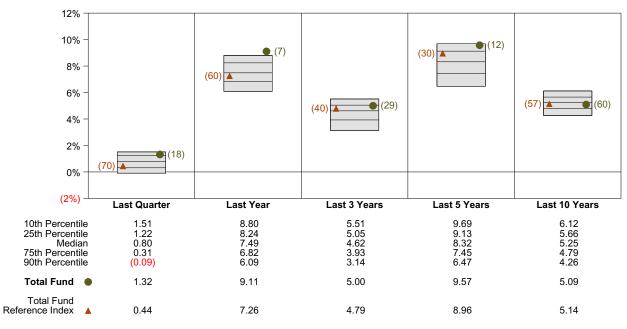
### **Quarterly Summary and Highlights**

- Total Fund's portfolio posted a 1.32% return for the quarter placing it in the 18 percentile of the CAI Public Fund Sponsor Database group for the quarter and in the 7 percentile for the last year.
- Total Fund's portfolio outperformed the Total Fund Reference Index by 0.88% for the quarter and outperformed the Total Fund Reference Index for the year by 1.85%.

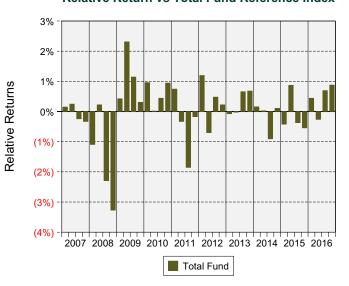
## **Quarterly Asset Growth**

Beginning Market Value	\$4,878,963,074
Net New Investment	\$-67,271,207
Investment Gains/(Losses)	\$63,482,065
Ending Market Value	\$4 875 173 932

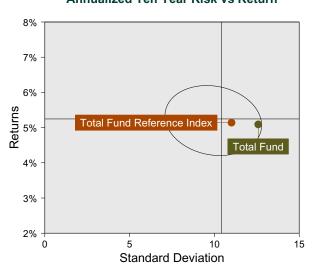
## Performance vs CAI Public Fund Sponsor Database (Gross)



## **Relative Return vs Total Fund Reference Index**



# CAI Public Fund Sponsor Database (Gross) Annualized Ten Year Risk vs Return



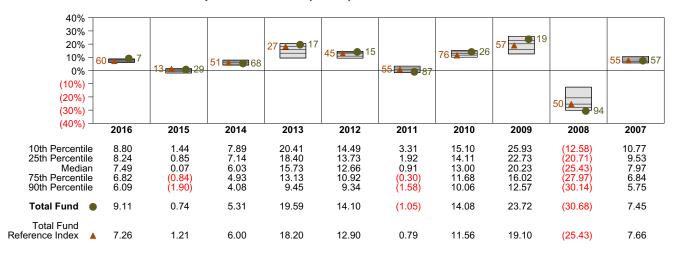


## Total Fund Return Analysis Summary

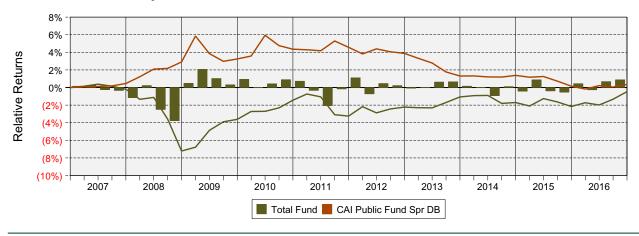
### **Return Analysis**

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

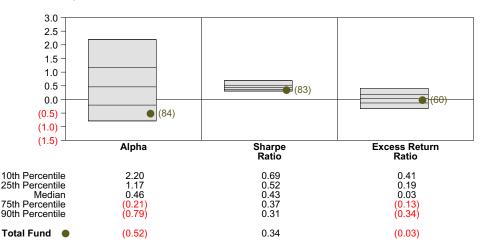
### Performance vs CAI Public Fund Sponsor Database (Gross)



### **Cumulative and Quarterly Relative Return vs Total Fund Reference Index**



Risk Adjusted Return Measures vs Total Fund Reference Index Rankings Against CAI Public Fund Sponsor Database (Gross) Ten Years Ended December 31, 2016



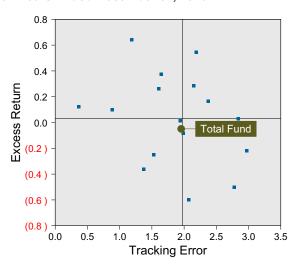


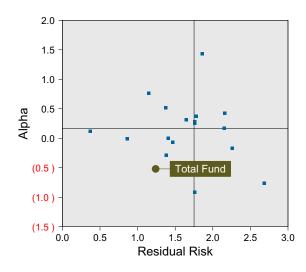
# Total Fund Total Fund vs Target Risk Analysis

#### **Risk Analysis**

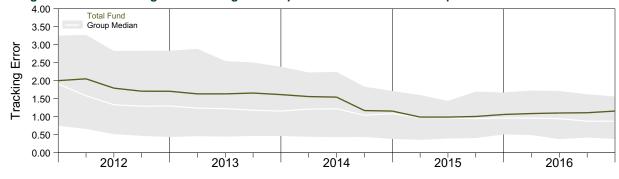
The graphs below analyze the performance and risk of the fund relative to the appropriate target mix. This relative performance is compared to a peer group of funds wherein each member fund is measured against its own target mix. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the target. The second scatter chart displays the relationship, sometimes called Information Ratio, between alpha (market-risk or "beta" adjusted return) and residual risk (non-market or "unsystematic" risk). The third chart shows tracking error patterns over time compared to the range of tracking error patterns for the peer group. The last two charts show the ranking of the fund's risk statistics versus the peer group.

## Risk Analysis vs CAI Public Fund Sponsor Database Ten Years Ended December 31, 2016

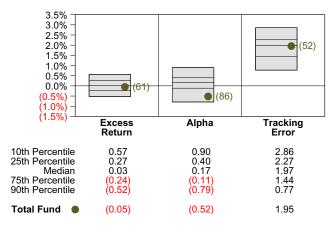


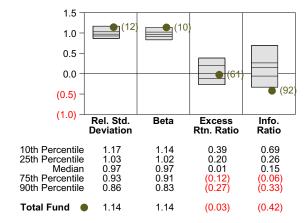


Rolling 12 Quarter Tracking Error vs Targets Compared to CAI Public Fund Sponsor Database



Risk Statistics Rankings vs Targets Rankings Against CAI Public Fund Sponsor Database Ten Years Ended December 31, 2016



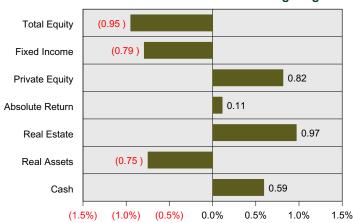




## Quarterly Total Fund Relative Attribution - December 31, 2016

The following analysis approaches Total Fund Attribution from the perspective of relative return. Relative return attribution separates and quantifies the sources of total fund excess return relative to its target. This excess return is separated into two relative attribution effects: Asset Allocation Effect and Manager Selection Effect. The Asset Allocation Effect represents the excess return due to the actual total fund asset allocation differing from the target asset allocation. Manager Selection Effect represents the total fund impact of the individual managers excess returns relative to their benchmarks.

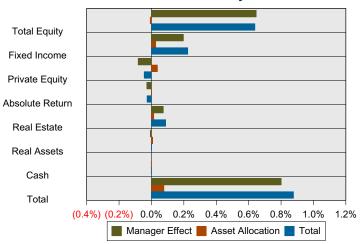




## **Actual vs Target Returns**

#### 2.44 (2.04) 3.34 5.05 0.48 0.82 2.88 1.96 (0.91) (0.57 0.18 1.32 0.44 (6%)(4%)(2%)0% 2% 4% 6% 8% Actual Target

### **Relative Attribution by Asset Class**



### Relative Attribution Effects for Quarter ended December 31, 2016

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	55%	56%	2.44%	1.27%	0.65%	(0.01%)	0.64%
Fixed Income	21%	22%	(2.04%)	(2.98%)	0.20%	0.03%	0.22%
Private Equity	5%	4%	`3.34%´	`5.05%′	(0.08%)	0.04%	(0.05%)
Absolute Return	8%	8%	0.48%	0.82%	(0.03%)	0.00%	(0.03%)
Real Estate	8%	7%	2.88%	1.96%	`0.07%´	0.01%	`0.09%
Real Assets	2%	3%	(0.91%)	(0.57%)	(0.01%)	0.01%	0.00%
Cash	1%	0%	0.18%	0.18%	0.00%′	(0.00%)	(0.00%)
Total			1.32% =	0.44% +	· 0.80% +	0.08%	0.88%

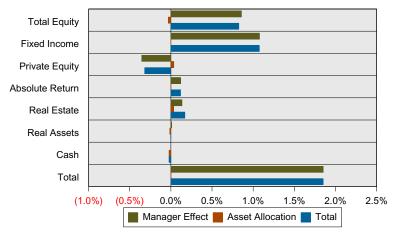
<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate Idx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark.



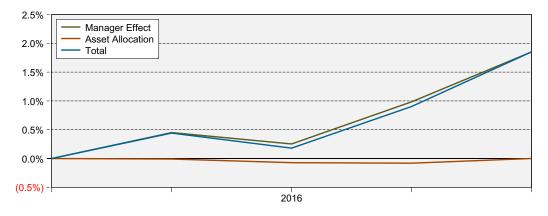
## **Cumulative Total Fund Relative Attribution - December 31, 2016**

The charts below accumulate the Total Fund Attribution Analysis (shown earlier) over multiple periods to examine the cumulative sources of excess total fund performance relative to target. These cumulative results quantify the longer-term sources of total fund excess return relative to target by asset class. These relative attribution effects separate the cumulative sources of total fund excess return into Asset Allocation Effect and Manager Selection Effect.

### **One Year Relative Attribution Effects**



### **Cumulative Relative Attribution Effects**



## **One Year Relative Attribution Effects**

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	56%	56%	9.91%	8.36%	0.86%	(0.03%)	0.83%
Fixed Income	22%	24%	7.40%	2.65%	1.08%	(0.00%)	1.08%
Private Equity	4%	4%	9.09%	17.97%	(0.35%)	0.04%	(0.32%)
Absolute Return	7%	6%	5.16%	3.33%	0.12%	(0.00%)	`0.12%´
Real Estate	8%	7%	11.38%	9.69%	0.14%	`0.03%′	0.17%
Real Assets	2%	3%	7.00%	6.77%	0.01%	(0.01%)	(0.00%)
Cash	1%	0%	1.94%	1.94%	0.00%	(0.02%)	_(0.02%)
Total			9.11% =	7.26%	+ 1.85% +	0.00%	1.85%

<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate ldx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark.



The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods ended December 31, 2016. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns and Rankings for Periods Ended December 31, 2016

	Last Quarter		Last Year		Last 3 Years		Last 5 Years		Since Inception
Total Domestic Equity	5.68%		13.91%		8.31%		14.58%		<b>6.64%</b> (7/98)
Russell 3000 Index	4.21%		12.74%		8.43%		14.67%		6.10% (7/98)
Northern Trust Global	3.83%	49	12.01%	19	8.95%	25	14.73%	39	10.16% (8/88)
S&P 500 Index	3.82%	51	11.96%	20	8.87%	28	14.66%	41	10.11% (8/88)
CAI Large Cap Core	3.83%		10.40%		8.30%		14.44%		-
Cornerstone Investment Partners	9.03%	23	16.62%	29	2.98%	100	-		11.65% (6/12)
S&P 500 Index	3.82%	96	11.96%	85	8.87%	29	14.66%	51	14.83% (6/12)
CAI Large Cap Value	7.09%		15.25%		8.28%		14.69%		-
Polen Capital Management	(0.61%)	55	1.70%	72	11.37%	2	-		13.66% (7/12)
S&P 500 Index	3.82%	4	11.96%	2	8.87%	18	14.66%	32	14.09% (7/12)
CAI Large Cap Growth	(0.43%)		3.42%		7.31%		13.98%		-
Earnest Partners LLC	5.22%	39	16.52%	29	9.20%	21	14.78%	40	10.04% (5/05)
Russell MidCap Index	3.21%	53	13.80%	42	7.92%	35	14.72%	42	9.44% (5/05)
CAI Mid Capitalization	4.21%		12.23%		6.55%		13.84%		-
Dimensional Fund Advisors Inc.	15.32%	18	29.36%	31	8.48%	65	17.40%	32	12.82% (11/96)
Russell 2000 Value Index	14.07%	39	31.74%	14	8.31%	73	15.07%	79	10.09% (11/96)
CAI Small Cap Value	13.73%		27.75%		9.13%		16.43%		-
CastleArk Management	1.21%	68	6.01%	68	2.29%	64	-		7.68% (9/13)
Russell 2000 Growth Index	3.57%	26	11.32%	35	5.05%	32	13.74%	41	9.21% (9/13)
CAI Small Cap Growth	2.53%		8.63%		3.44%		13.40%		-
Total Global Equity	(0.73%)		8.65%		2.87%		9.41%		<b>6.51%</b> (4/10)
MSCI World Index	1.86%		7.51%		3.80%		10.41%		7.97% (4/10)
BlackRock Global Alpha Tilts	1.35%	40	-		-		-		15.57% (3/16)
MSCI World Index	1.86%	33	7.51%	37	3.80%	45	10.41%	60	15.21% (3/16)
CAI Global Eq Broad Style	0.67%		6.41%		3.53%		10.74%		-
MFS Investment Management	(3.83%)	92	6.06%	54	3.68%	47	-		8.63% (12/12)
MSCI ACWI ldx	1.30%	41	8.48%	28	3.69%	47	9.96%	72	8.74% (12/12)
CAI Global Eq Broad Style	0.67%		6.41%		3.53%		10.74%		-



The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods ended December 31, 2016. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns and Rankings for Periods Ended December 31, 2016

	Last Quarter		Last Year		Last 3 Years		Last 5 Years		Since Inception	,
Total International Equity MSCI EAFE Index	(0.09%) (0.71%)		<b>5.78%</b> 1.00%		0.50% (1.60%)		<b>8.79%</b> 6.53%		<b>6.87%</b> 4.04%	(5/96) (5/96)
AQR Emerging Mkts MSCI EM Gross Emerging Mkts Equity DB	(2.15%) (4.08%) (4.40%)	18 42	- 11.60% 10.31%	40	(2.19%) (1.33%)	68	- 1.64% 3.39%	78	1.84% (0.37%) -	(8/16) (8/16)
Brandes Investment Partners MSCI EAFE Index CAI Non-U.S. Eq. Style	2.60% (0.71%) (1.80%)	3 35	8.50% 1.00% 1.47%	3 56	0.78% (1.60%) (0.55%)	17 65	8.21% 6.53% 7.39%	29 73	8.15% 4.07% -	(2/98) (2/98)
William Blair & Company MSCI ACWI ex-US Index CAI Non-U.S. Eq. Style	(4.10%) (1.20%) (1.80%)	82 44	(1. <mark>45%)</mark> 5.01% 1.47%	82 16	(1.02%) (1.32%) (0.55%)	55 62	7.92% 5.48% 7.39%	37 89	6.89% 6.36% -	(12/03) (12/03)
Dimensional Fund Advisors Inc. Blended Benchmark CAI Intl Small Cap	1.71% (2.86%) (3.70%)	4 35	8.00% 2.18% (0.17%)	8 32	2.19% 2.10% 2.35%	52 53	11.68% 10.56% 11.72%	52 71	4.52% 2.12% -	(5/06) (5/06)
Total Fixed Income Blmbg Capital Aggregate	<b>(2.04%)</b> (2.98%)		<b>7.40%</b> 2.65%		<b>2.88%</b> 3.03%		<b>3.34%</b> 2.23%		<b>7.76%</b> 6.49%	(12/87) (12/87)
BlackRock US Debt ldx Fd Blmbg Aggregate ldx CAI Core Bond FI	(2.98%) (2.98%) (2.73%)	87 87	2.65% 3.13%	86	3.03% 3.39%	87	2.23% 2.86%	97	(1.97%) (0.78%)	
Reams Asset Management Blmbg Capital Aggregate CAI Intermediate FI	(2.71%) (2.98%) (1.91%)	100 100	4.38% 2.65% 2.33%	2 28	2.94% 3.03% 2.31%	6 5	3.09% 2.23% 2.27%	6 52	5.76% 4.82% -	(1/01) (1/01)
Loomis, Sayles & Company, L.P. Blmbg Capital Aggregate CAI Core Plus FI	(0.40%) (2.98%) (2.33%)	2 99	13.97% 2.65% 4.67%	1 99	4.28% 3.03% 3.54%	15 94	6.04% 2.23% 3.72%	1 100	9.27% 6.49% -	(12/87) (12/87)
Total Private Equity Abbott Capital Management 2010 Abbott Capital Management 2011 Abbott Capital Management 2012 Abbott Capital Management 2013 Abbott Capital Management 2014 Abbott Capital Management 2015 Abbott Capital Management 2016 Mesirow V Mesirow VI NB Secondary Opp Fund III Private Advisors Russell 3000 (1 Qtr in Arrears) + 3%	3.34% 3.87% 3.31% 3.25% 2.86% 1.66% 0.42% (1.36%) 3.95% 1.39% 7.04% 2.18% 5.05%		9.09% 11.03% 10.43% 9.42% 5.25% 2.86% (5.11%) - 12.03% 3.32% 12.83% (1.34%) 17.97%		12.25% 11.90% 9.90% 5.57% 1.72% - - 17.43% 0.47% 21.69% - 13.48%		9.71% 8.14% 4.86% - - - - 14.56% - - - 19.41%		6.53% (12.83%) (10.24%) 1.11% (0.11%) (4.17%) 3.14% (0.19%) 12.14% 0.37% (10.63%) 7.92%	(6/11) (7/12) (5/13) (4/14) (4/15) (3/16) (6/10) (7/13) (12/13)
Absolute Return	0.48%		5.16%		-		-		5.23%	(6/14)
Allianz SA 1000 T-Bills + 10% CAI Abs Return Hedge FoF	3.01% 2.49% 2.23%	13 25	11.15% 10.33% 3.53%	1	- 10.14% 1.89%	1	- 10.12% 4.27%	1	10.41% 10.15% -	(6/14) (6/14)
Newton 1-month LIBOR + 4% CAI Abs Return Hedge FoF	(4.54%) 1.12% 2.23%	100 73	3.31% 4.49% 3.53%	53 18	- 4.28% 1.89%	1	4.26% 4.27%	50	2.51% 4.31% -	(8/14) (8/14)
UBS A & Q 1-month LIBOR + 4% CAI Abs Return Hedge FoF	1.53% 1.12% 2.23%	65 73	2.42% 4.49% 3.53%	66 18	- 4.28% 1.89%	1	4.26% 4.27%	50	3.12% 4.34% -	(12/14) (12/14)
Real Assets	(0.91%)		7.00%		-		-		7.00%	(1/16)
Principal DRA Principal Blended Benchmark (1) CAI Alternative Invest DB	(0.91%) (0.57%) 2.55%	79 78	7.00% 6.77% 9.96%	66 69	- (1.00%)		- - 1.06%		7.00% 6.77% -	(1/16) (1/16)
Total Real Estate	2.88%		11.38%		12.89%		12.28%		6.55%	(7/86)
Real Estate Blended Benchmark (2) CAI Total Real Estate DB	2.88% 1.96% 1.87%	19 47	11.38% 9.69% 8.34%	22 33	12.89% 11.58% 11.89%	42 52	12.28% 11.34% 11.89%	42 62	6.55% - -	(7/86)
Total Fund Total Fund Reference Index*	<b>1.32%</b> 0.44%		<b>9.11%</b> 7.26%		<b>5.00%</b> 4.79%		<b>9.57%</b> 8.96%		9.52% -	(1/79)

<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate Idx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark. (1) Current Principal Blended Benchmark = 35% Barclays US Treasury US TIPS Idx, 15% Bloomberg Commodity Idx, 20% S&P Global Infrastructure Idx, 20% S&P Global Natural Resources Idx and 10% FTSE EPRA/NAREIT Developed Market Idx. (2) Blended Benchmark = NCREIF (NPI) through 6/30/06, NCREIF (NPI 1 Qtr Arrears) through 12/31/13 and NFI-ODCE (1 Qtr Arrears) thereafter.



The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

	2016		2015		2014		2013		2012	
Total Domestic Equity	13.91%		(0.07%)		11.63%		33.86%		16.12%	
Russell 3000 Index	12.74%		0.48%		12.56%		33.55%		16.42%	
Northern Trust Global	12.01%	19	1.49%	46	13.77%	47	32.46%	77	16.07%	48
S&P 500 Index	11.96%	20	1.38%	51	13.69%	48	32.39%	77	16.00%	48
CAI Large Cap Core	10.40%		1.41%		13.63%		34.49%		15.89%	
Cornerstone Investment Partners	16.62%	29	(13.54%)	99	8.32%	95	34.87%	46	-	
S&P 500 Index	11.96%	85	1.38%	3	13.69%	27	32.39%	75	16.00%	59
CAI Large Cap Value	15.25%		(2.56%)		12.54%		34.59%		16.78%	
Polen Capital Management	1.70%	72	15.51%	3	17.60%	6	23.45%	99	-	
S&P 500 Index	11.96%	2	1.38%	93	13.69%	25	32.39%	79	16.00%	55
CAI Large Cap Growth	3.42%		6.43%		11.83%		35.60%		16.14%	
Earnest Partners LLC	16.52%	29	1.25%	27	10.38%	46	31.29%	90	16.53%	47
Russell MidCap Index	13.80%	42	(2.44%)	67	13.22%	23	34.76%	63	17.28%	41
CAI Mid Capitalization	12.23%		(0.69%)		9.88%		35.84%		16.26%	
Dimensional Fund Advisors Inc.	29.36%	31	(6.06%)	76	5.04%	67	42.70%	23	22.43%	20
Russell 2000 Value Index	31.74%	14	(7.47%)	83	4.22%	82	34.52%	81	18.05%	50
CAI Small Cap Value	27.75%		(3.73%)		5.93%		38.72%		18.12%	
CastleArk Management	6.01%	68	(4.90%)	78	6.15%	31	-		-	
Russell 2000 Growth Index	11.32%	35	(1.38%)	50	5.60%	32	43.30%	74	14.59%	50
CAI Small Cap Growth	8.63%		(1.29%)		3.41%		46.83%		14.56%	
Total Global Equity	8.65%		(2.08%)		2.32%		24.81%		15.39%	
MSCI The World Index	7.51%		(0.87%)		4.94%		26.68%		15.83%	
MFS Investment Management	6.06%	54	(0.49%)	60	5.59%	34	23.08%	79	-	
MSCI ACWI ldx	8.48%	28	(1.84%)	72	4.71%	47	23.44%	78	16.80%	59
CAI Global Eq Broad Style	6.41%		0.17%		4.57%		27.98%		17.49%	



The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

	2016		2015		2014		2013		2012	
Total International Equity MSCI EAFE Index	<b>5.78%</b> 1.00%		<b>(0.41%)</b> (0.81%)		<b>(3.63%)</b> (4.90%)		<b>26.26%</b> 22.78%		<b>18.88%</b> 17.32%	
Brandes Investment Partners MSCI EAFE Index CAI Non-U.S. Eq. Style	8.50% 1.00% 1.47%	3 56	(1.25%) (0.81%) 0.48%	67 62	(4.45%) (4.90%) (3.88%)	56 61	29.45% 22.78% 22.49%	8 47	11.97% 17.32% 19.26%	97 70
William Blair & Company MSCI ACWI ex-US Index CAI Non-U.S. Eq. Style	(1.45%) 5.01% 1.47%	82 16	0.18% ( <mark>5.25%)</mark> 0.48%	53 92	(1.77%) (3.44%) (3.88%)	23 47	21.92% 15.78% 22.49%	54 89	23.79% 17.39% 19.26%	10 69
Dimensional Fund Advisors Inc. Blended Benchmark CAI Intl Small Cap	8.00% 2.18% (0.17%)	8 32	3.99% 9.59% 10.05%	86 56	(4.99%) (4.95%) (3.42%)	67 67	32.60% 29.30% 31.13%	35 67	22.79% 20.00% 23.55%	63 79
Total Fixed Income Blmbg Capital Aggregate	<b>7.40%</b> 2.65%		<b>(2.49%)</b> 0.55%		<b>4.00%</b> 5.97%		<b>(0.53%)</b> (2.02%)		<b>8.82%</b> 4.21%	
BlackRock Intermediate Agg Blmbg Capital Int Aggregate CAI Intermediate FI	1.97% 2.33%	72	1.31% 1.21% 1.28%	43 64	4.37% 4.12% 3.47%	9 13	(0.93%) (1.02%) (0.49%)	67 74	3.68% 3.56% 4.89%	86 87
Reams Asset Management Blmbg Capital Aggregate CAI Core Plus FI	4.38% 2.65% 4.67%	63 99	0.38% 0.55% 0.34%	49 38	4.09% 5.97% 6.20%	97 61	(1.08%) (2.02%) (0.68%)	75 96	7.94% 4.21% 8.67%	61 100
Loomis, Sayles & Company, L.P. Blmbg Capital Aggregate CAI Core Plus FI	13.97% 2.65% 4.67%	1 99	(6.10%) 0.55% 0.34%	100 38	5.94% 5.97% 6.20%	61 61	2.41% (2.02%) (0.68%)	4 96	15.47% 4.21% 8.67%	1 100
CAI Global FI (Unhedged)	2.23%		(3.38%)		1.29%		(2.66%)		6.61%	
Total Private Equity Abbott Capital Management 2010 Abbott Capital Management 2011 Abbott Capital Management 2012 Abbott Capital Management 2013 Abbott Capital Management 2014 Abbott Capital Management 2015 Mesirow V Mesirow VI NB Secondary Opp Fund III Private Advisors Russell 3000 (1 Qtr in Arrears) + 3%	9.09% 11.03% 10.43% 9.42% 5.25% 2.86% (5.11%) 12.03% 3.32% 12.83% (1.34%) 17.97%		12.34% 12.32% 10.12% 2.45% 2.23% 0.39% 		15.40% 12.36% 9.17% 4.97% (2.17%) - 21.07% 2.22% 19.77% - 20.79%		8.66% 7.33% 1.20% (2.50%) - - 14.22% - - 24.63%		3.44% (1.66%) (5.63%) - - - - 6.65% - - - 33.30%	
Absolute Return	5.16%		4.92%		-		-		-	
Allianz SA 1000 T-Bills + 10% CAI Abs Return Hedge FoF	11.15% 10.33% 3.53%	1 1	9.76% 10.05% (0.33%)	1	- 10.03% 3.78%	1	- 10.07% 8.92%	34	- 10.11% 6.42%	9
Newton 1-month LIBOR + 4% CAI Abs Return Hedge FoF	3.31% 4.49% 3.53%	53 18	1.50% 4.19% (0.33%)	29 8	- 4.16% 3.78%	39	- 4.19% 8.92%	89	- 4.24% 6.42%	79
UBS A & Q 1-month LIBOR + 4% CAI Abs Return Hedge FoF	2.42% 4.49% 3.53%	66 18	4.09% 4.19% (0.33%)	9 8	- 4.16% 3.78%	39	- 4.19% 8.92%	89	- 4.24% 6.42%	79
Total Real Estate	11.38%		13.44%		13.87%		13.58%		9.22%	
Real Estate Blended Benchmark (1) CAI Total Real Estate DB	11.38% 9.69% 8.34%	22 33	13.44% 13.82% 14.50%	57 55	13.87% 11.26% 12.61%	45 61	13.58% 10.99% 11.85%	41 59	9.22% 11.00% 10.67%	60 48
Total Fund Total Fund Reference Index*	<b>9.11%</b> 7.26%		<b>0.74%</b> 1.21%		<b>5.31%</b> 6.00%		<b>19.59%</b> 18.20%		<b>14.10%</b> 12.90%	

<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate Idx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark. (1) Blended Benchmark = NCREIF (NPI) through 6/30/06, NCREIF (NPI 1 Qtr Arrears) through 12/31/13 and NFI-ODCE (1 Qtr Arrears) thereafter.



## **Investment Manager Returns**

The table below details the rates of return for the Fund's investment managers over various time periods ended December 31, 2016. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

## Returns for Periods Ended December 31, 2016

	Last	Last	Last 3	Last 5	Since
et of Fee Returns	Quarter	Year	Years	Years	Inception
Total Domestic Equity	5.60%	13.55%	7.97%	14.23%	6.30% (7/98)
Russell 3000 Index	4.21%	12.74%	8.43%	14.67%	6.10% (7/98)
Northern Trust Global	3.82%	11.99%	8.93%	14.71%	9.24% (9/94)
S&P 500 Index	3.82%	11.96%	8.87%	14.66%	9.27% (9/94)
Cornerstone Investment Partners S&P 500 Index	8.93% 3.82%	16.16% 11.96%	2.57% 8.87%	- 14.66%	11.21% (6/12) 14.83% (6/12)
Polen Capital Management	(0.73%)	1.19%	10.82%	14.00%	13.09% (7/12)
S&P 500 Index	3.82%	11.96%	8.87%	14.66%	14.09% (7/12)
Earnest Partners LLC	5.08%	15.90%	8.62%	14.16%	9.19% (5/05)
Russell MidCap Index Dimensional Fund Advisors Inc.	3.21%	13.80%	7.92%	14.72%	9.44% (5/05)
Russell 2000 Value Index	15.17% 14.07%	28.68% 31.74%	7.89% 8.31%	16.77% 15.07%	12.15% (11/96) 10.09% (11/96)
CastleArk Management	1.04%	5.30%	1.61%	-	6.97% (9/13)
Russell 2000 Growth Index	3.57%	11.32%	5.05%	13.74%	9.21% (9/13)
Total Global Equity	(0.82%)	8.26%	2.50%	9.00%	6.06% (4/10)
MSCI World Index	1.86%	7.51%	3.80%	10.41%	7.97% (4/10)
BlackRock Global Alpha Tilts	1.34%	-	-	-	15.53% (3/16)
MSCI World MFS Investment Management	1.86% (3.93%)	7.51% 5.62%	3.80% 3.26%	10.41%	15.21% (3/16) 8.20% (12/12)
MSCI ACWI Idx	1.30%	8.48%	3.69%	9.96%	8.20% (12/12) 8.74% (12/12)
Total International Equity	(0.21%)	5.27%	0.02%	8.23%	6.07% (5/96)
MSCI EAFE Index	(0.71%)	1.00%	(1.60%)	6.53%	4.04% (5/96)
AQR Emerging Markets	(2.15%)	-	-	-	1.84% (8/16)
MSCI EM Gross Brandes Investment Partners	(4.08%)	11.60%	(2.19%)	1.64%	(0.37%) (8/16) 7.38% (2/98)
MSCI EAFE Index	2.50% (0.71%)	8.05% 1.00%	0.37% (1.60%)	7.77% 6.53%	7.38% (2/98) 4.07% (2/98)
William Blair & Company	(4.20%)	(1.84%)	(1.41%)	7.49%	6.45% (12/03
MSCI ACWI ex-US Index	(1.20%)	5.01%	(1.32%)	5.48%	6.36% (12/03)
Dimensional Fund Advisors Inc.	1.71%	8.00%	2.19%	11.55%	4.08% (5/06)
Blended Benchmark	(2.86%)	2.18%	2.10%	10.56%	2.12% (5/06)
Total Fixed Income Blmbg Capital Aggregate	(2.09%) (2.98%)	7.21% 2.65%	2.73% 3.03%	3.19% 2.23%	6.83% (9/94) 5.64% (9/94)
BlackRock US Debt Idx Fd	(2.99%)	2.0370	3.0370	2.2570	(2.01%) (6/16)
Blmbg Aggregate Idx	(2.98%)	2.65%	3.03%	2.23%	(0.78%) (6/16)
Reams Asset Management	(2.75%)	4.22%	2.78%	2.94%	5.51% (1/01)
Loomis, Sayles & Company, L.P. Blmbg Capital Aggregate	(0.44%) (2.98%)	13.82% 2.65%	4.15% 3.03%	5.91% 2.23%	8.46% (9/94) 5.64% (9/94)
Total Private Equity	3.34%	9.09%	12.25%	9.71%	6.53% (6/10)
Abbott Capital Management 2010	3.87%	11.03%	11.90%	8.14%	(12.83%) (6/10)
Abbott Capital Management 2011	3.31%	10.43%	9.90%	4.86%	(10.24%) (6/11)
Abbott Capital Management 2012	3.25%	9.42%	5.57%	=	1.11% (7/12)
Abbott Capital Management 2013 Abbott Capital Management 2014	2.86% 1.66%	5.25% 2.86%	1.72%	-	(0.11%) (5/13) (4.17%) (4/14)
Abbott Capital Management 2015	0.42%	(5.11%)	-	-	(4.17%) (4/14) 3.14% (4/15)
Abbott Capital Management 2016	(1.36%)	(0/0)	-	-	(0.19%) (3/16)
Mesirow V	3.95%	12.03%	17.43%	14.56%	12.14% (6/10)
Mesirow IV	1.39%	3.32%	0.47%	-	0.37% (7/13)
NB Secondary Opp Fund III Private Advisors	7.04% 2.18%	12.83% (1. <mark>34%</mark> )	21.69%	-	8.78% (12/13) (10.63%) (4/15)
Russell 3000 (1 Qtr in Arrears) + 3%	5.05%	17.97%	13.48%	19.41%	7.92% (4/15)
Absolute Return	0.48%	5.16%	-	-	5.23% (6/14)
Allianz SA 1000	3.01%	11.15%	-	-	10.41% (6/14)
T-Bills + 10%	2.49%	10.33%	10.14%	10.12%	10.15% (6/14)
Newton 1-month LIBOR + 4%	( <del>4.54%)</del> 1.12%	3.31% 4.49%	4.28%	4.26%	2.51% (8/14) 4.31% (8/14)
UBS A & Q	1.53%	2.42%	-		3.12% (12/14)
1-month LIBOR + 4%	1.12%	4.49%	4.28%	4.26%	4.34% (12/14)
Real Assets	(0.91%)	7.00%	-	-	7.00% (1/16)
Principal DRA Principal Blended Benchmark (1)	(0.91%) (0.57%)	7.00% 6.77%	<del>-</del> -	- -	7.00% (1/16) 6.77% (1/16)
Total Real Estate	2.82%	11.09%	12.59%	11.94%	5.36% (7/86)
Real Estate	2.82%	11.09%	12.59%	11.94%	5.36% (7/86)
Blended Benchmark (2)	1.96%	9.69%	11.58%	11.34%	-
Total Fund	1.25%	8.80%	4.71%	9.27%	9.14% (1/79)
Total Fund Reference Index*	0.44%	7.26%	4.79%	8.96%	- ' '

<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate Idx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark. (1) Current Principal Blended Benchmark = 35% Barclays US Treasury US TIPS Idx, 15% Bloomberg Commodity Idx, 20% S&P Global Infrastructure Idx, 20% S&P Global Natural Resources Idx and 10% FTSE EPRA/NAREIT Developed Market Idx. (2) Blended Benchmark consists of NCREIF (NPI) through 6/30/06, NCREIF (NPI 1 Qtr Arrears) through 12/31/13 and NFI-ODCE (1 Qtr Arrears) thereafter.



## **Investment Manager Returns**

The table below details the rates of return for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

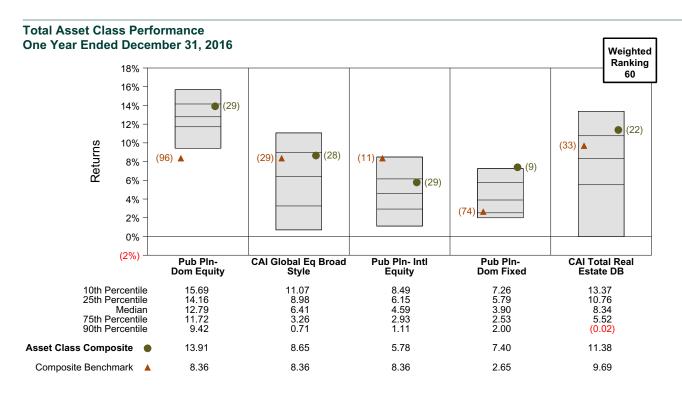
	2016	2015	2014	2013	2012
Net of Fee Returns					
Total Domestic Equity	13.55%	(0.39%)	11.28%	33.44%	15.82%
Russell 3000 Index	12.74%	0.48%	12.56%	33.55%	16.42%
Northern Trust Global	11.99%	1.47%	13.75%	32.43%	16.04%
S&P 500 Index	11.96%	1.38%	13.69%	32.39%	16.00%
Cornerstone Investment Partners	16.16%	(13.89%)	7.89%	34.35%	-
S&P 500 Index	11.96%	1.38%	13.69%	32.39%	16.00%
Polen Capital Management	1.19%	14.94%	17.02%	22.84%	-
S&P 500 Index	11.96%	1.38%	13.69%	32.39%	16.00%
Earnest Partners LLC	15.90%	0.71%	9.79%	30.60%	15.87%
Russell MidCap Index	13.80%	(2.44%)	13.22%	34.76%	17.28%
Dimensional Fund Advisors Inc.	28.68%	(6.57%)	4.47%	41.95%	21.77%
Russell 2000 Value Index	31.74%	(7.47%)	4.22%	34.52%	18.05%
CastleArk Management	5.30%	(5.54%)	5.45%	-	-
Russell 2000 Growth Index	11.32%	(1.38%)	5.60%	43.30%	14.59%
Total Global Equity	8.26%	(2.44%)	1.95%	24.37%	14.88%
MSCI The World Index	7.51%	(0.87%)	4.94%	26.68%	15.83%
MFS Investment Management	5.62%	(0.89%)	5.17%	22.47%	-
MSCI ACWI	8.48%	(1.84%)	4.71%	23.44%	16.80%
Total International Faulty	5.27%	(0.90%)	(4.09%)	25.66%	18.32%
Total International Equity		(0.89%)	(4.90%)	22.78%	
MSCI EAFE Index Brandes Investment Partners	1.00% 8.05%	(0.81%) (1.66%)	(4.84%)	28.93%	17.32% 11.51%
MSCI EAFE Index	1.00%	(0.81%)	(4.90%)	22.78%	17.32% 23.38%
William Blair & Company	(1.84%)	(0.22%)	(2.17%)	21.36%	
MSCI ACWI ex-US Index Dimensional Fund Advisors Inc.	5.01% 8.00%	(5.25%) 3.99%	(3.44%) (4.99%)	15.78% 32.39%	17.39% 22.26%
Blended Benchmark	2.18%	3.99% 9.59%	(4.95%)	32.39% 29.30%	20.00%
Total Fixed Income	7.21%	(2.63%)	3.85%	(0.69%)	8.65%
Blmbg Capital Aggregate	2.65%	0.55%	5.97%	(2.02%)	4.21%
BlackRock Intermediate Agg	4.070/	1.28%	4.34%	(0.96%)	3.65%
Blmbg Capital Int Aggregate	1.97%	1.21%	4.12%	(1.02%)	3.56%
Reams Asset Management	4.22%	0.23%	3.94%	(1.23%)	7.78%
Loomis, Sayles & Company, L.P.	13.82%	(6.20%)	5.82%	2.29%	15.33%
Blmbg Capital Aggregate	2.65%	0.55%	5.97%	(2.02%)	4.21%
Total Private Equity	9.09%	12.34%	15.40%	8.66%	3.44%
Abbott Capital Management 2010	11.03%	12.32%	12.36%	7.33%	(1.66%)
Abbott Capital Management 2011	10.43%	10.12%	9.17%	1.20%	(5.63%)
Abbott Capital Management 2012	9.42%	2.45%	4.97%	(2.50%)	-
Abbott Capital Management 2013	5.25%	2.23%	(2.17%)	-	-
Abbott Capital Management 2014	2.86%	0.39%	-	-	-
Abbott Capital Management 2015	(5.11%)	-	-	-	-
Mesirow V	12.03%	19.41%	21.07%	14.22%	6.65%
Mesirow VI	3.32%	(3.99%)	2.22%	-	-
NB Secondary Opp Fund III	12.83%	33.37%	19.77%	-	-
Private Advisors	(1.34%)	-	-	-	-
Russell 3000 (1 Qtr in Arrears) + 3%	17.97%	2.56%	20.79%	24.63%	33.30%
Absolute Return	5.16%	4.92%	-	-	-
Allianz SA 1000	11.15%	9.76%	-	-	-
T-Bills + 10%	10.33%	10.05%	10.03%	10.07%	10.11%
Newton	3.31%	1.50%	-	-	-
1-month LIBOR + 4%	4.49%	4.19%	4.16%	4.19%	4.24%
UBS A & Q	2.42%	4.09%	-	-	-
1-month LIBOR + 4%	4.49%	4.19%	4.16%	4.19%	4.24%
Total Real Estate	11.09%	13.15%	13.54%	13.15%	8.83%
Real Estate	11.09%	13.15%	13.54%	13.15%	8.83%
Blended Benchmark (1)	9.69%	13.82%	11.26%	10.99%	11.00%
Total Fund	8.80%	0.46%	5.02%	19.26%	13.78%
Total Fund Reference Index*	7.26%	1.21%	6.00%	18.20%	12.90%
		* *			

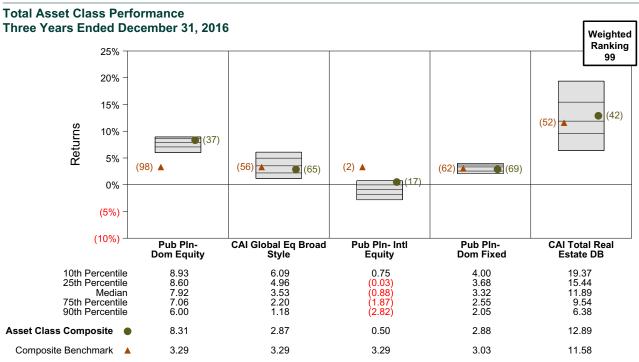
<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate Idx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark. (1) Blended Benchmark = NCREIF (NPI) through 6/30/06, NCREIF (NPI 1 Qtr Arrears) through 12/31/13 and NFI-ODCE (1 Qtr Arrears) thereafter.



## **Asset Class Rankings**

The charts below show the rankings of each asset class component of the Total Fund relative to appropriate comparative databases. In the upper right corner of each graph is the weighted average of the rankings across the different asset classes. The weights of the fund's actual asset allocation are used to make this calculation. The weighted average ranking can be viewed as a measure of the fund's overall success in picking managers and structuring asset classes.



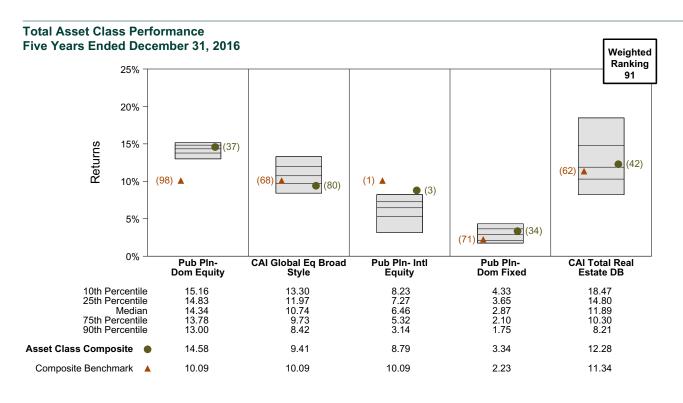


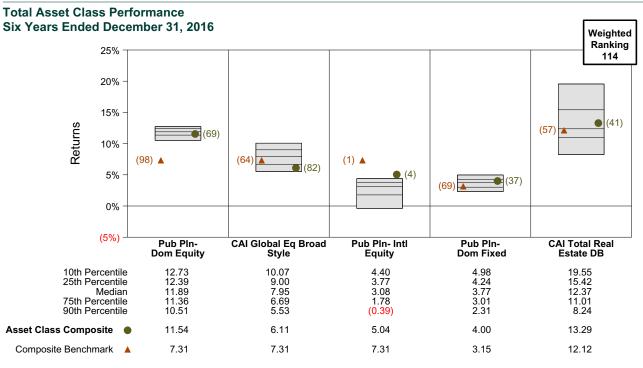
<sup>\*</sup> Current Quarter Target = 56.0% MSCI ACWI IMI, 22.0% Blmbg Aggregate ldx, 8.0% 3-month Treasury Bill+3.0%, 7.0% NFI-ODCE (1 Qtr in Arrears), 4.0% Russell 3000 (1 Qtr in Arrears)+3.0% and 3.0% Principal Blended Benchmark.



## **Asset Class Rankings**

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## **Research and Educational Programs**

The Callan Institute provides research that updates clients on the latest industry trends while helping them learn through carefully structured educational programs. Visit www.callan.com/research to see all of our publications, or for more information contact Anna West at 415.974.5060 / institute@callan.com.

## **New Research from Callan's Experts**

2017 Defined Contribution Trends Survey | Callan's 10th Annual DC Trends Survey highlights plan sponsors' key themes from 2016 and expectations for 2017.

ESG Factors: U.S. Investor Usage Crystalizes | This charticle looks at environmental, social, and governance (ESG) factors from the perspectives of U.S. asset owners and global investment managers, revealing the growing incorporation of ESG factors in investment decision making.



Fixed Income: A Macroeconomic Lightning Rod | Callan's October 2016 Regional Workshop addressed alternative fixed income strategies to deal with the shifting market and economic environment investors face, as the extended period of low yields in the wake of the Global Financial Crisis appears to be ending.

ESG Interest and Implementation Survey | Callan's fourth annual survey on the status of ESG factor integration in the U.S. institutional market reflects responses from 84 funds representing approximately \$843 billion in assets.

2016 Cost of Doing Business Survey | In this survey, Callan compares the costs of administering and operating



funds and trusts across all types of tax-exempt and taxqualified organizations in the U.S. We identify practices and trends to help institutional investors manage expenses.

ESG and Investors: What, Why, and Who | In this video, Mark Wood, CFA, of Callan's Global Manager Research group explains ESG investing principles and how asset managers can implement them.

Momentum: The Trend Is Your Friend | Callan's director of Hedge Fund Research, Jim McKee, explores the advantages of momentum-based investing strategies, which profit from market trends in whichever direction. He discusses the rationale behind them, how they are defined and harnessed for different diversification needs, and whether they are appropriate for fund sponsors.

### Periodicals

Private Markets Trends, Fall 2016 | Gary Robertson, manager of Callan's Private Equity Research group, discusses the steady performance of private markets in 2016, with yearto-date figures tracking very close to 2015's levels.

DC Observer, 3rd Quarter 2016 | This quarter's cover story is "Merging DC Plans: Making the Transition Smooth."

Hedge Fund Monitor, 3rd Quarter 2016 | This quarter's cover story is "Musketeers or Mercenaries...," on the growing appeal of the multi-strategy hedge fund category.

Capital Market Review, 3rd Quarter 2016 | A quarterly macroeconomic newsletter providing thoughtful insights on the economy and recent performance in equity, fixed income, alternatives, international, real estate, and other capital markets.

### **Events**

Miss out on a Callan conference or workshop? Event summaries and speakers' presentations are available on our website: https://www.callan.com/education/CII/

Mark your calendars for our **National Conference**, January 23–25, 2017, at the Palace Hotel in San Francisco.

For more information about events, please contact Barb Gerraty: 415.274.3093 / gerraty@callan.com

# The Center for Investment Training Educational Sessions

The Center for Investment Training, better known as the "Callan College," provides a foundation of knowledge for industry professionals who are involved in the investment decision-making process. It was founded in 1994 to provide clients and non-clients alike with basic- to intermediate-level instruction. Our next sessions are:

### Introduction to Investments

San Francisco, April 18-19, 2017 San Francisco, July 25-26, 2017 Chicago, October 24-25, 2017

This program familiarizes fund sponsor trustees, staff, and asset management advisors with basic investment theory, terminology, and practices. It lasts one-and-a-half days and is designed for individuals who have less than two years of experience with asset-management oversight and/or support responsibilities. Tuition for the Introductory "Callan College" session is \$2,350 per person. Tuition includes instruction, all materials, breakfast and lunch on each day, and dinner on the first evening with the instructors.

#### **Customized Sessions**

The "Callan College" is equipped to customize a curriculum to meet the training and educational needs of a specific organization. These tailored sessions range from basic to advanced and can take place anywhere—even at your office.

Learn more at https://www.callan.com/education/college/ or contact Kathleen Cunnie: 415.274.3029 / cunnie@callan.com

## **Education: By the Numbers**

**500** 

Attendees (on average) of the Institute's annual National Conference

**50**+

Unique pieces of research the Institute generates each year

3,500

Total attendees of the "Callan College" since 1994

1980

Year the Callan Institute was founded



"We think the best way to learn something is to teach it.

Entrusting client education to our consultants and specialists ensures that they have a total command of their subject matter. This is one reason why education and research have been cornerstones of our firm for more than 40 years."

Ron Peyton, Chairman and CEO



## **List of Callan's Investment Manager Clients**

Confidential - For Callan Client Use Only

Callan takes its fiduciary and disclosure responsibilities to clients very seriously. We recognize that there are numerous potential conflicts of interest encountered in the investment consulting industry and that it is our responsibility to manage those conflicts effectively and in the best interest of our clients. At Callan, we employ a robust process to identify, manage, monitor and disclose potential conflicts on an on-going basis.

The list below is an important component of our conflicts management and disclosure process. It identifies those investment managers that pay Callan fees for educational, consulting, software, database or reporting products and services. We update the list quarterly because we believe that our fund sponsor clients should know the investment managers that do business with Callan, particularly those investment manager clients that the fund sponsor clients may be using or considering using. Please refer to Callan's ADV Part 2A for a more detailed description of the services and products that Callan makes available to investment manager clients through our Institutional Consulting Group, Independent Adviser Group and Fund Sponsor Consulting Group. Due to the complex corporate and organizational ownership structures of many investment management firms, parent and affiliate firm relationships are not indicated on our list.

Fund sponsor clients may request a copy of the most currently available list at any time. Fund sponsor clients may also request specific information regarding the fees paid to Callan by particular fund manager clients. Per company policy, information requests regarding fees are handled exclusively by Callan's Compliance Department.

Manager Name
1607 Capital Partners, LLC
Aberdeen Asset Management PLC
Acadian Asset Management LLC
AEGON USA Investment Management
Affiliated Managers Group, Inc.
AllianceBernstein
Allianz Global Investors
Allianz Life Insurance Company of North America
American Century Investment Management
Amundi Smith Breeden LLC
Analytic Investors
Angelo, Gordon & Co.
Apollo Global Management
AQR Capital Management
Ares Management LLC
Ariel Investments, LLC
Aristotle Capital Management, LLC
Artisan Holdings
Atlanta Capital Management Co., LLC
Aviva Investors Americas
AXA Investment Managers
Babson Capital Management
Baillie Gifford Overseas Limited
Baird Advisors
Bank of America
Baring Asset Management
Barings LLC
Baron Capital Management, Inc.
Barrow, Hanley, Mewhinney & Strauss, LLC
BlackRock
BMO Global Asset Management
BNP Paribas Investment Partners
BNY Mellon Asset Management
Boston Partners
Brandes Investment Partners, L.P.
Brandywine Global Investment Management, LLC
Brown Brothers Harriman & Company

Manager Name
Cambiar Investors, LLC
Capital Group
CastleArk Management, LLC
Causeway Capital Management
Channing Capital Management, LLC
Chartwell Investment Partners
ClearBridge Investments, LLC
Cohen & Steers Capital Management, Inc.
Columbia Management Investment Advisers, LLC
Columbia Threadneedle Investments
Columbus Circle Investors
Corbin Capital Partners, L.P.
Cornerstone Capital Management
Cramer Rosenthal McGlynn, LLC
Credit Suisse Asset Management
Crestline Investors, Inc.
D.E. Shaw Investment Management, L.L.C.
Delaware Investments
DePrince, Race & Zollo, Inc.
Deutsche Asset Management
Diamond Hill Capital Management, Inc.
Duff & Phelps Investment Mgmt. Co.
Eagle Asset Management, Inc.
EARNEST Partners, LLC
Eaton Vance Management
Epoch Investment Partners, Inc.
Fayez Sarofim & Company
Federated Investors
Fidelity Institutional Asset Management
Fiera Capital Global Asset Management
First Eagle Investment Management, LLC
First Hawaiian Bank Wealth Management Division
First Quadrant L.P.
Fisher Investments
Fort Washington Investment Advisors, Inc.
Franklin Templeton Institutional
Fred Alger Management, Inc.

Manager Name Manager Name Fuller & Thaler Asset Management, Inc. Opus Capital Management Inc. Pacific Investment Management Company GAM (USA) Inc. **GE Asset Management** Parametric Portfolio Associates GMO Peregrine Capital Management, Inc. Goldman Sachs Asset Management **PGIM** PGIM Fixed Income Guggenheim Investments **GW&K Investment Management** Pictet Asset Management Ltd. Harbor Capital Group Trust PineBridge Investments Hartford Funds Pinnacle Asset Management L.P. Hartford Investment Management Co. Pioneer Investments Henderson Global Investors PNC Capital Advisors, LLC Holland Capital Management Principal Global Investors Hotchkis & Wiley Capital Management, LLC Private Advisors, LLC **HSBC Global Asset Management** Putnam Investments, LLC Income Research + Management, Inc. QMA (Quantitative Management Associates) Insight Investment Management Limited **RBC Global Asset Management** Institutional Capital LLC Regions Financial Corporation INTECH Investment Management, LLC RidgeWorth Capital Management, Inc. Invesco Rockefeller & Co., Inc. **Investec Asset Management** Rothschild Asset Management, Inc. Ivy Investments Russell Investments Janus Capital Management, LLC Santander Global Facilities Jennison Associates LLC Schroder Investment Management North America Inc. Jensen Investment Management Scout Investments J.P. Morgan Asset Management SEI Investments KeyCorp Smith, Graham & Co. Investment Advisors, L.P. Lazard Asset Management Smith Group Asset Management Legal & General Investment Management America Standard Life Investments Limited Lincoln National Corporation Standish LMCG Investments, LLC State Street Global Advisors Logan Capital Management Stone Harbor Investment Partners, L.P. Logan Circle Partners, L.P. Systematic Financial Management **Longview Partners** T. Rowe Price Associates. Inc. Loomis, Sayles & Company, L.P. Taplin, Canida & Habacht Lord Abbett & Company The Boston Company Asset Management, LLC Los Angeles Capital Management The Davis Companies LSV Asset Management The Hartford MacKay Shields LLC The London Company Man Investments Inc. The TCW Group, Inc. Manning & Napier Advisors, LLC Thompson, Siegel & Walmsley LLC Manulife Asset Management Timberland Investment Resources, LLC Martin Currie Inc. Tri-Star Trust Bank Mellon Capital Management **UBS Asset Management** MFS Investment Management Van Eck Global MidFirst Bank Versus Capital Group Mondrian Investment Partners Limited Victory Capital Management Inc. Montag & Caldwell, LLC Vontobel Asset Management, Inc. Morgan Stanley Investment Management Voya Financial Mountain Lake Investment Management LLC Voya Investment Management (fka ING) MUFG Union Bank, N.A. Waddell & Reed Asset Management Group Neuberger Berman WCM Investment Management Newton Investment Management (fka Newton Capital Management) WEDGE Capital Management Nicholas Investment Partners Wellington Management Company, LLP Nikko Asset Management Co., Ltd. Wells Capital Management Northern Trust Asset Management Western Asset Management Company Nuveen Investments, Inc. William Blair & Company OFI Global Asset Management Windham Capital Management, LLC Old Mutual Asset Management