
1Q

2016

OAKLAND POLICE & FIRE RETIREMENT SYSTEM
QUARTERLY PERFORMANCE REPORT



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TABLE OF CONTENTS

- A** TOTAL PORTFOLIO SUMMARY
- B** INVESTMENT MARKET RISK METRICS
- C** ECONOMIC OVERVIEW
- D** TOTAL PORTFOLIO REVIEW
- E** MANAGER MONITORING / PROBATION LIST
- F** INDIVIDUAL MANAGER PERFORMANCE

Appendix

TOTAL PORTFOLIO SUMMARY

As of March 31, 2016, the City of Oakland Police and Fire Retirement System (OPFRS) portfolio had an aggregate value of \$370.3 million. This represents a (\$16.9) million decrease in value, which includes (\$15.5) million in benefit payments, over the quarter. During the previous one-year period, the OPFRS Total Portfolio decreased by (\$70.6) million, including (\$60.5) million in withdrawals during the period.

Asset Allocation Trends

The asset allocation targets (see table on page 20) reflect those as of March 31, 2016. Target weightings reflect the Plan's evolving asset allocation (effective 3/31/2014).

With respect to policy targets, the portfolio ended the latest quarter ***overweight Covered Calls and cash, while underweight Domestic and International Equity, Fixed Income, and Real Return.***

Recent Investment Performance

During the most recent quarter, the OPFRS Total Portfolio generated an absolute return of (0.1%), gross of fees, underperforming its policy benchmark by (1.2%). The portfolio has also underperformed its benchmark over the fiscal YTD, 1-year, and 3-year period while continuing to outperform over the 5-year period.

The Total Portfolio underperformed the Median fund's return over all periods measured. Performance differences with respect to the Median Fund continue to be attributed largely to differences in asset allocation.

	Quarter	Fiscal YTD	1 Year	3 Year	5 Year
Total Portfolio ¹	(0.1)	(2.6)	(2.6)	5.8	5.7
<i>Policy Benchmark</i> ²	<i>1.1</i>	<i>(0.3)</i>	<i>(0.1)</i>	<i>6.1</i>	<i>5.5</i>
Excess Return	(1.2)	(2.3)	(2.5)	(0.3)	0.2
Reference: Median Fund ³	1.2	(1.0)	(0.6)	6.1	6.5
Reference: Total Net of Fees ⁴	(0.2)	(2.9)	(2.9)	5.4	5.3

¹ Gross of Fees. Performance since 2005 includes securities lending.

² Evolving Policy Benchmark consists of 43% Russell 3000, 12% MSCI ACWI ex U.S., 20% BC Universal, 15% CBOE BXM and 10% CPI+3%.

³ Mellon Total Funds Public Universe.

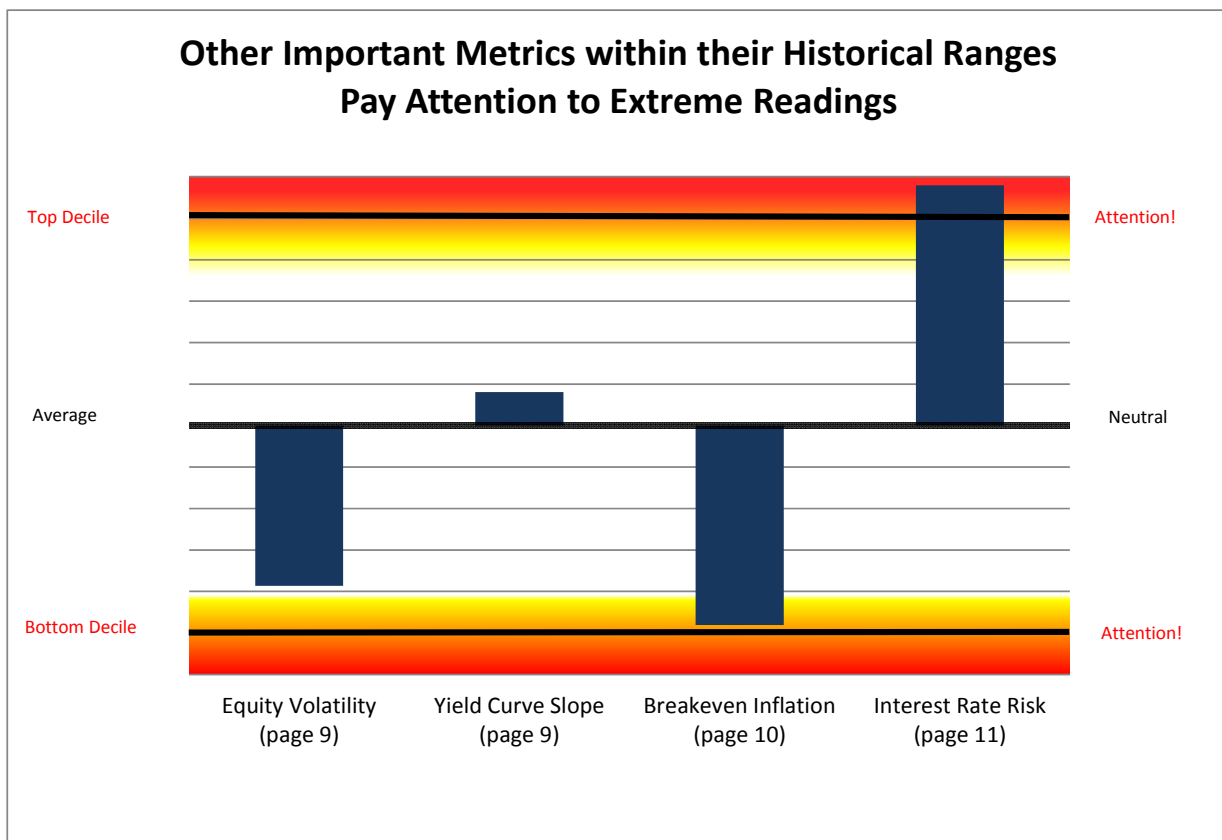
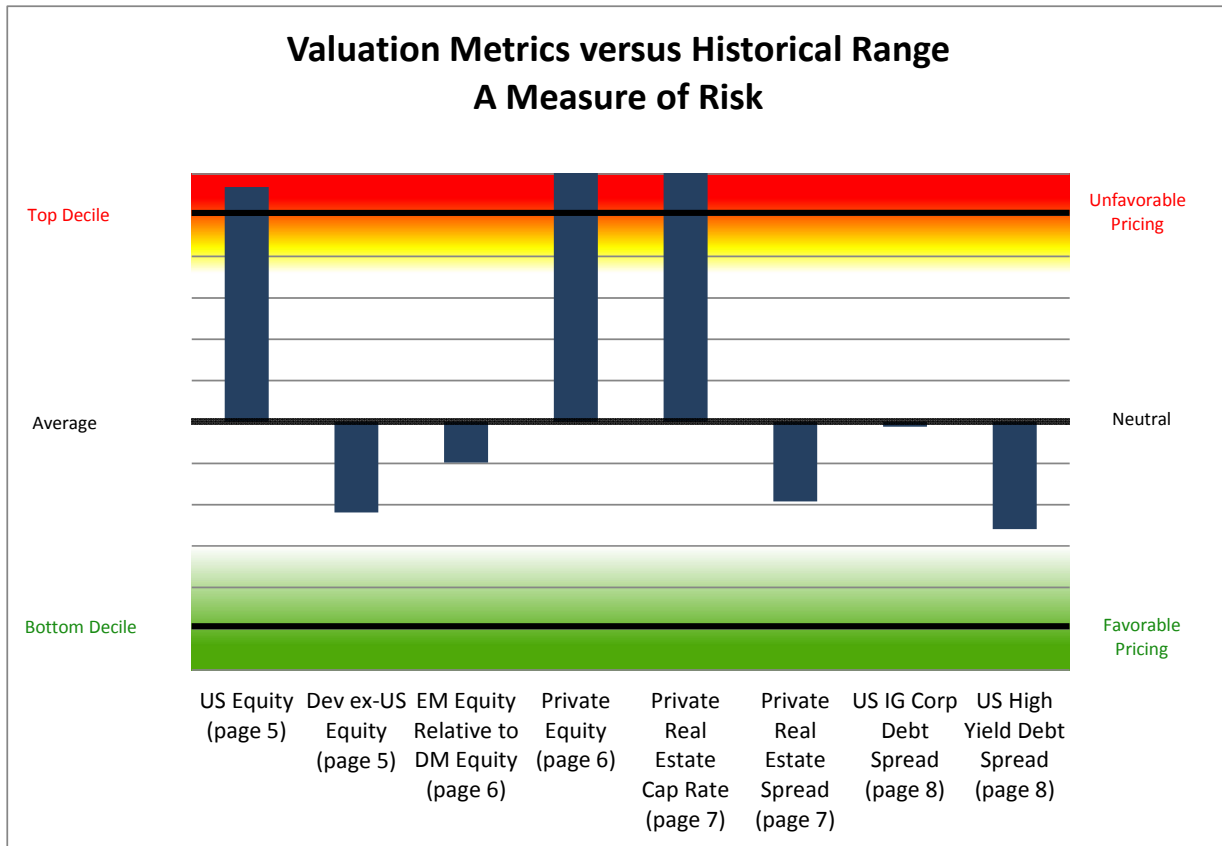
⁴ Net of fee returns are estimated based on OPFRS manager fee schedule.

INVESTMENT MARKET RISK METRICS

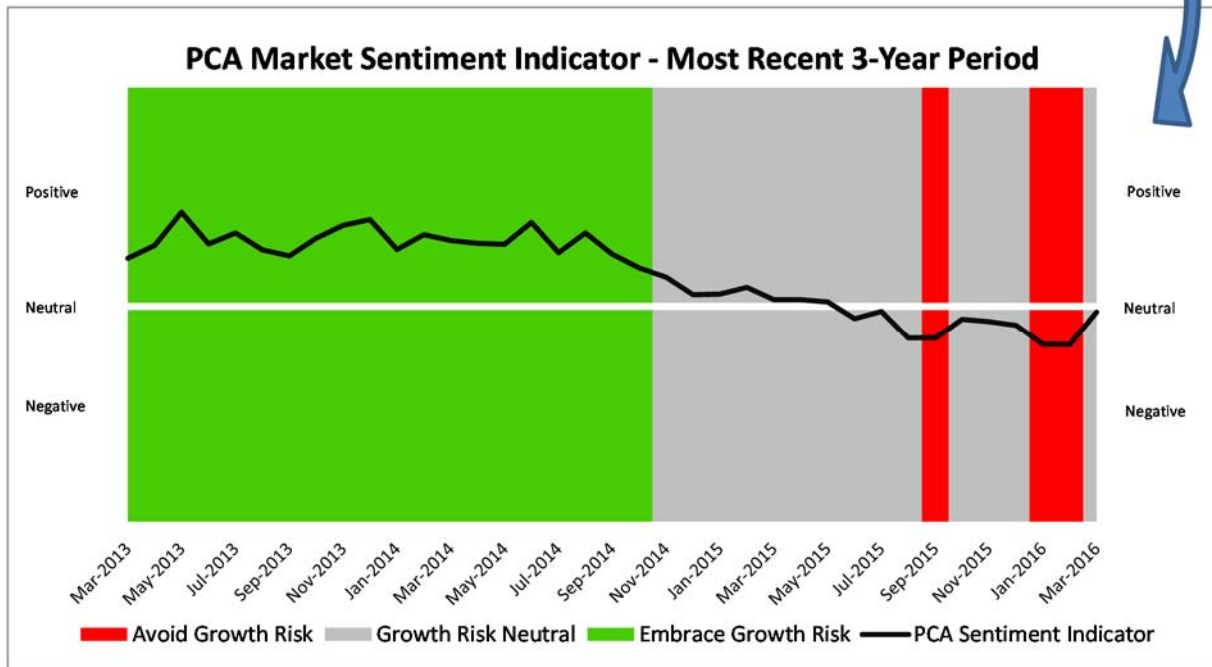
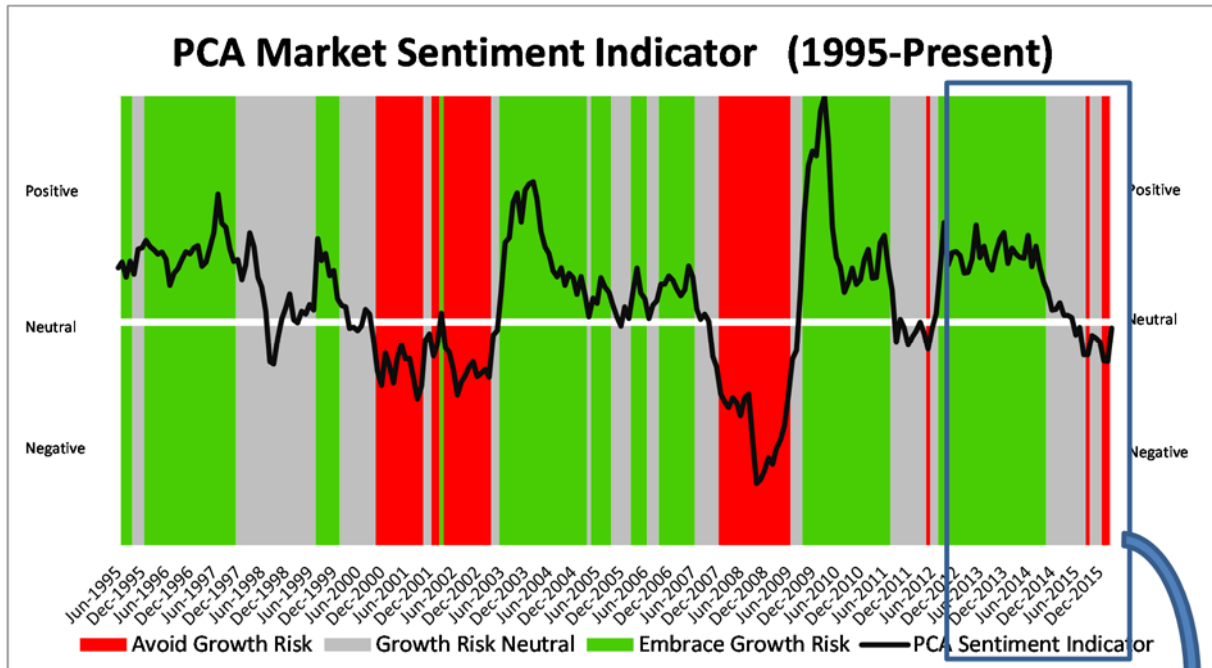
Takeaways

- Worldwide, equity markets rallied in March after Janet Yellen indicated the Federal Reserve would not raise rates and reduced expected 2016 hikes by half.
- Bond credit spreads tightened on the Federal Reserve news.
- Prices of U.S. public equity, private equity, and private real estate equity remain expensive relative to U.S. credit and non-U.S. equities.
- Broad commodity prices ticked up slightly during March.
- The PCA Market Sentiment Indicator returned to **neutral** in March versus the negative January and February indications; driven by the March equity market rally.
- Breakeven inflation recovered from recent lows, moving above 1.5%, but remains very low.
- After increasing during the first half of March, the 10-year Treasury yield declined subsequent to the Fed announcement, ending the month below 1.8%.

Risk Overview



Market Sentiment



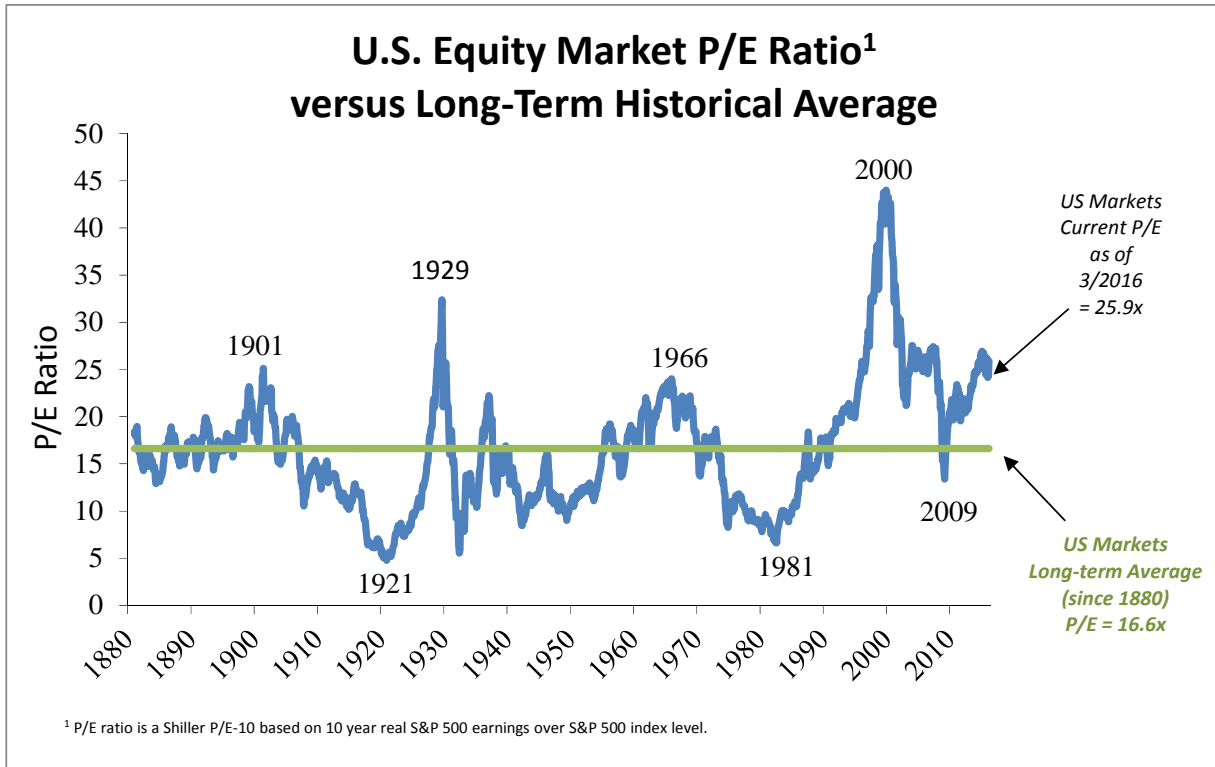
Information Behind Current Sentiment Reading

Bond Spread Momentum Trailing-Twelve Months
 Equity Return Momentum Trailing-Twelve Months
 Agreement Between Bond Spread and Equity Spread Momentum Measures?

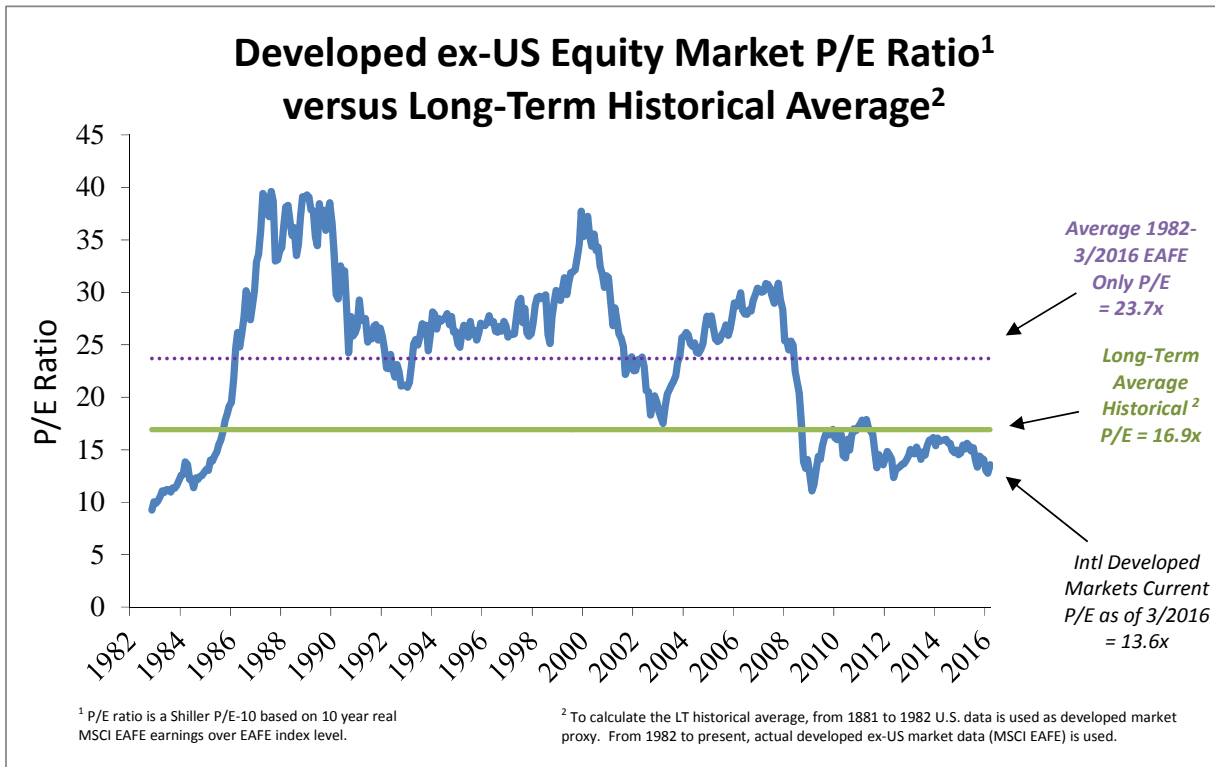
Negative	
Positive	
Disagree	

Growth Risk Visibility (Current Overall Sentiment)	Neutral	
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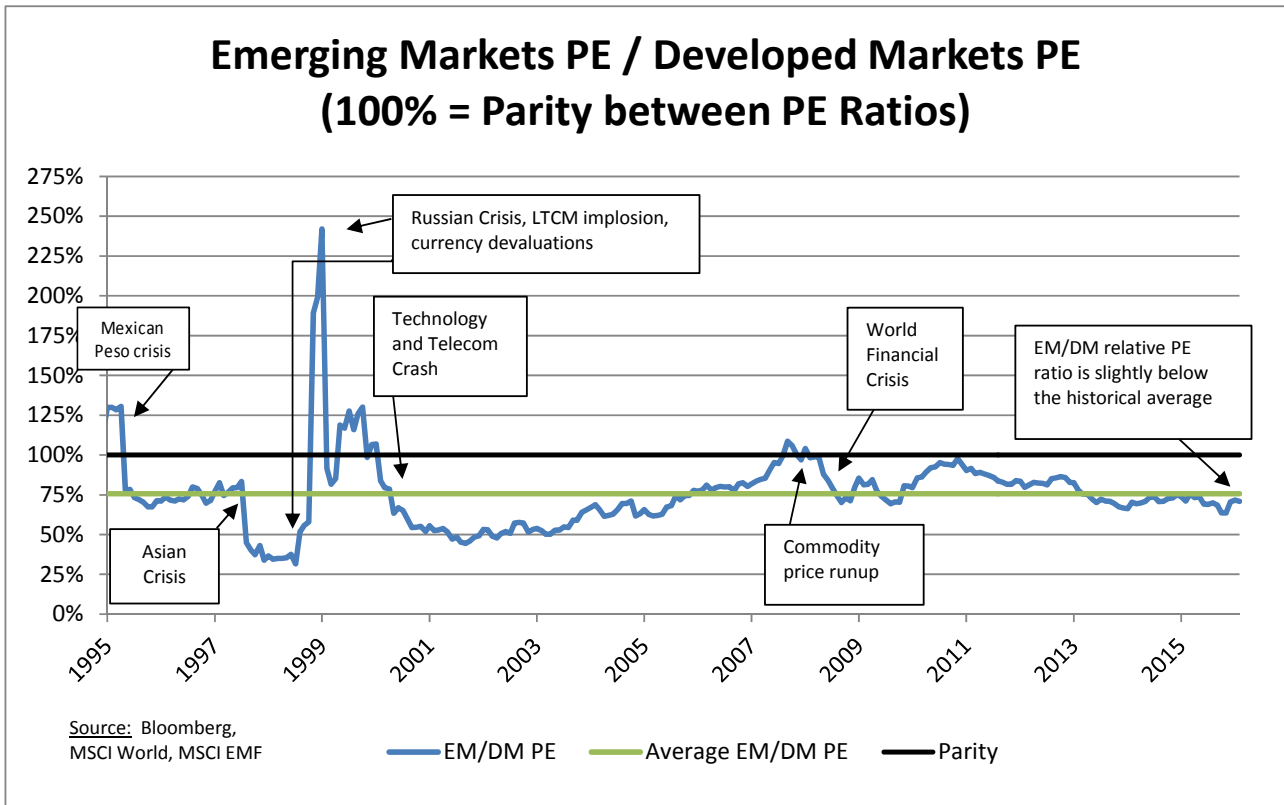
Developed Equity Markets



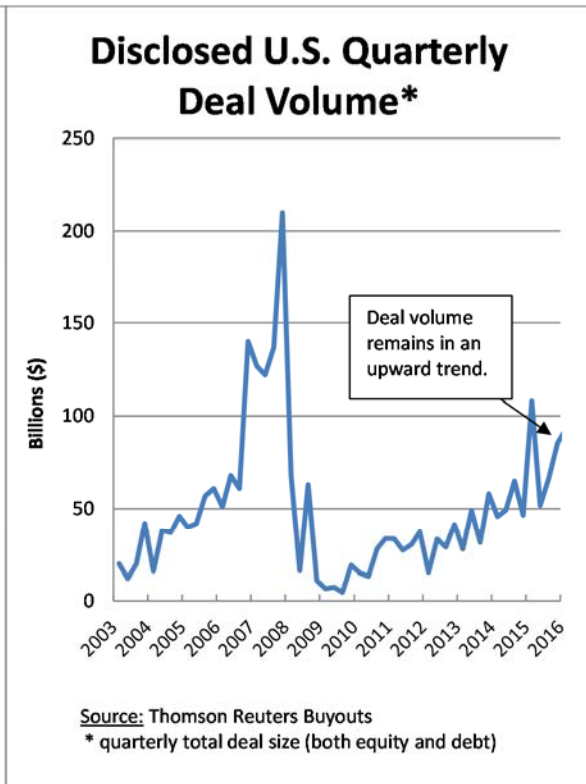
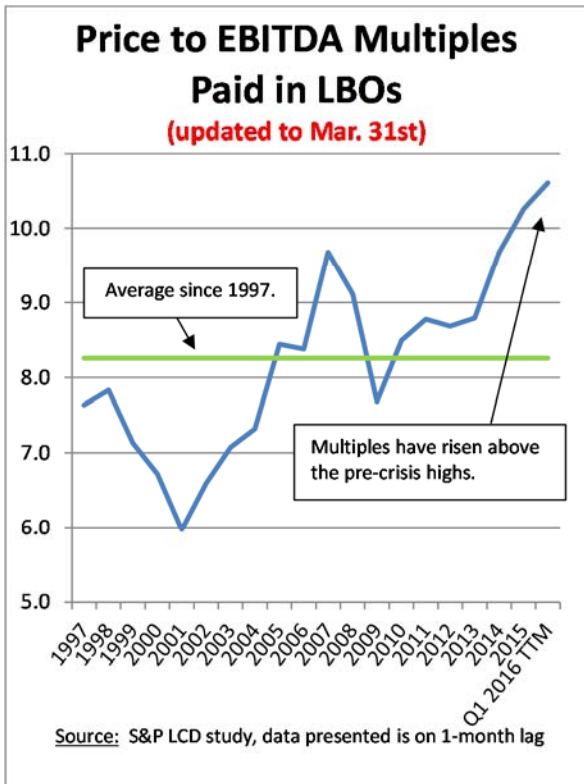
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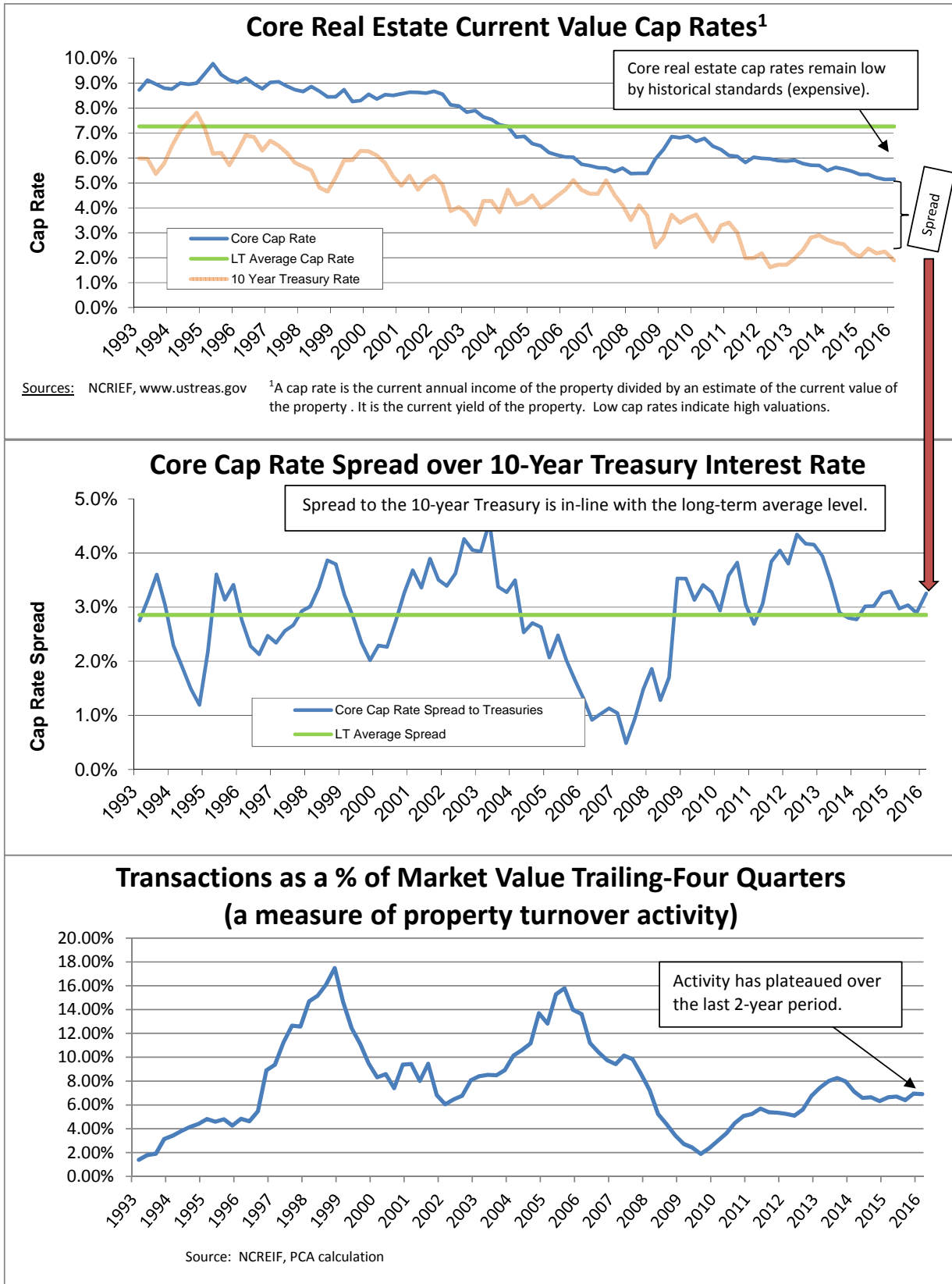
Emerging Market Equity Markets



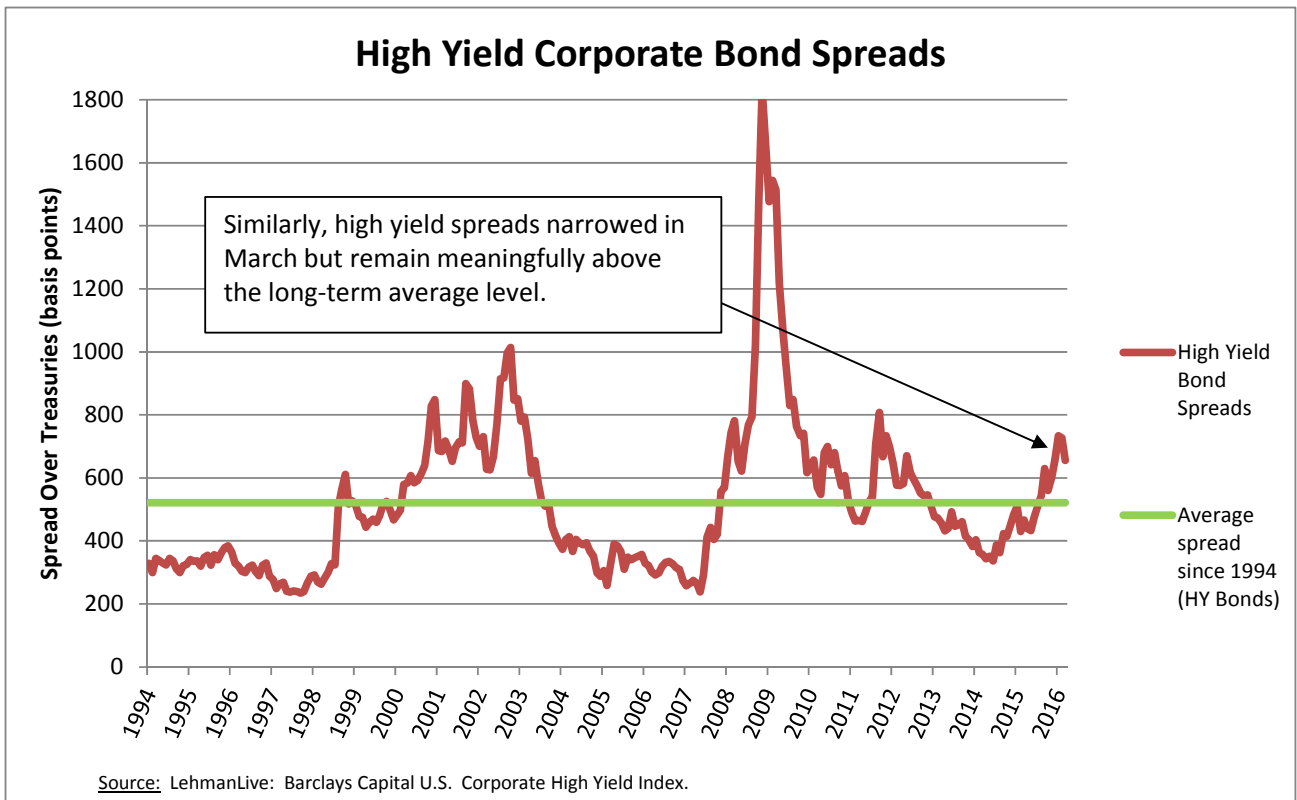
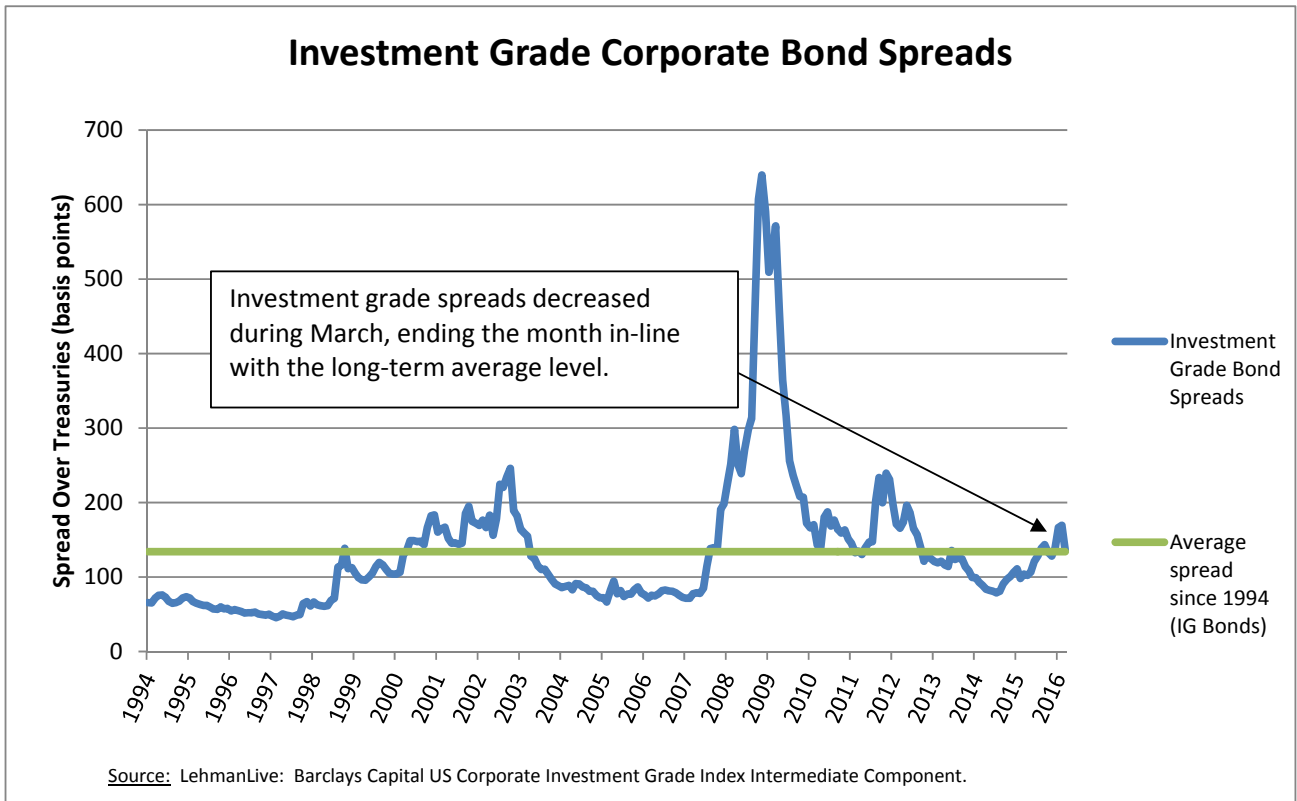
US Private Equity



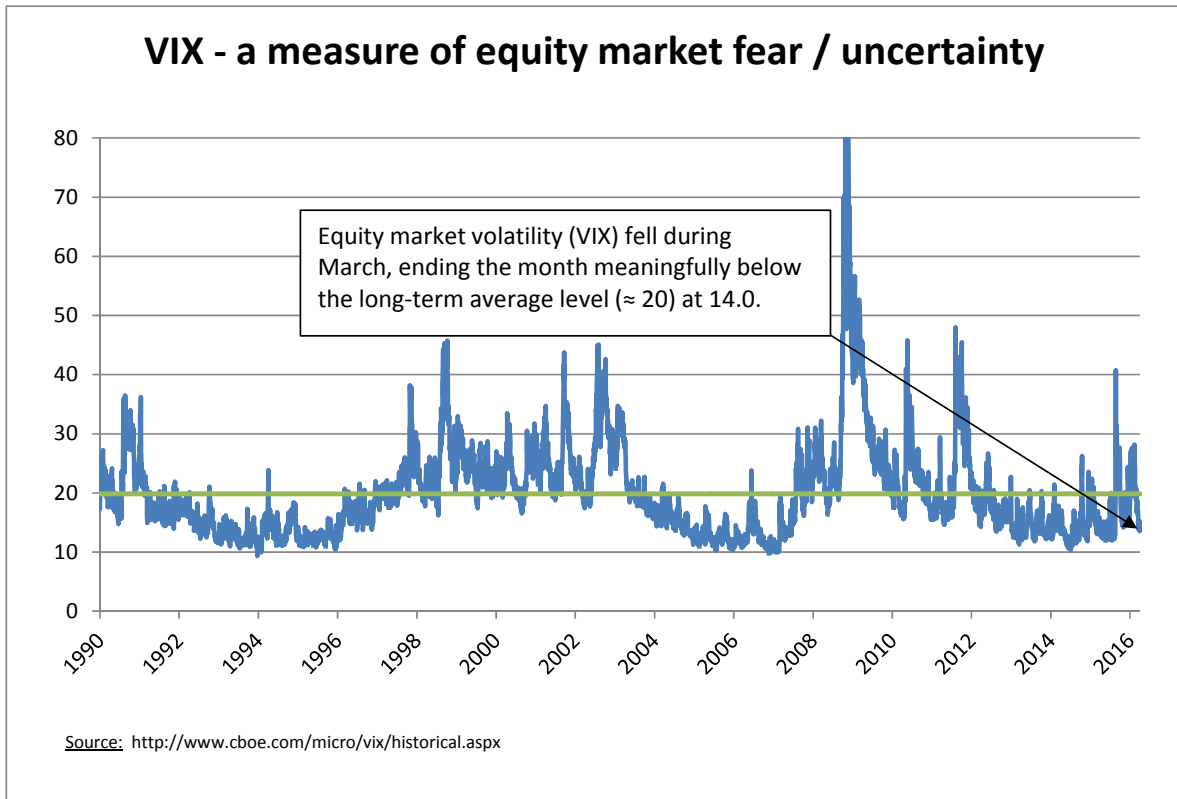
Private Real Estate Markets



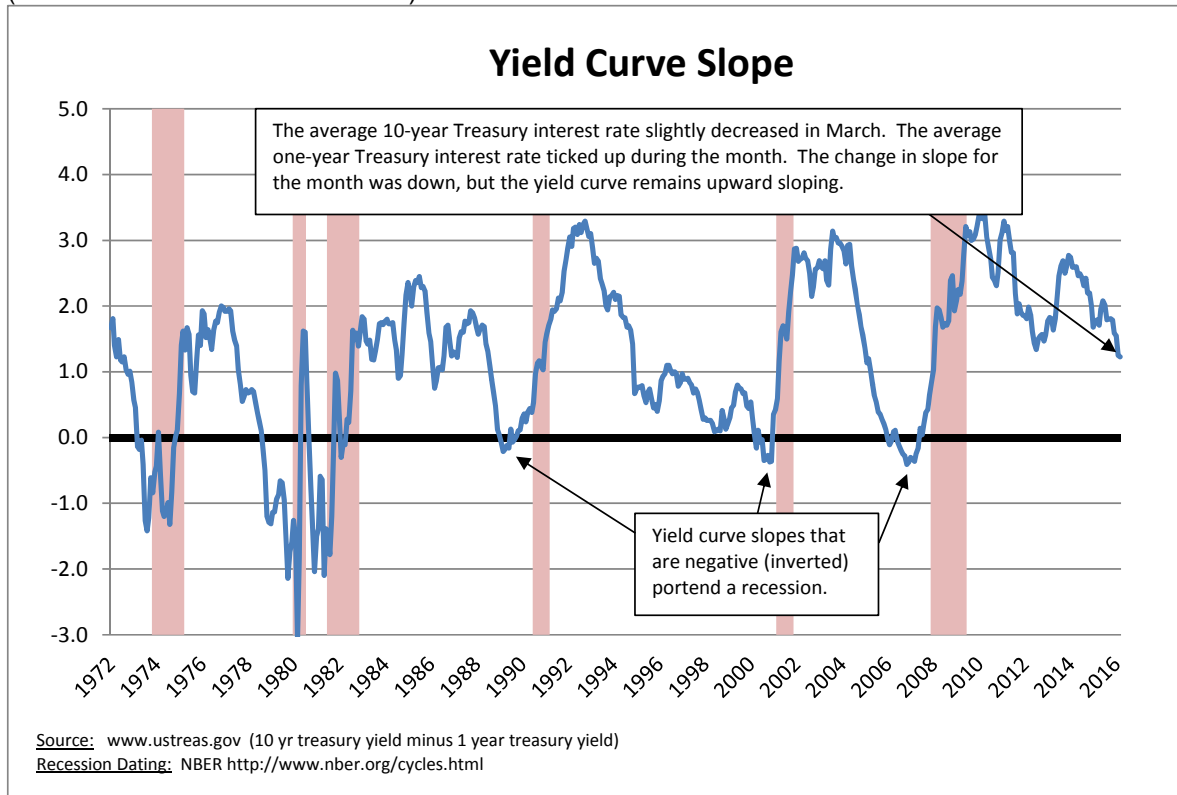
US Fixed Income



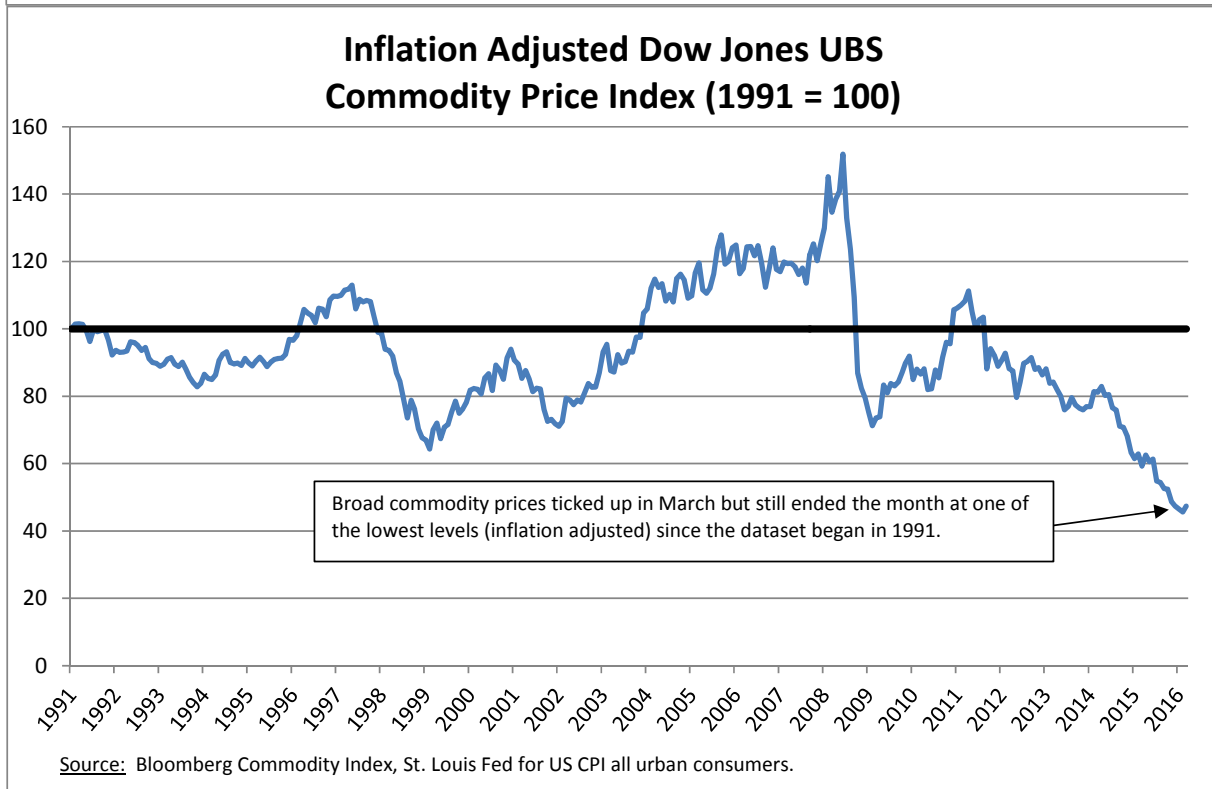
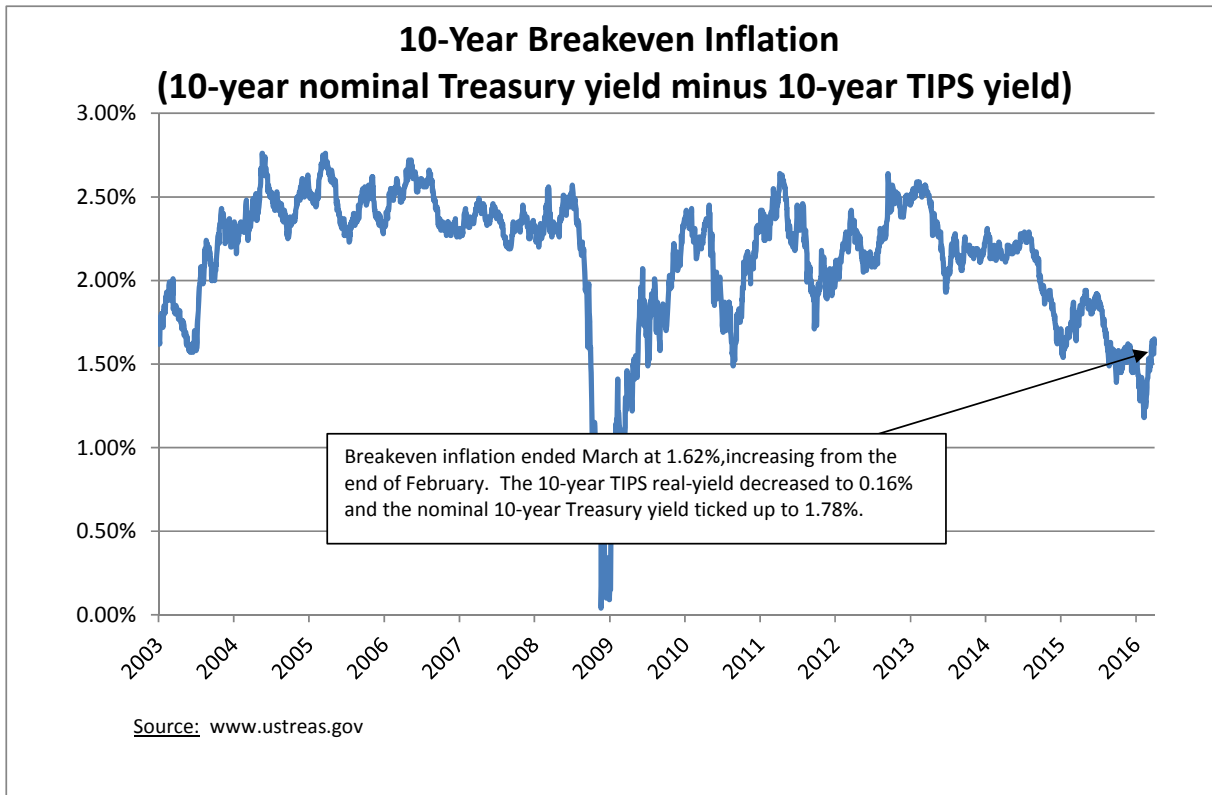
Other Market Metrics



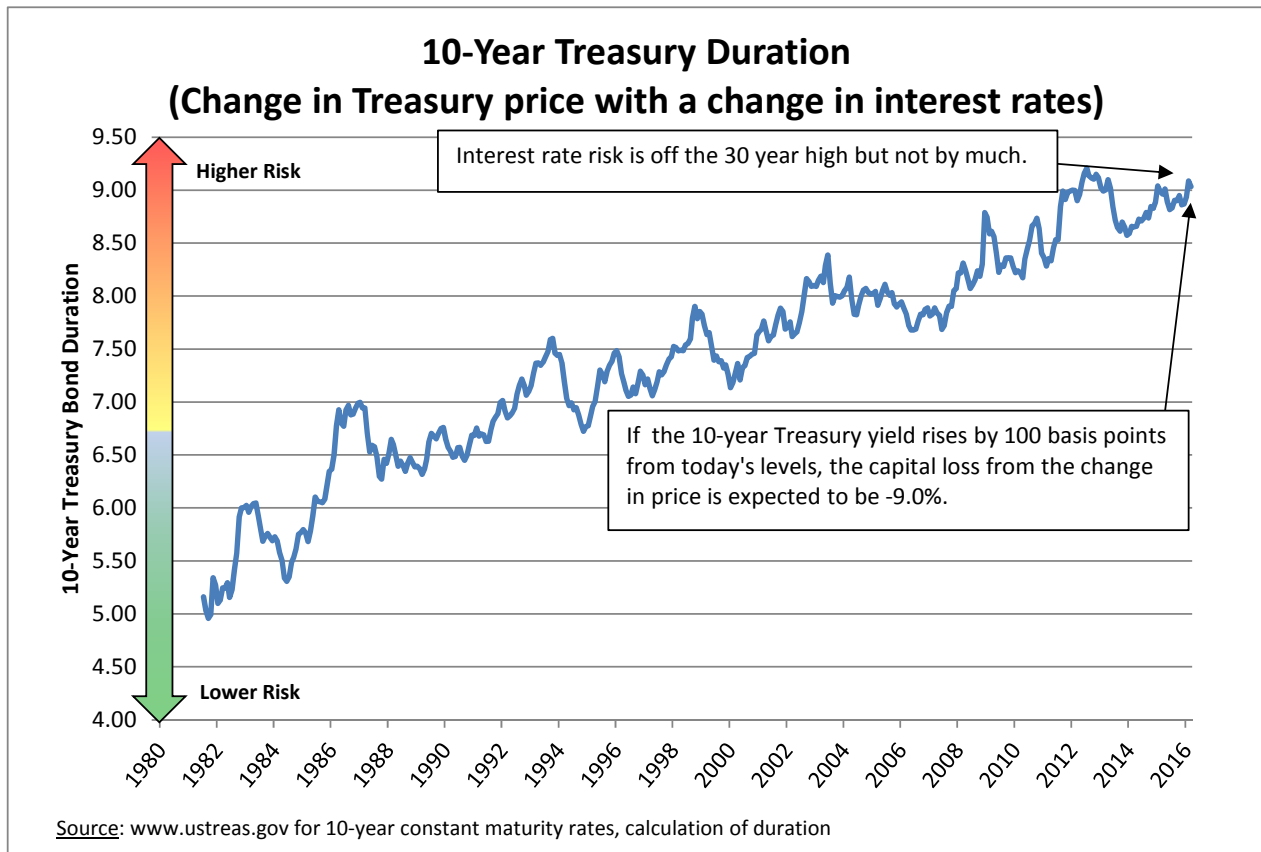
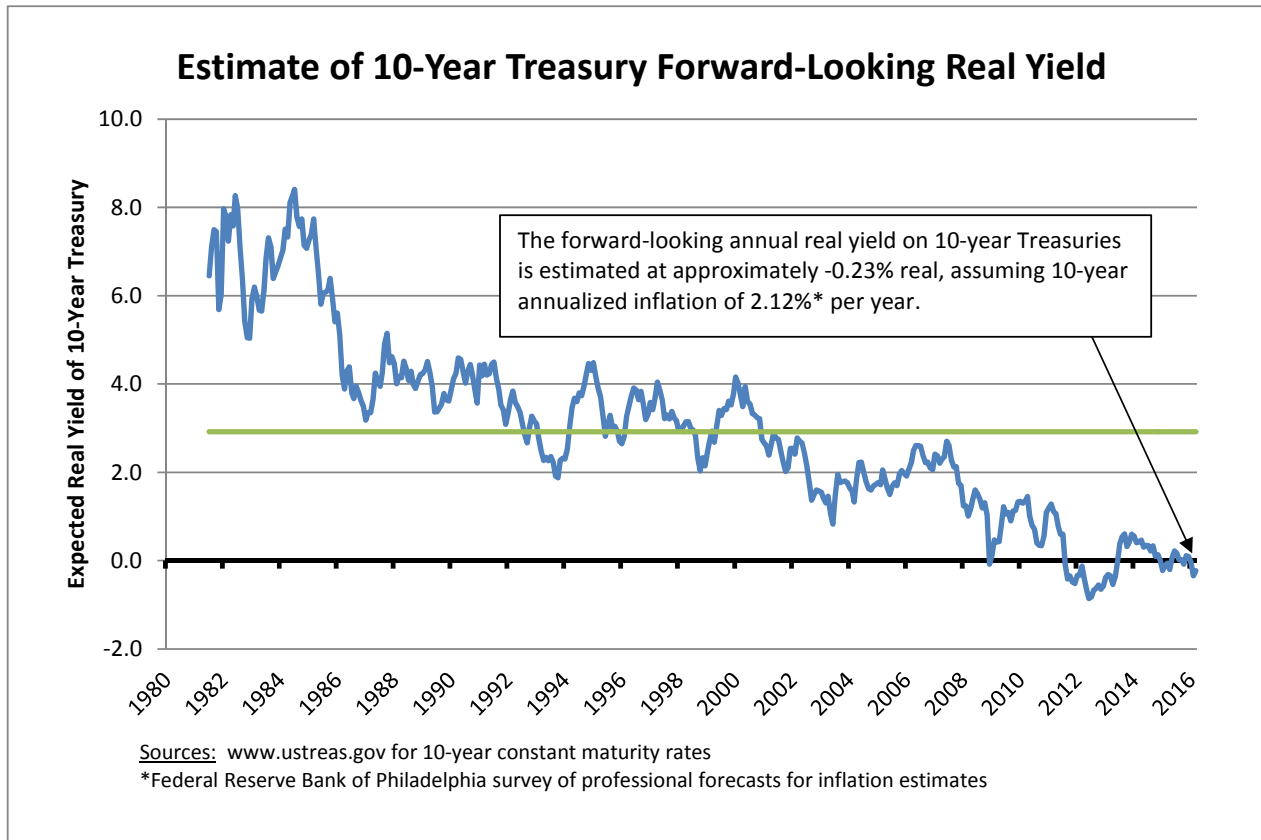
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Measures of Inflation Expectations



Measures of US Treasury Interest Rate Risk



ECONOMIC OVERVIEW

Overview: US GDP growth for the first quarter of 2016 (advanced estimate) has slowed since the fourth quarter of 2015 decreasing from 1.4% to 0.5%. GDP growth during the first quarter was driven mostly by consumer spending on household services. The unemployment rate dropped to 4.9% as of quarter end, continuing its downward trend over the last 2+ years. The Consumer Price Index for All Urban Consumers increased by 0.5% in the quarter. Commodities improved in the first quarter, as they returned 0.3%, up from last quarter’s return of (10.5%). The US dollar appreciated against the British Pound, and depreciated against the Yen and Euro this quarter. US equities provided mixed results, with broad and large cap stocks delivering slightly positive returns for the quarter, and small cap growth and core stocks earning negative returns over the same period. International Equities performed poorly for the quarter and 1-year periods. The BC Universal Index returned 3.1% during the quarter, which increased the 1-year return to 1.8%.

Economic Growth

- Real GDP increased at an annualized rate of 0.5 percent in the first quarter of 2016, which is the lowest rate of growth since the first quarter of 2014.
- Consumer spending on household services, nondurable goods, and residential investment as well as state and local government spending had the largest impact on GDP.
- First quarter gains in GDP growth was slightly offset by decreases in business investment, private inventory investment, goods exports, and federal government spending.



Inflation

- The Consumer Price Index for All Urban Consumers (CPI-U) increased by 0.5 percent in the quarter on an annualized basis after seasonal adjustment.
- Quarterly percentage changes may be adjusted between data publications due to periodic updates in seasonal factors.
- Core CPI-U increased by 3.2 percent for the quarter on an annualized basis.
- Over the last 12 months, core CPI-U increased 2.3 percent after seasonal adjustment.



Unemployment

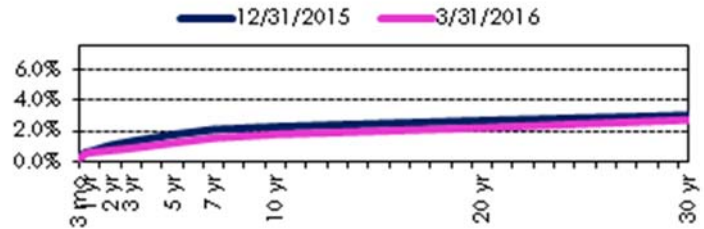
- The US economy gained approximately 628,000 jobs in the quarter.
- The unemployment rate fell slightly to 4.9% at quarter end.
- The majority of jobs gained occurred in the retail trade, construction, and leisure and hospitality. The majority of jobs lost occurred in temporary help services, mining and logging, and durable goods.



Interest Rates & U.S. Dollar

- US Treasury yields rose on average over the quarter.
- The Federal Reserve has maintained the federal funds rate between 0.25 percent and 0.50 percent.
- The US dollar appreciated against the British Pound by 2.6%, and depreciated against the Yen and Euro by 6.4% and 4.8%, respectively.

Treasury Yield Curve Changes

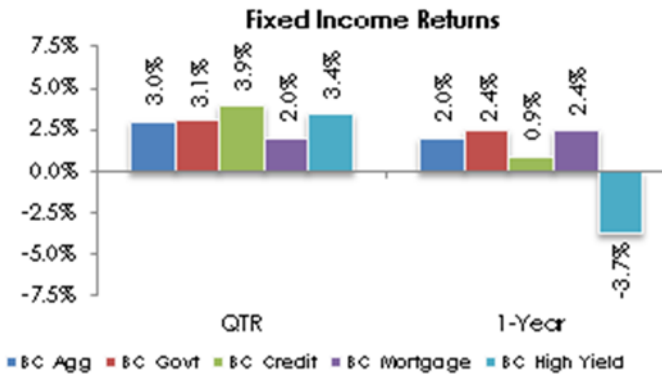


Source: U.S. Treasury Department

Fixed Income

- US bond markets delivered positive returns for the quarter with credit, returning 3.9%, performing the best, while ABS performed the worst at 1.4%.

Despite a strong first quarter, high yield continued to trail all other bond sectors over the trailing 1-year period. Governments and MBS provided the strongest returns each with 2.4%.

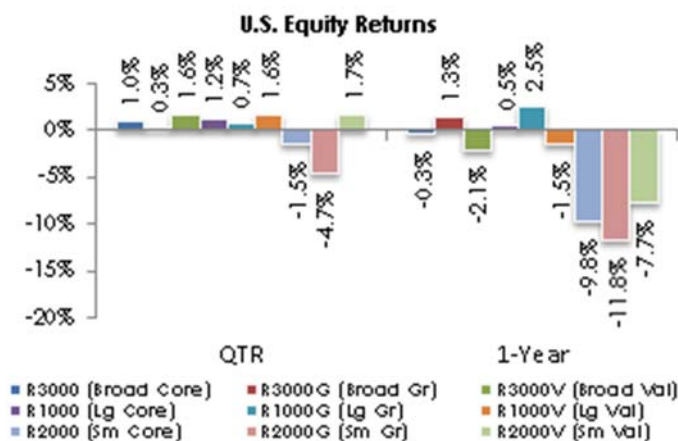


US Fixed Income Sector Performance (BC Aggregate Index)			
Sector	Weight	QTR	1 Year
Governments*	40.6%	3.1%	2.4%
Agencies	4.1%	2.4%	0.8%
Inv. Grade Credit	24.7%	3.9%	0.9%
MBS	28.2%	2.0%	2.4%
ABS	0.6%	1.4%	1.7%
CMBS	1.8%	3.6%	2.8%

*U.S. Treasuries and Government Related

U.S. Equities

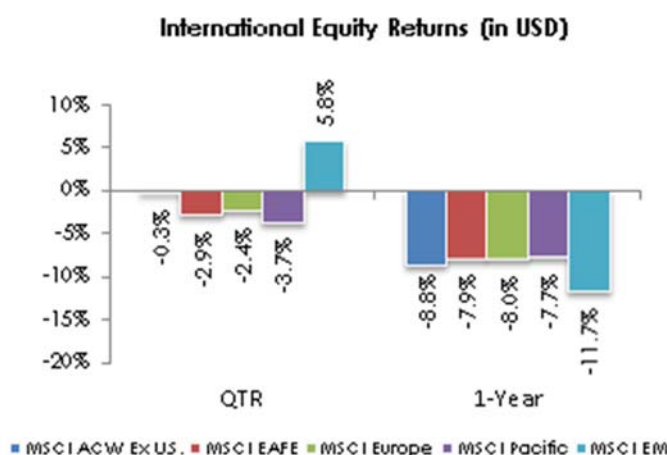
- During the quarter, broad and large cap stocks performed similarly, while small cap core and growth stocks performed poorly with returns of (1.5%) and (4.7%), respectively.
- During the 1-year period, growth outperformed value stocks in the broad and large capitalizations, but underperformed in the small cap space. Large cap growth stocks performed the best over the 1-year period returning 2.5%, while small cap growth lagged behind, with a double digit negative return of (11.8%).



Sector	Weight	QTR	1 Year
Information Tech	20.1%	2.5%	10.9%
Financials	17.2%	-2.6%	-1.8%
Health Care	13.7%	-5.1%	-4.1%
Consumer Disc.	13.6%	3.0%	9.3%
Industrials	10.9%	5.5%	3.6%
Consumer Staple	9.2%	5.9%	13.2%
Energy	6.1%	4.8%	-12.4%
Utilities	3.5%	15.7%	17.9%
Materials	3.2%	6.8%	-2.3%
Telecomm. Serv.	2.5%	15.5%	18.6%

International Equities

- International equities performed poorly over the quarter with the exception of emerging markets which posted the only positive return at 5.8%.
- Over the 1-year period, international equities provided negative returns across the board. The Pacific had the least negative results, while emerging markets performed the worst with (7.7%), and (11.7%), respectively.



Sector	Weight	QTR	1 Year
Europe Ex. UK	32.7%	-3.0%	-10.2%
Emerging Markets	21.9%	5.8%	-11.7%
Japan	16.2%	-7.3%	-8.8%
United Kingdom	13.9%	-3.6%	-12.4%
Pacific Ex. Japan	8.7%	0.8%	-13.3%
Canada	6.7%	10.7%	-12.2%

Market Summary – Long-term Performance*

Indexes	Month	Quarter	1 Year	3 Years	5 Years	10 Years	20 Years
Global Equity							
MSCI AC World Index	7.5%	0.4%	-3.8%	6.1%	5.8%	4.6%	6.2%
Domestic Equity							
S&P 500	6.8%	1.4%	1.8%	11.8%	11.6%	7.0%	8.0%
Russell 3000	7.0%	1.0%	-0.3%	11.2%	11.0%	6.9%	8.0%
Russell 3000 Growth	6.8%	0.3%	1.3%	13.2%	12.0%	8.1%	7.2%
Russell 3000 Value	7.3%	1.6%	-2.1%	9.1%	10.0%	5.6%	8.3%
Russell 1000	7.0%	1.2%	0.5%	11.5%	11.4%	7.1%	8.1%
Russell 1000 Growth	6.7%	0.7%	2.5%	13.6%	12.4%	8.3%	7.4%
Russell 1000 Value	7.2%	1.6%	-1.5%	9.4%	10.3%	5.7%	8.3%
Russell 2000	8.0%	-1.5%	-9.8%	6.8%	7.2%	5.3%	7.7%
Russell 2000 Growth	7.7%	-4.7%	-11.8%	7.9%	7.7%	6.0%	5.8%
Russell 2000 Value	8.3%	1.7%	-7.7%	5.7%	6.7%	4.4%	9.1%
CBOE BXM Index	2.0%	-0.7%	2.7%	6.0%	6.5%	4.4%	7.1%
International Equity							
MSCI AC World Index ex USA	8.2%	-0.3%	-8.8%	0.8%	0.8%	2.4%	4.8%
MSCI EAFE	6.6%	-2.9%	-7.9%	2.7%	2.8%	2.3%	4.5%
MSCI Pacific	7.2%	-3.7%	-7.7%	1.5%	3.0%	1.5%	1.7%
MSCI Europe	6.4%	-2.4%	-8.0%	3.3%	2.7%	2.7%	6.5%
MSCI EM (Emerging Markets)	13.3%	5.8%	-11.7%	-4.2%	-3.8%	3.3%	5.4%
Fixed Income							
BC Universal	1.2%	3.1%	1.8%	2.5%	4.0%	5.0%	5.8%
Global Agg. - Hedged	0.8%	3.3%	2.4%	3.7%	4.6%	4.8%	5.7%
BC Aggregate Bond	0.9%	3.0%	2.0%	2.5%	3.8%	4.9%	5.6%
BC Government	0.2%	3.1%	2.4%	2.1%	3.4%	4.5%	5.3%
BC Credit Bond	2.5%	3.9%	0.9%	2.9%	5.0%	5.7%	6.2%
BC Mortgage Backed Securities	0.3%	2.0%	2.4%	2.7%	3.2%	4.9%	5.5%
BC High Yield	4.4%	3.4%	-3.7%	1.8%	4.9%	7.0%	6.8%
BC WGIL All Maturities - Hedged	1.5%	4.1%	0.5%	1.4%	4.2%	4.8%	---
Emerging Markets Debt	3.1%	4.5%	3.5%	2.6%	5.7%	7.0%	9.6%
Real Estate							
NCREIF UNLAGGED	0.7%	2.2%	11.8%	11.9%	11.9%	7.6%	9.9%
FTSE NAREIT All Equity Index	10.0%	5.9%	4.1%	9.2%	11.4%	6.1%	10.5%
Commodity Index							
DJUBS	3.8%	0.3%	-19.6%	-16.9%	-14.2%	-6.2%	0.6%

* Performance is annualized for periods greater than one year.

TOTAL PORTFOLIO REVIEW

OPFRS Portfolio Performance

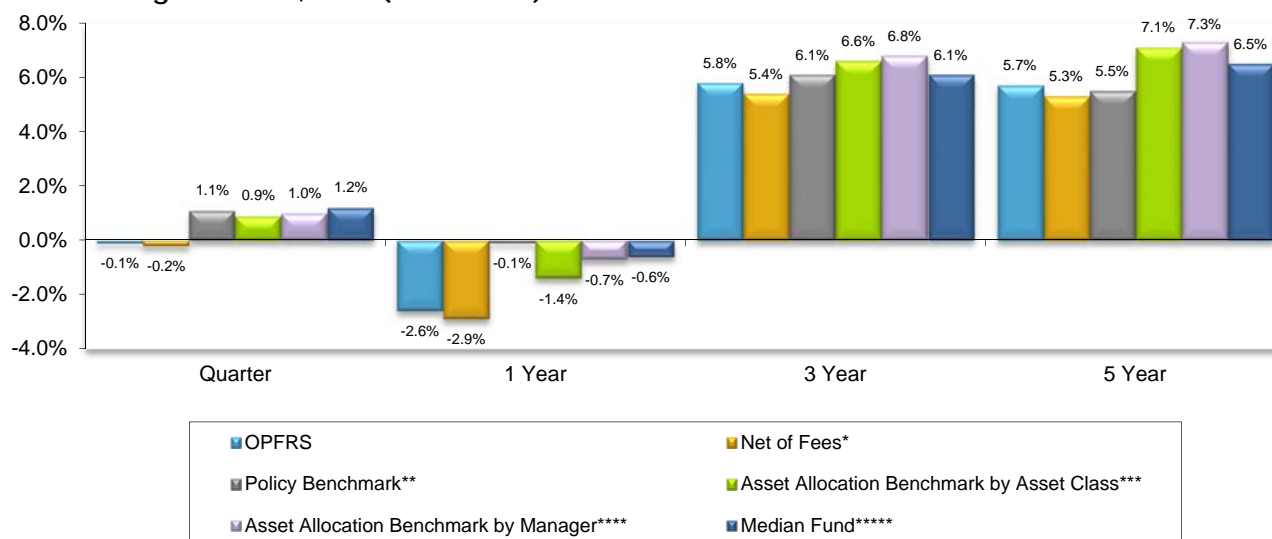
This section includes an overview of the performance of the OPFRS investment portfolio, as well as a detailed analysis of asset classes and specific mandates.

Portfolio Performance Overview

During the latest quarter ending March 31, 2016, the OPFRS Total Portfolio generated a return of (0.1%), gross of fees, underperforming its benchmark by (1.2%). The Plan’s Domestic Equity allocation underperformed its benchmark by (50) basis points, while the Plan’s International Equity allocation underperformed its benchmark by (2.3%). The Plan’s Fixed Income allocation underperformed its benchmark by (20) basis points and the Real Return allocation underperformed by (8.4%). Covered Calls remained the only bright spot during the quarter, outperforming its benchmark by 90 basis points over the period.

The Total Portfolio produced negative relative results versus the policy benchmark over the quarter, 1-, and 3-year periods while outperforming over the 5-year period, gross of fees. Relative to the Median Fund, The Total Portfolio underperformed over all periods measured. Performance differences with respect to the Median Fund continue to be attributed largely to differences in asset allocation.

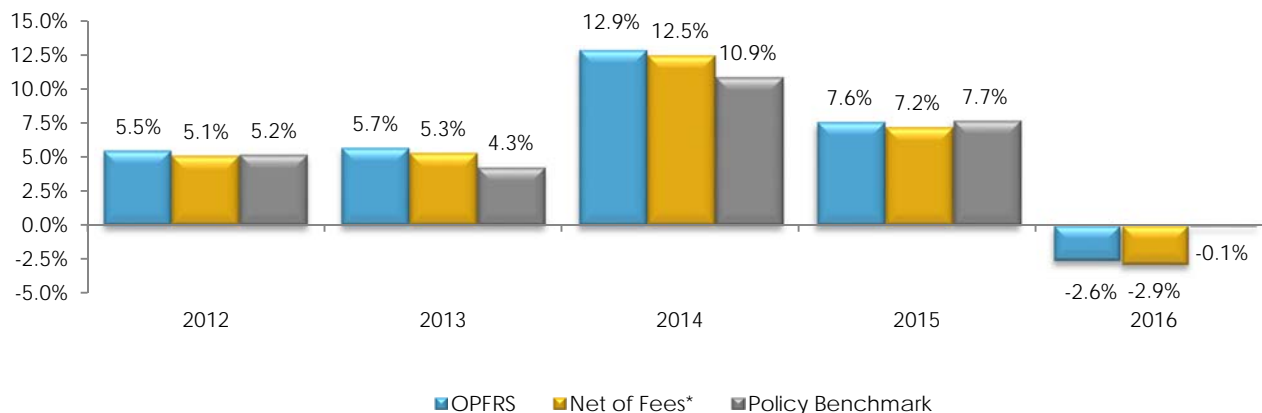
Periods Ending March 31, 2016 (annualized)



* Net of fee returns are estimated based on OPFRS manager fee schedule.
 ** The Evolving Policy Benchmark consists of 43% Russell 3000, 12% MSCI ACWI ex U.S., 20% BC Universal, 15% CBOE BXM and 10% CPI+3%.
 *** Asset Allocation Benchmark by Asset Class is calculated using actual weightings of the broad asset classes.
 **** Asset Allocation Benchmark by Manager consists of weighted average return of individual manager benchmarks, based on managers’ actual allocations.
 ***** Median Fund is the Mellon Total Public Funds Universe.

Absolute performance results have been positive in four of the last five 12-month periods ending March 31. The Plan also outperformed its policy benchmark in three out of the last five periods, gross of fees.

12-Month Performance – Periods Ending March 31



*Net of fee returns are estimated based on OPFRS manager fee schedule

Portfolio Valuation

The OPFRS portfolio had an aggregate value of \$370.3 million as of March 31, 2016. During the latest quarter, the portfolio decreased by (\$16.9) million, including (\$15.5) million in net benefit payments. Over the latest year, the portfolio decreased by (\$70.6) million, including (\$60.5) million in net benefit payments.

Investment Portfolio Valuation as of March 31, 2016*

	March 31, 2016	December 31, 2015	Quarterly Change	Percentage Change	March 31, 2015	Annual Change	Percentage Change
OPFRS	\$370.3	\$387.2	(\$16.9)	(4.4%)	\$440.9	(\$70.6)	(16.0%)

*The calculations listed above represent change in dollar value and not investment returns.

Actual vs. Target Allocations

With respect to policy targets, the portfolio ended the latest quarter **overweight Covered Calls and Cash, while underweight Domestic and International Equity, Fixed Income, and Real Return**. Target weightings reflect the Plan’s evolving asset allocation (effective 3/31/2014).

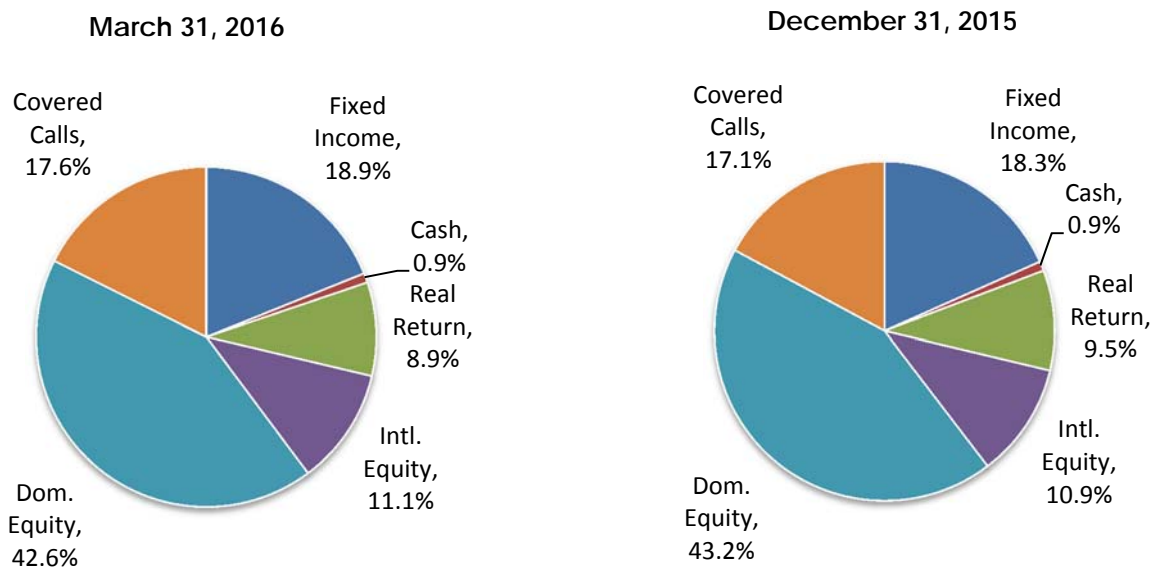
As of March 31, 2016

Segment	Actual \$(000)	Actual %*	Target %	Variance
Total Investment Portfolio	370,254	100.0%	100.0%	---
Domestic Equity	157,826	42.6%	43.0%	-0.2%
Large Cap Equity	110,738	29.9%	29.0%	0.9%
Mid Cap Equity	29,104	7.9%	8.0%	-0.1%
Small Cap Equity	17,984	4.8%	6.0%	-1.2%
International Equity	41,125	11.1%	12.0%	-0.9%
Total Equity	198,951	53.7%	55.0%	-1.3%
Fixed Income	69,882	18.9%	20.0%	-1.1%
Covered Calls	65,288	17.6%	15.0%	2.6%
Real Return	32,908	8.9%	10.0%	-1.1%
Cash	3,225	0.9%	0.0%	0.9%

* In aggregate, asset class allocations equal 100% of total investment portfolio. Differences due to rounding.

During the latest quarter, Domestic Equity’s weighting decreased by (0.6%), Fixed Income increased its weighting by 0.6%, and International Equity’s weighting increased by 0.2%. Actual weighting for Covered Calls increased by 0.5%, while the actual weighting for Real Return decreased by (0.6%). Cash weighting remained the same.

Investment Portfolio Actual Asset Allocation Comparison



Asset Class Performance

The **Domestic Equity** asset class underperformed its benchmark by (50) and (110) basis points over the most recent quarter and 1-year period, respectively. Over the longer term, the Domestic Equity portfolio slightly underperformed its benchmark by (20) basis points over both the 3-year and 5-year periods.

The **International Equity** portfolio underperformed its policy benchmark by (2.3%) during the most recent quarter while still outperforming by 40 basis points over the 1-year period. The International Equity portfolio also outperformed over the 3- and 5-year periods by 1.4% and 0.7%, respectively.

The **Fixed Income** asset class underperformed its benchmark by (20) basis points over the most recent quarter, and underperformed by (60) basis points over the 1-year period. Over the longer-term, the Fixed Income portfolio underperformed its benchmark by (40) basis points over the 3-year period, while slightly outperforming its benchmark over the 5-year period by 10 basis points.

The **Covered Calls** asset class outperformed by 0.9% and 1.4% over the most recent quarter and 1-year period, respectively.

The **Real Return** asset class performance continues to trail its benchmark, underperforming by (8.4%) over the most recent quarter, and by (19.7%) over the 1-year period.

Periods ending March 31, 2016

Asset Class	Quarter	1-Year	3-Year	5-Year
Total Investment Portfolio	(0.1)	(2.6)	5.8	5.7
<i>Policy Benchmark¹</i>	<i>1.1</i>	<i>(0.1)</i>	<i>6.1</i>	<i>5.5</i>
Public Equity	(0.1)	(2.8)	9.1	8.7
<i>Policy Benchmark²</i>	<i>0.7</i>	<i>(2.1)</i>	<i>8.9</i>	<i>8.7</i>
Domestic Equity	0.5	(1.4)	10.9	10.8
<i>Blended Benchmark⁴</i>	<i>1.0</i>	<i>(0.3)</i>	<i>11.1</i>	<i>11.0</i>
Large Cap	1.2	0.7	11.5	11.4
<i>Russell 1000</i>	<i>1.2</i>	<i>0.5</i>	<i>11.5</i>	<i>11.4</i>
Mid Cap	0.9	(1.6)	10.2	9.5
<i>Russell Midcap</i>	<i>2.2</i>	<i>(4.0)</i>	<i>10.4</i>	<i>10.3</i>
Small Cap	(3.7)	(13.1)	9.4	9.1
<i>Russell 2000</i>	<i>(1.5)</i>	<i>(9.8)</i>	<i>6.8</i>	<i>7.2</i>
International Equity	(2.6)	(8.4)	2.2	1.5
<i>Blended Benchmark⁵</i>	<i>(0.3)</i>	<i>(8.8)</i>	<i>0.8</i>	<i>0.8</i>
Fixed Income	2.9	1.2	2.1	4.0
<i>BC Universal (blend)⁶</i>	<i>3.1</i>	<i>1.8</i>	<i>2.5</i>	<i>3.9</i>
Covered Calls	0.2	4.1	---	---
<i>CBOE BXM</i>	<i>(0.7)</i>	<i>2.7</i>	---	---
Real Return	(7.0)	(15.8)	---	---
<i>CPI + 3%</i>	<i>1.4</i>	<i>3.9</i>	---	---

¹ The Evolving Policy Benchmark consists of 43% Russell 3000, 12% MSCI ACWI ex U.S., 20% BC Universal, 15% CBOE BXM, and 10% CPI+3%.

² The Public Equity benchmark consists of 80% Russell 3000 and 20% MSCI ACWI ex U.S.

⁴ Domestic Equity Benchmark consists of S&P 500 thru 3/31/98, 29% R1000, 57% R1000V, 14% RMC from 4/1/98 - 12/31/04, and Russell 3000 from 1/1/05 to the present.

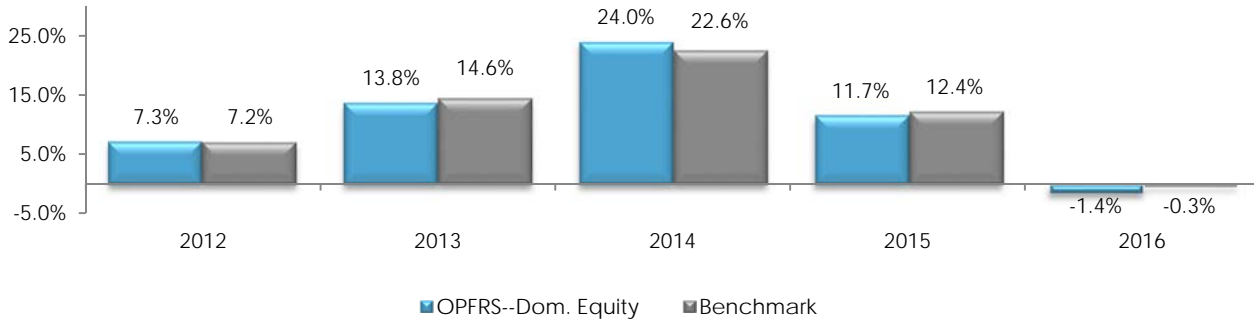
⁵ International Equity Benchmark consists of MSCI EAFE thru 12/31/04, and MSCI ACWI x U.S. thereafter.

⁶ Fixed Income Benchmark consists of BC Aggregate prior to 4/1/06, BC Universal prior to 7/1/2012, and a blend of 75% bills, 25% BC Universal thereafter.

Asset Class Performance

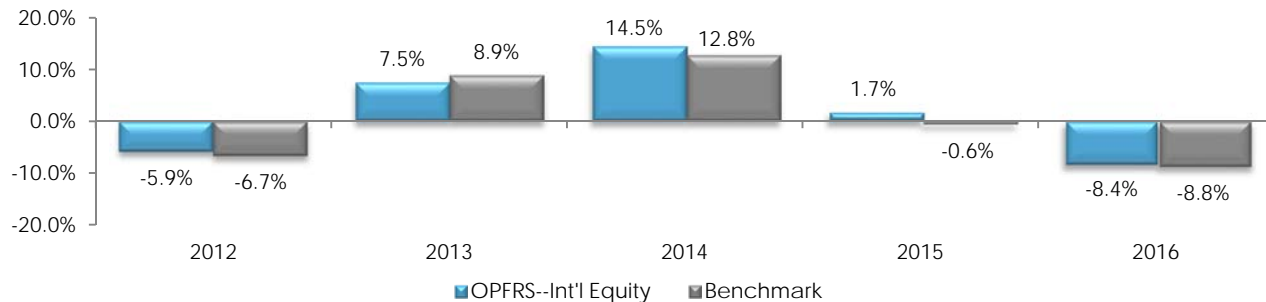
The Domestic Equity portfolio outperformed the policy benchmark in two out of five of latest 12-month periods. The Plan finished the latest 12-month period ending March 31, 2016, with a return of (1.4%), underperforming the policy benchmark by (1.1%).

Domestic Equity 12-Month Performance – Periods Ending March 31



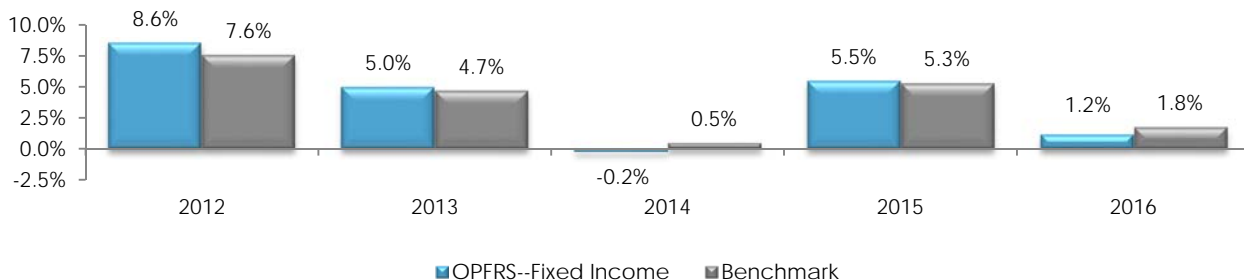
The International Equity portfolio outperformed or matched the policy benchmark in four of the five latest 12-month periods. The Plan finished the latest 12-month period ending March 31, 2016, with a return of (8.4%), outperforming the policy benchmark by 40 basis points.

International Equity 12-Month Performance – Periods Ending March 31



The Fixed Income portfolio outperformed or matched the policy benchmark in three of the last five 12-month periods. The Plan finished the latest 12-month period ending March 31, 2016, with a return of 1.2%, underperforming the policy benchmark by (60) basis points.

Fixed Income 12-Month Performance – Periods Ending March 31



Manager Performance

Domestic Equity – Periods ending March 31, 2016

Manager	Mkt Value (\$000)	Asset Class	Quarter	1 YR	3 YR	5 YR	Since Inception*	Inception Date**
Northern Trust R1000 Index	55,523	Large Cap Core	1.2	0.8	11.6	11.3	12.9	5/2010
<i>Russell 1000 Index</i>	---	---	1.2	0.5	11.5	11.4	12.1	---
SSgA Russell 1000 Value	26,808	Large Cap Value	1.7	-1.4	---	---	0.4	10/2014
<i>Russell 1000 Value Index</i>	---	---	1.6	-1.5	---	---	0.3	---
SSgA Russell 1000 Growth	28,407	Large Cap Growth	0.8	2.5	---	---	6.0	10/2014
<i>Russell 1000 Growth Index</i>	---	---	0.7	2.5	---	---	6.1	---
Earnest	29,104	Mid Cap Core	0.9	-1.6	10.2	9.5	7.7	3/2006
<i>Russell MidCap</i>	---	---	2.2	-4.0	10.4	10.3	7.6	---
NWQ	9,784	Small Cap Value	1.7	-4.5	11.6	11.6	6.6	1/2006
<i>Russell 2000 Value Index</i>	---	---	1.7	-7.7	5.7	6.7	4.8	---
Lord Abbett	8,200	Small Cap Growth	-10.0	-22.7	6.4	6.2	13.5	6/2010
<i>Russell 2000 Growth Index</i>	---	---	-4.7	-11.8	7.9	7.7	13.7	---

* Performance is calculated based on the first full month of performance since funding.

** Inception date reflects the month when portfolio received initial funding.

During the latest three-month period ending March 31, 2016, none of OPFRS' three active domestic equity managers outperformed their respective benchmarks.

Northern Trust, the Plan's passive large cap core transition account continues to perform in-line with its benchmark over all time periods measured. This performance is within expectations for a passive mandate.

SSgA Russell 1000 Value, the Plan's passive large cap value account has continued to perform within expectations for a passive mandate.

SSgA Russell 1000 Growth, the Plan's passive large cap growth account has continued to perform within expectations for a passive mandate.

Earnest Partners, the Plan's mid cap core manager, completed the quarter with an 0.9% return, underperforming the Russell Midcap Index by (1.3%). Over the latest 1-year period, Earnest outperformed its benchmark by 2.4%, while underperforming over the 3- and 5-year periods by (20) and (80) basis points, respectively.

NWQ, the Plan's small cap value manager, matched the Russell 2000 Value Index over the latest 3-month period. Over the longer-term, NWQ has outperformed its benchmark return over the 1-, 3-, and 5-year periods by 3.2%, 5.9%, and 4.9%, respectively.

Lord Abbett, the Plan's small cap growth manager, underperformed the Russell 2000 Growth Index by (5.3%) over the quarter. Over the 1-year period, Lord Abbett underperformed the benchmark by (10.9%) while also underperforming over both the 3- and 5-year periods by (1.5%).

International Equity – Periods ending March 31, 2016

Manager	Mkt Value (\$000)	Asset Class	Quarter	1 YR	3 YR	5 YR	Since Inception*	Inception Date**
SSgA	11,877	International	-2.9	-8.0	2.5	2.6	6.9	7/2002
<i>MSCI EAFE Index</i>	---	---	-2.9	-7.9	2.7	2.8	6.9	---
Hansberger	14,758	International	-2.8	-7.8	2.0	0.7	3.2	1/2006
<i>MSCI ACWI x US</i>	---	---	-0.3	-8.8	0.8	0.8	3.3	---
Fisher	14,490	International	-2.0	-9.3	2.4	1.7	1.7	4/2011
<i>MSCI ACWI x US</i>	---	---	-0.3	-8.8	0.8	0.8	0.8	---

* Performance is calculated based on the first full month of performance since funding.

** Inception date reflects the month when portfolio received initial funding.

During the latest three-month period ending March 31, 2016, neither of OPFRS' two active International Equity managers outperformed their benchmark.

The **SSgA** account has performed roughly in-line with its benchmark over all time periods measured. This performance is within expectations for a passive mandate.

Hansberger, one of OPFRS' active international equity managers, underperformed the MSCI ACWI x US Index during the quarter by (2.5%). The portfolio outperformed over the 1- and 3-year periods by 1.0% and 1.2%, respectively, while slightly underperforming over the 5-year period by (10) basis points.

Fisher, one of OPFRS' active international equity managers, underperformed the MSCI ACWI x US Index by (1.7%) during the quarter. Over the latest 1-year period, Fisher trailed its benchmark target by (50) basis points, but outperformed over the 3- and 5-year periods by 1.6% and 0.9%, respectively.

Fixed Income – Periods ending March 31, 2016

Manager	Mkt Value (\$000)	Asset Class	Quarter	1 YR	3 YR	5 YR	Since Inception **	Inception Date ***
Reams	23,811	Core Plus	3.5	2.3	2.5	4.6	6.0	1/1998
<i>BC Universal Index (blend)*</i>	---	---	<i>3.1</i>	<i>1.8</i>	<i>2.5</i>	<i>3.9</i>	<i>5.3</i>	---
T. Rowe Price	38,411	Core	2.9	2.2	2.7	---	3.8	5/2011
<i>BC Aggregate Index</i>	---	---	<i>3.0</i>	<i>2.0</i>	<i>2.5</i>	---	<i>3.6</i>	---
DDJ	7,621	H.Y. / B.L.	1.6	-4.8	---	---	-2.6	1/2015
<i>BofAML US HY Master II</i>	---	---	<i>3.2</i>	<i>-4.0</i>	---	---	<i>-1.9</i>	---

* Previously the benchmark for Reams was the BC Aggregate; this was changed to the BC Universal beginning 4/1/2006.

** Performance is calculated based on the first full month of performance since funding.

*** Inception date reflects the month when portfolio received initial funding.

During the latest three-month period ending March 31, 2016, one of OPFRS' two active Fixed Income managers outperformed its benchmark.

Reams, the Plan's core plus fixed income manager, produced a quarterly return of 3.5%, outperforming the BC Universal (blend) Index by 40 basis points. During the latest 1-year period, the portfolio beat its benchmark by 50 basis points while matching its benchmark over the 3-year period. Reams outperformed its benchmark over the 5-year period by 70 basis points.

T. Rowe Price, the Plan's core fixed income manager, produced a quarterly return of 2.9%, underperforming the BC Aggregate Index by (10) basis points. The portfolio outperformed its benchmark over both the 1- and 3-year periods by 20 basis points.

DDJ, the Plan's High Yield & Bank Loan manager, underperformed its benchmark, the BofAML US High Yield Master II index, by (1.6%) over the most recent quarter, and underperformed over the 1-year period by (80) basis points.

Covered Calls & Total Real Return – Periods ending March 31, 2016

Manager	Mkt Value (\$000)	Asset Class	Quarter	1 YR	3 YR	5 YR	Since Inception **	Inception Date ***
Parametric	65,288	Covered Calls	0.2	4.1	---	---	5.3	3/2014
<i>CBOE BXM</i>	---	---	<i>-0.7</i>	<i>2.7</i>	---	---	<i>3.8</i>	---
Wellington	32,908	Total Real Return	-7.0	-15.8	---	---	-6.8	1/2014
<i>CPI + 3%</i>	---	---	<i>1.4</i>	<i>3.9</i>	---	---	<i>3.9</i>	---

** Performance is calculated based on the first full month of performance since funding.

*** Inception date reflects the month when portfolio received initial funding.

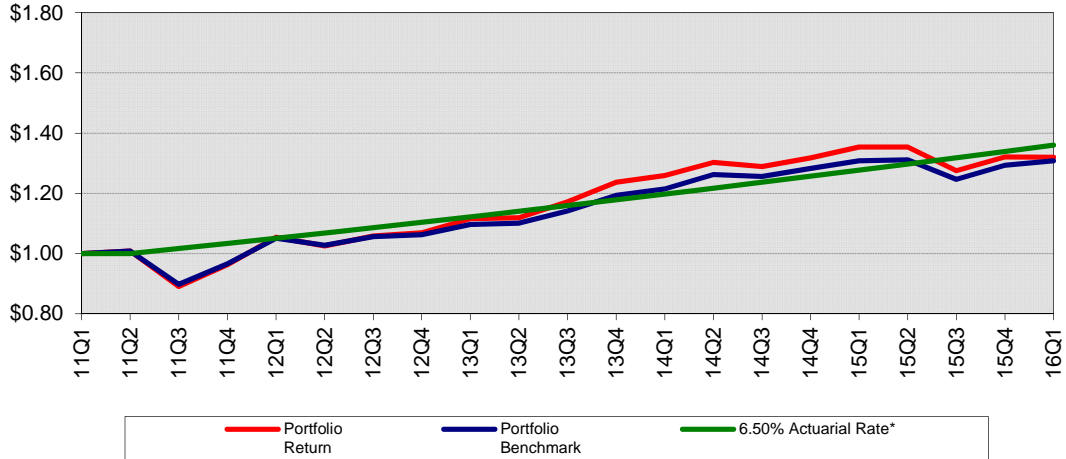
During the latest three-month period ending March 31, 2016, OPFRS' Covered Calls manager outperformed its benchmark, while OPFRS' Real Return manager underperformed its benchmark.

Parametric, the Plan's Covered Calls manager, produced a quarterly return of 20 basis points, outperforming its benchmark by 90 basis points. Over the most recent 1-year period, the portfolio has outperformed its benchmark by 1.4%.

Wellington, the Plan's Total Real Return manager, produced a quarterly loss of (7.0%), underperforming its benchmark by (8.4%). The portfolio also trailed its benchmark by (19.7%) over the 1-year period.

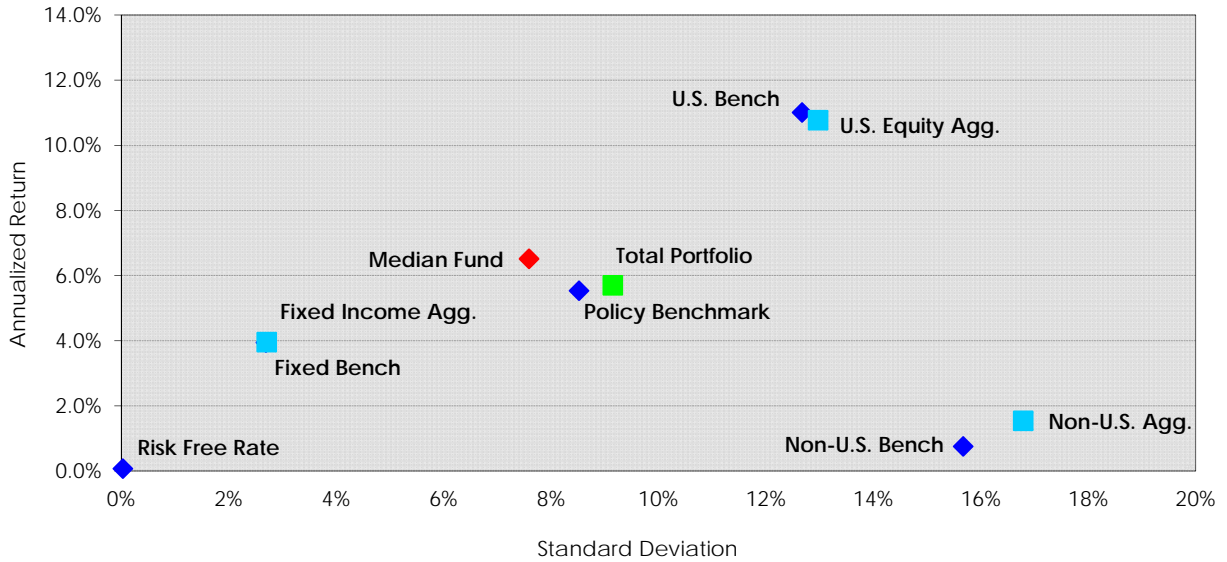
OPFRS Risk/Return Analysis
Period ending March 31, 2016

Growth of a Dollar
Past 5 Years



* The actuarial expected rate of return was 8% through 6/30/2009, 7.5% through 6/30/2010, 7% through 6/30/2011, 6.75% through 6/30/2014, and 6.5% currently

Five-Year Annualized Risk/Return



**City of Oakland Police & Fire Retirement, Asset Allocation
as of March 31, 2016**

Manager	Style	Market Value \$(000)	Target	Actual ¹	Difference
Total Plan		\$370,254	100.0%	100.0%	0.0%
Public Equity		\$198,951	55.0%	53.7%	-1.3%
Domestic Equity		\$157,826	43.0%	42.6%	-0.4%
Large Cap Equity					
Northern Trust	Large Cap Core	55,523	14.2%	15.0%	0.8%
SSgA Russell 1000 Value	Large Cap Value	26,808	7.4%	7.2%	-0.2%
SSgA Russell 1000 Growth	Large Cap Growth	28,407	7.4%	7.7%	0.3%
Mid Cap Equity					
Earnest Partners	Mid Cap Core	29,104	8.0%	7.9%	-0.1%
Small Cap Equity					
NWQ	Small Cap Value	9,784	3.0%	2.6%	-0.4%
Lord Abbett	Small Cap Growth	8,200	3.0%	2.2%	-0.8%
International Equity		\$41,125	12.0%	11.1%	-0.9%
SSgA	International	11,877	3.6%	3.2%	-0.4%
Hansberger	International	14,758	4.2%	4.0%	-0.2%
Fisher	International	14,490	4.2%	3.9%	-0.3%
Fixed Income		\$69,882	20.0%	18.9%	-1.1%
Reams	Core Plus	23,811	8.0%	6.4%	-1.6%
T. Rowe Price	Core	38,411	10.0%	10.4%	0.4%
DDJ	High Yield/Bank Loans	7,621	2.0%	2.1%	0.1%
Transition (Reams) ³	Transition Portfolio	39	0.0%	0.0%	---
Covered Calls		\$65,288	15.0%	17.6%	2.6%
Parametric (Eaton Vance)	Active/Replication	65,288	---	17.6%	---
Real Return		\$32,908	10.0%	8.9%	-1.1%
Wellington	Multi Asset	32,908	---	8.9%	---
Total Cash²		\$3,225	0.0%	0.9%	0.9%

1. In aggregate, asset class allocations equal to 100% of total investment portfolio.

2. Includes cash balance with City Treasury and Torrey Pines Bank as of 3/31/2016.

3. Includes a residual \$39,178 in the Reams transition account.

MANAGER MONITORING / PROBATION LIST

Monitoring/Probation Status

As of March 31, 2016
Return vs. Benchmark since Corrective Action

Portfolio	Status	Concern	Months Since Corrective Action	Performance [^] Since Corrective Action	Date of Corrective Action*
Hansberger	On Watch	Organizational	22	-4.8%	5/28/2014
MSCI ACWI ex-US	---	---	22	-6.9%	---

[^] Annualized performance if over one year.

* Approximate date based on when Board voted to either monitor a manager at a heightened level or place it on probation.

Investment Performance Criteria
For Manager Monitoring/Probation Status

Asset Class	Short-term (rolling 12 mth periods)	Medium-term (rolling 36 mth periods)	Long-term (60 + months)
Active Domestic Equity	Fd return < bench return – 3.5%	Fd annlzd return < bench annlzd return – 1.75% for 6 consecutive months	VRR < 0.97 for 6 consecutive months
Active International Equity	Fd return < bench return – 4.5%	Fd annlzd return < bench annlzd return – 2.0% for 6 consecutive months	VRR < 0.97 for 6 consecutive months
Passive International Equity	Tracking Error > 0.50%	Tracking Error > 0.45% for 6 consecutive months	Fd annlzd return < bench annlzd return – 0.40% for 6 consecutive months
Fixed Income	Fd return < bench return – 1.5%	Fd annlzd return < bench annlzd return – 1.0% for 6 consecutive months	VRR < 0.98 for 6 consecutive months

All critelized basis.

VRR – Value Relative Ratio – is calculated as: manager cumulative return / benchmark cumulative return.

Oakland Police & Fire
Performance Summary and Universe Rankings
Period Ending March 31, 2016

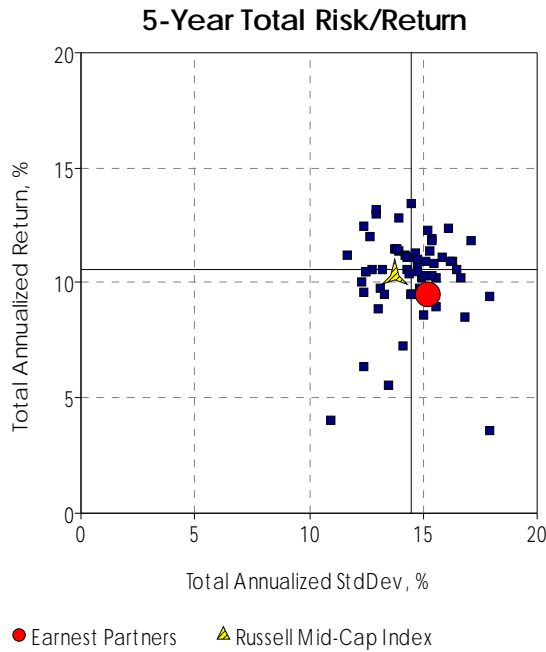
Mellon Total Funds - Public Universe				
	Quarter	1- Year	3-Year	5-Year
Maximum	3.7	2.0	9.0	9.2
Percentile 25	1.6	0.2	6.9	7.1
Median	1.2	-0.6	6.1	6.5
Percentile 75	0.8	-2.2	4.9	5.7
Minimum	-0.8	-4.2	1.1	1.6
Number of Portfolios	112	102	95	90
Oakland Police & Fire Total				
Return	-0.1	-2.6	5.8	5.7
Quartile Rank	4th	4th	3rd	3rd

Notes:

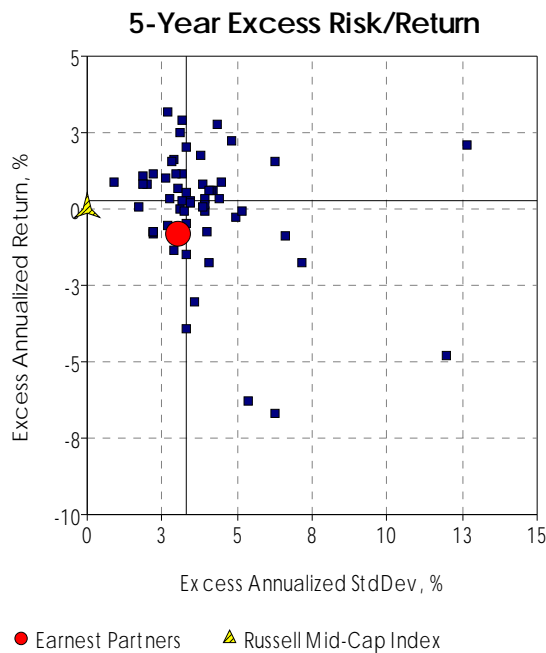
Source: Mellon Total Public Funds Universe

All performance is shown **gross of fees**.

Oakland Mid Cap Core Manager Comparisons as of March 31, 2016

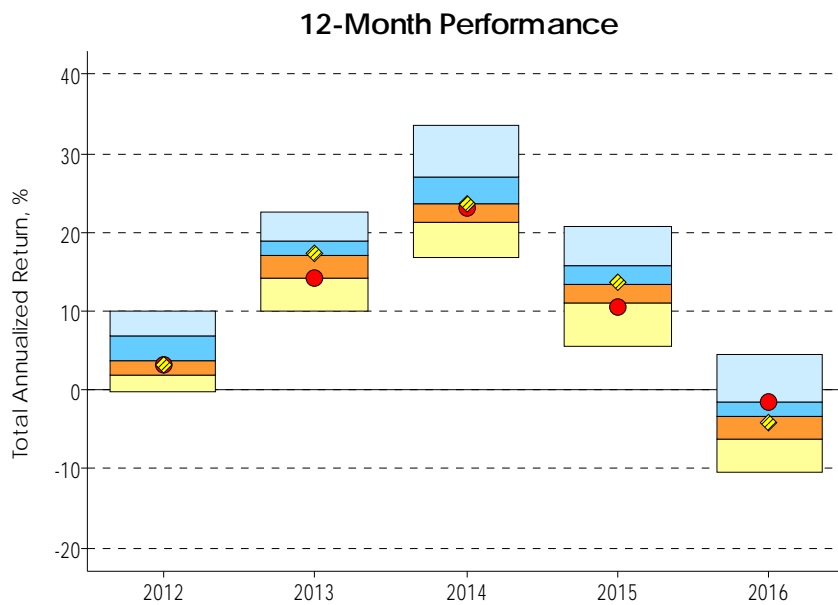
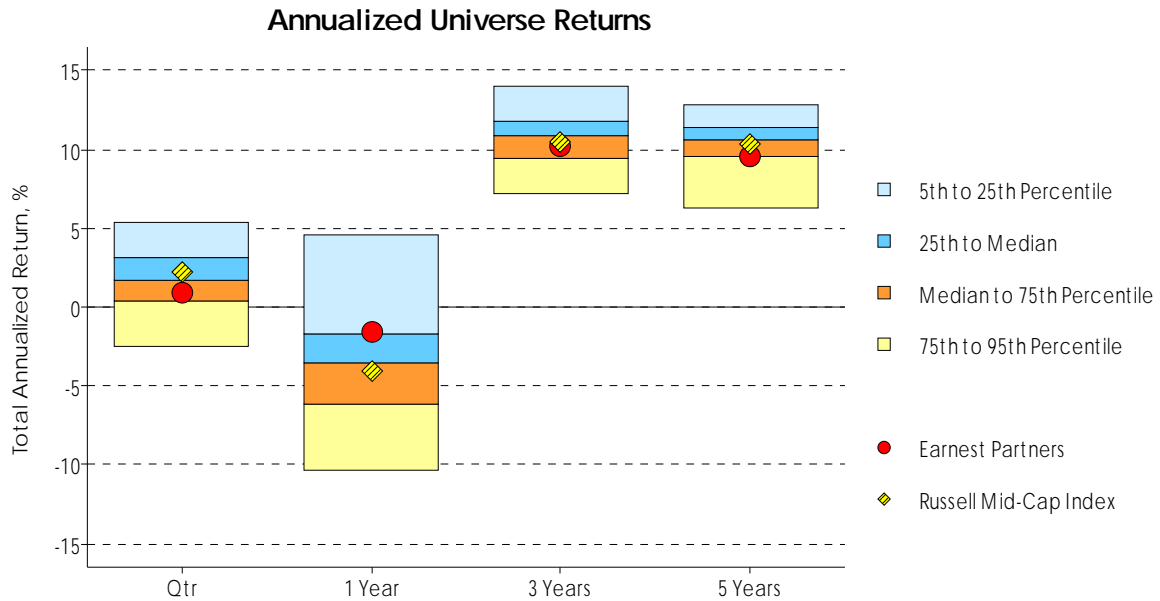


	Annualized Return, %	Annualized StdDev, %	Sharpe Ratio
Earnest Partners	9.52	15.18	0.63
Russell Mid-Cap Index	10.30	13.80	0.75
Mid Cap Core Universe Median	10.58	14.48	0.72



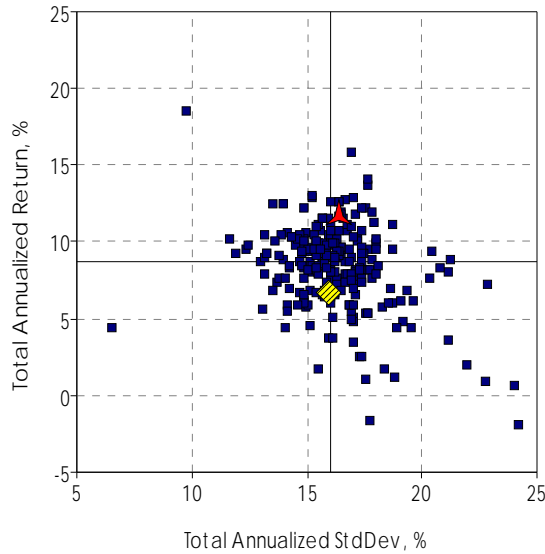
	Annualized Excess Return, %	Annualized Excess StdDev, %	Sharpe Ratio, Excess
Earnest Partners	-0.78	3.00	-0.26
Russell Mid-Cap Index	0.00	0.00	NA
Mid Cap Core Universe Median	0.28	3.29	0.08

Oakland Mid Cap Core Manager Comparisons as of March 31, 2016



Oakland Small Cap Value Manager Comparisons as of March 31, 2016

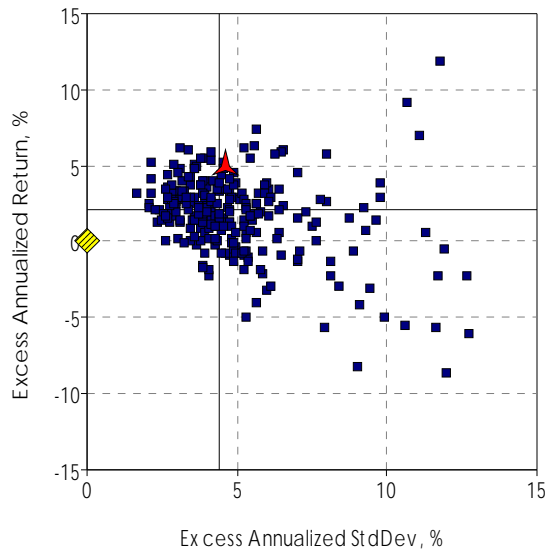
5-Year Total Risk/Return



▲ NW Q ◆ Russell 2000 Value Index

	Annualized Return, %	Annualized StdDev, %	Sharpe Ratio
NW Q	11.62	16.42	0.71
Russell 2000 Value Index	6.67	15.93	0.42
Small Cap Value Universe Median	8.73	16.04	0.55

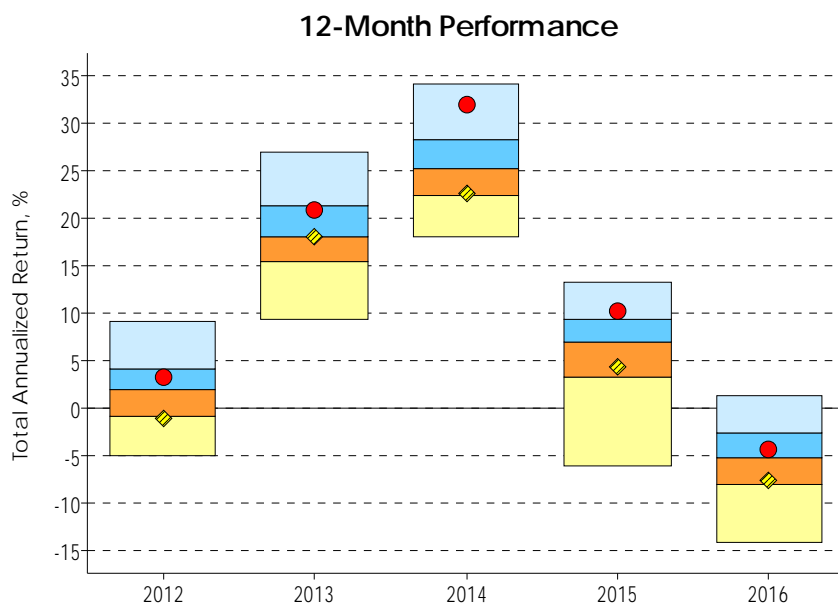
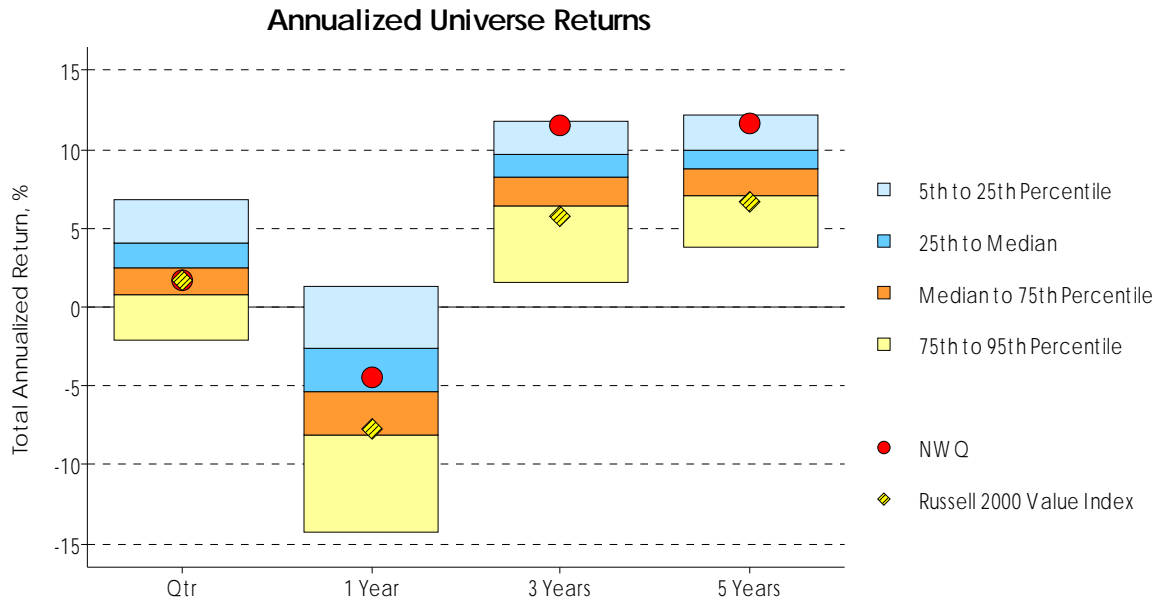
5-Year Excess Risk/Return



▲ NW Q ◆ Russell 2000 Value Index

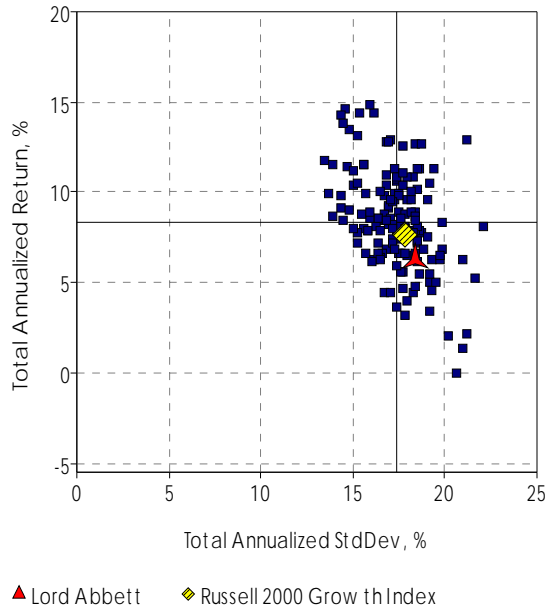
	Annualized Excess Return, %	Annualized Excess StdDev, %	Sharpe Ratio, Excess
NW Q	4.96	4.61	1.08
Russell 2000 Value Index	0.00	0.00	NA
Small Cap Value Universe Median	2.07	4.43	0.47

Oakland Small Cap Value Manager Comparisons as of March 31, 2016



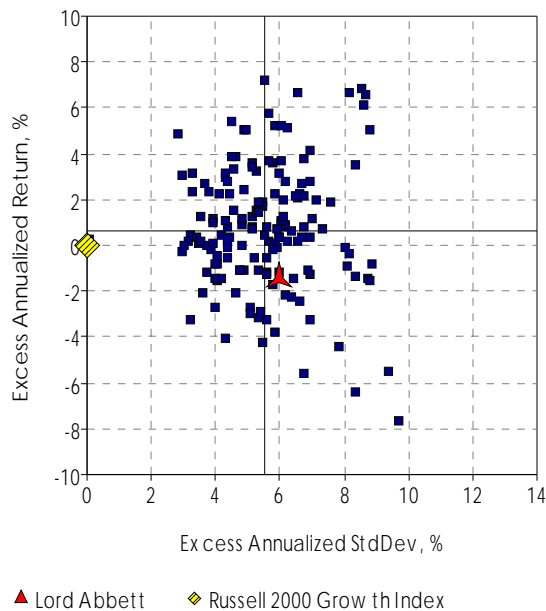
Oakland Small Cap Growth Manager Comparisons as of March 31, 2016

5 -Year Total Risk/Return



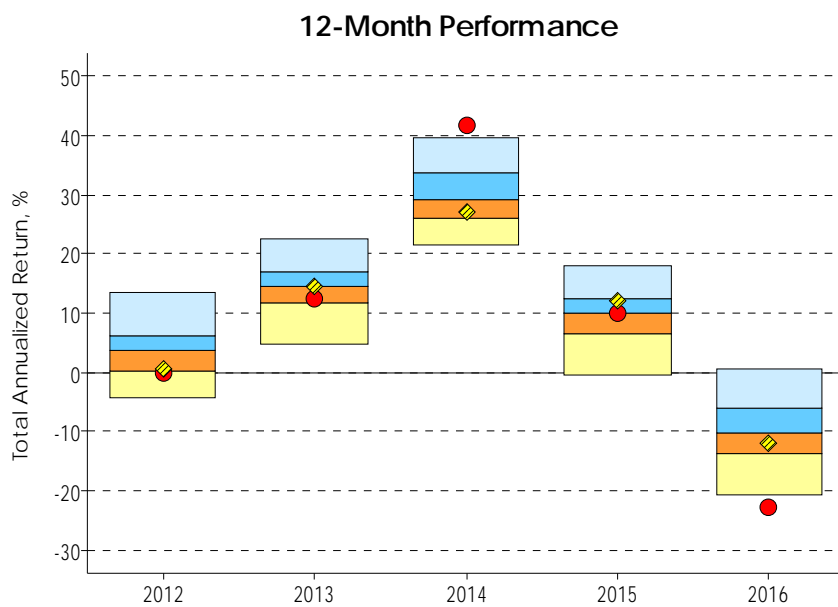
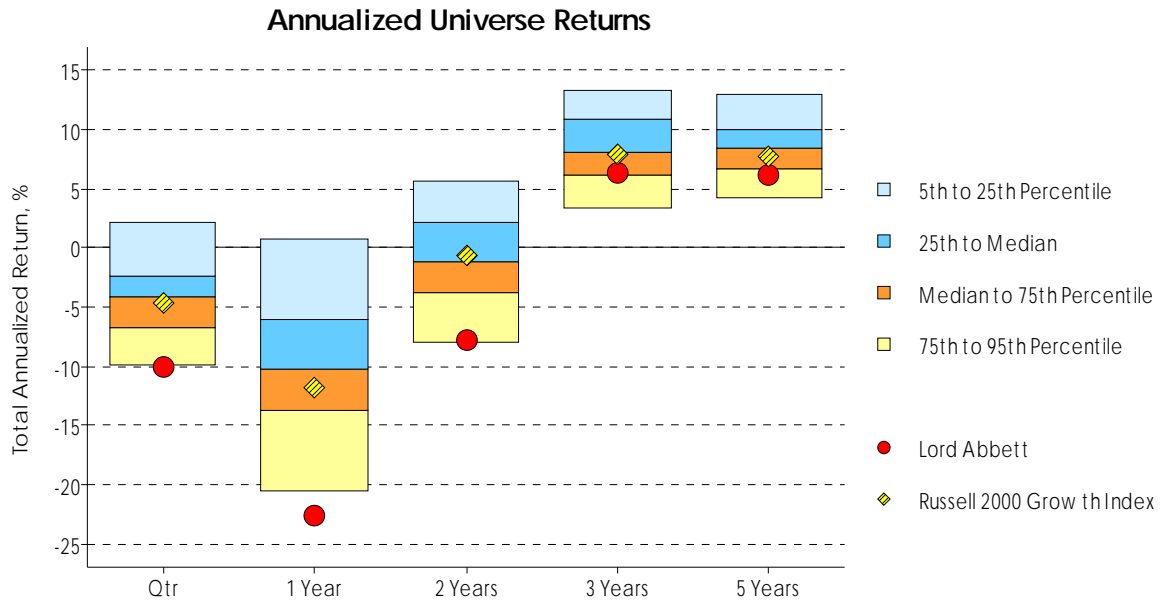
	Annualized Return, %	Annualized StdDev, %	Sharpe Ratio
Lord Abbett	6.24	18.35	0.34
Russell 2000 Growth Index	7.70	17.78	0.43
Small Cap Growth Universe Median	8.36	17.39	0.49

5 -Year Excess Risk/Return



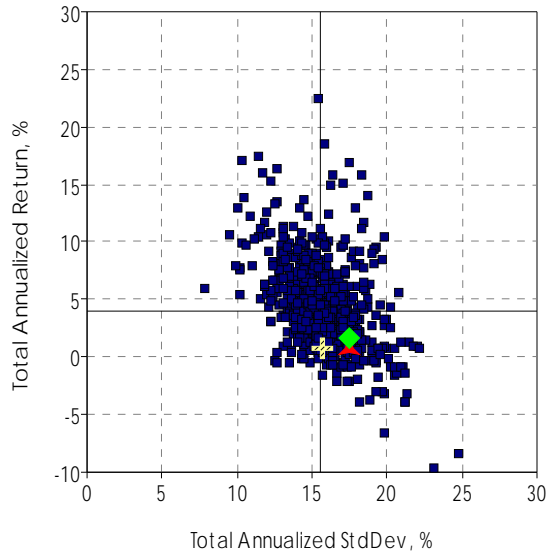
	Annualized Excess Return, %	Annualized Excess StdDev, %	Sharpe Ratio, Excess
Lord Abbett	-1.46	5.96	-0.24
Russell 2000 Growth Index	0.00	0.00	NA
Small Cap Growth Universe Median	0.66	5.51	0.12

Oakland Small Cap Growth Manager Comparisons as of March 31, 2016



Oakland International Equity Manager Comparisons as of March 31, 2016

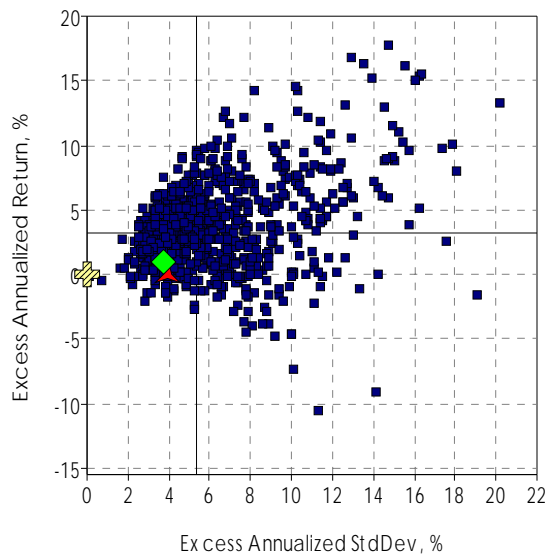
5-Year Total Risk/Return



▲ Hansberger ◆ Fisher ◆ MSCI AC World Index ex USA

	Annualized Return, %	Annualized StdDev, %	Sharpe Ratio
Hansberger	0.75	17.46	0.04
Fisher	1.73	17.45	0.10
MSCI AC World Index ex USA	0.76	15.67	0.05
International Equity Universe Median	3.98	15.51	0.25

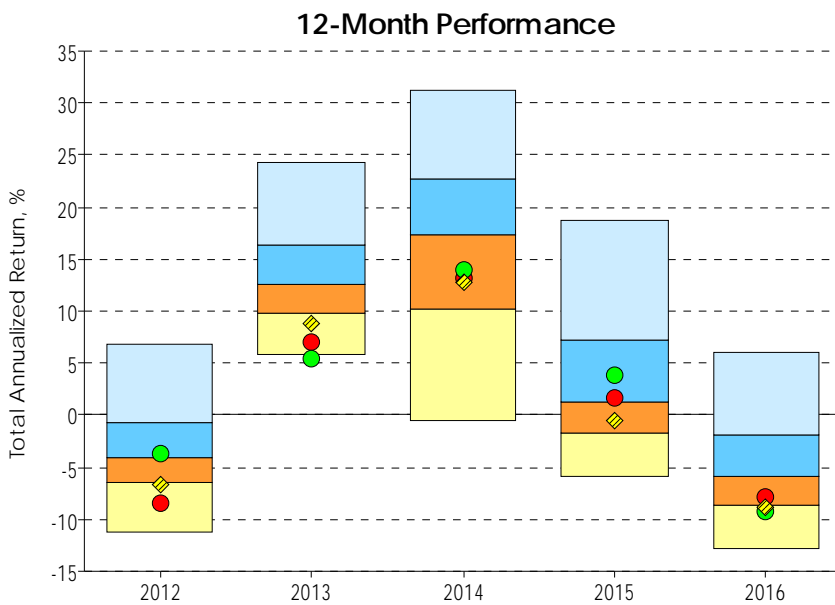
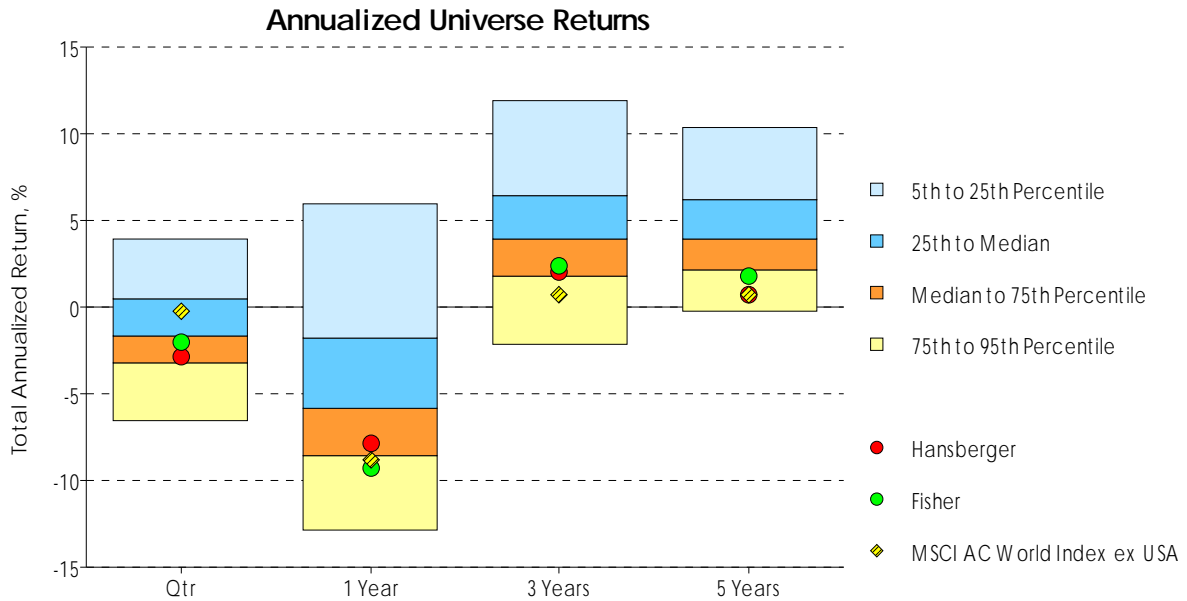
5-Year Excess Risk/Return



▲ Hansberger ◆ Fisher ◆ MSCI AC World Index ex USA

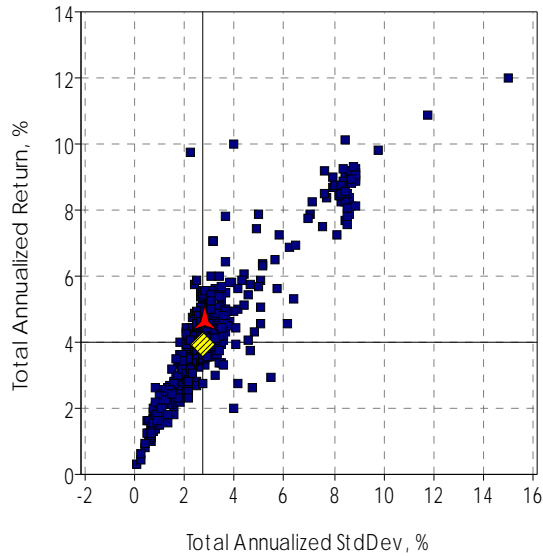
	Annualized Excess Return, %	Annualized Excess StdDev, %	Sharpe Ratio, Excess
Hansberger	-0.01	3.95	0.00
Fisher	0.97	3.78	0.26
MSCI AC World Index ex USA	0.00	0.00	NA
International Equity Universe Median	3.21	5.33	0.59

Oakland International Equity Manager Comparisons as of March 31, 2016



Oakland Fixed Income Manager Comparisons as of March 31, 2016

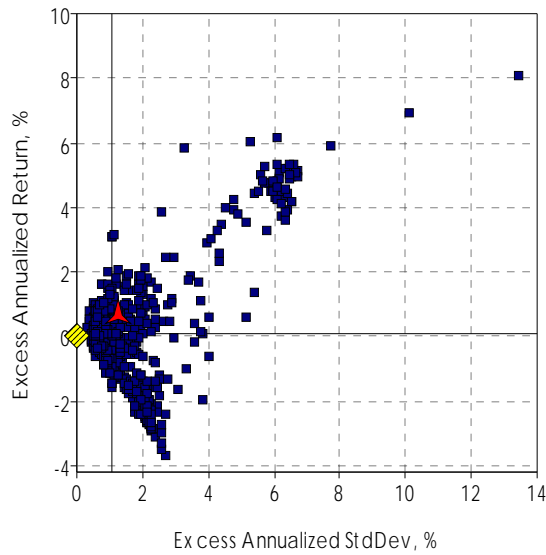
5-Year Total Risk/Return



▲ Reams ◆ Oakland BC Universal Blend

	Annualized Return, %	Annualized StdDev, %	Sharpe Ratio
Reams	4.60	2.82	1.63
Oakland BC Universal Blend	3.95	2.69	1.47
U.S. F.I. Manager Universe Median	4.01	2.72	1.52

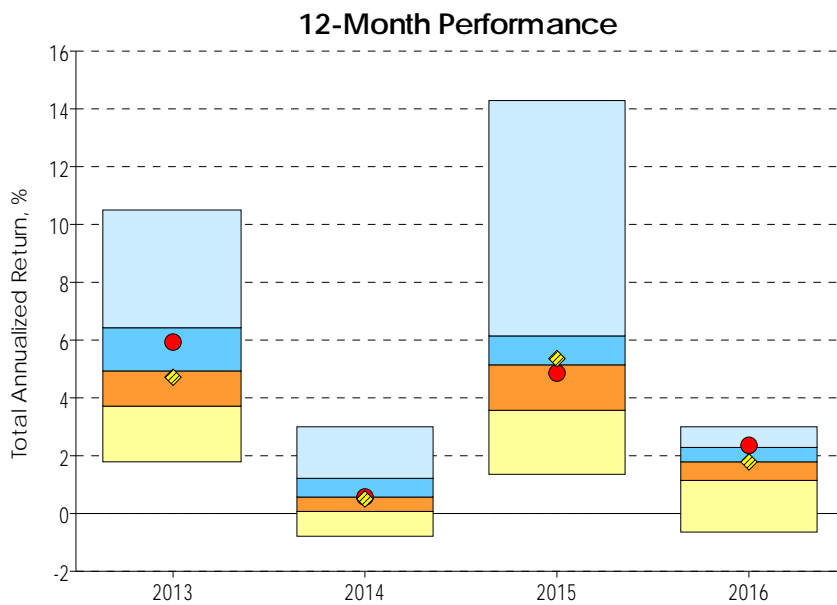
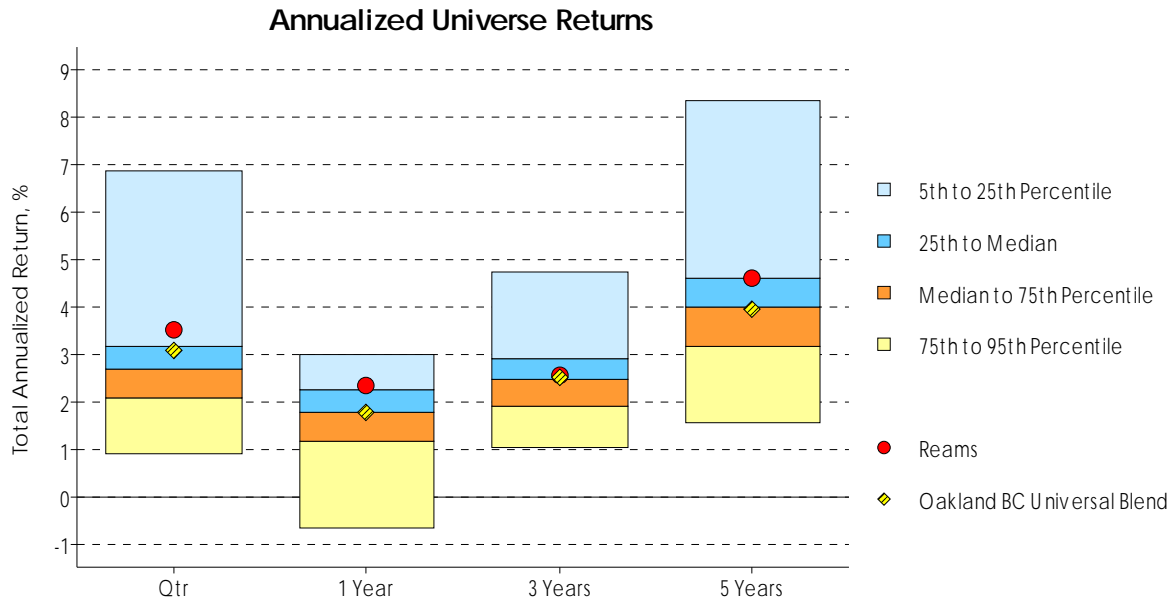
5-Year Excess Risk/Return



▲ Reams ◆ Oakland BC Universal Blend

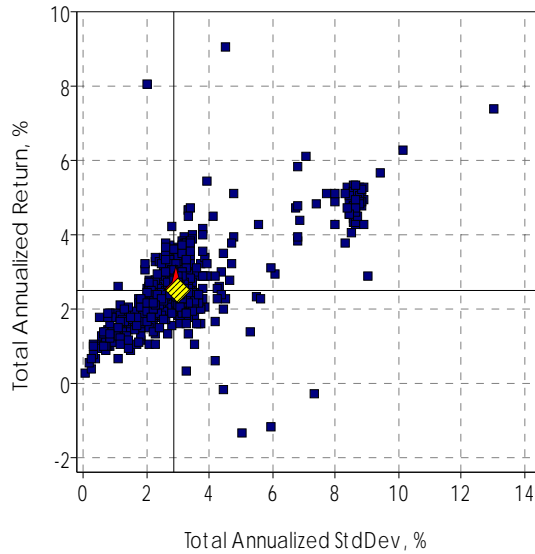
	Annualized Excess Return, %	Annualized Excess StdDev, %	Sharpe Ratio, Excess
Reams	0.65	1.23	0.53
Oakland BC Universal Blend	0.00	0.00	NA
U.S. F.I. Manager Universe Median	0.06	1.08	0.06

Oakland Fixed Income Manager Comparisons as of March 31, 2016



Oakland Fixed Income Manager Comparisons as of March 31, 2016

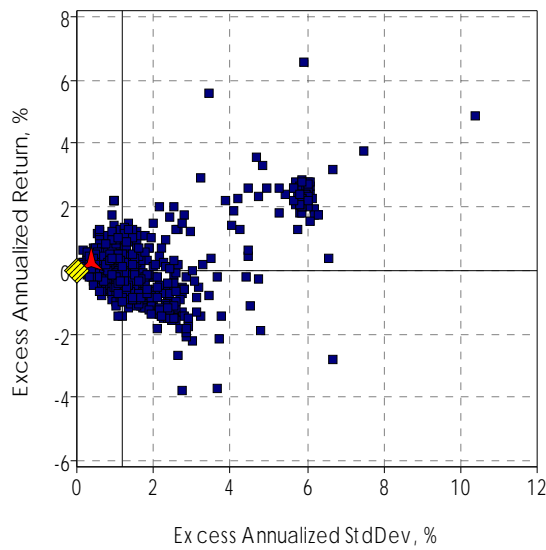
3-Year Total Risk/Return



▲ T. Rowe Price ◆ BC Aggregate Bond

	Annualized Return, %	Annualized StdDev, %	Sharpe Ratio
T. Rowe Price	2.73	2.96	0.92
BC Aggregate Bond	2.50	3.00	0.83
U.S. Fixed Income Manager Universe Median	2.47	2.91	0.91

3-Year Excess Risk/Return

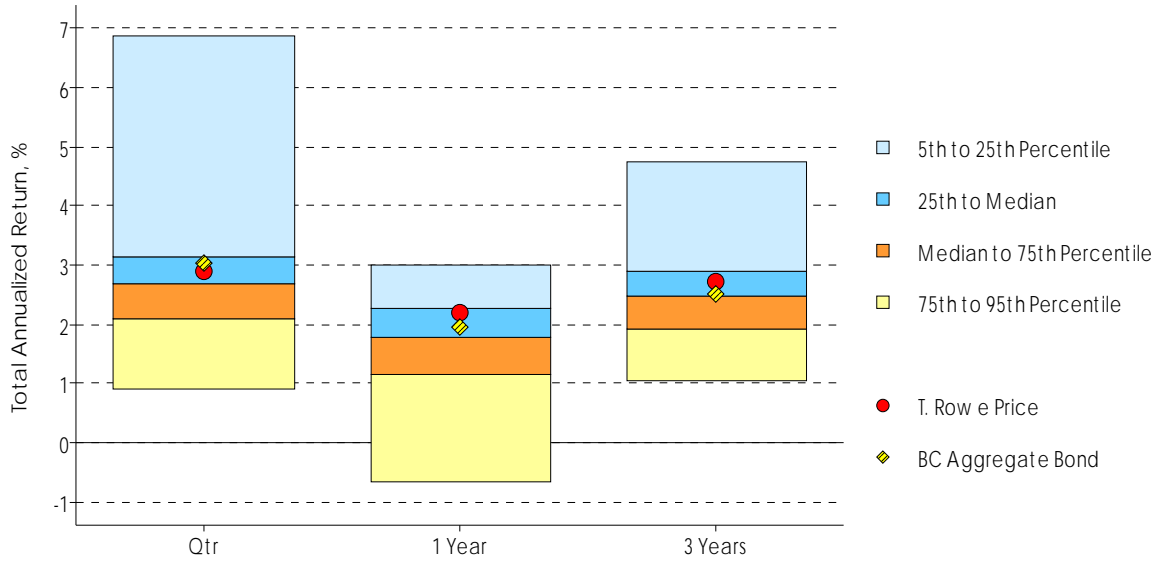


▲ T. Rowe Price ◆ BC Aggregate Bond

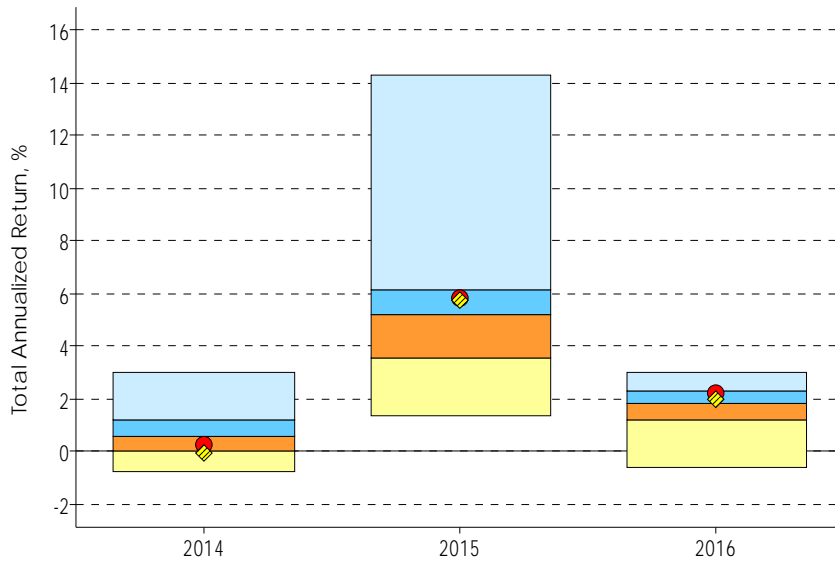
	Annualized Excess Return, %	Annualized Excess StdDev, %	Sharpe Ratio, Excess
T. Rowe Price	0.23	0.38	0.59
BC Aggregate Bond	0.00	0.00	NA
U.S. Fixed Income Manager Universe Median	-0.03	1.16	-0.04

Oakland Fixed Income Manager Comparisons as of March 31, 2016

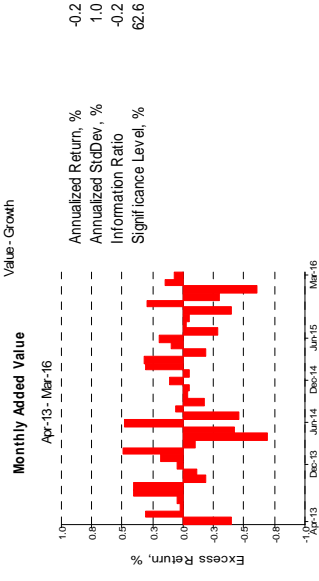
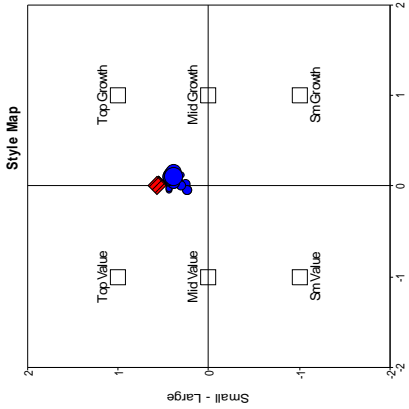
Annualized Universe Returns



12-Month Performance

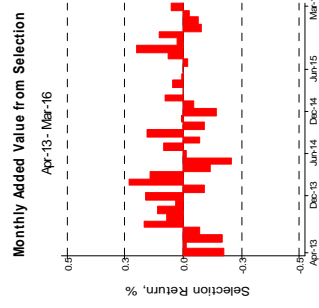
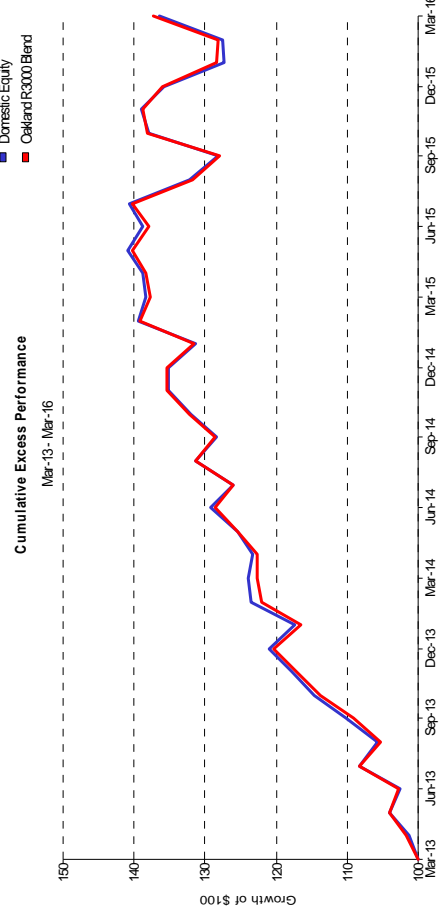
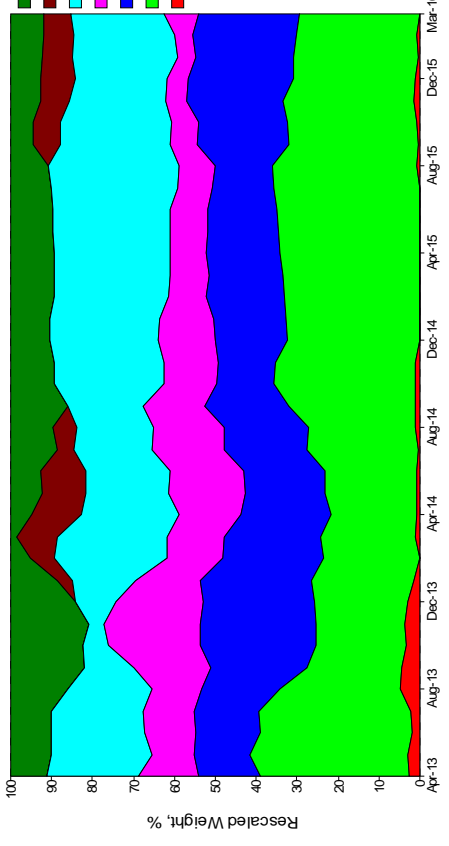


Domestic Equity



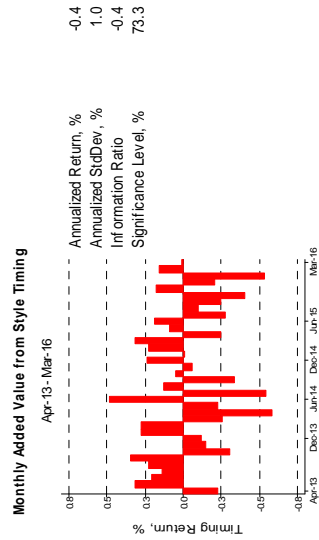
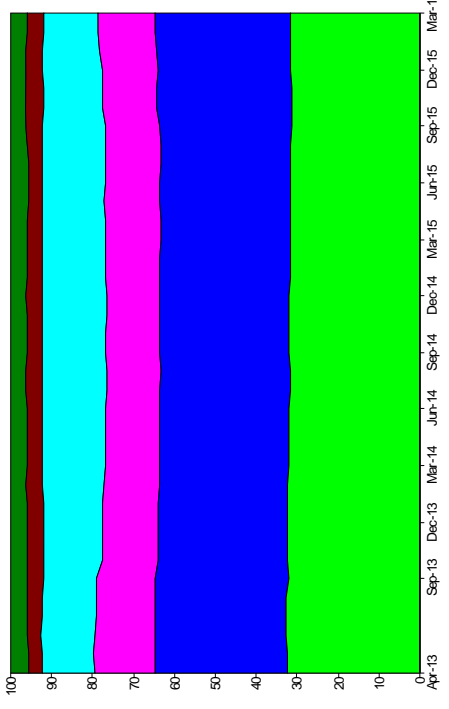
Asset Loadings - Manager

Apr-13 - Mar-16

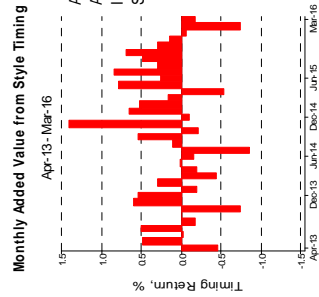
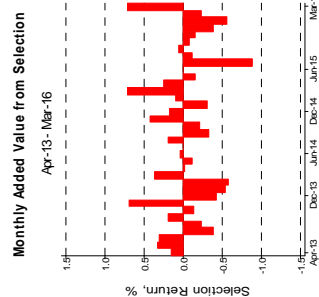
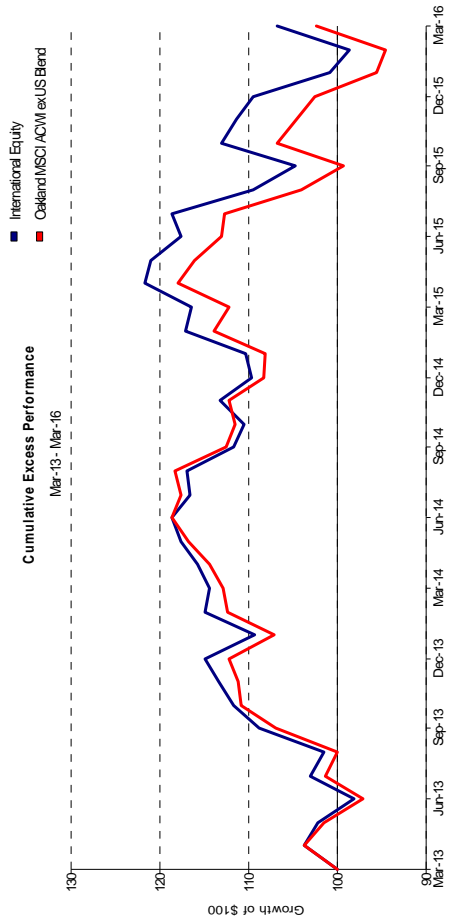
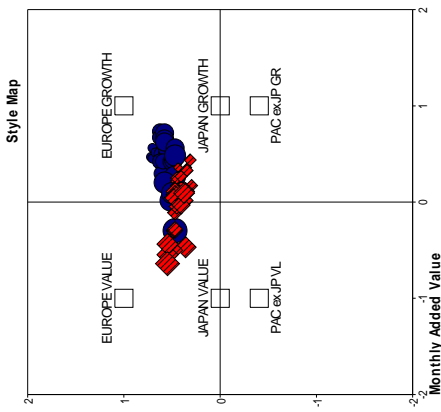


Asset Loadings - Benchmark

Apr-13 - Mar-16

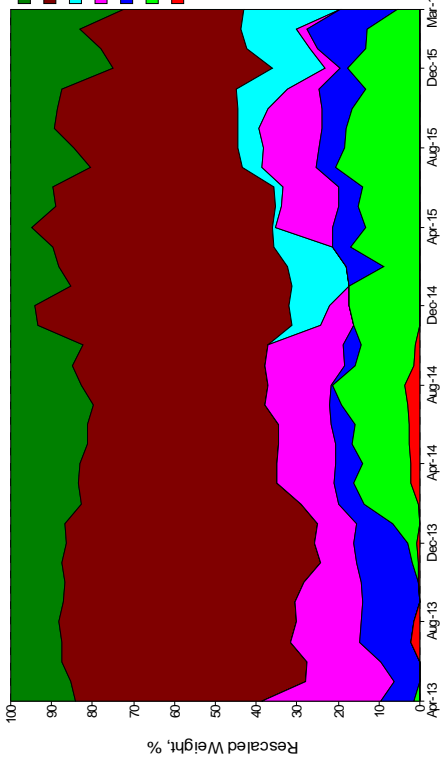


International Equity



Asset Loadings - Manager

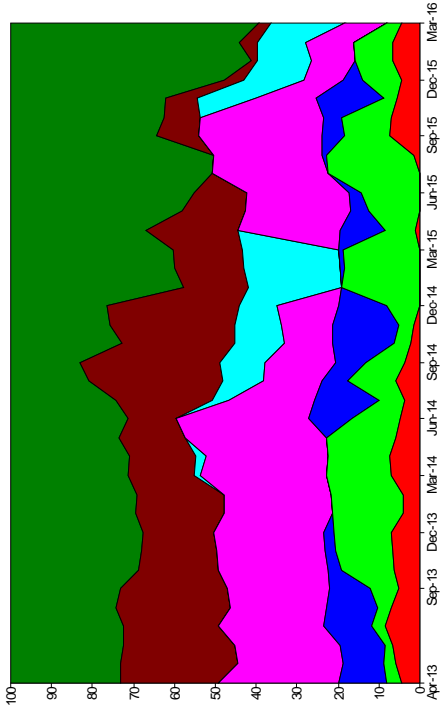
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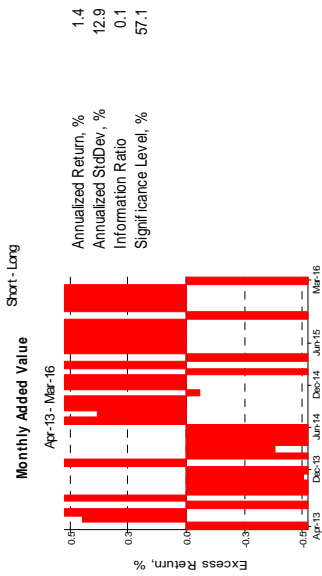
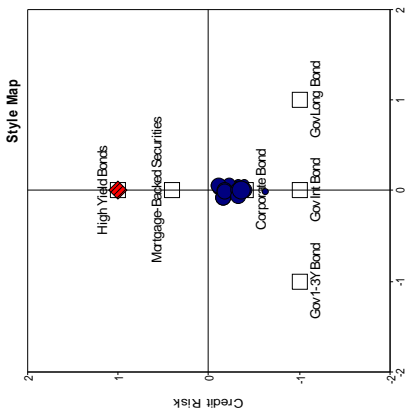
- EUROPE VALUE
- EUROPE GROWTH
- PAC ex JP VL
- PAC ex JP GR
- JAPAN VALUE
- JAPAN GROWTH
- Cash

Asset Loadings - Benchmark

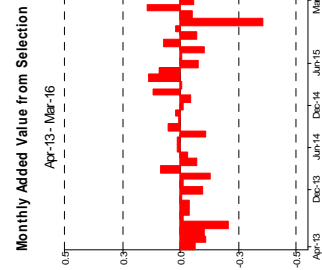
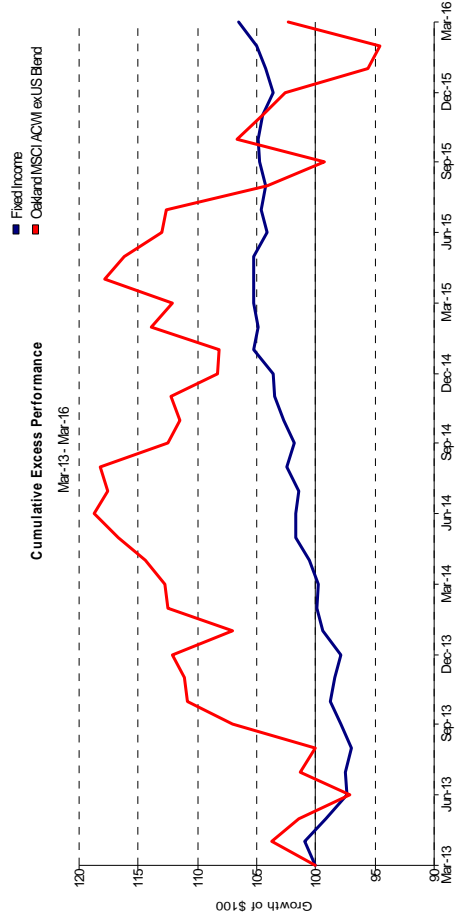
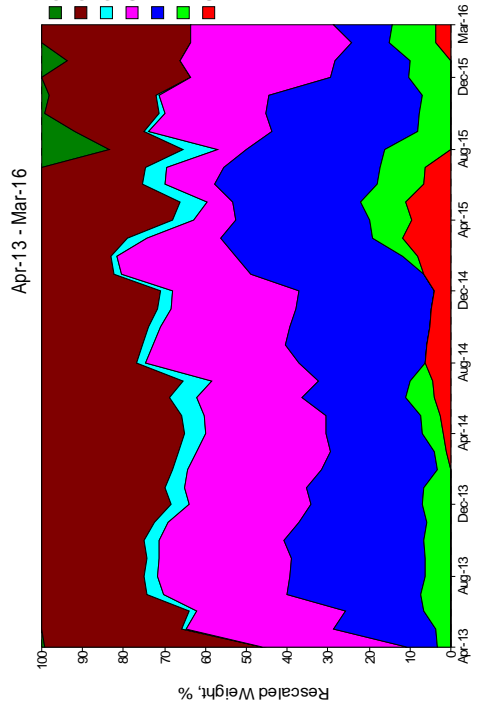
Apr-13 - Mar-16



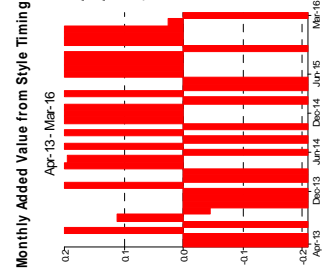
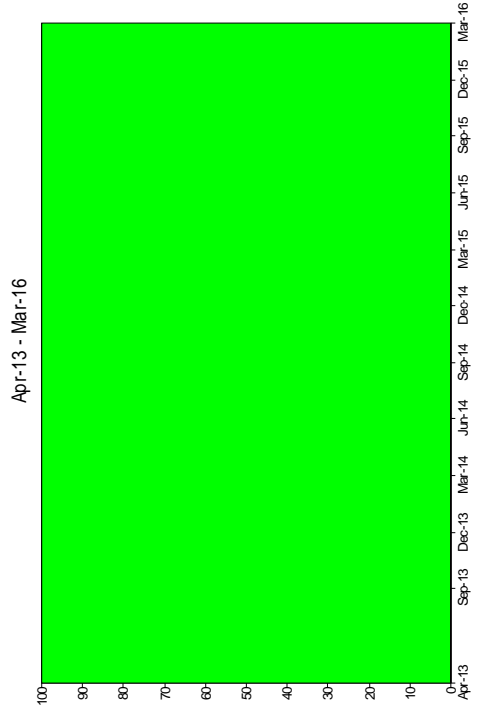
Fixed Income



Asset Loadings - Manager



Asset Loadings - Benchmark



Appendix

Glossary

Alpha

The premium an investment earns above a set standard. This is usually measured in terms of a common index (i.e., how the stock performs independent of the market). An Alpha is usually generated by regressing a security's excess return on the S&P 500 excess return.

Annualized Performance

The annual rate of return that when compounded t times generates the same t period holding return as actually occurred from period 1 to period t .

Batting Average

Percentage of periods a portfolio outperforms a given index.

Beta

The measure of an asset's risk in relation to the Market (for example, the S&P 500) or to an alternative benchmark or factors. Roughly speaking, a security with a Beta of 1.5, will have moved, on average, 1.5 times the market return.

Bottom-up

A management style that de-emphasizes the significance of economic and market cycles, focusing instead on the analysis of individual stocks.

Dividend Discount Model

A method to value the common stock of a company that is based on the present value of the expected future dividends.

Growth Stocks

Common stock of a company that has an opportunity to invest money and earn more than the opportunity cost of capital.

Information Ratio

The ratio of annualized expected residual return to residual risk. A central measurement for active management, value added is proportional to the square of the information ratio.

R-Squared

Square of the correlation coefficient. The proportion of the variability in one series that can be explained by the variability of one or more other series a regression model. A measure of the quality of fit. 100% R-square means perfect predictability.

Standard Deviation

The square root of the variance. A measure of dispersion of a set of data from its mean.

Sharpe Ratio

A measure of a portfolio's excess return relative to the total variability of the portfolio.

Style Analysis

A returns-based analysis using a multi-factor attribution model. The model calculates a product's average exposure to particular investment styles over time (i.e., the product's normal style benchmark).

Top-down

Investment style that begins with an assessment of the overall economic environment and makes a general asset allocation decision regarding various sectors of the financial markets and various industries.

Tracking Error

The standard deviation of the difference between the performance of a portfolio and an appropriate benchmark.

Turnover

For mutual funds, a measure of trading activity during the previous year, expressed as a percentage of the average total assets of the fund. A turnover rate of 25% means that the value of trades represented one-fourth of the assets of the fund.

Value Stocks

Stocks with low price/book ratios or price/earnings ratios. Historically, value stocks have enjoyed higher average returns than growth stocks (stocks with high price/book or P/E ratios) in a variety of countries.

Benchmark Definitions

Barclays Capital Universal: includes market coverage by the Aggregate Bond Index fixed rate debt issues, which are rated investment grade or higher by Moody's Investor Services, Standard and Poor's Corporation, or Fitch Investor's Service, in that order with all issues having at least one year to maturity and an outstanding par value of at least \$100 million) and includes exposures to high yield CMBS securities. All returns are market value weighted inclusive of accrued interest.

MSCI ACWI x US: MSCI ACWI (All Country World Index) Free excluding US (gross dividends): is a free-floating adjusted market capitalization index designed to measure equity performance in the global developed and emerging markets. As of April 2002, the index consisted of 49 developed and emerging market country indices.

MSCI EAFE (Europe, Australasia, Far East): is a free float-adjusted market capitalization index that is designed to measure developed market equity performance, excluding the US & Canada.

Russell 1000: measures the performance of the 1,000 largest securities in the Russell 3000 Index. Russell 1000 is highly correlated with the S&P 500 Index and capitalization-weighted.

Russell 1000 Growth: measures the performance of those Russell 1000 securities with a greater-than-average growth orientation. Securities in this index tend to exhibit higher price-to-book and price-earnings ratios, lower dividend yields and higher forecasted growth values than the Value universe.

Russell 1000 Value: measures the performance of those Russell 1000 securities with a less-than-average growth orientation. Securities in this index tend to exhibit lower price-to-book and price-earnings ratios, higher dividend yields and lower forecasted growth values than the Growth universe.

Russell MidCap: measures the performance of the smallest 800 companies in the Russell 1000 Index, as ranked by total market capitalization.

Russell 2000: measures the performance of the 2,000 smallest securities in the Russell 3000 Index. Russell 2000 is market capitalization-weighted.

Russell 2000 Growth: measures the performance of those Russell 2000 securities with a greater-than-average growth orientation. Securities in this index tend to exhibit higher price-to-book and price-to-earnings ratios.

Russell 2000 Value: measures the performance of those Russell 2000 securities with a less-than-average growth orientation. Securities in this index tend to exhibit lower price-to-book and price-to-earnings ratios.

CBOE BXM: measures the performance of a hypothetical buy-write strategy on the S&P 500 Index.

CPI + 3%: measures changes in the price level of the Consumer Price Index (CPI) with the addition of an additional 300 basis points. The CPI is a sample estimate which tracks the price level changes of a market basket of consumer goods and services purchased by households.

RISK METRIC DESCRIPTION – Rationale for selection and calculation methodology

US Equity Markets:

Metric: $P/E \text{ ratio} = \text{Price} / \text{"Normalized" earnings for the S\&P 500 Index}$

To represent the price of US equity markets, we have chosen the S&P 500 index. This index has the longest published history of price, is well known, and also has reliable, long-term, published quarterly earnings. The price= P of the P/E ratio is the current price of the market index (the average daily price of the most recent full month for the S&P 500 index). Equity markets are very volatile. Prices fluctuate significantly during normal times and extremely during periods of market stress or euphoria. Therefore, developing a measure of earnings power (E) which is stable is vitally important, if the measure is to provide insight. While equity prices can and do double, or get cut in half, real earnings power does not change nearly as much. Therefore, we have selected a well known measure of real, stable earnings power developed by Yale Professor Robert Shiller known as the Shiller E-10. The calculation of E-10 is simply the average real annual earnings over the past 10 years. Over 10 years, the earnings shenanigans and boom and bust levels of earnings tend to even out (and often times get restated). Therefore, this earnings statistic gives a reasonably stable, slow-to-change estimate of average real earnings power for the index. Professor Shiller's data and calculation of the E-10 are available on his website at <http://www.econ.yale.edu/~shiller/data.htm>. We have used his data as the base for our calculations. Details of the theoretical justification behind the measure can be found in his book *Irrational Exuberance* [Princeton University Press 2000, Broadway Books 2001, 2nd ed., 2005].

Developed Equity Markets Excluding the US:

Metric: $P/E \text{ ratio} = \text{Price} / \text{"Normalized" earnings for the MSCI EAFE Index}$

To represent the price of non-US developed equity markets, we have chosen the MSCI EAFE index. This index has the longest published history of price for non-US developed equities. The price= P of the P/E ratio is the current price of the market index (the average daily price of the most recent full month for the MSCI EAFE index). The price level of this index is available starting in December 1969. Again, for the reasons described above, we elected to use the Shiller E-10 as our measure of earnings (E). Since 12/1972, a monthly price earnings ratio is available from MSCI. Using this quoted ratio, we have backed out the implied trailing-twelve month earnings of the EAFE index for each month from 12/1972 to the present. These annualized earnings are then inflation adjusted using CPI-U to represent real earnings in US dollar terms for each time period. The Shiller E-10 for the EAFE index (10 year average real earnings) is calculated in the same manner as detailed above.

However, we do not believe that the pricing and earnings history of the EAFE markets are long enough to be a reliable representation of pricing history for developed market equities outside of the US. Therefore, in constructing the Long-Term Average Historical P/E for developed ex-US equities for comparison purposes, we have elected to use the US equity market as a developed market proxy, from 1881 to 1982. This lowers the Long-Term Average Historical P/E considerably. We believe this methodology provides a more realistic historical comparison for a market with a relatively short history.

Emerging Market Equity Markets:

Metric: Ratio of Emerging Market P/E Ratio to Developed Market P/E Ratio

To represent the Emerging Markets P/E Ratio, we have chosen the MSCI Emerging Market Free Index, which has P/E data back to January 1995 on Bloomberg. To represent the Developed Markets PE Ratio, we have chosen the MSCI World Index, which also has data back to January 1995 on Bloomberg. Although there are issues with published, single time period P/E ratios, in which the denominator effect can cause large movements, we feel that the information contained in such movements will alert investors to market activity that they will want to interpret.

US Private Equity Markets:

Metrics: S&P LCD Average EBITDA Multiples Paid in LBOs and US Quarterly Deal Volume

The Average Purchase Price to EBITDA multiples paid in LBOs is published quarterly by S&P in their LCD study. This is the total price paid (both equity and debt) over the trailing-twelve month EBITDA (earnings before interest, taxes, depreciation and amortization) as calculated by S&P LCD. This is the relevant, high-level pricing metric that private equity managers use in assessing deals. Data is published monthly.

US quarterly deal volume for private equity is the total deal volume in \$ billions (both equity and debt) reported in the quarter by Thomson Reuters Buyouts. This metric gives a measure of the level of activity in the market. Data is published quarterly.

U.S Private Real Estate Markets:

Metrics: US Cap rates and Annual US Real Estate Deal Volume

Real estate cap rates are a measure of the price paid in the market to acquire properties versus their annualized income generation before financing costs (NOI=net operating income). The date is published by NCREIF. We chose to use current value cap rate. These are capitalization rates from properties that were revalued during the quarter. While this data does rely on estimates of value and therefore tends to be lagging, (estimated prices are slower to rise and slow to fall than transaction prices), the data series goes back to 1979, providing a long data series for valuation comparison. Data is published quarterly.

Annual US real estate deal volume is the total deal transaction volume in \$ billions (both equity and debt) reported by Real Capital Analytics during the trailing-twelve months. This metric gives the level of activity in the market. Data is published monthly.

Measure of Equity Market Fear / Uncertainty

Metric: VIX – Measure of implied option volatility for U.S. equity markets

The VIX is a key measure of near-term volatility conveyed by implied volatility of S&P 500 index option prices. VIX increases with uncertainty and fear. Stocks and the VIX are negatively correlated. Volatility tends to spike when equity markets fall.

Measure of Monetary Policy

Metric: Yield Curve Slope

We calculate the yield curve slope as the 10 year treasury yield minus the 1 year treasury yield. When the yield curve slope is zero or negative, this is a signal to pay attention. A negative yield curve slope signals lower rates in the future, caused by a contraction in economic activity. Recessions are typically preceded by an inverted (negatively sloped) yield curve. A very steep yield curve (2 or greater) indicates a large difference between shorter-term interest rates (the 1 year rate) and longer-term rates (the 10 year rate). This can signal expansion in economic activity in the future, or merely higher future interest rates.

Definition of “extreme” metric readings

A metric reading is defined as “extreme” if the metric reading is in the top or bottom decile of its historical readings. These “extreme” reading should cause the reader to pay attention. These metrics have reverted toward their mean values in the past.

Credit Markets US Fixed Income:

Metric: Spreads

The absolute level of spreads over treasuries and spread trends (widening / narrowing) are good indicators of credit risk in the fixed income markets. Spreads incorporate estimates of future default, but can also be driven by technical dislocations in the fixed income markets. Abnormally narrow spreads (relative to historical levels) indicate higher levels of valuation risk, wide spreads indicate lower levels of valuation risk and / or elevated default fears. Investment grade bond spreads are represented by the Barclays Capital US Corporate Investment Grade Index Intermediate Component. The high yield corporate bond spreads are represented by the Barclays Capital US Corporate High Yield Index.

Measures of US Inflation Expectations

Metrics: Breakeven Inflation and Inflation Adjusted Commodity Prices

Inflation is a very important indicator impacting all assets and financial instruments. Breakeven inflation is calculated as the 10 year nominal treasury yield minus the 10 year real yield on US TIPS (treasury inflation protected securities). Abnormally low long-term inflation expectations are indicative of deflationary fears. A rapid rise in breakeven inflation indicates acceleration in inflationary expectations as market participants sell nominal treasuries and buy TIPS. If breakeven inflation continues to rise quarter over quarter, this is a signal of inflationary worries rising, which may cause Fed action and / or dollar decline.

Commodity price movement (above the rate of inflation) is an indication of anticipated inflation caused by real global economic activity putting pressure on resource prices. We calculate this metric by adjusted in the Dow Jones UBS Commodity Index (formerly Dow Jones AIG Commodity Index) by US CPI-U. While rising commodity prices will not necessarily translate to higher US inflation, higher US inflation will likely show up in higher commodity prices, particularly if world economic activity is robust.

These two measures of anticipated inflation can, and often are, conflicting.

Measures of US Treasury Bond Interest Rate Risk

Metrics: 10-Year Treasury Forward-Looking Real Yield and 10-Year Treasury Duration

The expected annualized real yield of the 10 year US Treasury Bond is a measure of valuation risk for US Treasuries. A low real yield means investors will accept a low rate of expected return for the certainty of receiving their nominal cash flows. PCA estimates the expected annualized real yield by subtracting an estimate of expected 10 year inflation (produced by the Survey of Professional Forecasters as collected by the Federal Reserve Bank of Philadelphia), from the 10 year Treasury constant maturity interest rate.

Duration for the 10-Year Treasury Bond is calculated based on the current yield and a price of 100. This is a measure of expected percentage movements in the price of the bond based on small movements in percentage yield. We make no attempt to account for convexity.

RISK METRICS DESCRIPTION – PCA Market Sentiment Indicator

What is the PCA Market Sentiment Indicator (PMSI)?

The PMSI is a measure meant to gauge the market's sentiment regarding economic growth risk. Growth risk cuts across most financial assets, and is the largest risk exposure that most portfolios bear. The PMSI takes into account the momentum (trend over time, positive or negative) of the economic growth risk exposure of publicly traded stocks and bonds, as a signal of the future direction of growth risk returns; either positive (risk seeking market sentiment), or negative (risk averse market sentiment).

How do I read the PCA Market Sentiment Indicator (PMSI) graph?

Simply put, the PMSI is a color coded indicator that signals the market's sentiment regarding economic growth risk. It is read left to right chronologically. A green indicator on the PMSI indicates that the market's sentiment towards growth risk is positive. A gray indicator indicates that the market's sentiment towards growth risk is neutral or inconclusive. A red indicator indicates that the market's sentiment towards growth risk is negative. The black line on the graph is the level of the PMSI. The degree of the signal above or below the neutral reading is an indication the signal's current strength.

How is the PCA Market Sentiment Indicator (PMSI) Constructed?

The PMSI is constructed from two sub-elements representing investor sentiment in stocks and bonds:

1. Stock return momentum: Return momentum for the S&P 500 Equity Index (trailing 12-months)
2. Bond yield spread momentum: Momentum of bond yield spreads (excess of the measured bond yield over the identical duration U.S. Treasury bond yield) for corporate bonds (trailing 12-months) for both investment grade bonds (75% weight) and high yield bonds (25% weight). The scale of this measure is adjusted to match that of the stock return momentum measure.

The black line reading on the graph is calculated as the average of the stock return momentum measure and the bonds spread momentum measure. The color reading on the graph is determined as follows:

1. If both stock return momentum and bond spread momentum are positive = GREEN (positive)
2. If one of the momentum indicators is positive, and the other negative = GRAY (inconclusive)
3. If both stock return momentum and bond spread momentum are negative = RED (negative)

What does the PCA Market Sentiment Indicator (PMSI) mean? Why might it be useful?

There is strong evidence that time series momentum is significant and persistent. In particular, across an extensive array of asset classes, the sign of the trailing 12-month return (positive or negative) is indicative of future returns (positive or negative) over the next 12 month period. The PMSI is constructed to measure this momentum in stocks and corporate bond spreads. A reading of green or red is agreement of both the equity and bond measures, indicating that it is likely that this trend (positive or negative) will continue over the next 12 months. When the measures disagree, the indicator turns gray. A gray reading does not necessarily mean a new trend is occurring, as the indicator may move back to green, or into the red from there. The level of the reading (black line) and the number of months at the red or green reading, gives the user additional information on which to form an opinion, and potentially take action.

Momentum is defined as the persistence of relative performance. There is a significant amount of academic evidence indicating that positive momentum (e.g., strong performing stocks over the recent past continue to post strong performance into the near future) exists over near-to-intermediate holding periods. See, for example, "Understanding Momentum," *Financial Analysts Journal*, Scowcroft, Sefton, March, 2005.

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