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***California Public Employees' Retirement  
System***

*Performance Review – June 30, 2016*

# June 2016 Asset Class Assumptions



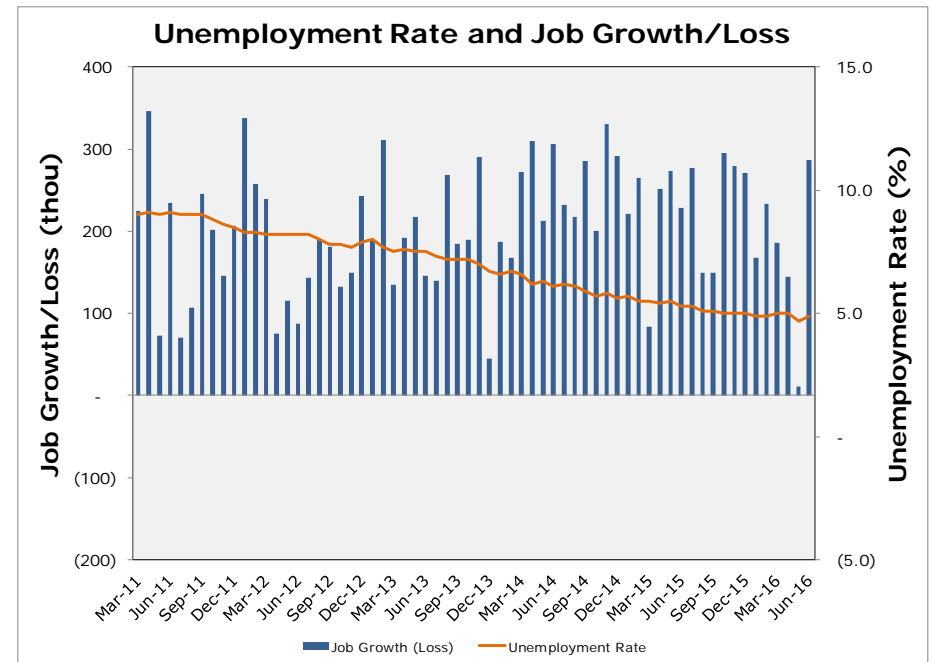
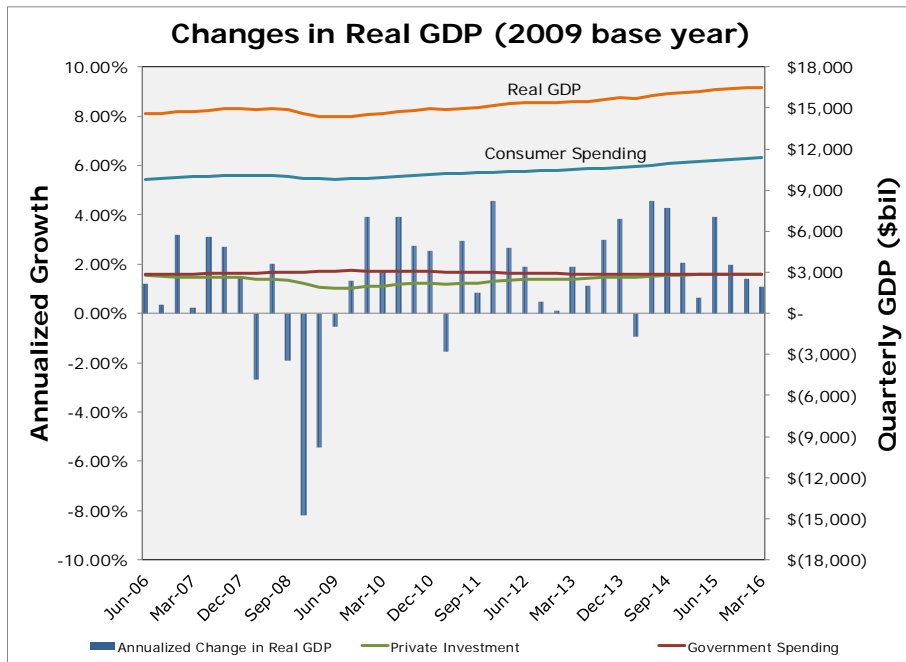
	Total Return (%)			Risk (%)
	Dec. 2015	Q2 2016	Change vs YE	Dec. 2015
<u>Investment Categories:</u>				
U.S. Stocks	6.50	6.25	(0.25)	17.00
Dev ex-U.S. Stocks	6.50	6.25	(0.25)	18.00
Emerging Mkt Stocks	6.50	6.25	(0.25)	26.00
Global Stocks	6.70	6.45	(0.25)	17.10
Private Markets	9.50	8.95	(0.55)	27.50
Cash Equivalents	1.25	1.15	(0.10)	1.25
Core Bonds	3.50	2.75	(0.75)	5.00
LT Core Bonds	4.30	3.15	(1.15)	10.00
TIPS	3.25	2.35	(0.90)	6.00
High Yield Bonds	6.35	5.65	(0.70)	10.00
EMD Local Currency (h)	5.60	4.70	(0.90)	5.00
U.S. RE Securities	5.00	4.70	(0.30)	17.00
Private Real Estate	5.80	5.85	0.05	14.00
Commodities	3.55	3.45	(0.10)	15.00
MLPs	9.65	8.35	(1.30)	17.00
Real Asset Basket	6.40	5.85	(0.55)	8.40
Inflation:	1.55	1.45	(0.10)	1.75
<u>Returns minus Inflation:</u>				
U.S. Stocks	4.95	4.80	(0.15)	
U.S. Bonds	1.95	1.30	(0.65)	
Cash Equivalents	(0.30)	(0.30)	-	
<u>Stocks minus Bonds:</u>	3.00	3.50	0.50	
<u>Bonds minus Cash:</u>	2.25	1.60	(0.65)	

# Economic Review



June 30, 2016	Key Economic Indicators			
<b>CPI (all items)</b> Seasonally adjusted	Monthly Change		Cumulative Change	
	Jun-16	0.2	3-Month	0.8
	May-16	0.2	12-Month	1.1
	Apr-16	0.4	10-Yr Annual	1.7
Breakeven Inflation	10-Year	1.5		
<b>Consumer Sentiment</b> Unv. of Michigan Survey	Jun-16	93.5		
	May-16	94.7		
	1-Yr Ago	96.1	10-Yr Avg	77.8
<b>Manufacturing</b> Inst. for Supply Mgmt Purchasing Mngrs' Idx	Jun-16	53.2	Change in Manufacturing Sector	
	May-16	51.3	>50	Expansion
	1-Yr Avg	50.3	<50	Contraction

Note: Seasonally adjusted CPI data is utilized to better reflect short-term pricing activity.

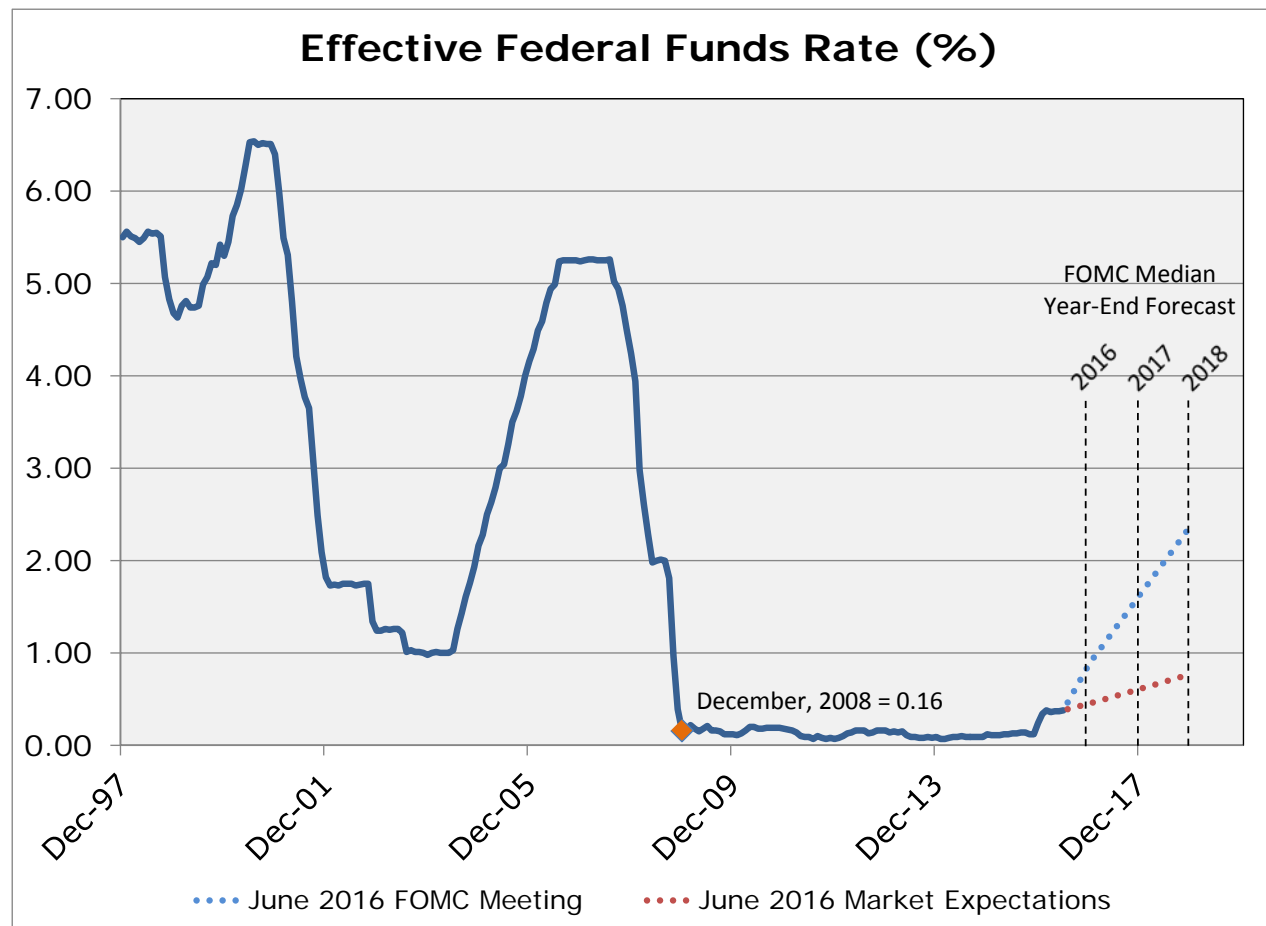


Data sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve Bank of St. Louis, Barclays Capital



## Federal Reserve

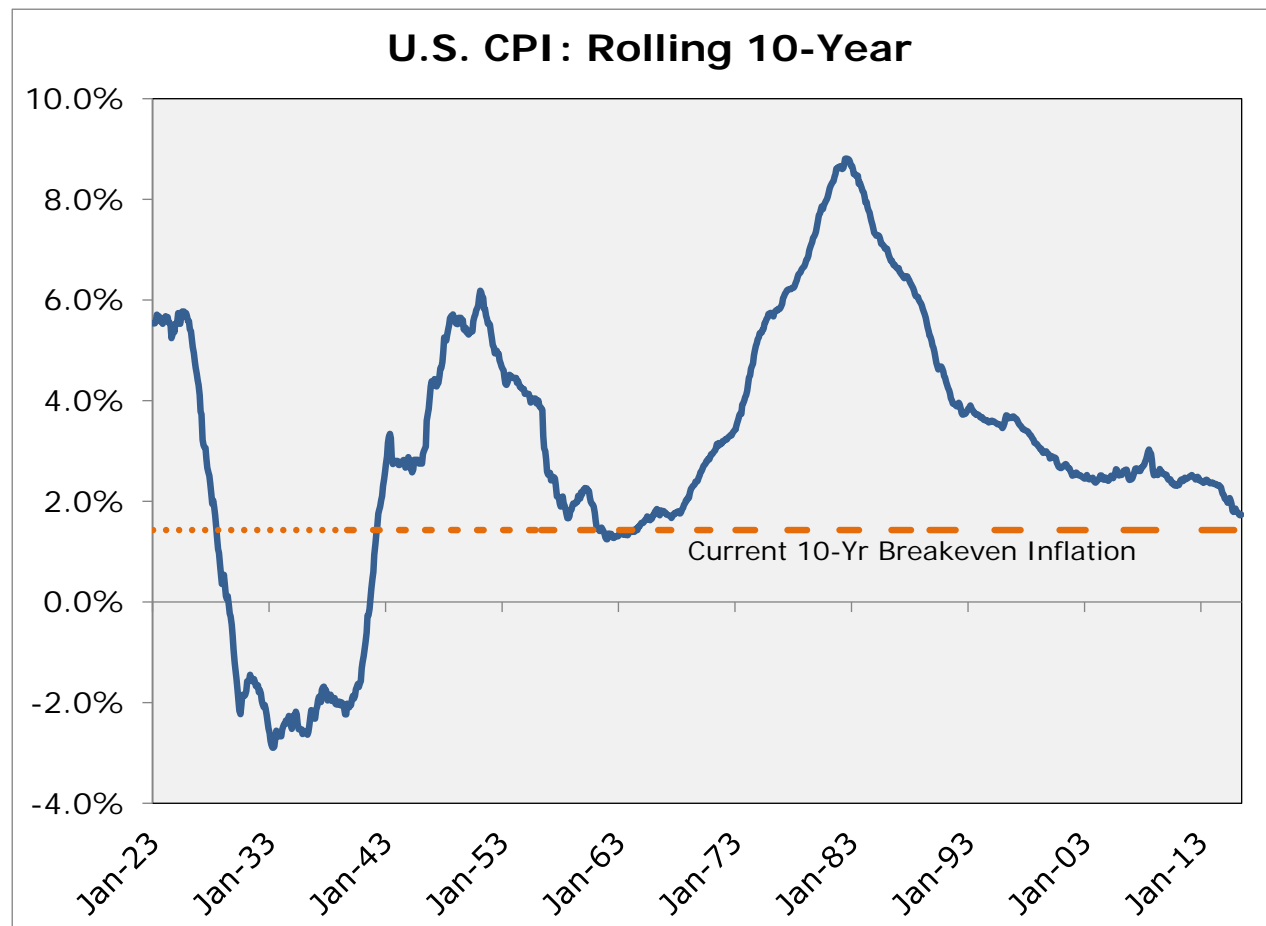
- Median forecast by Open Market Committee equals 0.88% for year-end 2016, which implies two 0.25% increases during second half of 2016
- Market forecast based on futures pricing is only 10 basis points higher than current





## Inflation

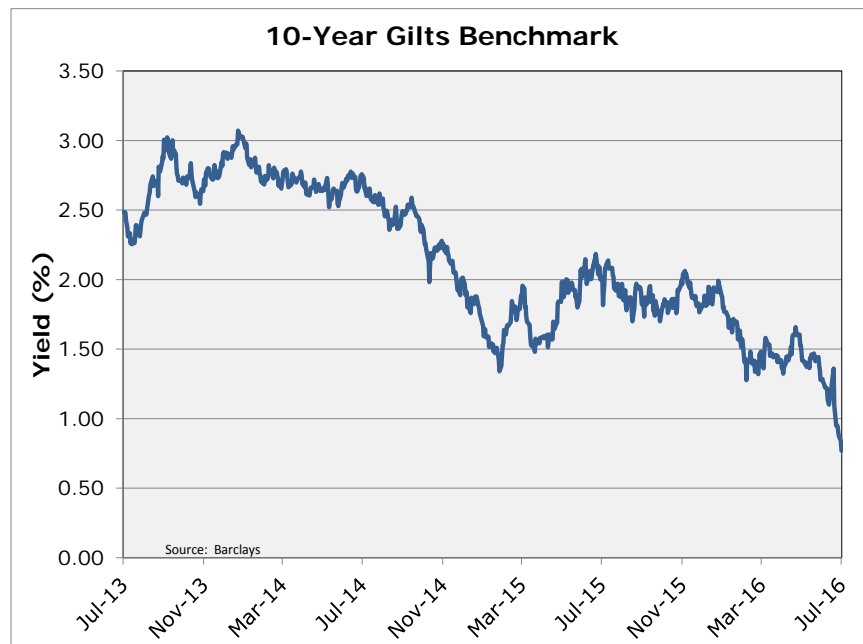
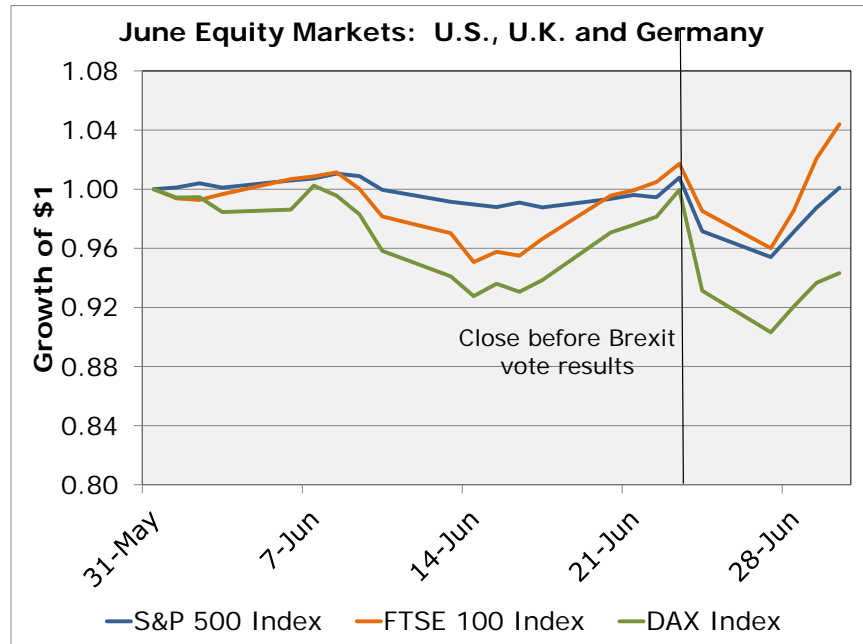
- CPI moved higher during Q2, although the 1-year gain is still modest
- Inflation expectation close to lowest actual reading since Great Depression
- Expectation also lower than most recent 10-year of 1.7%





## Market Reaction to Brexit

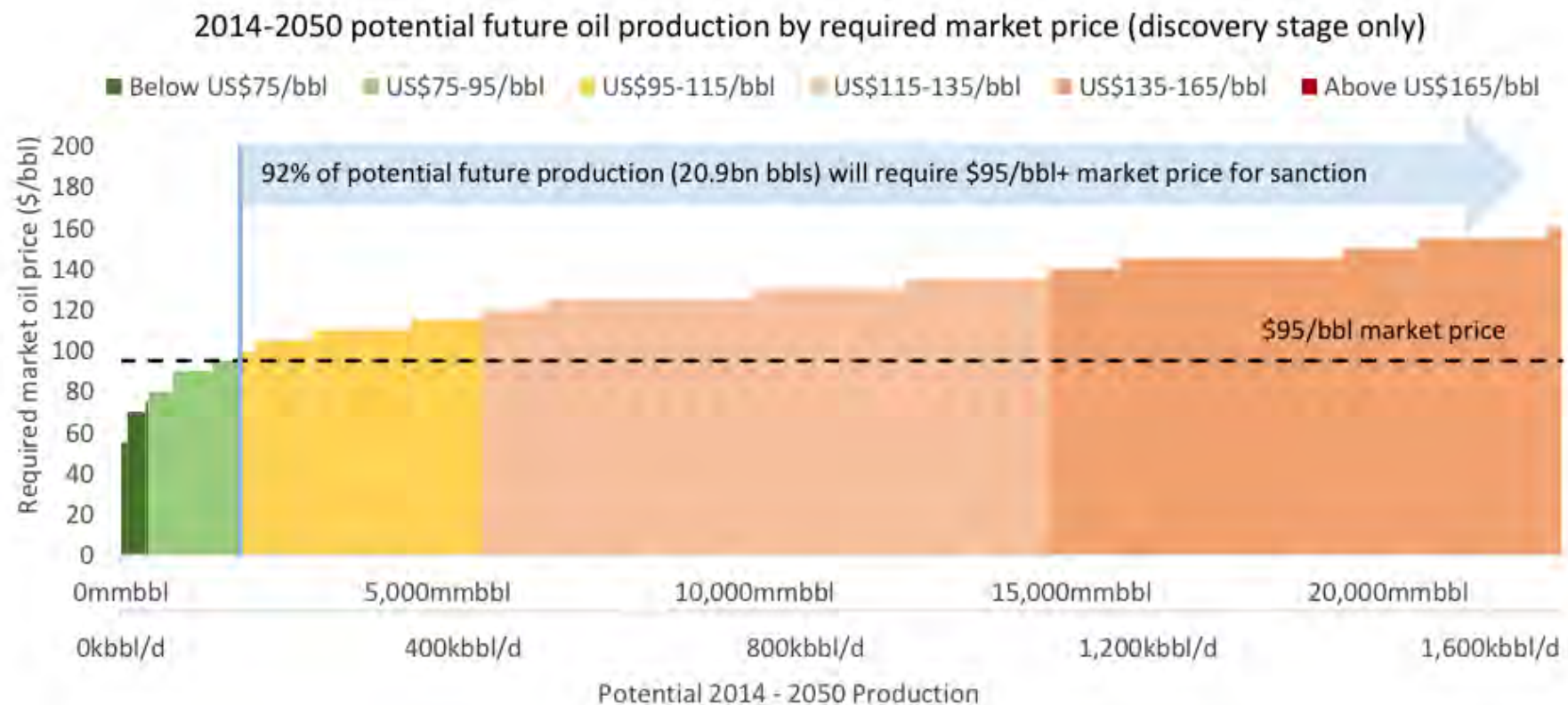
- Pound sterling is down -12% from the pre-vote high versus the U.S. dollar (as of July 4<sup>th</sup>)
- Equity prices dropped in reaction to the announcement but then recovered in the U.K. and U.S.
  - S&P 500 Index -0.7%
  - FTSE 100 Index +2.6%
  - DAX Index -5.6%
- Gilt yields remain depressed
- Flight to quality pushed Treasury yields lower, as well



# Climate Risk for Investors – Stranded Assets



- 50-80% of reserves may well become Stranded Assets
- Understanding oil price sensitivity across different companies is important for investors as there is over \$2T in Capex which may be at risk of being unprofitable
- Capital Expenditure is at risk



Source: The Carbon Tracker Initiative (CTI and ETA 2014)



## *Investors' Perspective*

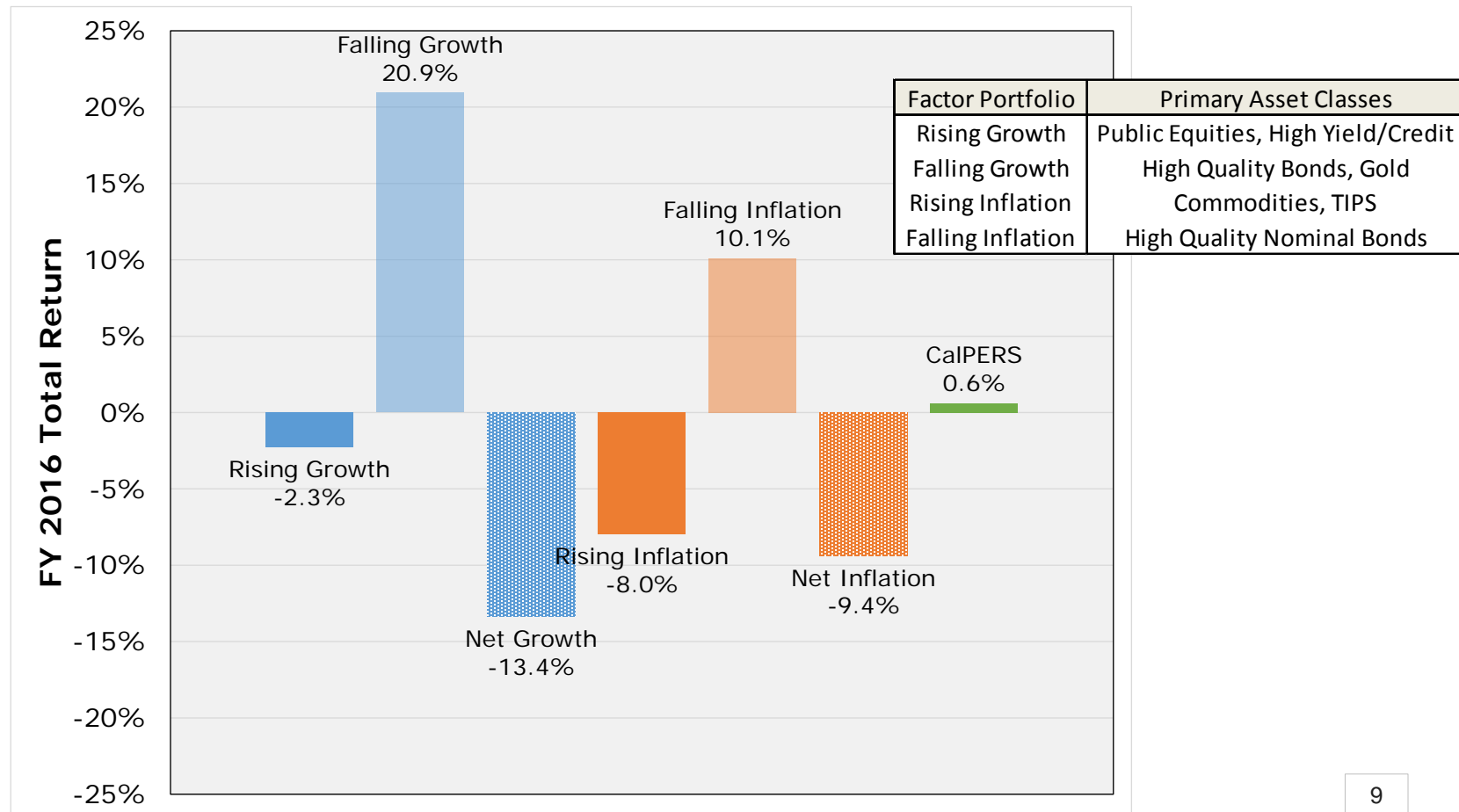
- Specific Investor Strategies
  - **Stewardship of Capital:** Engaging w/Corporates & Outsourced fund managers, shifting fiduciary duty definitions
  - **Evolving Investment Strategy:** Responding to Client Awareness & Concerns
  - Building the **Capacity to Execute:** through Education & Research - Investors also starting to **Engage with Policymakers**
- State of the **marketplace**
  - \$21 Trillion of Assets using ESG
  - Over \$60 Trillion of PRI signatories
  - \$500B of Primary ESG
  - \$100B new in past year
  - \$1T net new Fixed Income/Infrastructure per year expected going forward
- **Divestment:** Negative screening usually a bad idea for returns





# Macroeconomic Factor Portfolios

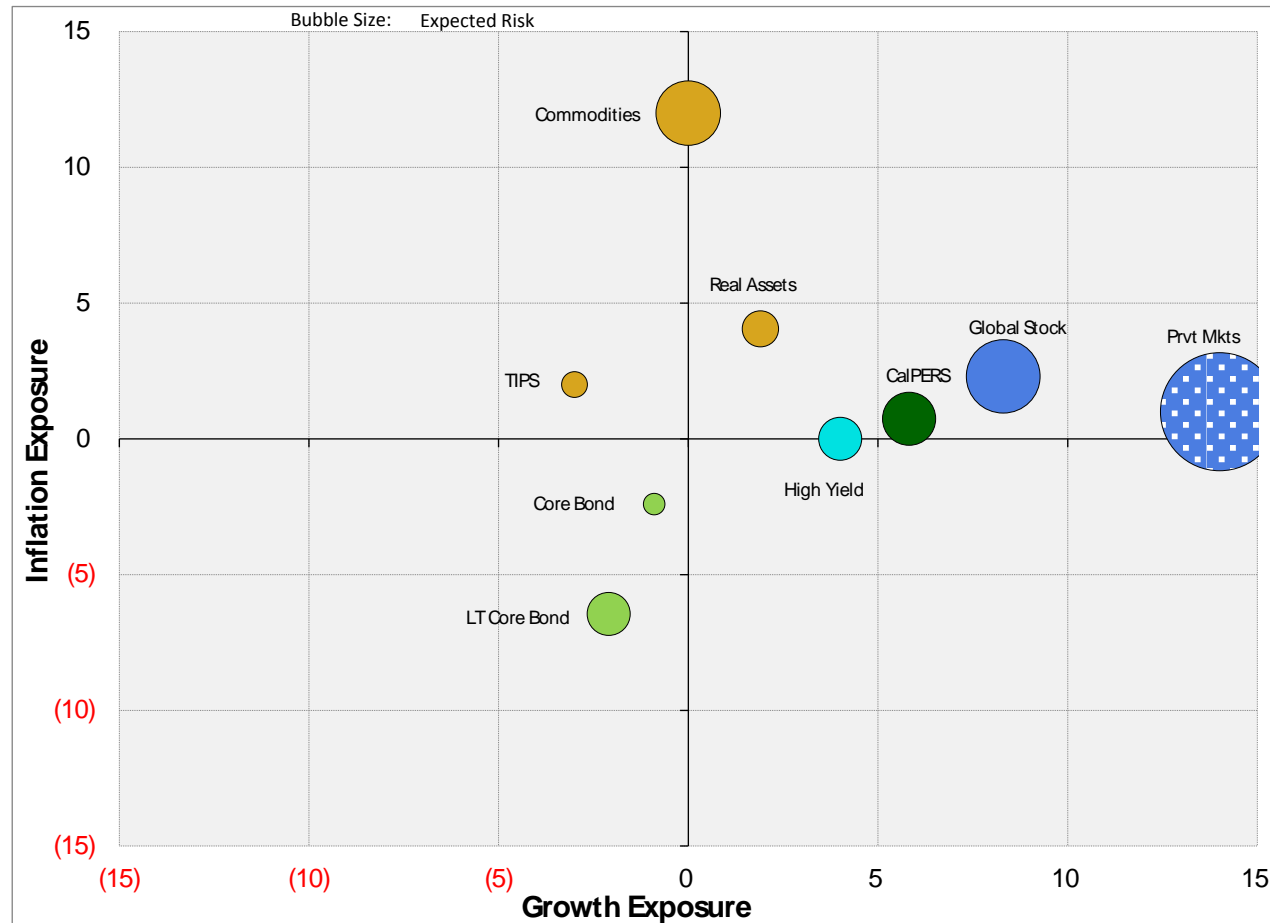
- Strong returns in high quality bonds and gold boosted the Falling Growth & Inflation factor portfolios
- Growth assets produced moderate to negative returns



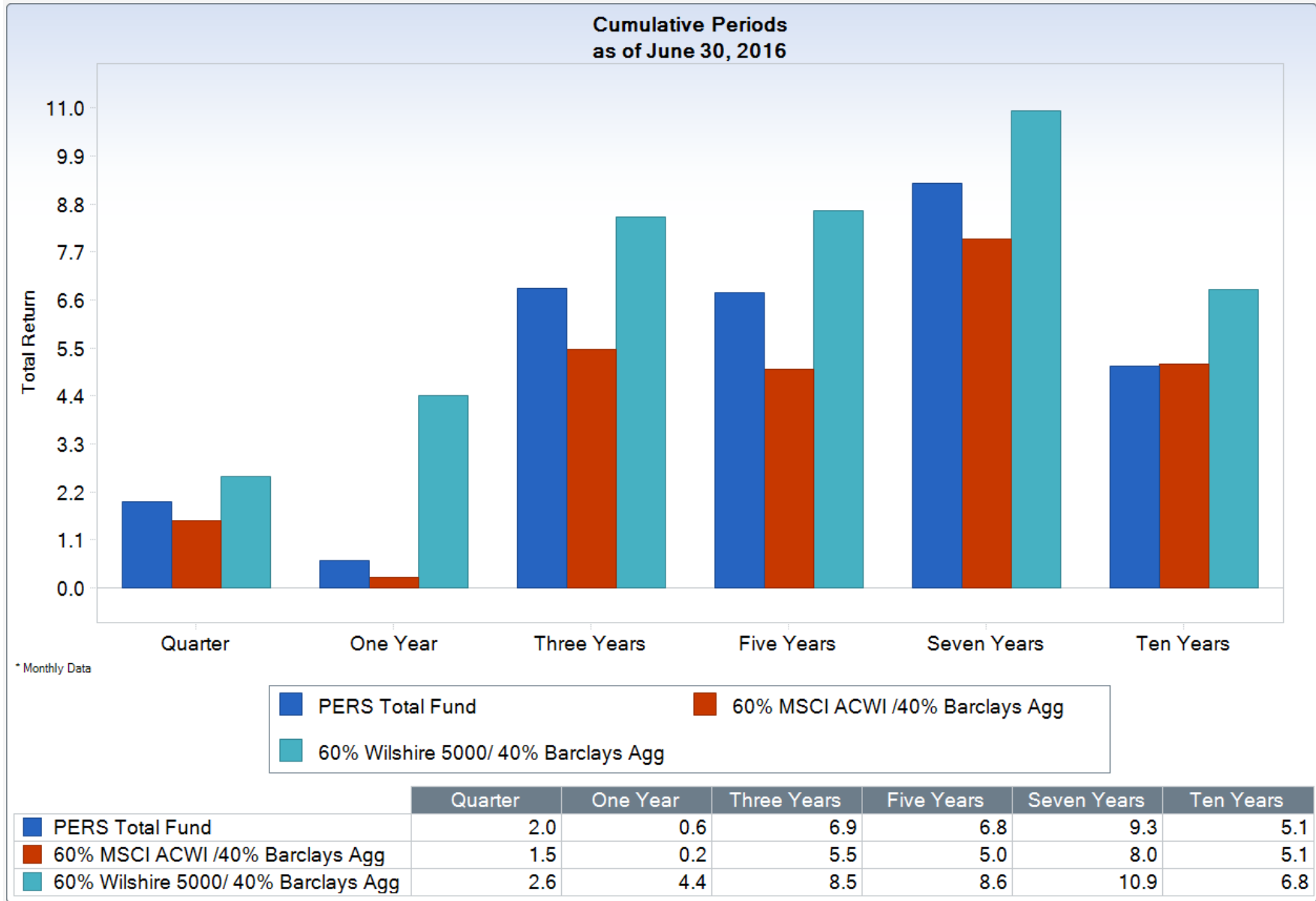
# Sensitivity to Economic Conditions



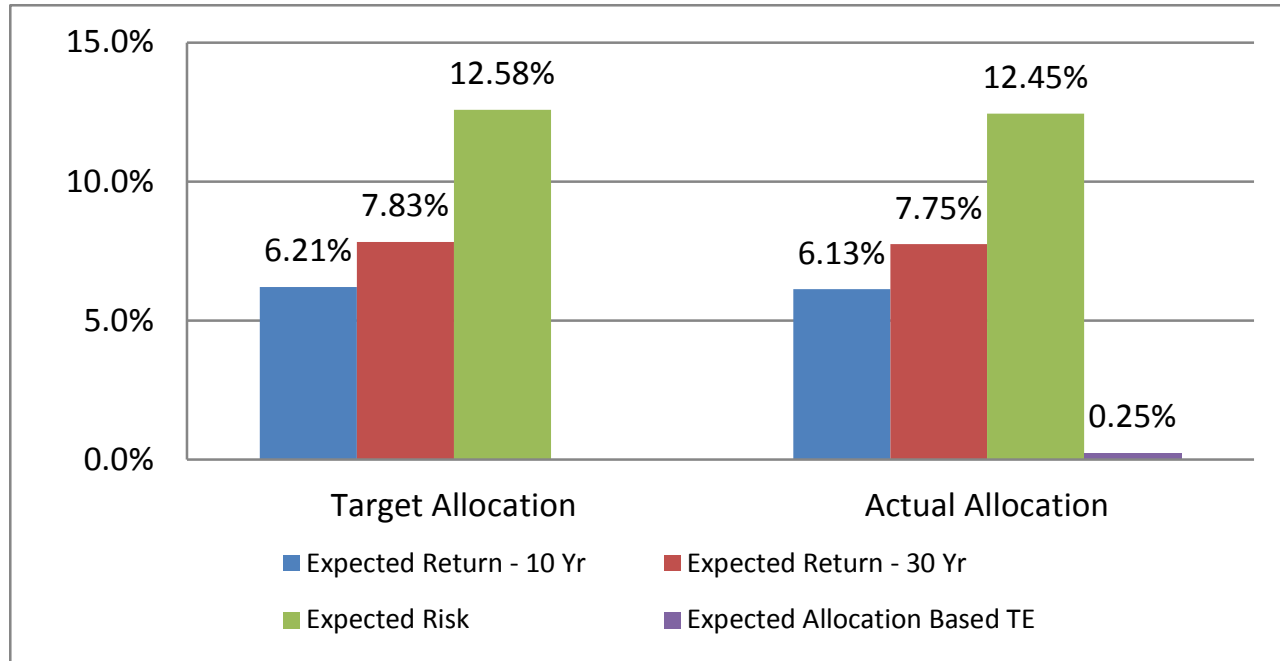
- Exposures to inflation and growth can be measured at the asset class and total fund level
- Global equities have a positive sensitivity to rising growth and inflation while investment grade bonds exhibit a negative relationship



# Performance for a 60% Equity/40% Bond Portfolio



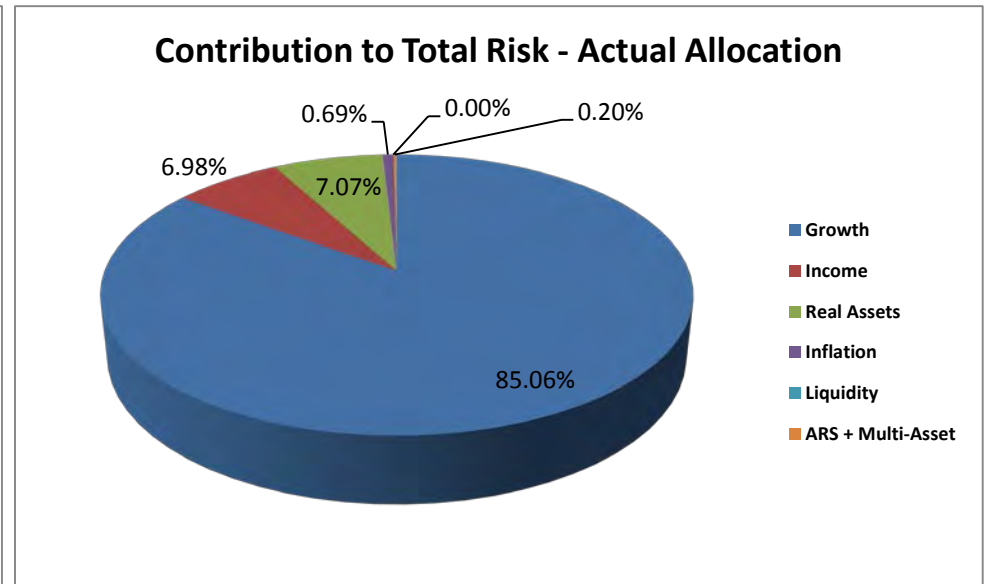
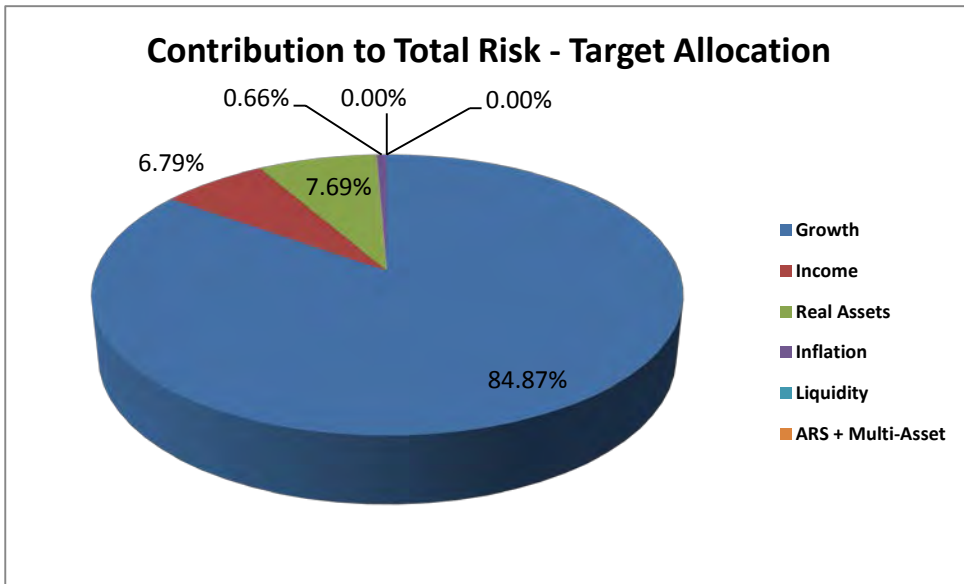
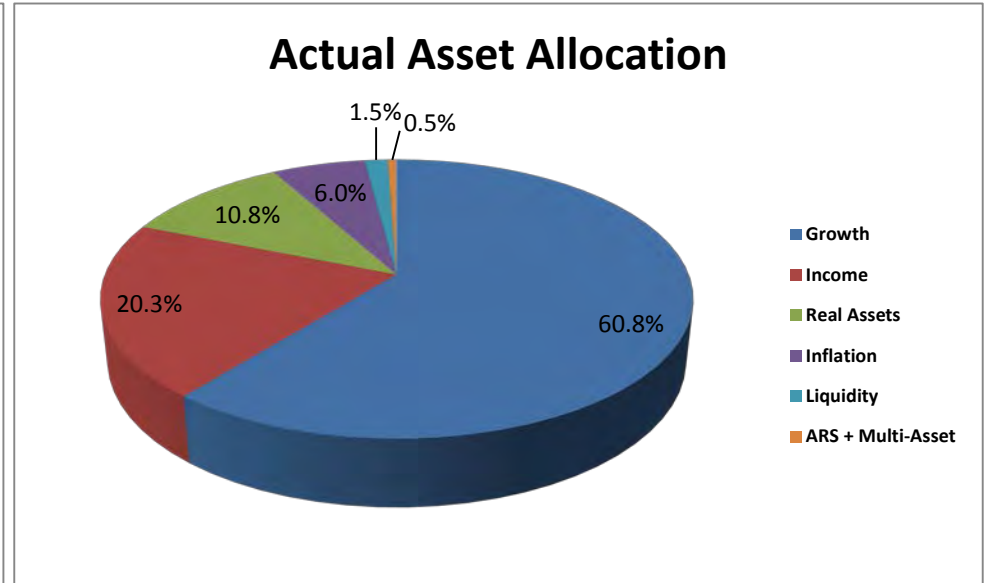
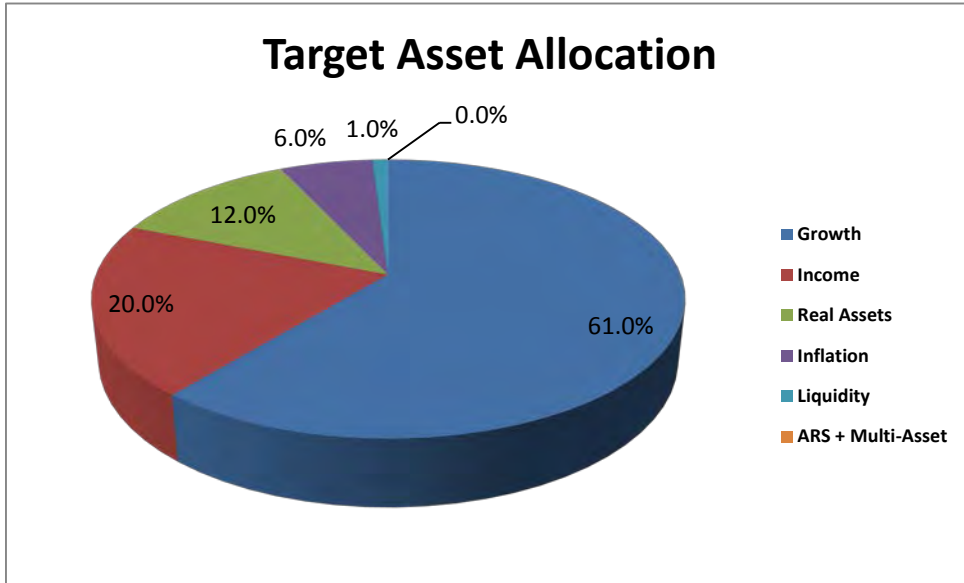
# CalPERS Expected Return and Risk Estimates



Forecasts using Wilshire's June 2016 Asset Class Assumptions.



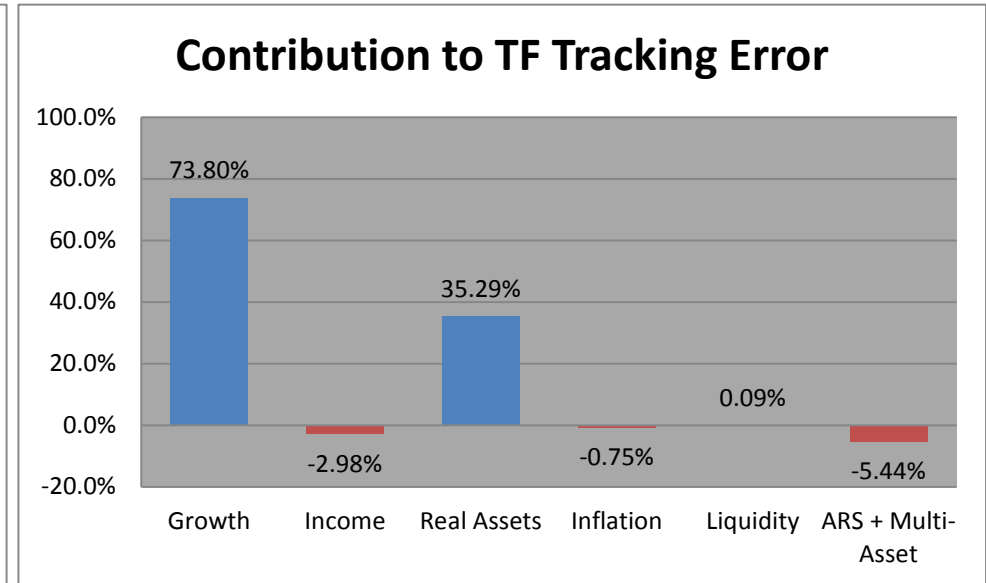
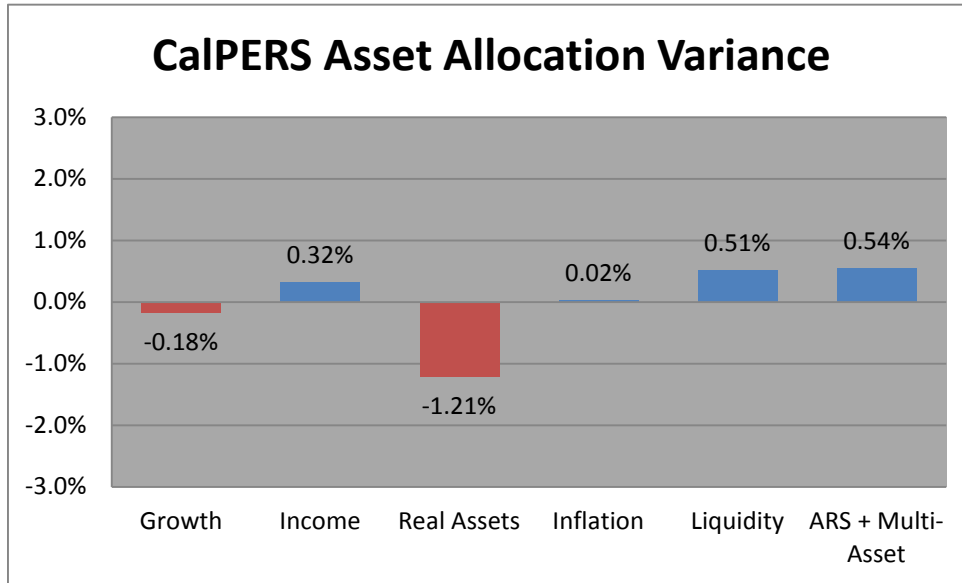
# Asset and Risk Allocation



Forecasts using Wilshire's June 2016 Asset Class Assumptions.



## Drivers of Expected Excess Risk



- This excess risk forecast is based on asset allocation variance only.
- Other sources of risk (structural within asset classes, manager/program specific source of tracking error, covariance) are not considered here.



# Total Fund – Performance

	Market Value	5-Year Ratios							
		Qtr	1-Year	3-Year	5-Year	10-Year	VaR	Sharpe	Info
<b>TOTAL FUND</b>	<b>\$295.1 bil</b>	<b>2.0%</b>	<b>0.6%</b>	<b>6.9%</b>	<b>6.8%</b>	<b>5.1%</b>	<b>\$40.6 bil</b>	<b>1.0</b>	<b>0.1</b>
<i>Total Fund Policy Benchmark</i>		<b>2.0%</b>	<b>1.0%</b>	<b>6.9%</b>	<b>6.6%</b>	<b>6.2%</b>		<b>0.9</b>	<b>0.0</b>
<i>Actuarial Rate</i>		1.8%	7.5%	7.5%	7.6%	7.7%			
<b>GROWTH</b>	<b>179.5</b>	<b>1.2%</b>	<b>-2.6%</b>	<b>7.3%</b>	<b>6.8%</b>	<b>5.4%</b>	<b>\$37.5 bil</b>	<b>0.6</b>	<b>-0.1</b>
<i>Growth Policy Benchmark</i>		1.3%	-3.1%	7.4%	7.0%	6.4%		<b>0.6</b>	<b>0.0</b>
<b>PUBLIC EQUITY</b>	<b>153.1</b>	<b>1.3%</b>	<b>-3.4%</b>	<b>6.8%</b>	<b>6.1%</b>	<b>4.7%</b>	<b>\$31.1 bil</b>	<b>0.4</b>	<b>0.7</b>
<i>Public Equity Policy Benchmark</i>		1.2%	-4.0%	6.5%	5.9%	5.0%		<b>0.4</b>	<b>0.0</b>
<b>PRIVATE EQUITY</b>	<b>26.4</b>	<b>0.4%</b>	<b>1.7%</b>	<b>10.0%</b>	<b>9.7%</b>	<b>10.2%</b>	<b>\$8.7 bil</b>	<b>2.3</b>	<b>-0.1</b>
<i>Private Equity Policy Benchmark</i>		1.1%	-0.8%	10.8%	10.6%	12.7%		<b>0.8</b>	<b>0.0</b>
<b>INCOME</b>	<b>59.9</b>	<b>3.9%</b>	<b>9.3%</b>	<b>6.2%</b>	<b>5.9%</b>	<b>7.1%</b>	<b>\$7.6 bil</b>	<b>1.2</b>	<b>0.7</b>
<i>Income Policy Benchmark</i>		3.6%	9.3%	5.5%	5.3%	6.5%		<b>1.0</b>	<b>0.0</b>
<b>REAL ASSETS</b>	<b>31.8</b>	<b>1.9%</b>	<b>6.0%</b>	<b>10.6%</b>	<b>11.1%</b>	<b>-0.1%</b>	<b>\$4.4 bil</b>	<b>1.6</b>	<b>0.0</b>
<i>Real Assets Policy Benchmark</i>		1.7%	11.1%	11.5%	11.0%	7.8%		<b>2.6</b>	<b>0.0</b>
<b>INFLATION</b>	<b>17.8</b>	<b>4.6%</b>	<b>-3.6%</b>	<b>-2.6%</b>	<b>-1.5%</b>	<b>--%</b>	<b>\$1.3 bil</b>	<b>-0.2</b>	<b>0.3</b>
<i>Inflation Policy Benchmark</i>		4.4%	-5.0%	-3.6%	-2.0%	--%		<b>-0.3</b>	<b>0.0</b>
<b>LIQUIDITY</b>	<b>4.5</b>	<b>0.1%</b>	<b>0.4%</b>	<b>0.6%</b>	<b>1.1%</b>	<b>1.9%</b>	<b>\$0.0 bil</b>	<b>0.7</b>	<b>-0.7</b>
<i>Liquidity Policy Benchmark</i>		0.1%	0.2%	1.1%	1.5%	3.3%		<b>0.8</b>	<b>0.0</b>
<b>ABSOLUTE RETURN STRATEGIES</b>	<b>0.4</b>	<b>-0.7%</b>	<b>-1.7%</b>	<b>4.1%</b>	<b>3.4%</b>	<b>3.3%</b>		<b>1.0</b>	<b>-0.5</b>
<i>Absolute Return Strategies Policy Benchmark</i>		1.5%	5.6%	5.4%	5.4%	6.8%		<b>25.2</b>	<b>0.0</b>
<b>MULTI-ASSET CLASS COMPOSITE</b>	<b>1.2</b>	<b>0.3%</b>	<b>-1.2%</b>	<b>5.3%</b>	<b>--%</b>	<b>--%</b>		<b>N/A</b>	<b>N/A</b>
<i>Absolute 7.5%</i>		1.8%	7.5%	7.5%	--%	--%		<b>N/A</b>	<b>N/A</b>
<b>CURRENCY + ASSET ALLOCATION TRANSITION</b>	<b>0.0</b>	<b>--%</b>	<b>--%</b>	<b>--%</b>	<b>--%</b>	<b>--%</b>		<b>N/A</b>	<b>N/A</b>
<b>TERMINATED AGENCY POOL</b>	<b>0.1</b>	<b>3.4%</b>	<b>9.9%</b>	<b>5.4%</b>	<b>--%</b>	<b>--%</b>		<b>N/A</b>	<b>N/A</b>
<b>TOTAL FUND PLUS TAP</b>	<b>295.2</b>	<b>2.0%</b>	<b>0.6%</b>	<b>6.9%</b>	<b>6.8%</b>	<b>5.1%</b>		<b>N/A</b>	<b>N/A</b>



# Total Fund – Attribution (Quarter)

California Public Employees' Retirement System  
Total Fund Attribution - Quarter  
As of 6/30/2016

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
<b>Growth</b>	62.29	1.18	61.00	1.25	1.29	-0.07	-0.02	0.02	-0.05	-0.04
Public Equity	53.06	1.32	51.00	1.18	2.06	0.14	-0.01	0.00	0.07	0.07
Private Equity	9.23	0.38	10.00	1.06	-0.77	-0.68	-0.01	0.02	-0.12	-0.10
<b>Income</b>	19.87	3.94	20.00	3.64	-0.13	0.30	0.00	0.00	0.06	0.06
<b>Real Assets</b>	10.42	1.89	12.00	1.74	-1.58	0.14	0.00	0.00	0.02	0.02
<b>Inflation</b>	5.93	4.62	6.00	4.36	-0.07	0.27	0.00	0.00	0.02	0.01
<b>Absolute Return</b>	0.55	-0.66	0.00	1.52	0.55	-2.19	0.00	-0.01	0.00	-0.01
<b>Liquidity</b>	0.95	0.13	1.00	0.07	-0.05	0.05	0.00	0.00	0.00	0.00
<b>Monthly Linked Return</b>	<b>100.00</b>	<b>2.00</b>	<b>100.00</b>	<b>1.96</b>		<b>0.03</b>	<b>-0.02</b>	<b>0.01</b>	<b>0.05</b>	<b>0.03</b>
<b>Trading/Hedging/Other</b>		-0.02		0.00		-0.02				<b>-0.02</b>
<b>Total</b>		<b>1.97</b>		<b>1.96</b>		<b>0.01</b>				<b>0.01</b>



# Total Fund – Attribution (Calendar YTD)



California Public Employees' Retirement System  
Total Fund Attribution - Calendar Year-to-Date  
As of 6/30/2016

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
<b>Growth</b>	62.05	1.75	61.00	2.61	1.05	-0.86	-0.16	0.07	-0.48	-0.57
Public Equity	52.62	1.94	51.00	1.37	1.62	0.58	-0.11	0.01	0.29	0.19
Private Equity	9.43	0.65	10.00	7.24	-0.57	-6.59	-0.05	0.07	-0.78	-0.76
<b>Income</b>	20.02	9.70	20.00	9.17	0.02	0.53	-0.06	0.01	0.10	0.04
<b>Real Assets</b>	10.77	2.21	12.00	4.58	-1.23	-2.36	-0.01	0.02	-0.28	-0.27
<b>Inflation</b>	5.44	8.16	6.00	7.47	-0.56	0.69	-0.01	-0.01	0.04	0.02
<b>Absolute Return</b>	0.56	0.90	0.00	3.13	0.56	-2.23	-0.01	-0.01	0.00	-0.02
<b>Liquidity</b>	1.17	0.24	1.00	0.15	0.17	0.10	0.01	0.00	0.00	0.01
<b>Monthly Linked Return</b>	<b>100.00</b>	<b>3.67</b>	<b>100.00</b>	<b>4.45</b>		<b>-0.78</b>	<b>-0.24</b>	<b>0.08</b>	<b>-0.62</b>	<b>-0.78</b>
<b>Trading/Hedging/Other</b>		0.01		0.00		0.01				<b>0.01</b>
<b>Total</b>		<b>3.68</b>		<b>4.45</b>		<b>-0.77</b>				<b>-0.77</b>

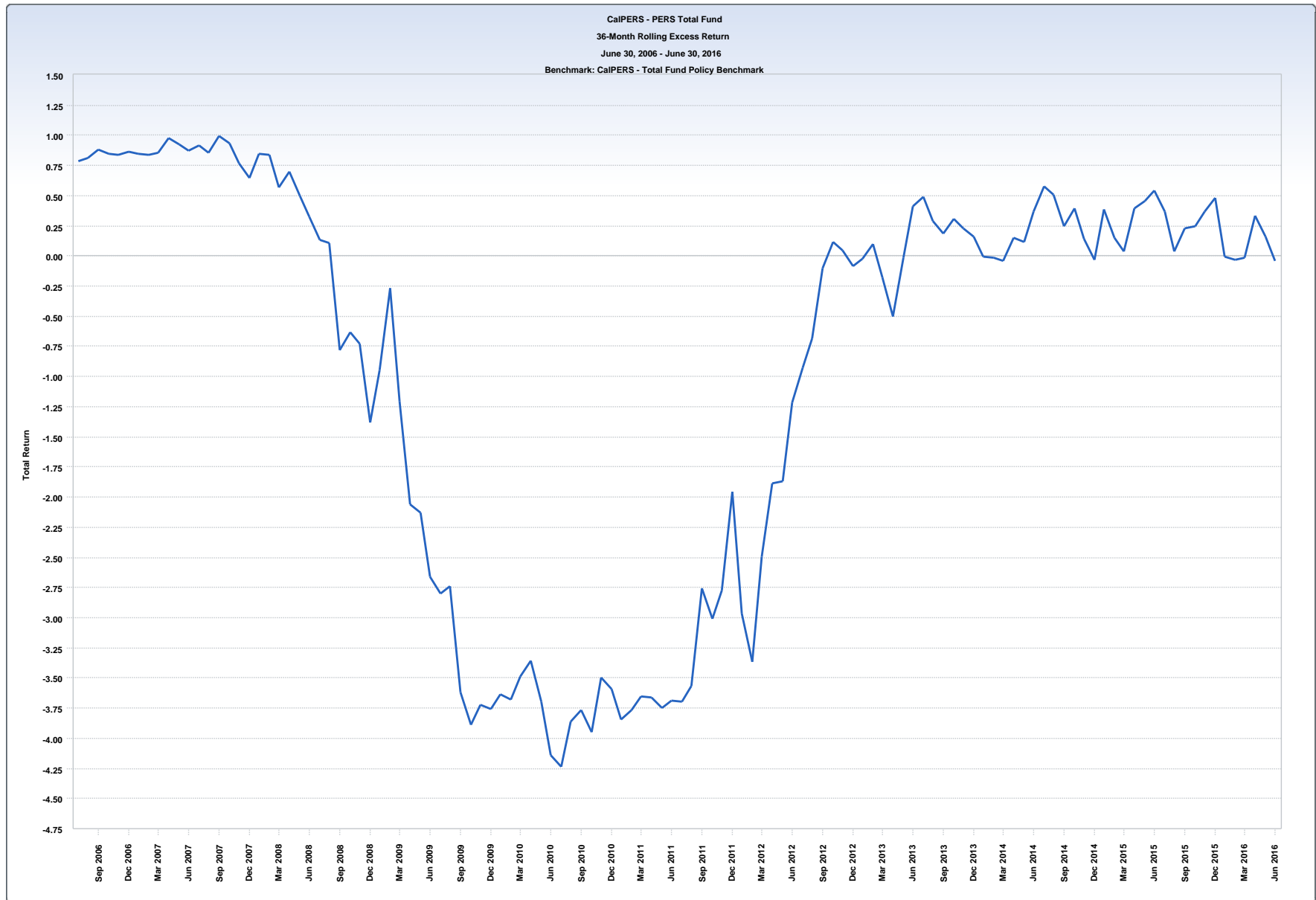


# Total Fund – Attribution (Fiscal YTD)

## California Public Employees' Retirement System Total Fund Attribution - Fiscal Year-to-Date As of 6/30/2016

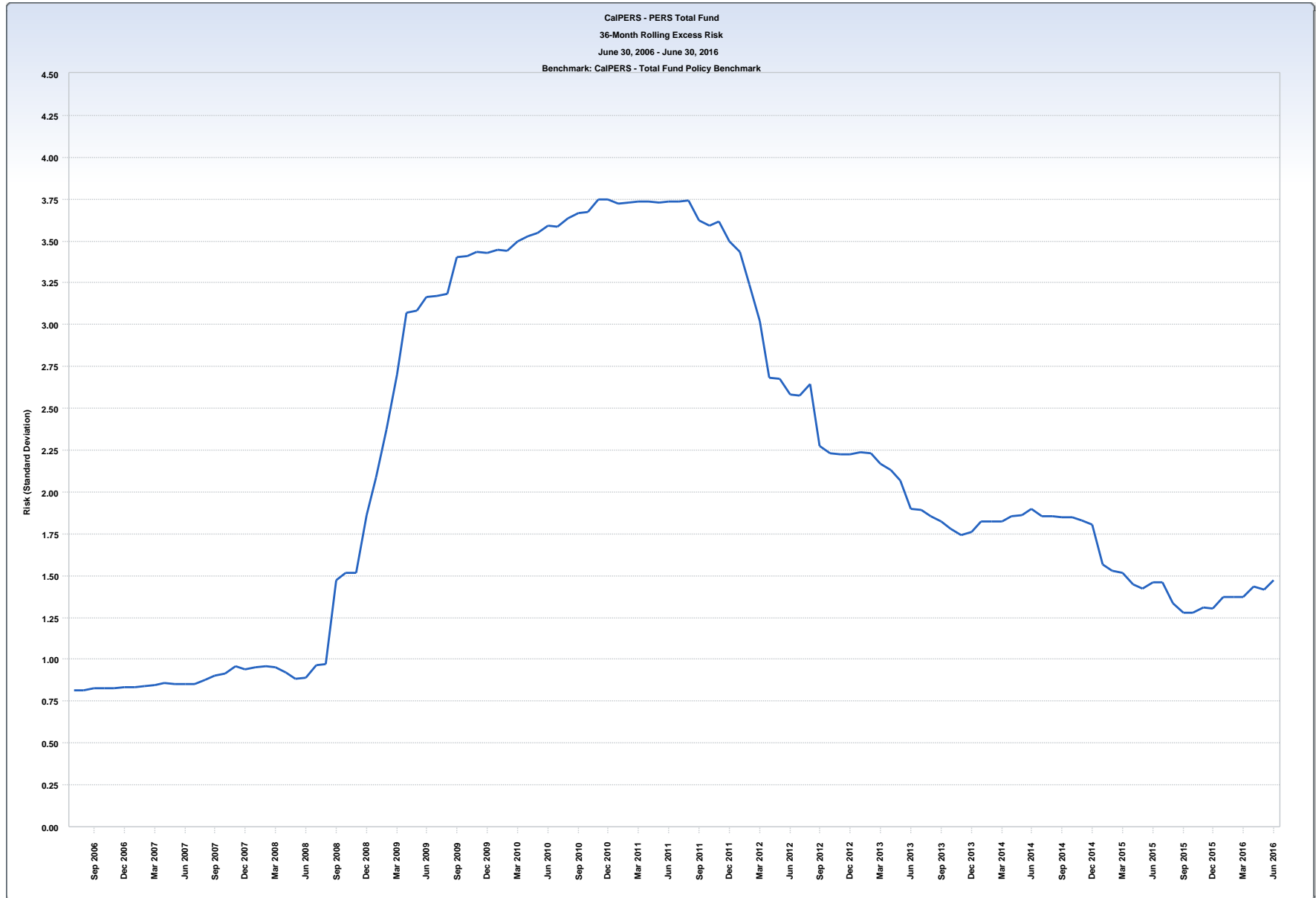
Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
<b>Growth</b>	62.57	-2.57	61.00	-3.08	1.57	0.51	-0.24	0.03	0.44	0.23
Public Equity	53.00	-3.38	51.00	-3.97	2.00	0.58	-0.20	0.01	0.30	0.11
Private Equity	9.57	1.70	10.00	-0.83	-0.43	2.53	-0.04	0.02	0.14	0.11
<b>Income</b>	19.46	9.29	20.00	9.31	-0.55	-0.02	-0.14	0.01	-0.01	-0.14
<b>Real Assets</b>	10.76	5.99	12.00	11.15	-1.24	-5.16	-0.15	0.04	-0.58	-0.68
<b>Inflation</b>	5.25	-3.64	6.00	-5.00	-0.75	1.35	0.07	-0.01	0.09	0.14
<b>Absolute Return</b>	0.60	-1.67	0.00	5.62	0.60	-7.29	0.03	-0.04	0.00	-0.01
<b>Liquidity</b>	1.37	0.36	1.00	0.19	0.37	0.17	0.05	0.00	0.00	0.05
<b>Monthly Linked Return</b>	<b>100.00</b>	<b>0.62</b>	<b>100.00</b>	<b>1.02</b>		<b>-0.40</b>	<b>-0.38</b>	<b>0.03</b>	<b>-0.06</b>	<b>-0.40</b>
<b>Trading/Hedging/Other</b>		-0.01		0.00		-0.01				<b>-0.01</b>
<b>Total</b>		<b>0.61</b>		<b>1.02</b>		<b>-0.41</b>				<b>-0.41</b>

# Total Fund – Rolling Excess Returns





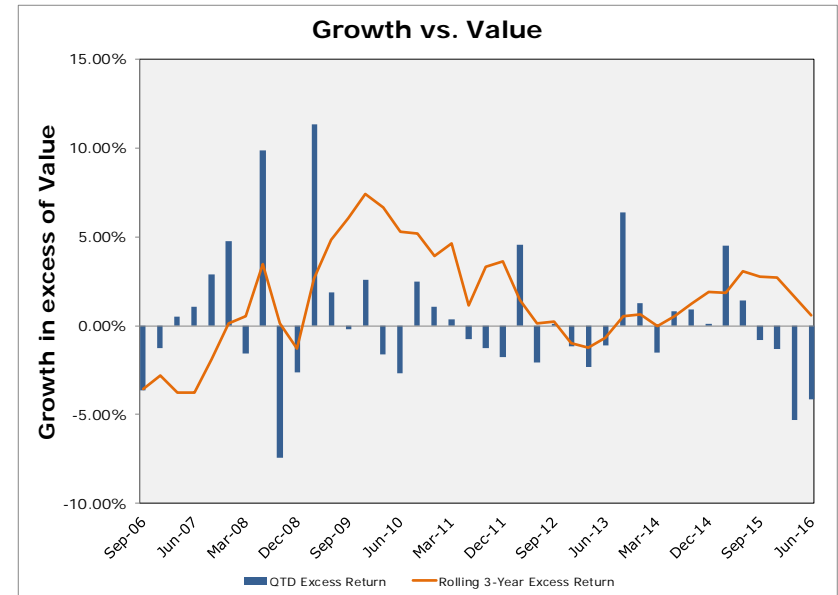
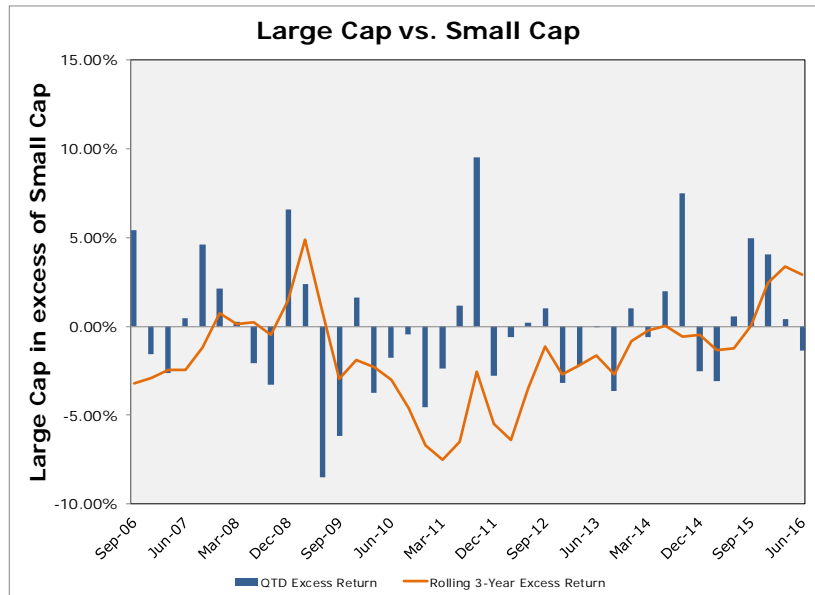
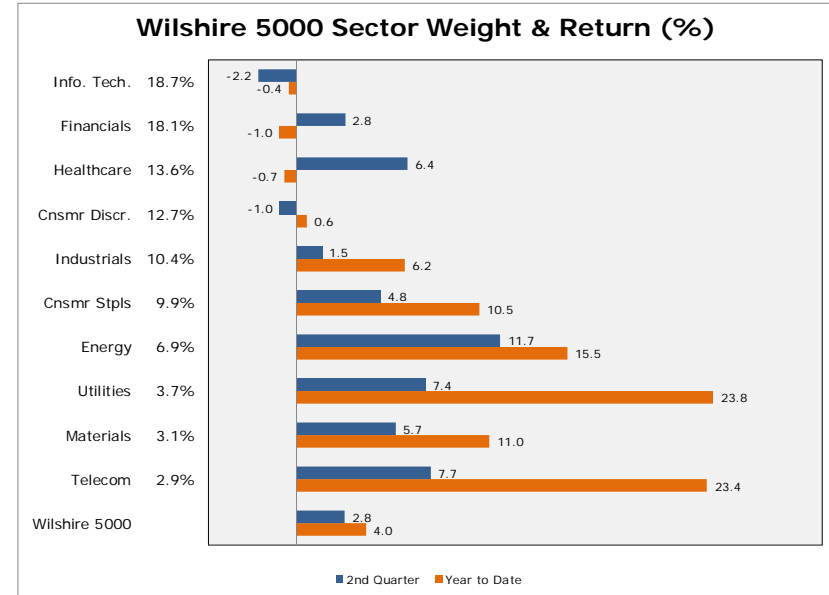
# Total Fund – Rolling Tracking Error



# U.S. Equity Market



June 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
Wilshire 5000	2.8	4.0	3.0	11.3	11.6	7.5
Wilshire U.S. Large Cap	2.7	3.9	3.8	11.6	11.9	7.5
Wilshire U.S. Small Cap	4.1	5.0	-4.0	8.4	9.7	7.9
Wilshire U.S. Large Growth	0.4	-1.3	-2.2	12.3	11.6	8.1
Wilshire U.S. Large Value	4.8	8.6	9.4	11.0	12.1	6.7
Wilshire U.S. Small Growth	2.2	-0.6	-11.9	6.3	8.1	7.7
Wilshire U.S. Small Value	6.0	10.4	4.0	10.5	11.1	8.0
Wilshire REIT Index	5.6	11.1	22.8	13.6	12.5	7.0
MSCI USA Minimum Volatility Index	5.6	11.4	16.5	14.2	13.9	8.7
FTSE RAFI U.S. 1000 Index	3.3	5.3	2.5	10.4	11.7	8.2

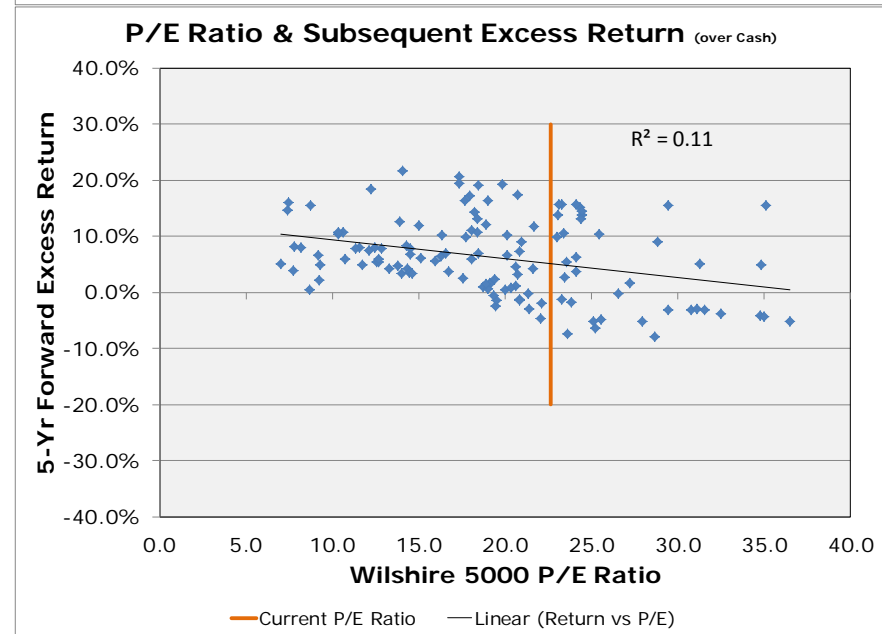
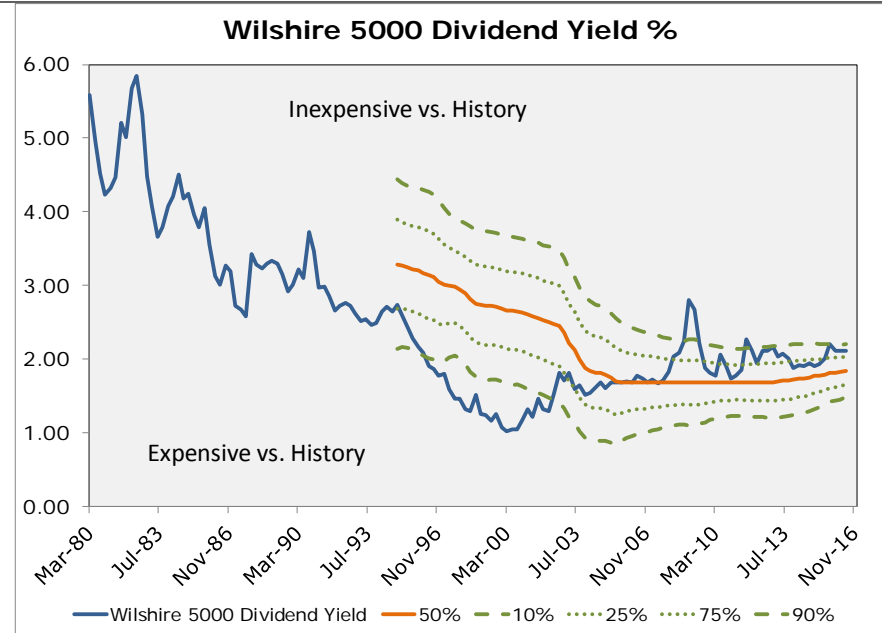
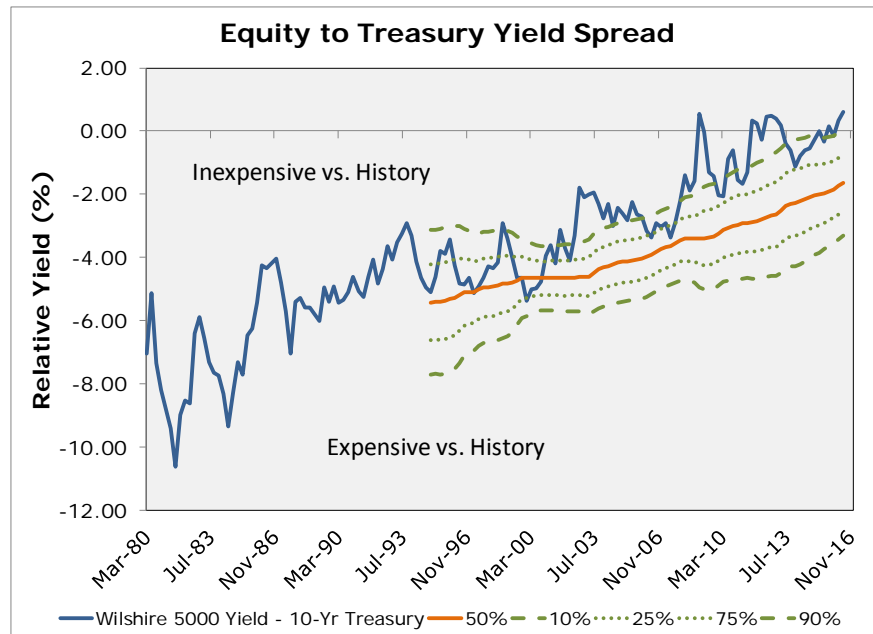


Data sources: Wilshire Compass, Wilshire Atlas



# U.S. Equity Valuations

- Distribution of historical dividend yield is tight; current observation at the 83%-percentile outcome
- Spread (discount) between the dividend yield and Treasuries has decreased as yields have fallen through the years

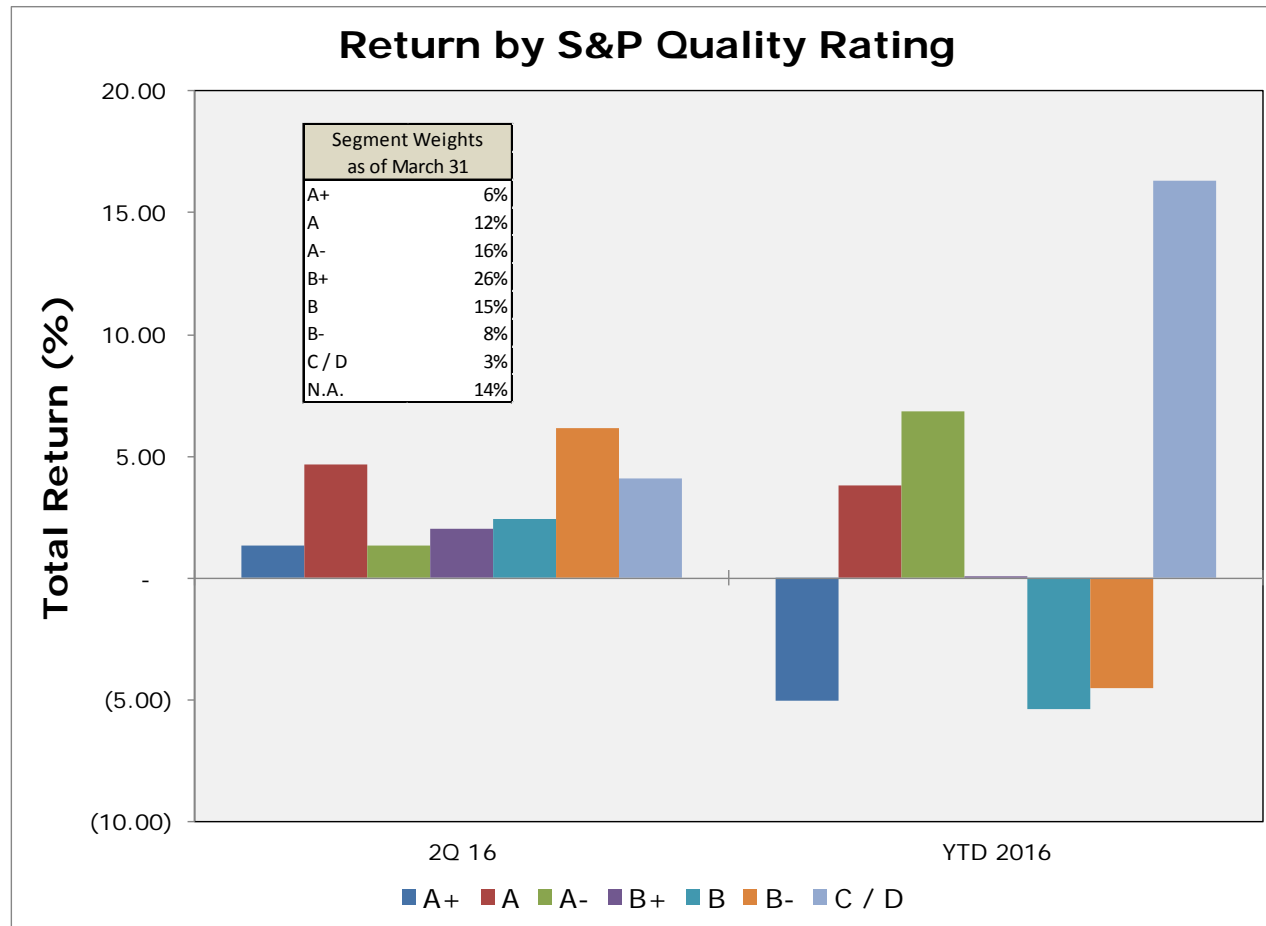


Source: Wilshire Compass, Wilshire Atlas, Barclays Capital



# Returns by Quality Segment

Lower quality names outperformed during Q2 (the A segment excluded) while results are mixed for the year

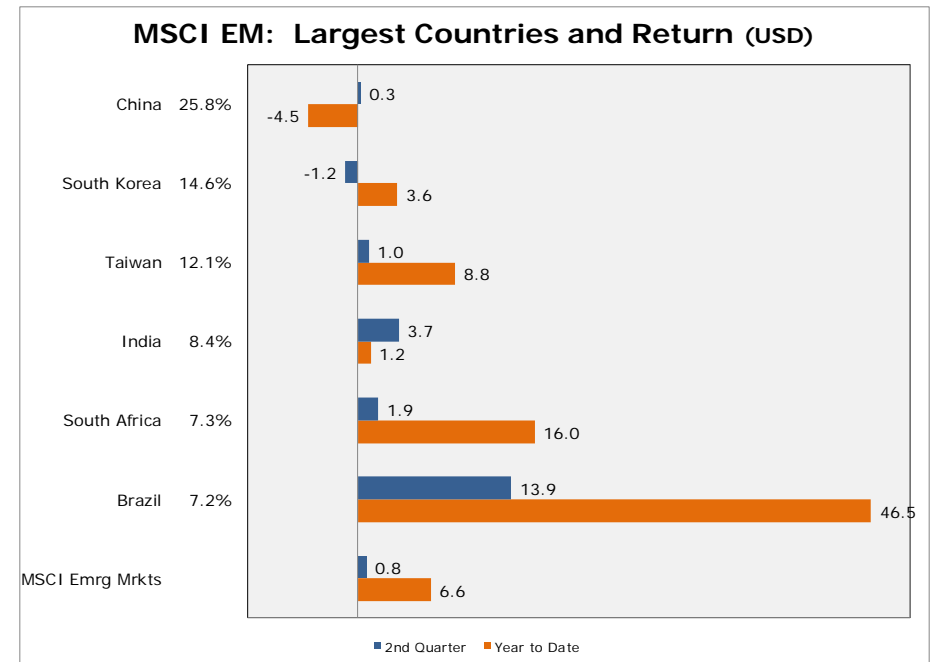
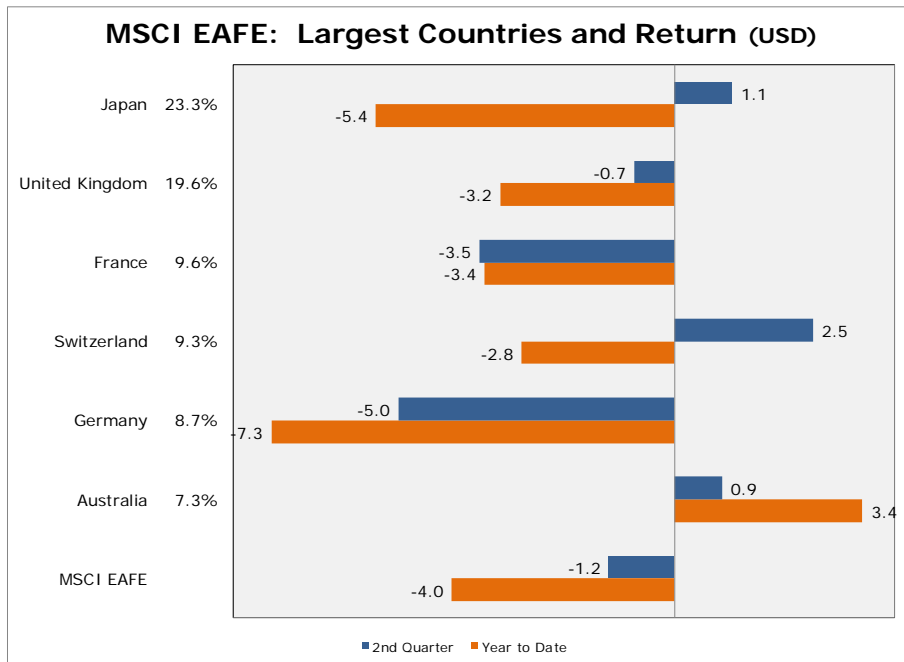


Data sources: Wilshire Atlas



# Non-U.S. Equity Market

June 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
MSCI ACWI ex-US (\$g)	-0.4	-0.7	-9.8	1.6	0.6	2.3
MSCI EAFE (\$g)	-1.2	-4.0	-9.7	2.5	2.1	2.1
MSCI Emerging Markets (\$g)	0.8	6.6	-11.7	-1.2	-3.4	3.9
MSCI Frontier Markets (\$g)	0.6	-0.1	-11.7	1.4	1.8	0.8
MSCI ACWI ex-US Growth (\$g)	0.6	0.4	-5.9	3.5	1.9	3.2
MSCI ACWI ex-US Value (\$g)	-1.5	-1.7	-13.7	-0.3	-0.8	1.4
MSCI ACWI ex-US Small (\$g)	-0.7	0.0	-5.1	5.3	2.7	4.5
MSCI EAFE Minimum Volatility Idx	1.0	3.1	4.3	8.7	7.6	6.4
FTSE RAFI Developed ex-US Index	-1.6	-4.0	-12.5	1.7	0.4	2.3
MSCI EAFE LC (g)	-0.5	-6.8	-9.7	6.3	6.7	2.6
MSCI Emerging Markets LC (g)	0.8	3.6	-7.3	4.1	2.4	6.1



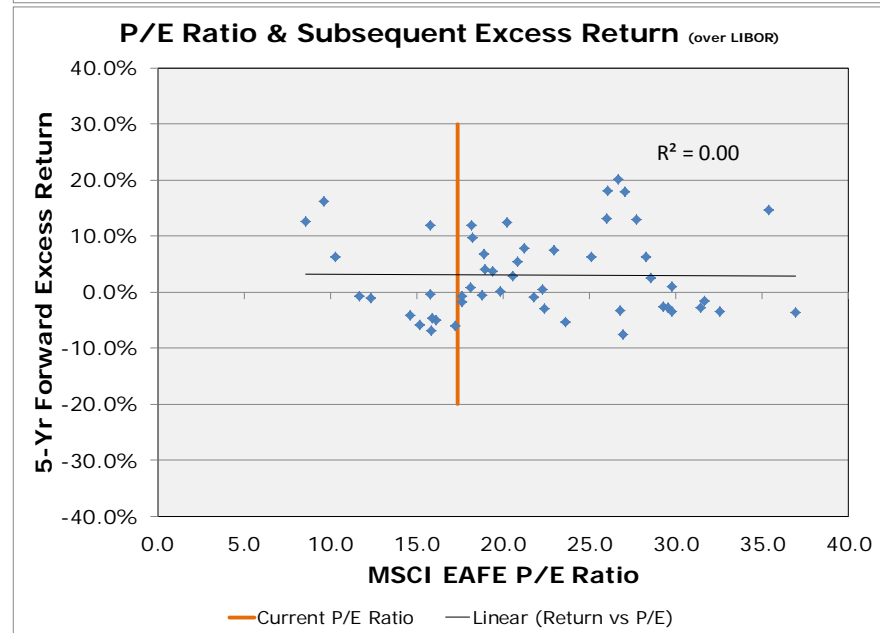
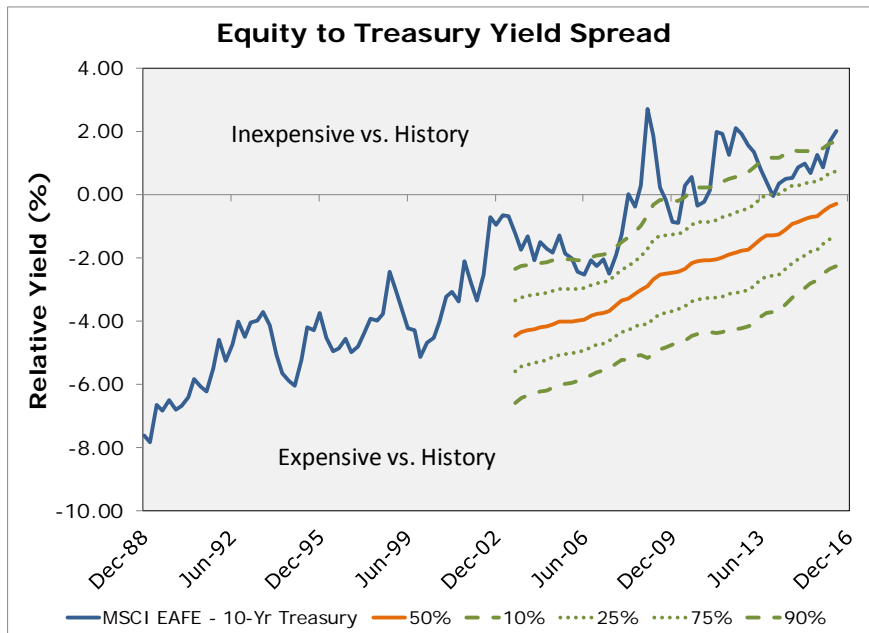
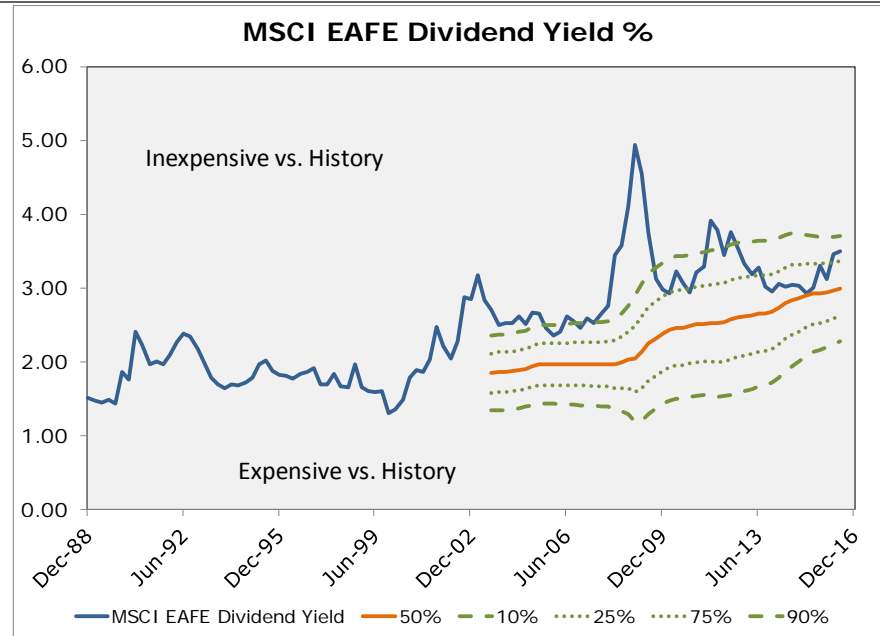
Data sources: Wilshire Compass





# Developed Market Equity Valuations

- Dividend yield is above the 15-year median; at the 82%-percentile outcome
- Spread between Developed Equity and the 10-Year Treasury has been narrowing

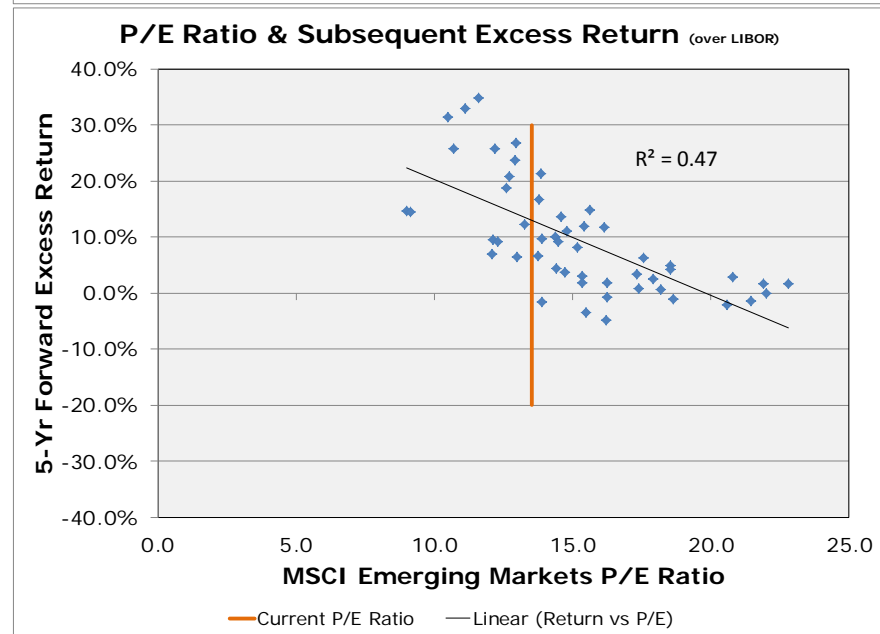
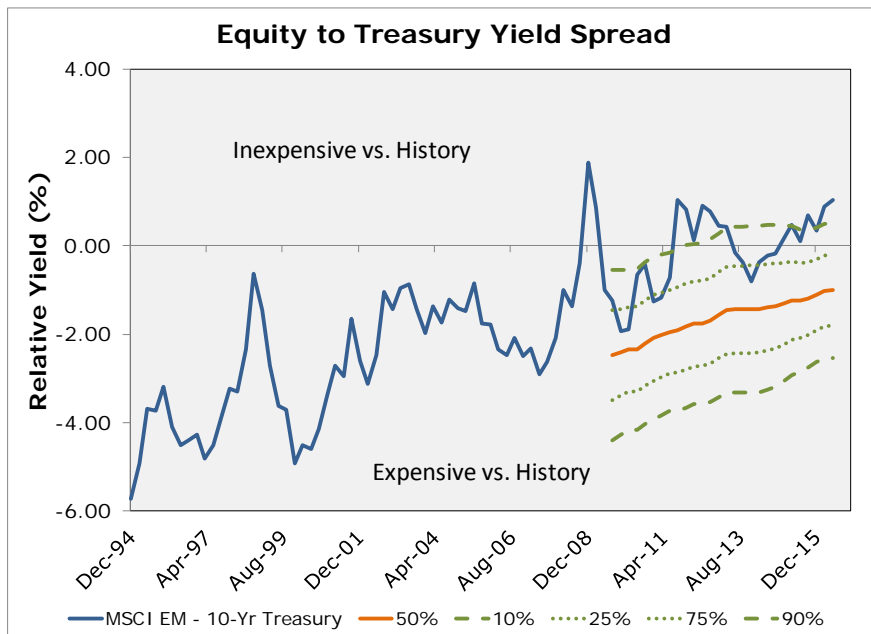
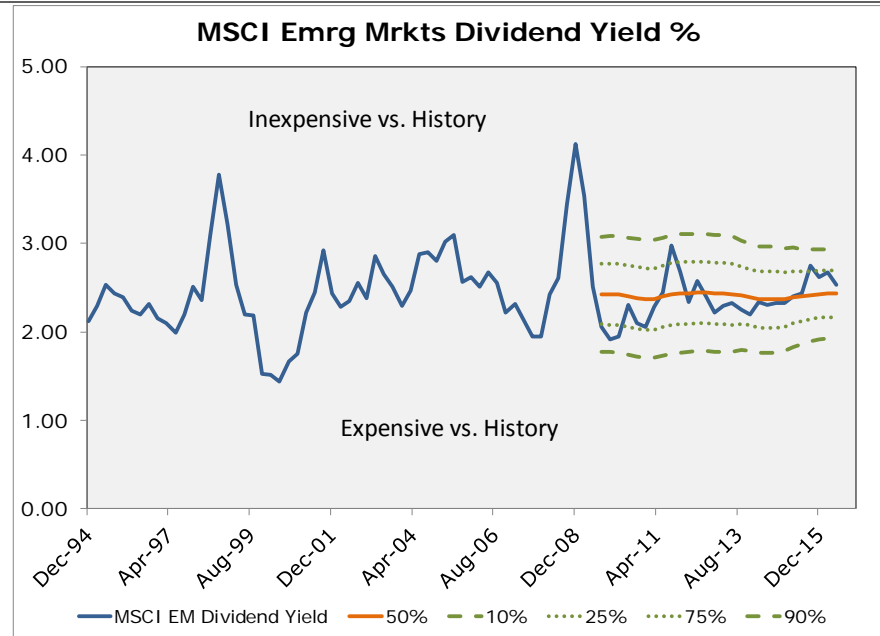


Source: Wilshire Compass, Wilshire Atlas, Barclays Capital



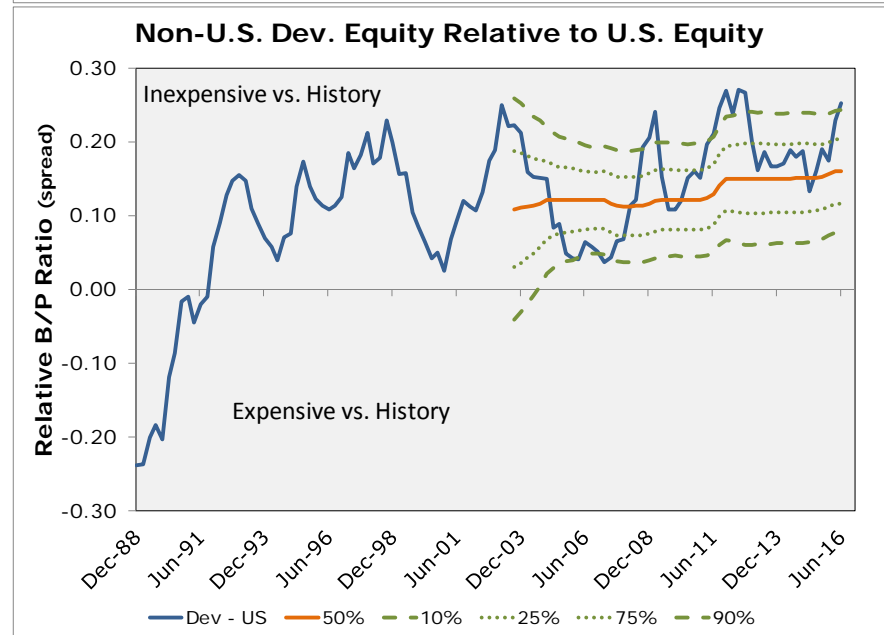
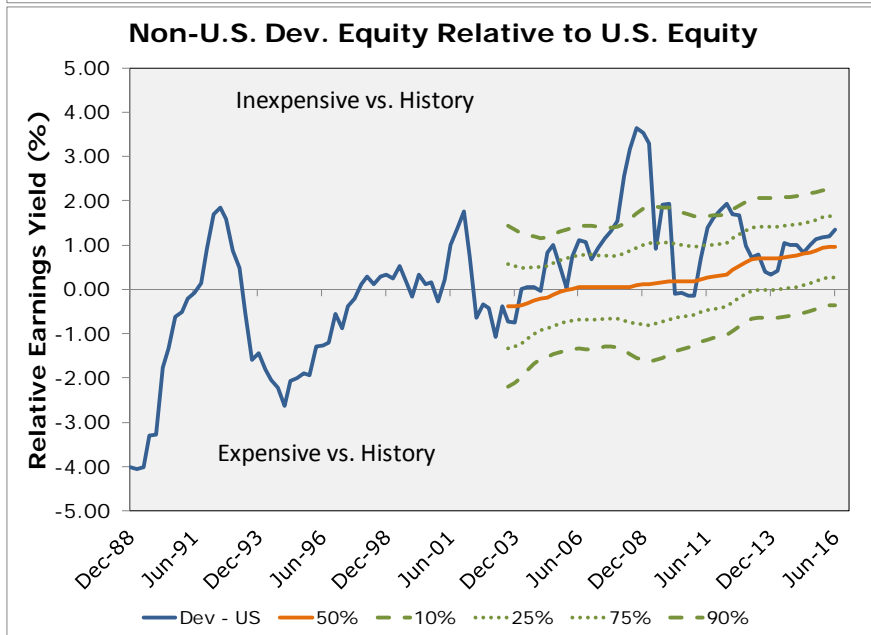
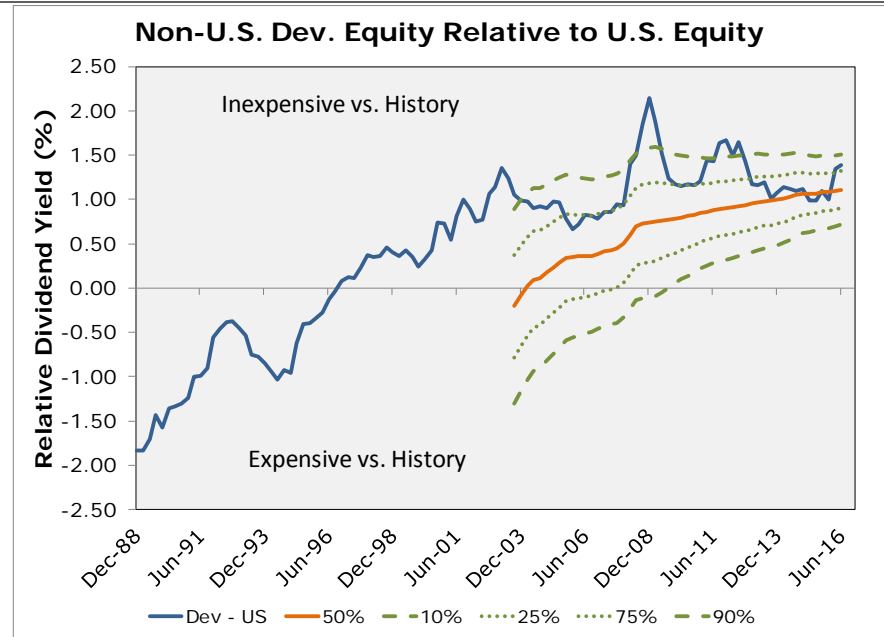
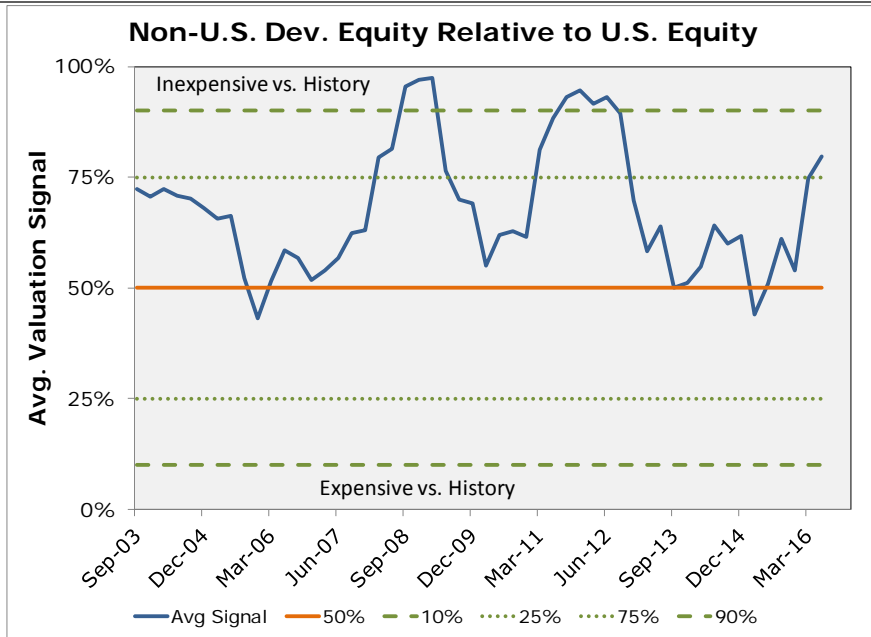
# Emerging Market Equity Valuations

- Current dividend yield above its 15-year median; at the 60%-percentile outcome
- Spread between Emerging Market Equity and the 10-Year Treasury has been narrowing



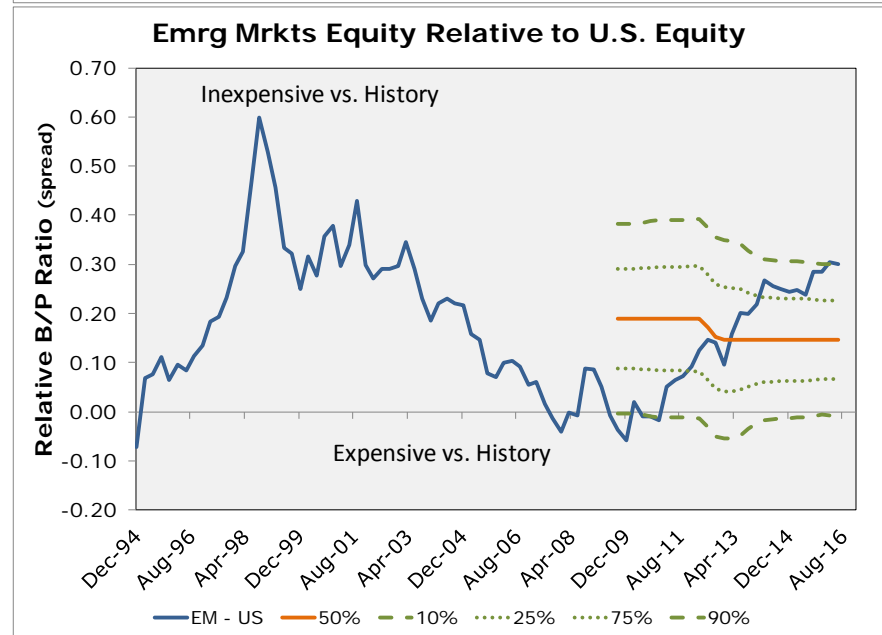
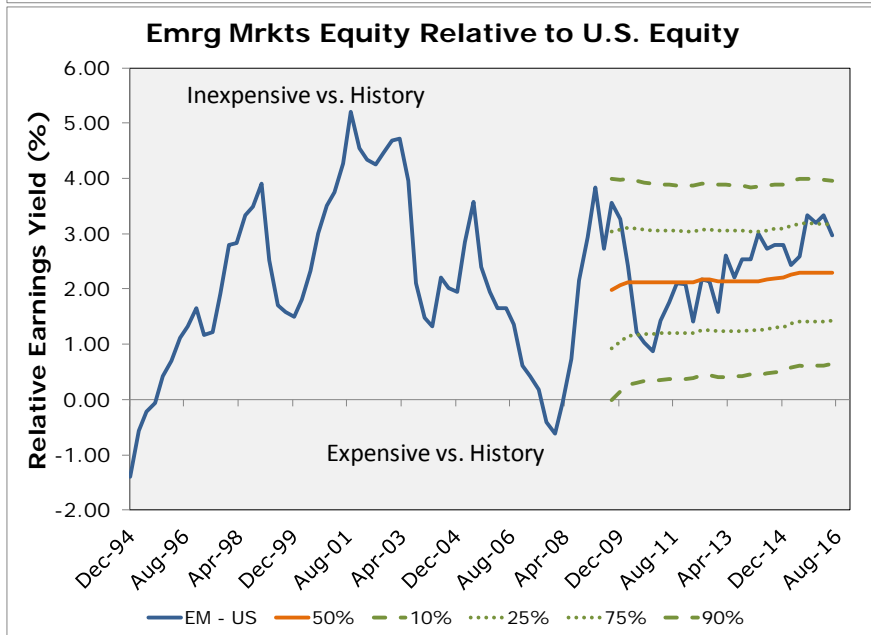
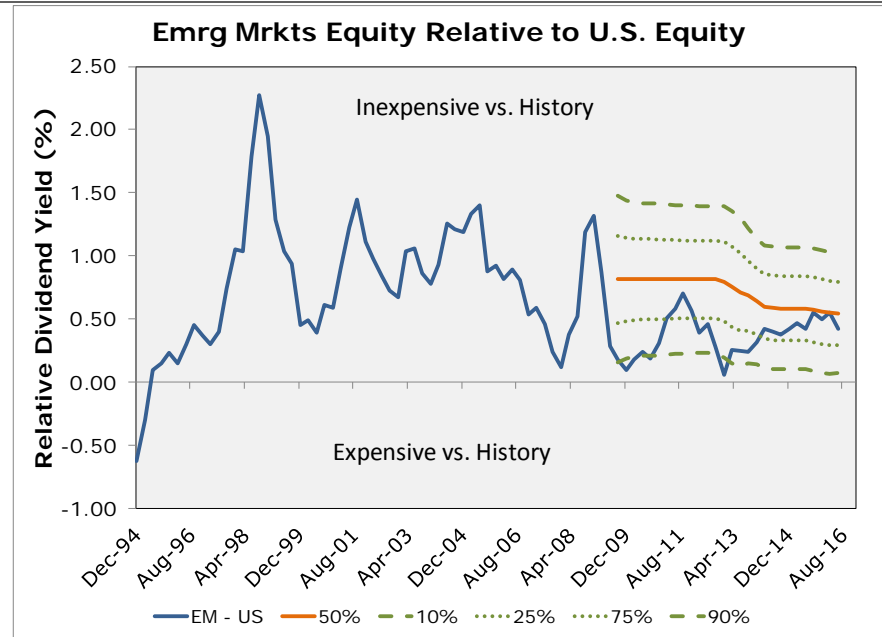
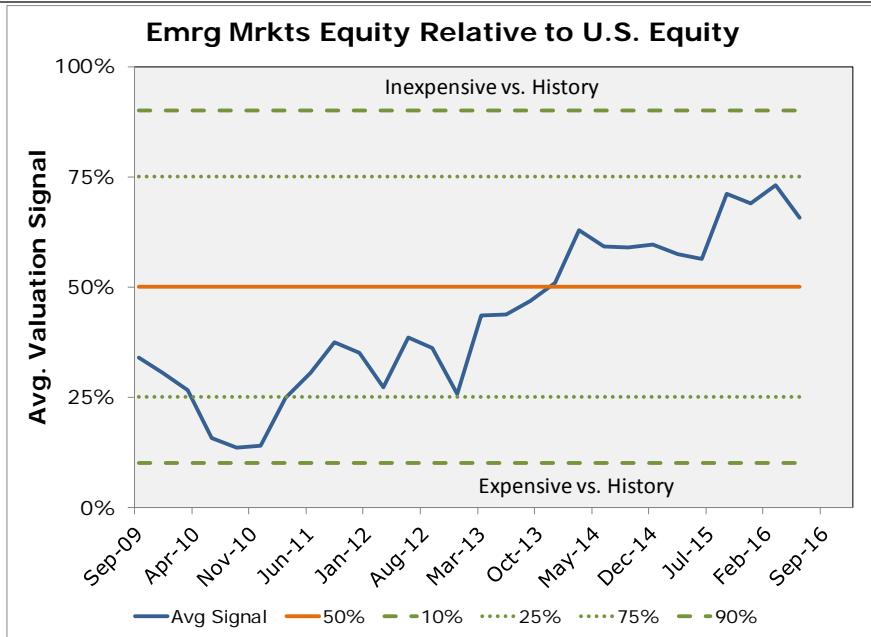
Source: Wilshire Compass, Wilshire Atlas, Barclays Capital

# Developed (Non-U.S.) Equity vs. U.S. Equity



Source: Wilshire Compass, Wilshire Atlas

# Emerging Markets Equity vs. U.S. Equity



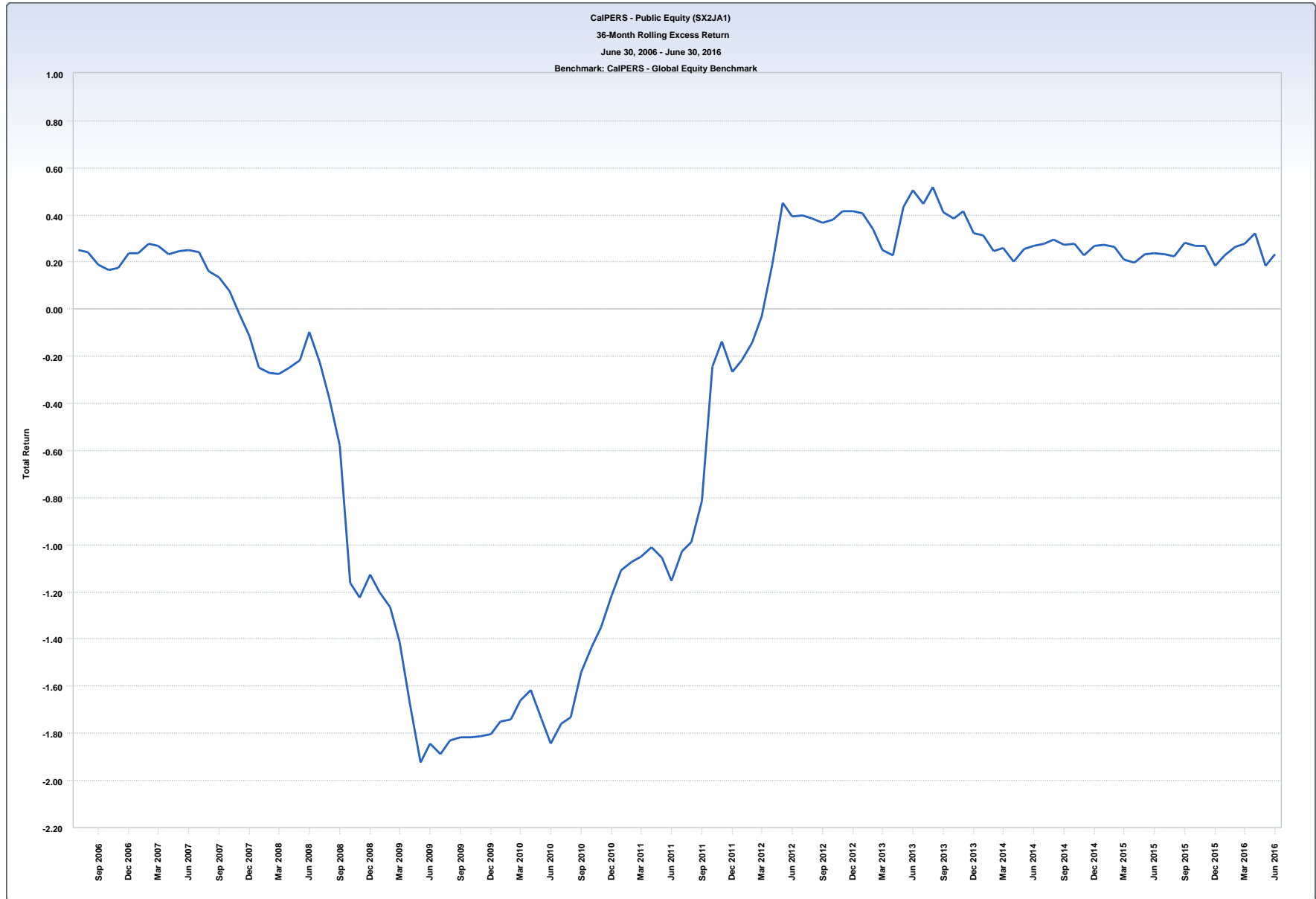
Source: Wilshire Compass, Wilshire Atlas

# Growth: Public Equity – Performance

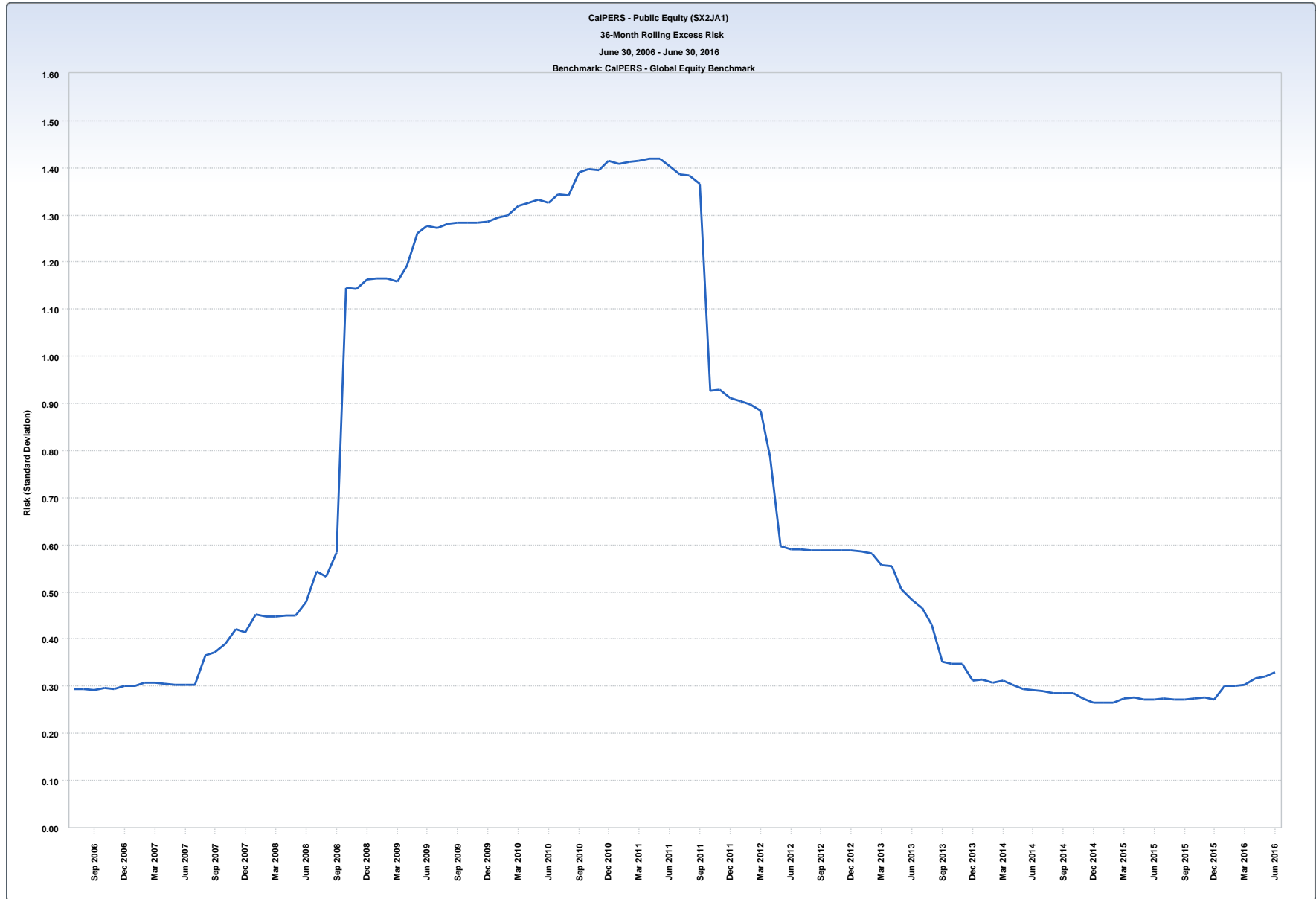


	<b>Market Value</b>	<b>Qtr</b>	<b>1-Year</b>	<b>3-Year</b>	<b>5-Year</b>	<b>10-Year</b>	<b>VaR</b>	<b>5-year Sharpe Ratio</b>	<b>5-year Info Ratio</b>
<b>PUBLIC EQUITY</b>	<b>153.1</b>	<b>1.3%</b>	<b>-3.4%</b>	<b>6.8%</b>	<b>6.1%</b>	<b>4.7%</b>	<b>\$31.1 bil</b>	<b>0.4</b>	<b>0.7</b>
<i>Public Equity Policy Benchmark</i>		1.2%	-4.0%	6.5%	5.9%	5.0%		<b>0.4</b>	<b>0.0</b>
<i>Value Added</i>		0.1%	0.6%	0.3%	0.2%	-0.3%			
<b>USEquity Composite</b>	<b>81.5</b>	<b>2.5%</b>	<b>1.0%</b>	<b>10.6%</b>	<b>11.3%</b>	<b>7.3%</b>		<b>0.9</b>	<b>0.1</b>
<i>Custom USEquity Benchmark</i>		2.6%	1.1%	10.7%	11.3%	7.3%		<b>0.9</b>	<b>0.0</b>
<i>Value Added</i>		-0.1%	-0.1%	-0.1%	0.0%	0.0%			
<b>Total Int'l Equity</b>	<b>71.6</b>	<b>0.0%</b>	<b>-8.2%</b>	<b>2.8%</b>	<b>1.3%</b>	<b>2.6%</b>		<b>0.1</b>	<b>-0.1</b>
<i>Custom Int'l Equity Benchmark</i>		-0.3%	-9.1%	2.5%	1.4%	2.4%		<b>0.1</b>	<b>0.0</b>
<i>Value Added</i>		0.3%	0.9%	0.3%	-0.1%	0.2%			

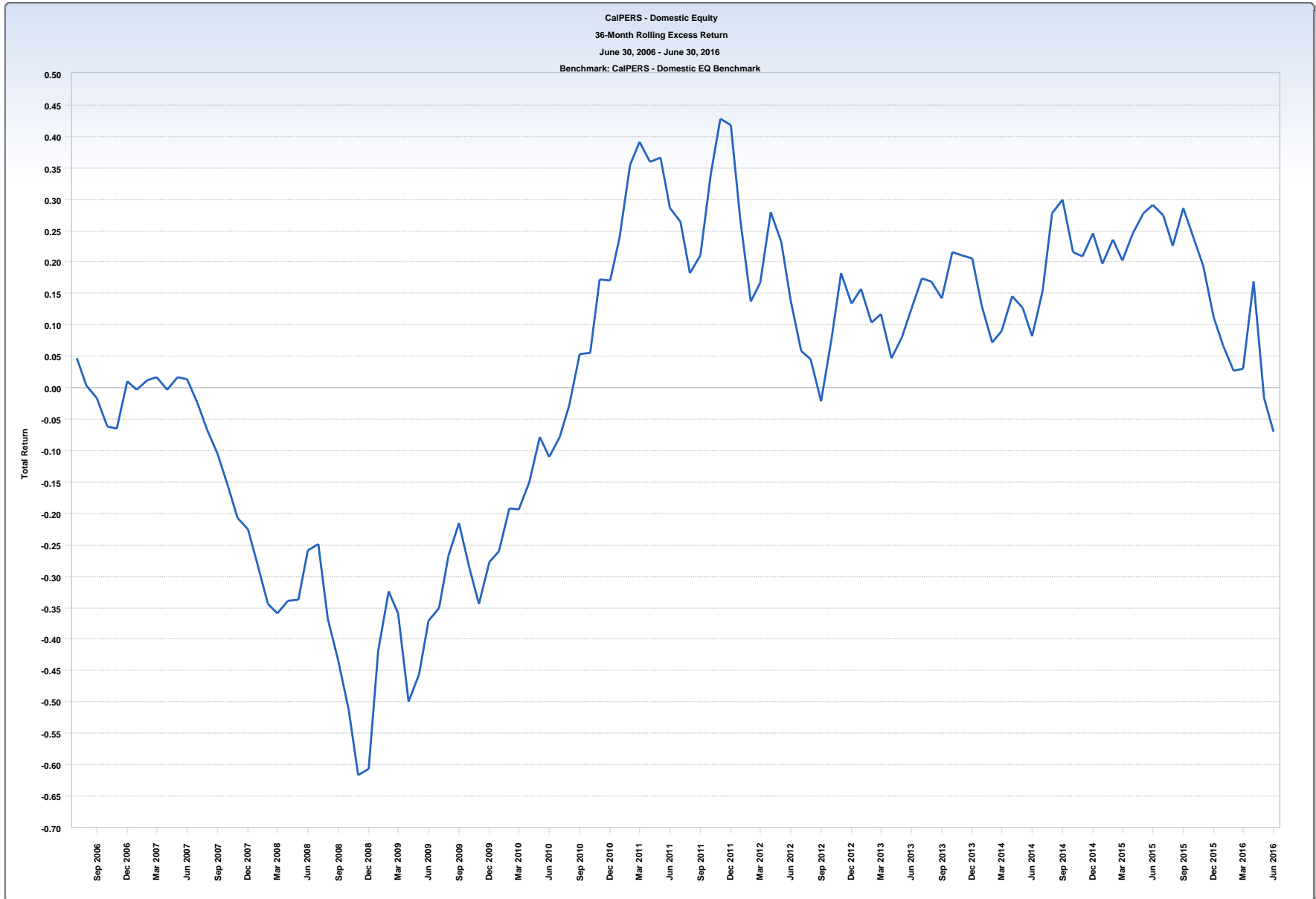
# Growth: Public Equity – Rolling Excess Returns



# Growth: Public Equity – Rolling Tracking Error

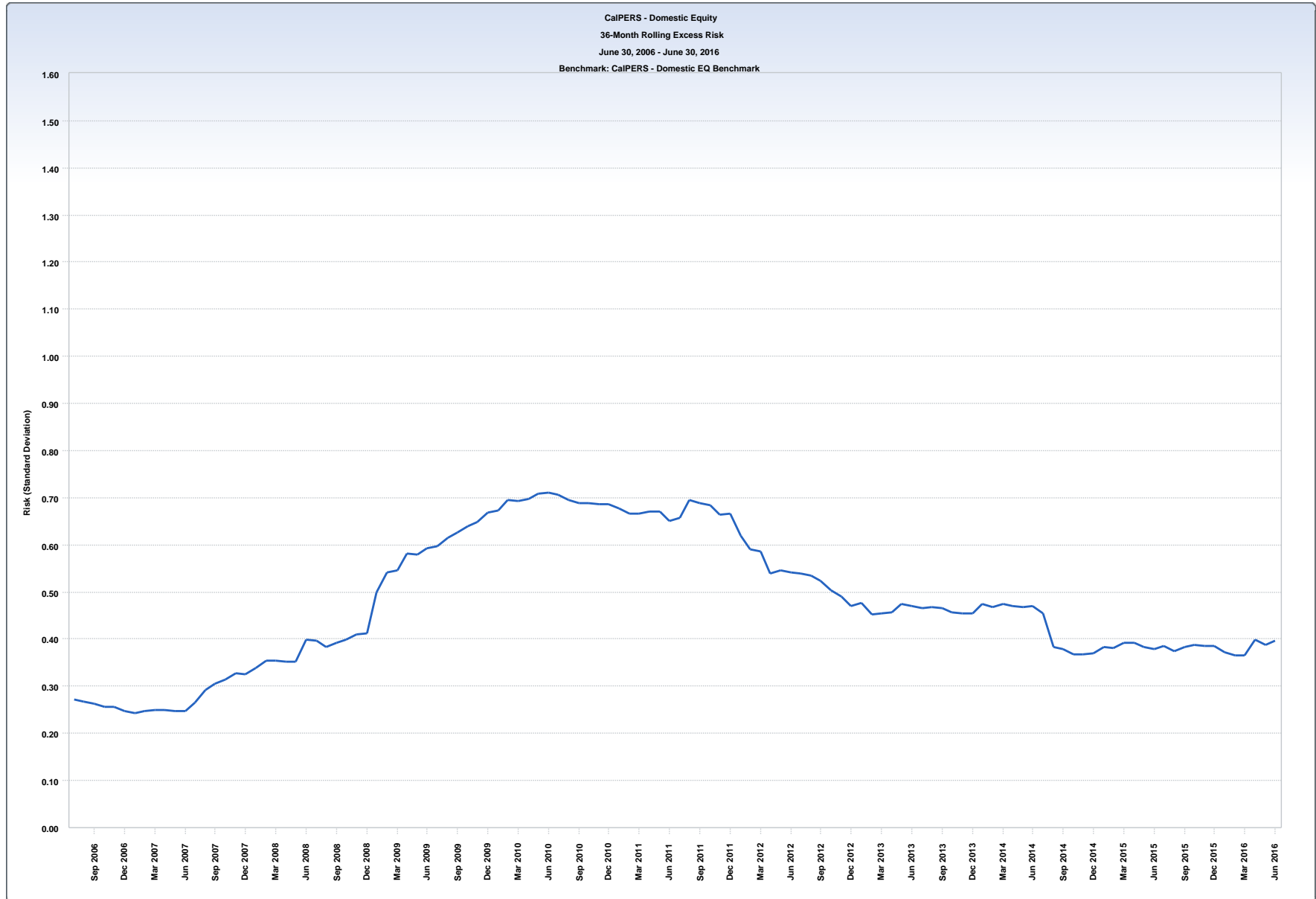


# Growth: US Equity – Rolling Excess Returns

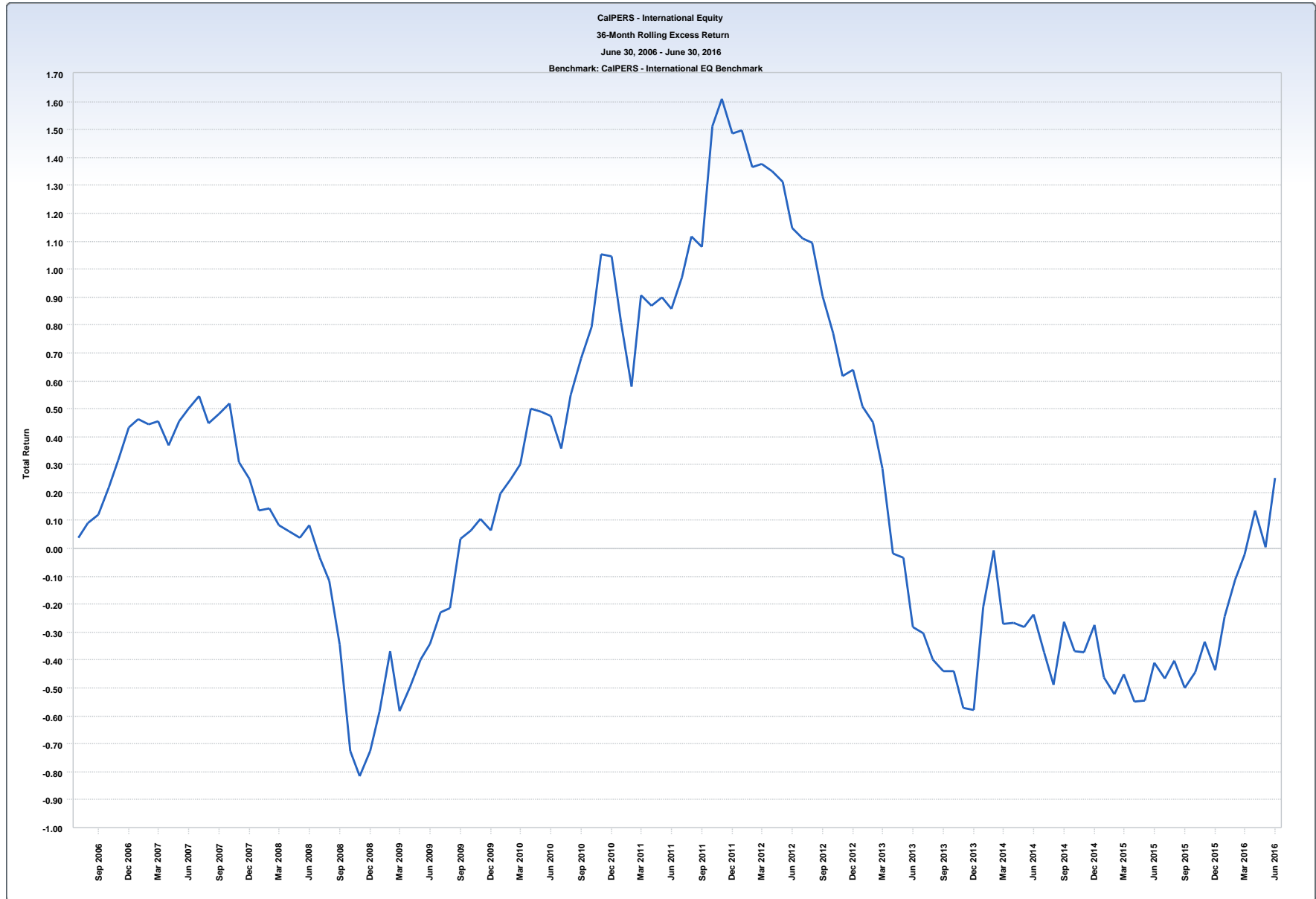




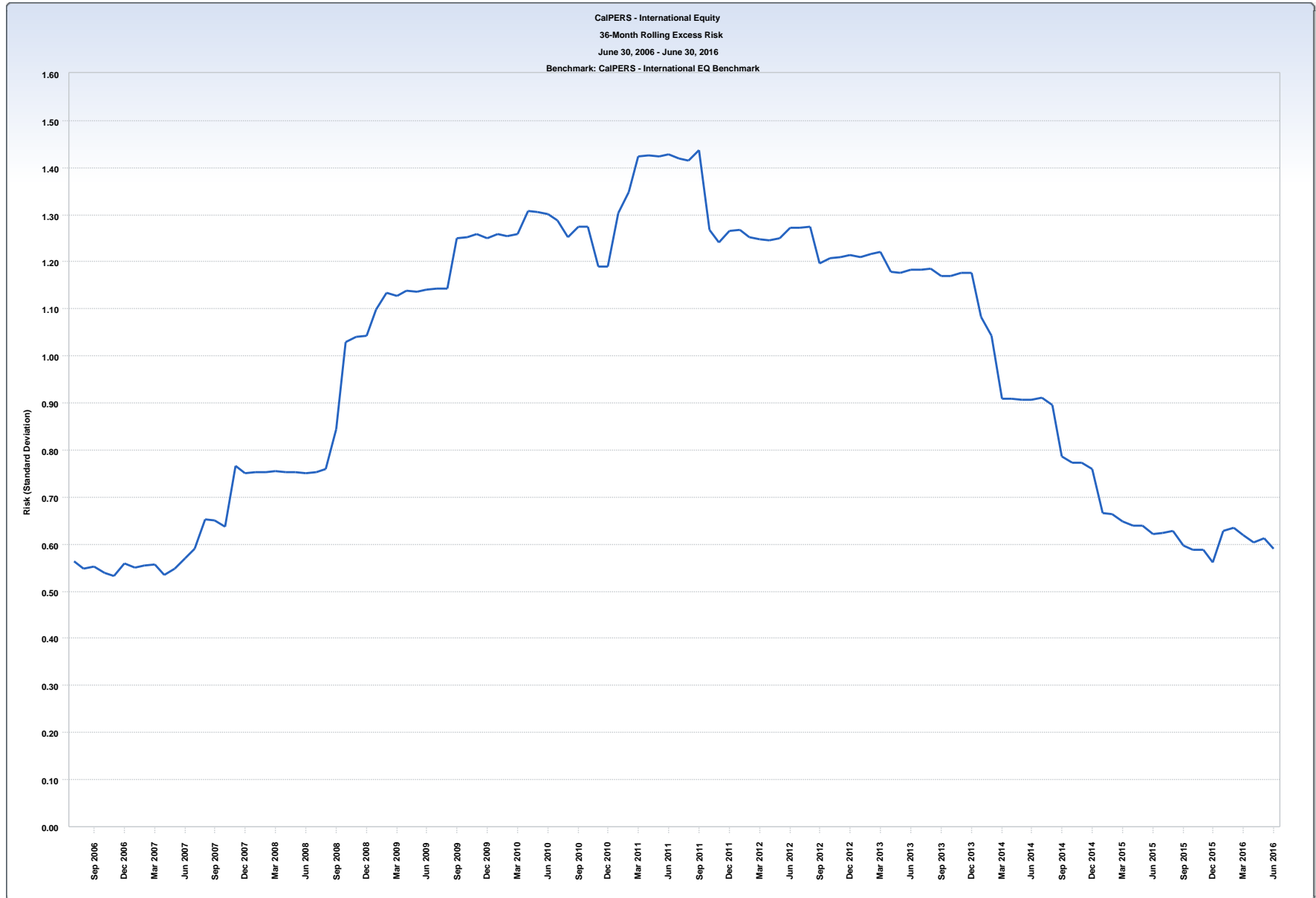
# Growth: US Equity – Rolling Tracking Error



# Growth: International Equity – Rolling Excess Returns



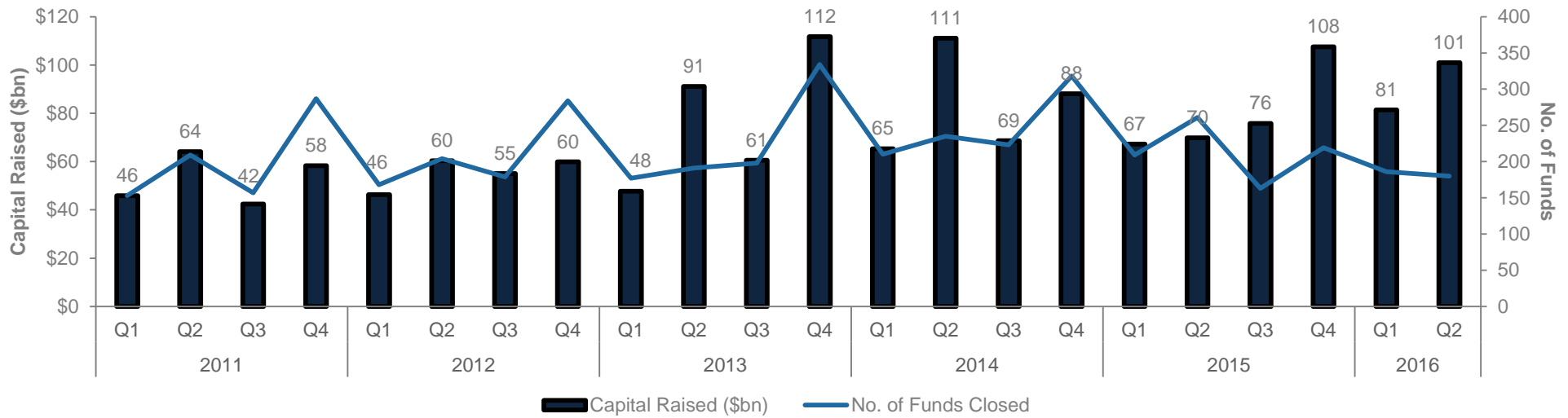
# Growth: International Equity – Rolling Tracking Error



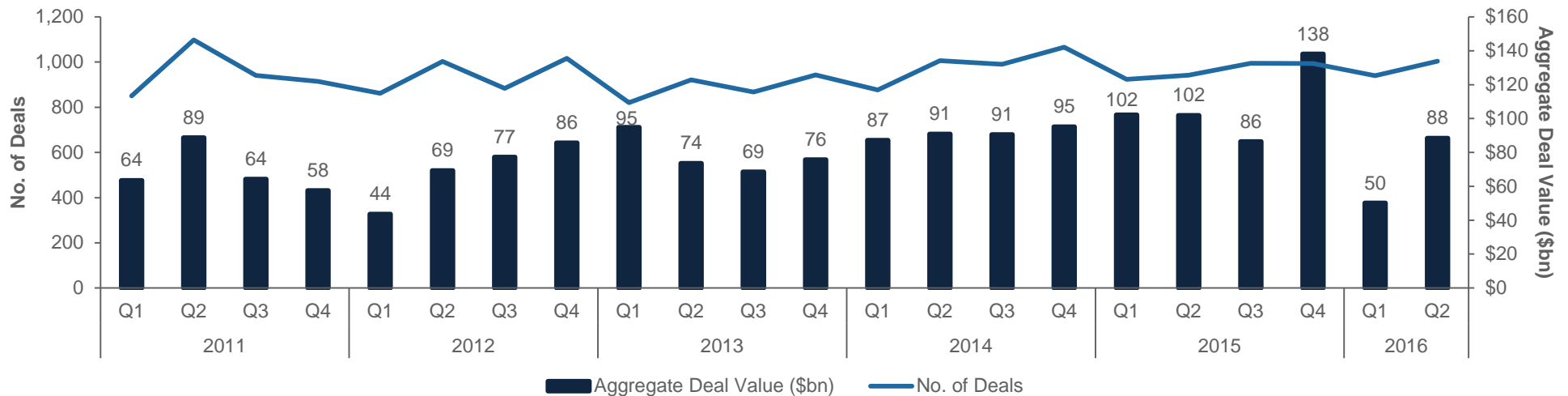
# Private Equity – Fundraising & Investment Activity



Global Private Equity Fundraising (Q1 2011 – Q2 2016)



Global Private Equity-Backed Buyout Activity (Q1 2011 – Q2 2016)

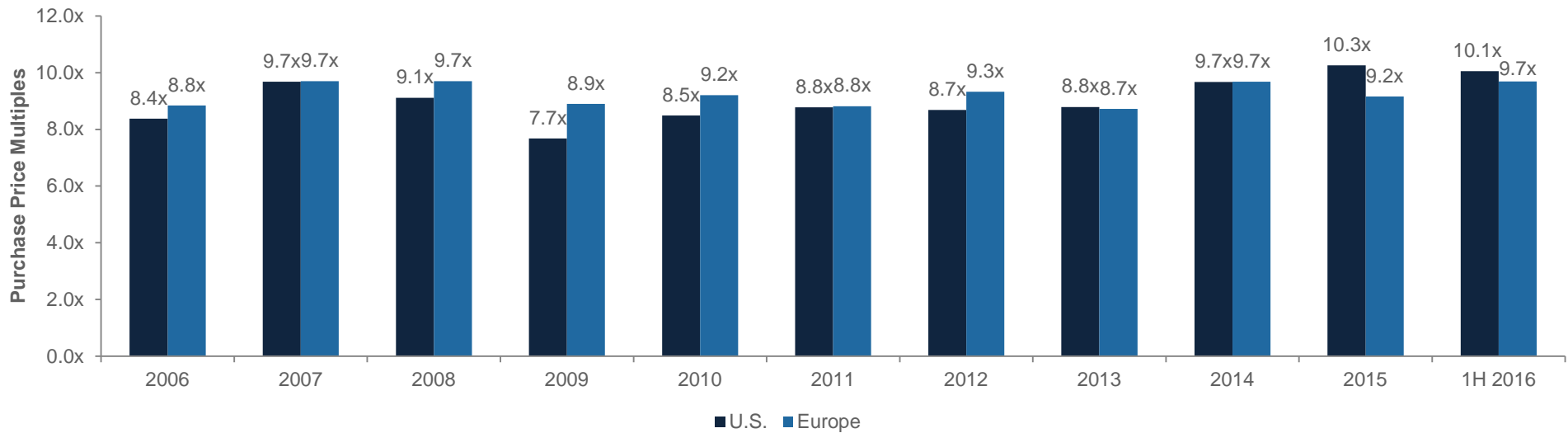


Sources: Preqin.

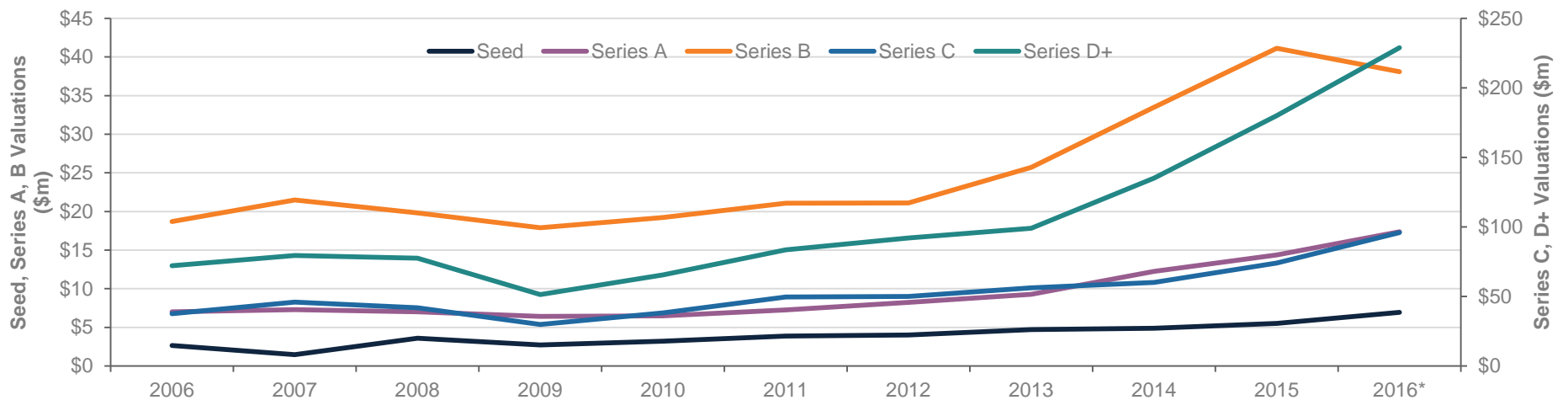
# Private Equity – Pricing & Valuations



Global LBO Multiples (2006 – 1H 2016)



U.S. Venture Capital Median Pre-Money Valuations (2006 – Feb. 2016)

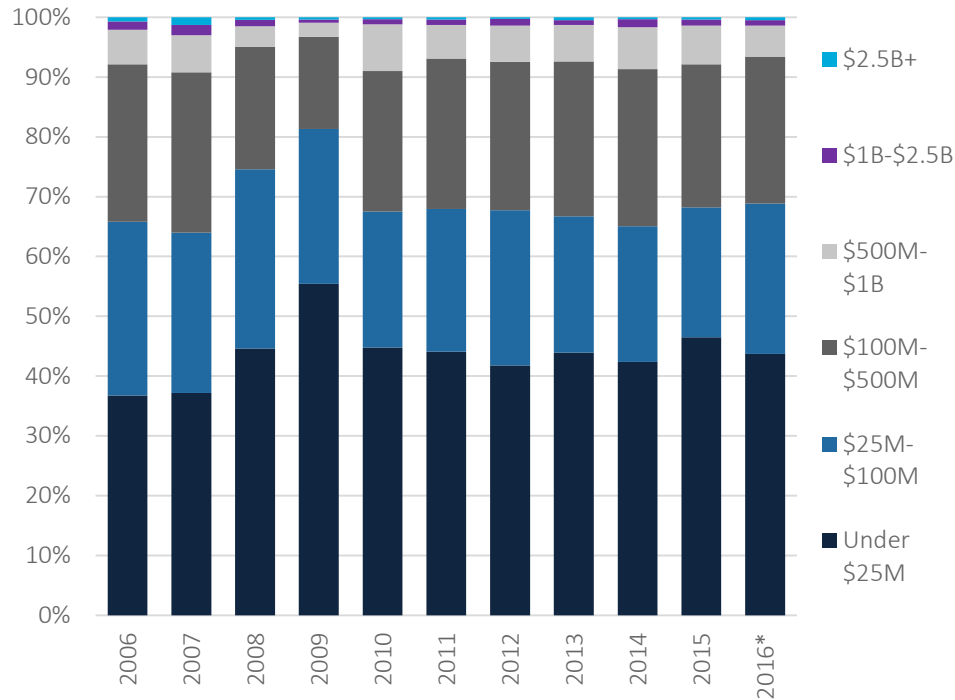


Source: S&P LCD, through 6/30/2016; Pitchbook, 2016 through 2/29/16.

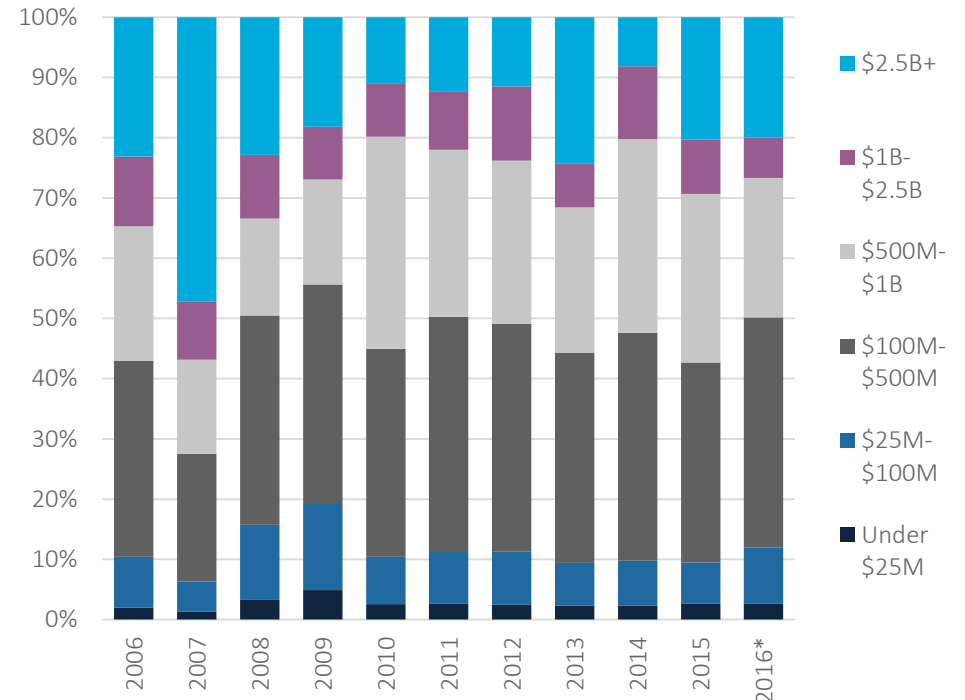
# Private Equity – U.S. Investment Activity by Deal Size



Percentage of Deal Volume (count) by Deal Size



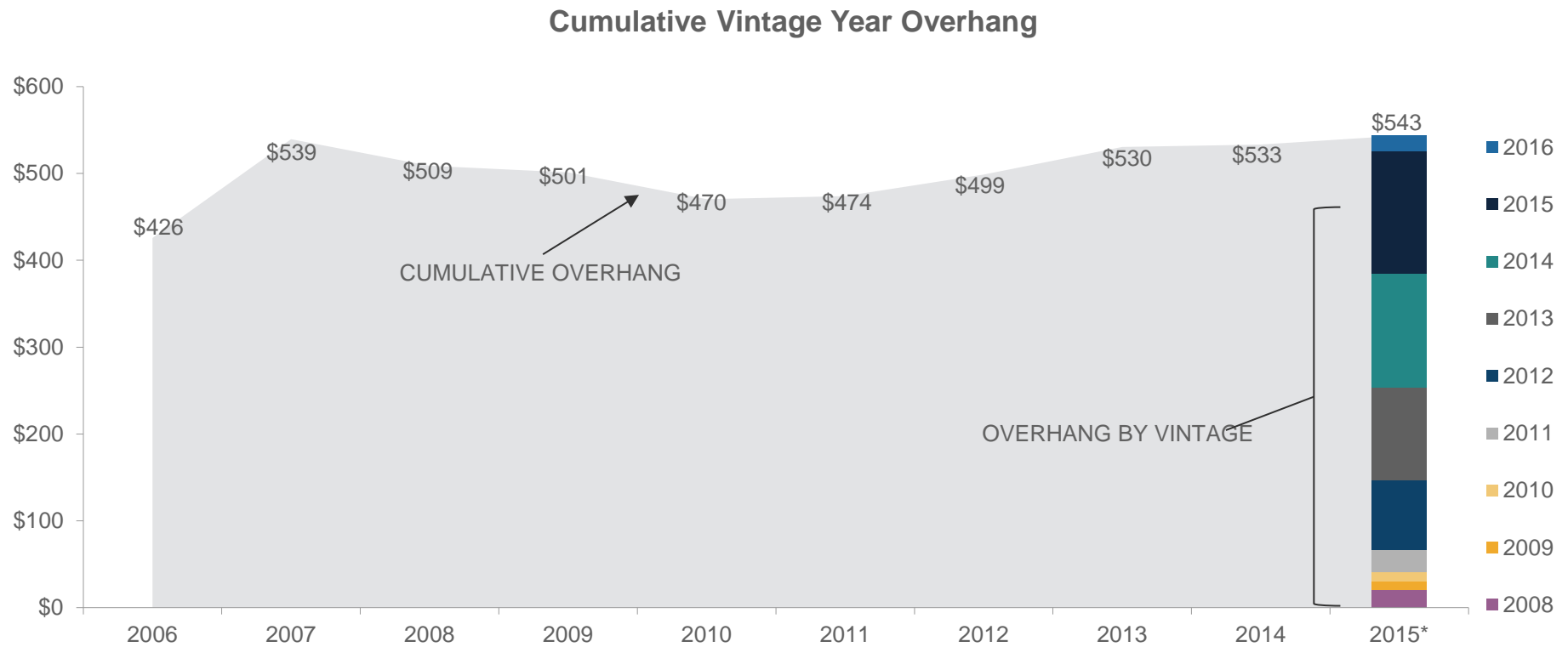
Percentage of Deal Volume (dollars) by Deal Size



- Smaller deals continue to dominant deal activity by count
- Mega transaction (\$2.5B+) volume remains significant in the first half of 2016

Source: Pitchbook. \* As of 6/30/16.

# Private Equity – Capital Overhang

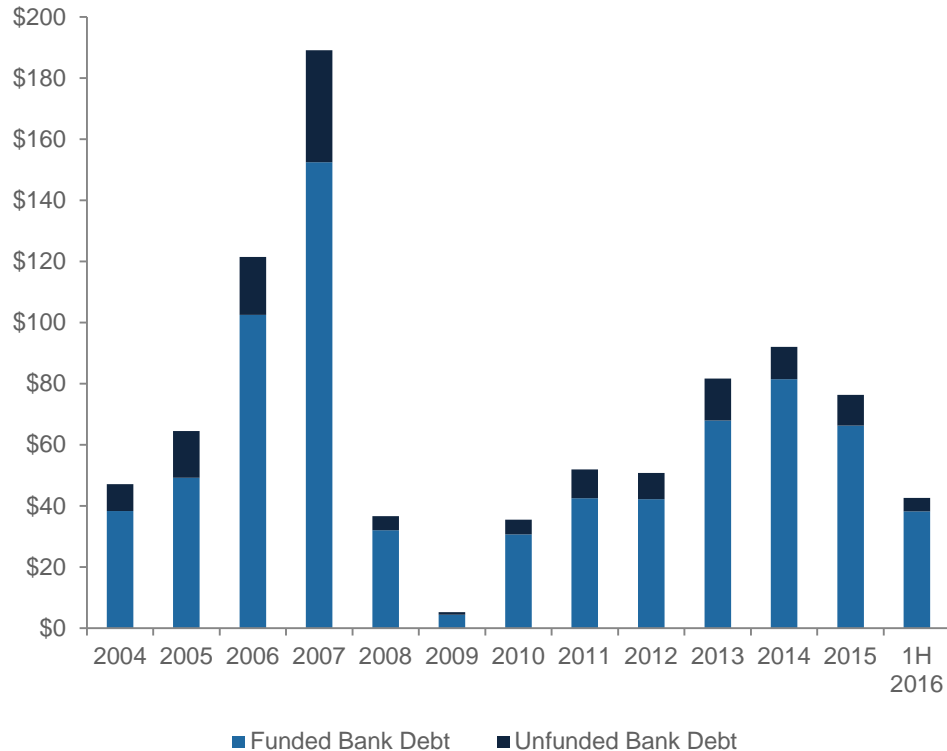


- Total private equity overhang significantly grew to an estimated \$539 billion during the run-up to the financial crisis
- While the overhang slightly decreased across 2007 to 2010, the overhang has increased back to 2007 peak levels

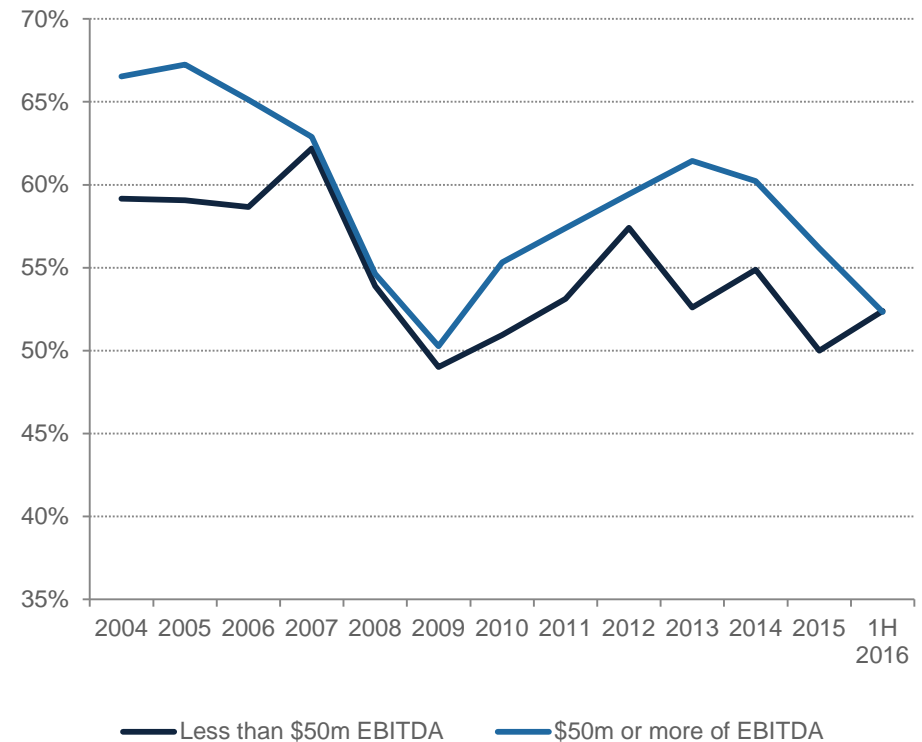
# Private Equity – U.S. Debt Markets



Total U.S. Leveraged Buyout Loan Volume (\$bn)  
(2004 – 1H 2016)



Percentage of Debt Used in Buyouts  
(2004 – 1H 2016)



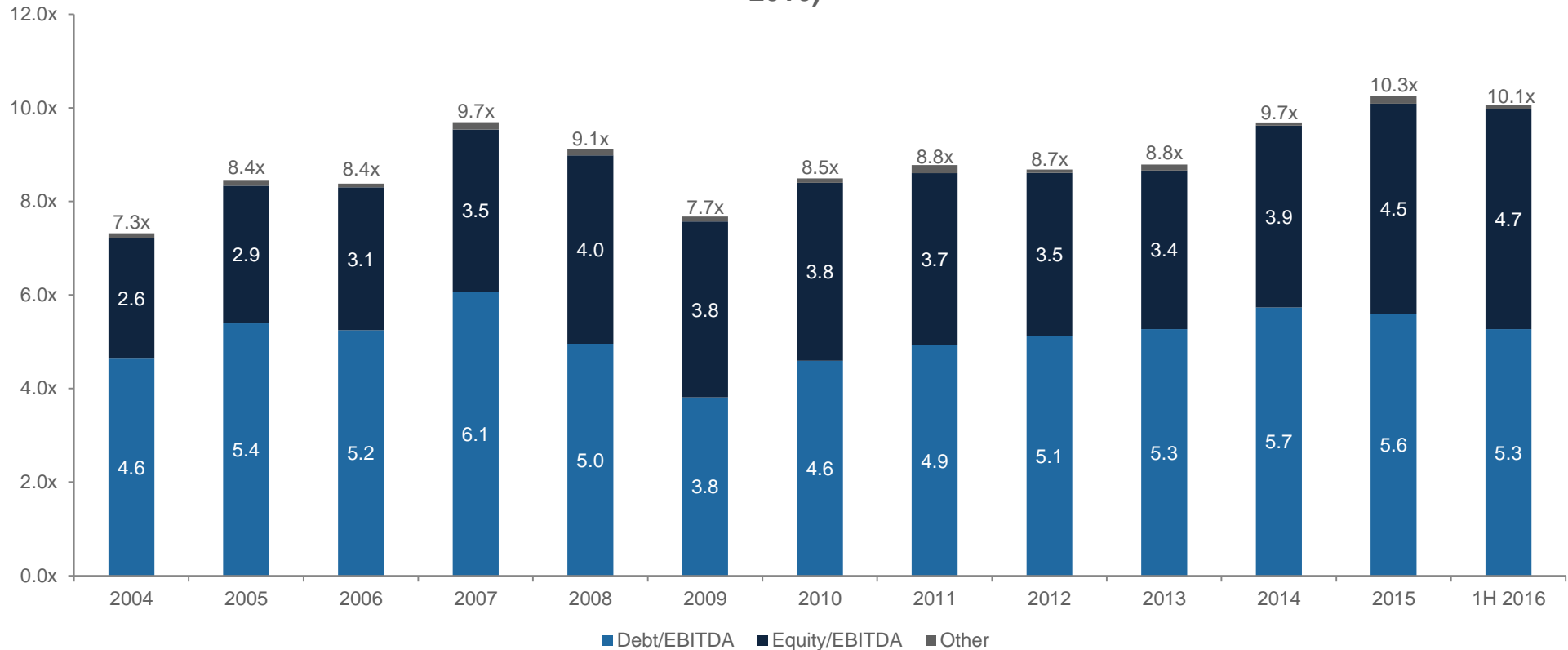
- The amount of capital available for leverage has decreased considerably since its peak volume in 2007; loan volume seems consistent in last few years
- Historically, middle-market transactions apply less leverage than large-cap deals



# Private Equity – U.S. LBO Purchase Price Multiples



Purchase Price Multiples of U.S. LBO Transactions (2004 – 1H 2016)



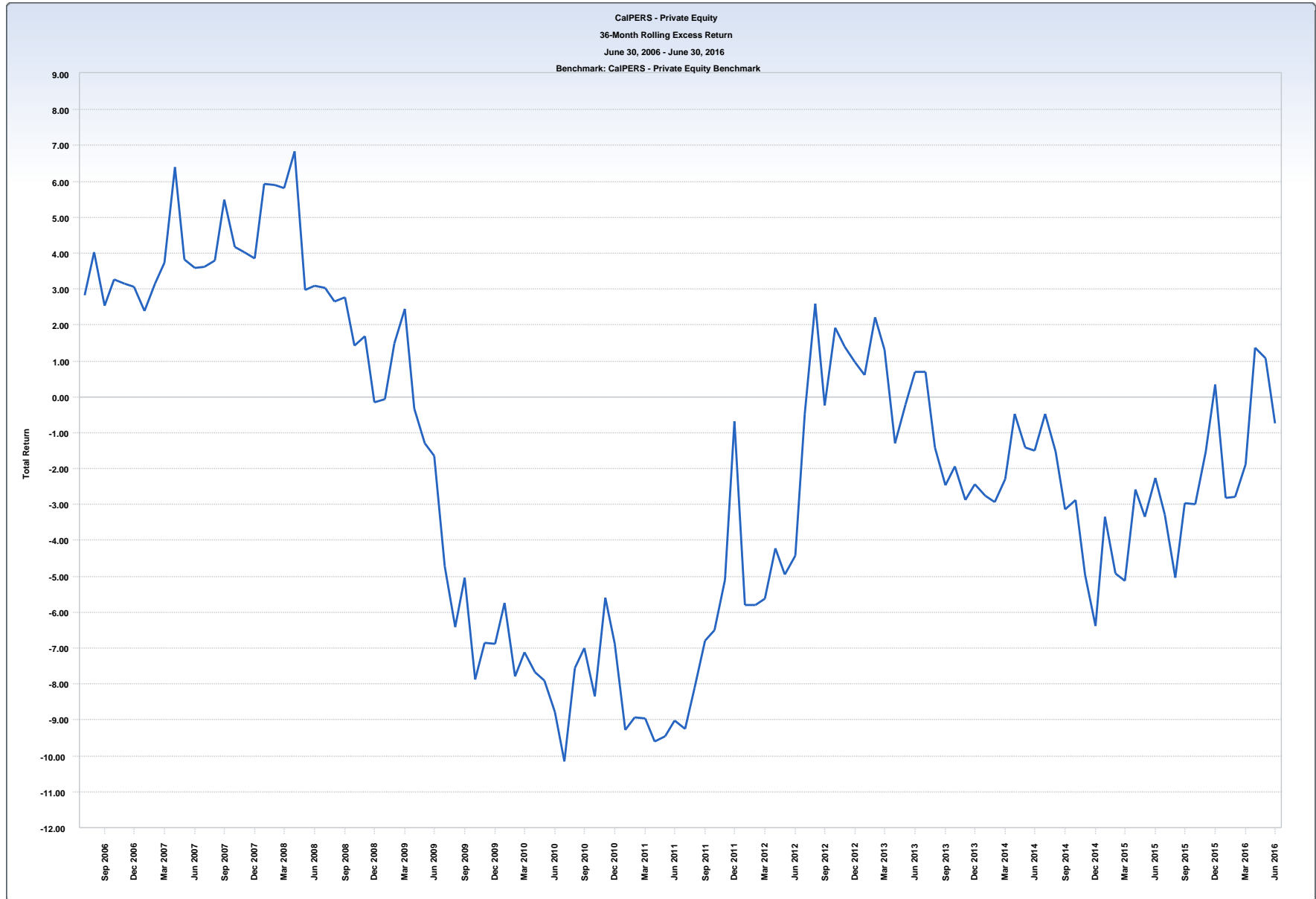
- As debt has become more readily available, purchase price multiples have increased from the low point in 2009
- Pricing in 1H 2016 has slightly decreased from the recent high in 2015

# Growth: Private Equity – Performance

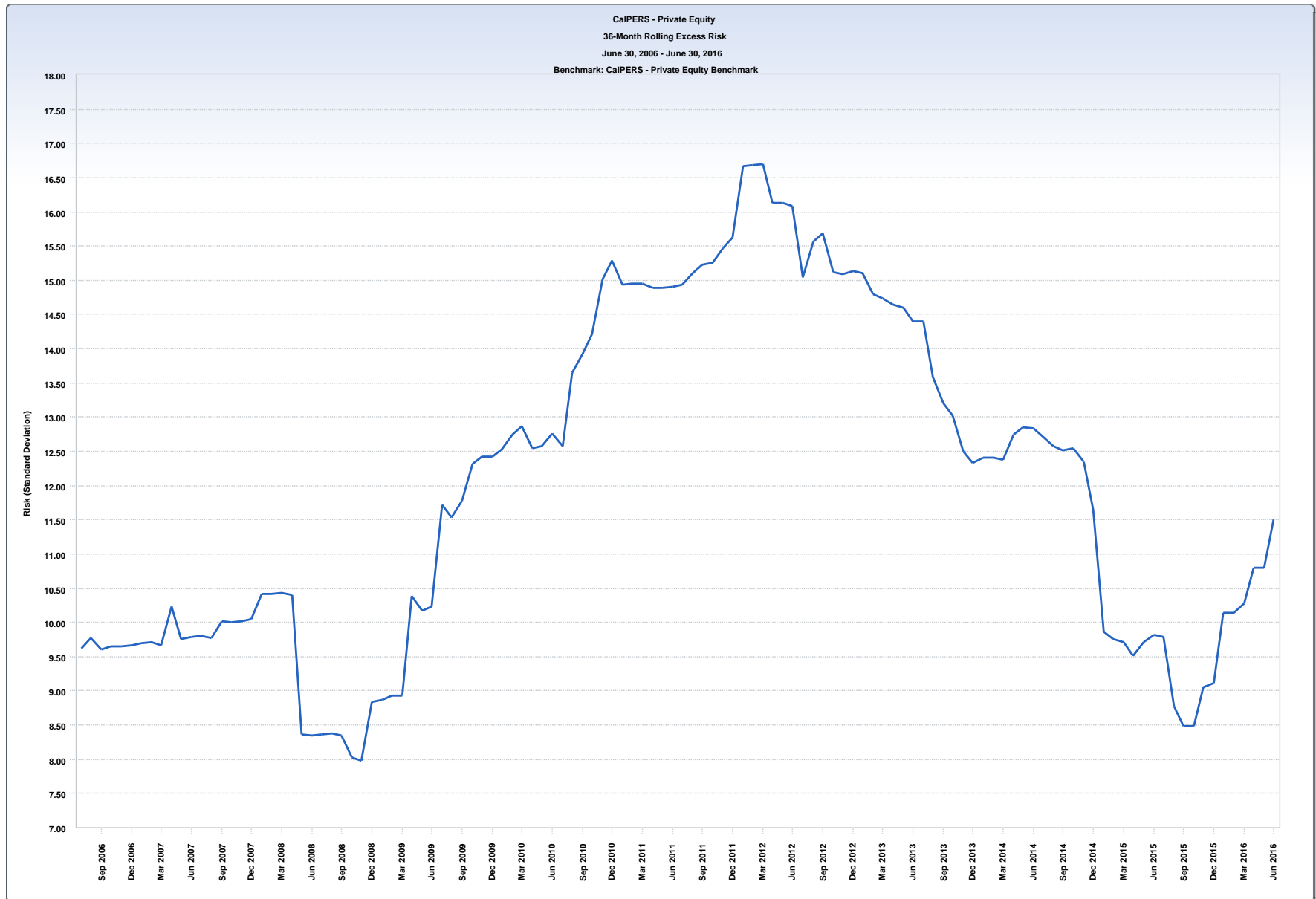


	<b>Market Value</b>	<b>Qtr</b>	<b>1-Year</b>	<b>3-Year</b>	<b>5-Year</b>	<b>10-Year</b>	<b>VaR</b>	<b>5-year Sharpe Ratio</b>	<b>5-year Info Ratio</b>
<b>PRIVATE EQUITY</b>	<b>26.4</b>	<b>0.4%</b>	<b>1.7%</b>	<b>10.0%</b>	<b>9.7%</b>	<b>10.2%</b>	<b>\$8.7 bil</b>	<b>2.3</b>	<b>-0.1</b>
<i>PE Policy Benchmark</i>		1.1%	-0.8%	10.8%	10.6%	12.7%		<b>0.8</b>	<b>0.0</b>
<i>Value Added</i>		-0.7%	2.5%	-0.8%	-0.9%	-2.5%			
Private Equity Partnership Investments	26.4	0.4%	1.8%	10.0%	9.8%	10.3%			
Private Equity Distribution Stock	0.0	-7.0%	-54.1%	-31.4%	-31.3%	-11.6%			

# Growth: Private Equity – Rolling Excess Returns



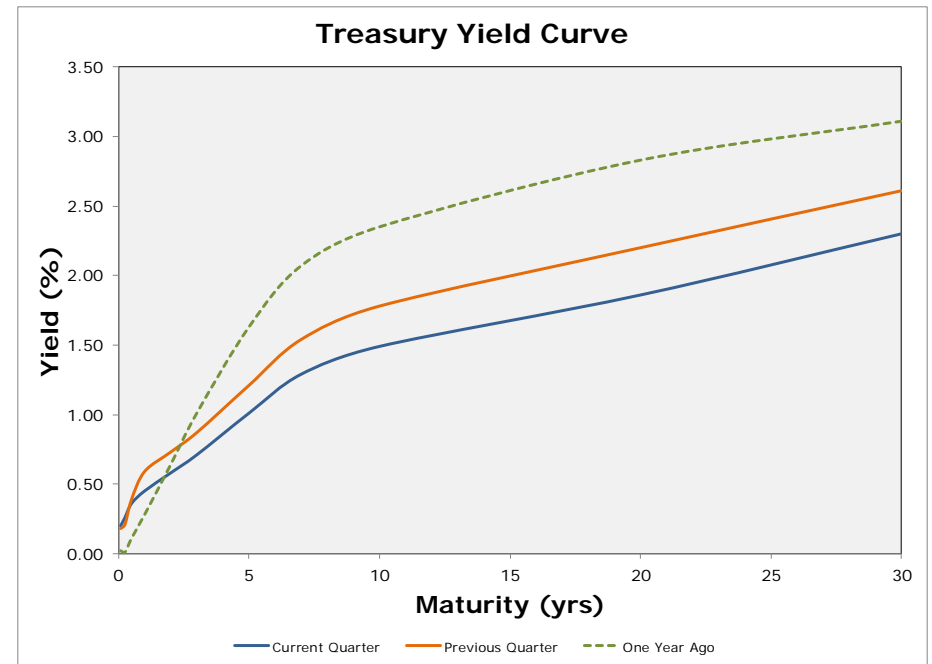
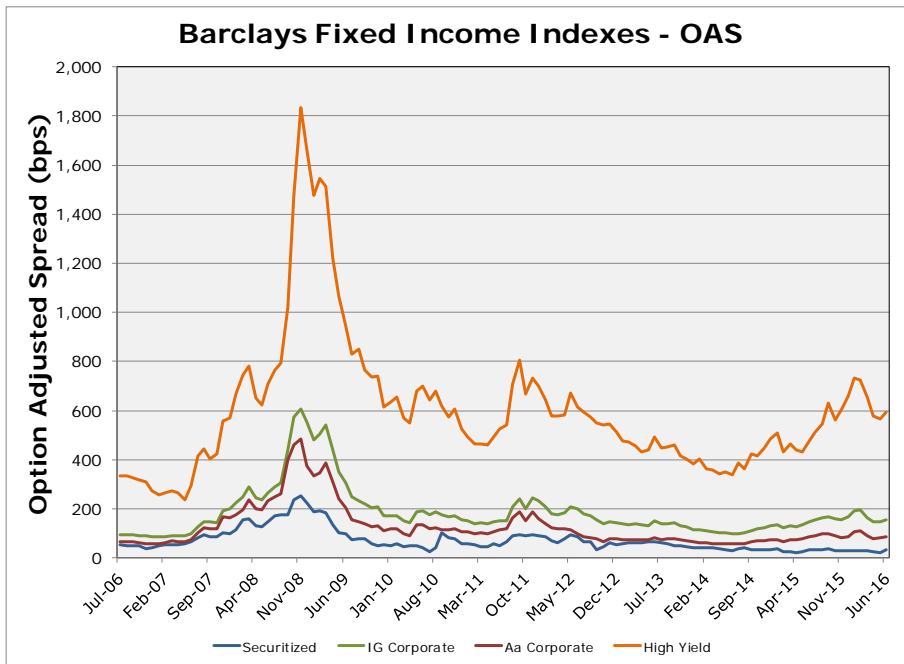
# Growth: Private Equity – Rolling Tracking Error





# U.S. Fixed Income Market

June 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
Barclays Aggregate Bond Index	2.2	5.3	6.0	4.1	3.8	5.1
Barclays Treasury Index	2.1	5.4	6.2	3.5	3.5	4.9
Barclays Gov't-Related Index	2.5	5.7	5.2	3.9	3.4	4.8
Barclays Securitized Index	1.2	3.3	4.4	3.7	3.1	4.9
Barclays Corporate IG Index	3.6	7.7	7.9	5.4	5.4	6.2
Barclays LT Govt/Credit Index	6.6	14.3	15.7	9.3	9.2	8.4
Barclays LT Treasury Index	6.4	15.1	19.3	10.5	10.3	8.8
Barclays LT Govt-Related Index	6.4	13.5	12.7	9.0	8.4	8.3
Barclays LT Corporate IG Index	6.6	13.9	14.1	8.6	8.5	8.1
Barclays U.S. TIPS Index	1.7	6.2	4.4	2.3	2.6	4.7
Barclays High Yield Index	5.5	9.1	1.6	4.2	5.8	7.6
Treasury Bills	0.1	0.1	0.2	0.1	0.1	1.0

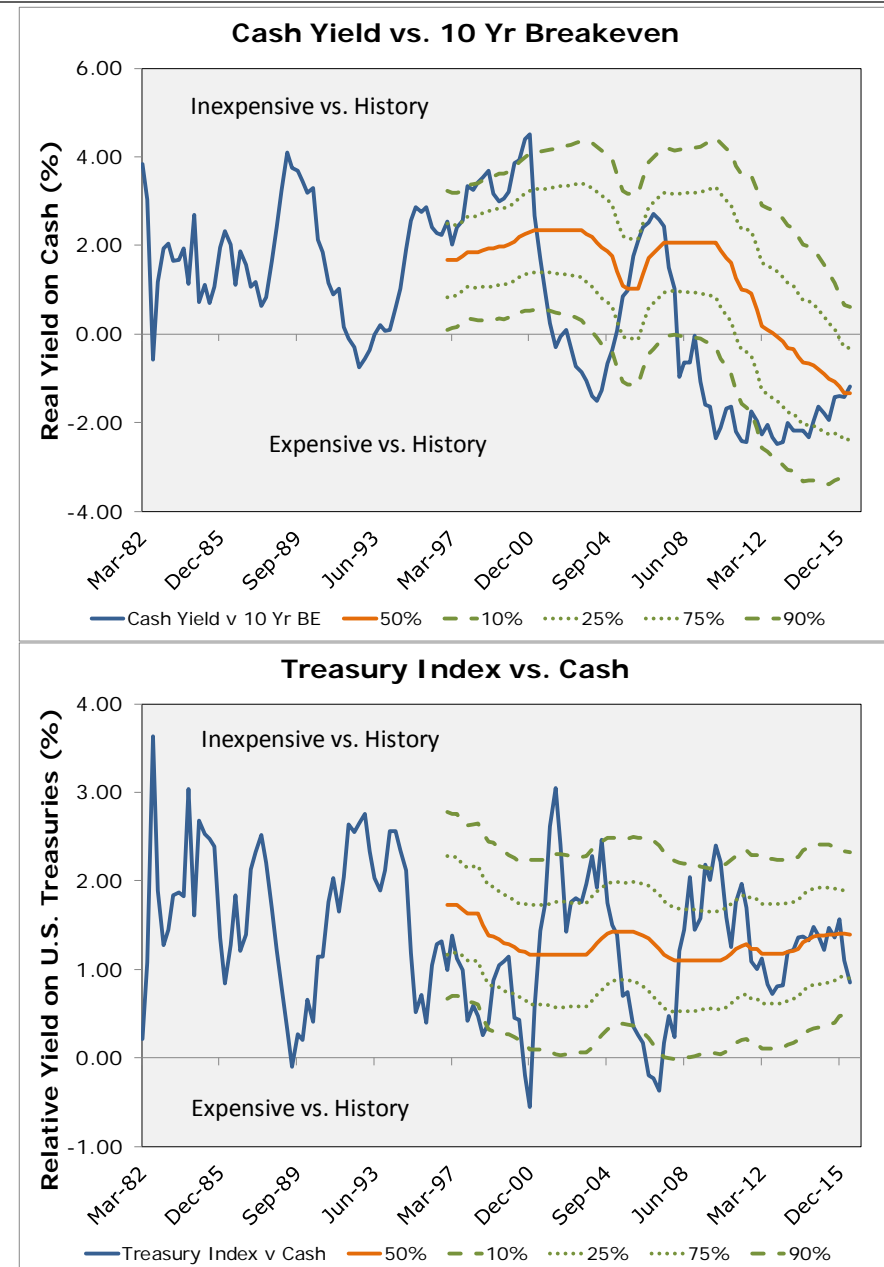


Data sources: Wilshire Compass, Barclays Capital, U.S. Treasury



## Cash and Treasury Environment

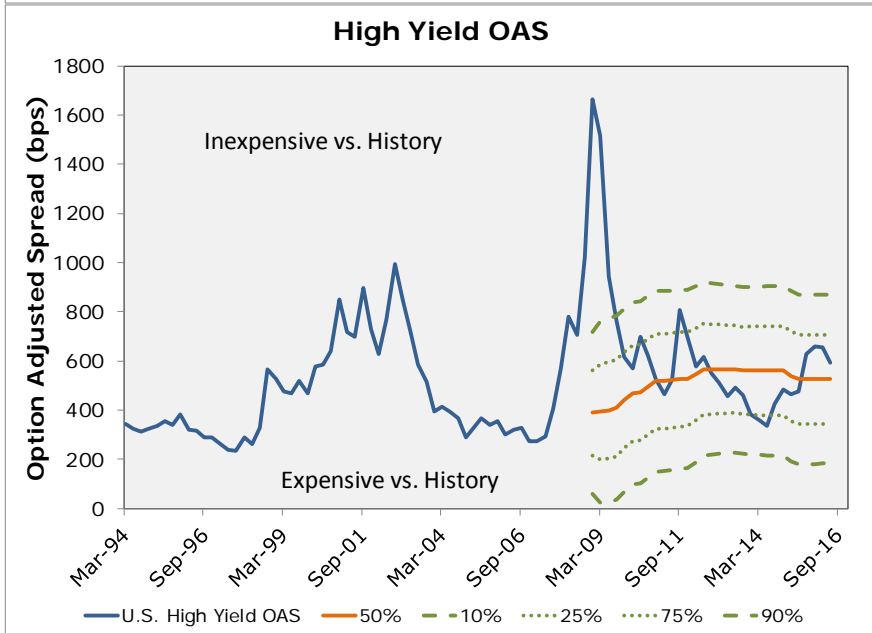
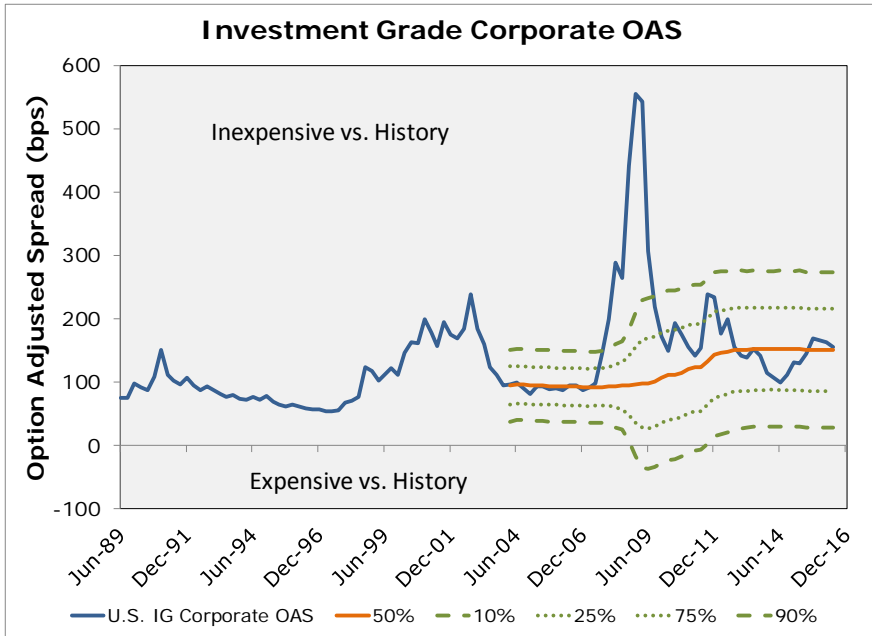
- Real yield on cash is still negative but has been improving
  - Median for the past 15 years is actually negative
  - 3-month Treasury moved away from zero during Q4 2015, currently at 0.26%
  
- Spread between the broad Treasury market and cash is well below the 15-year median





# Relative Fixed Income Yields

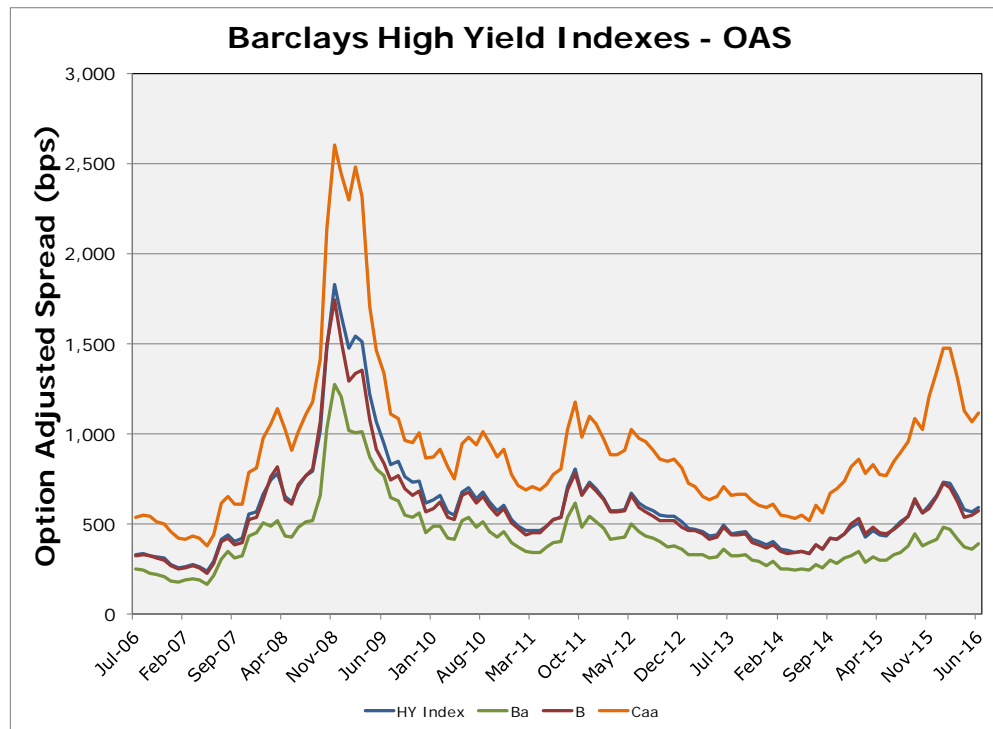
- Spread versus Treasuries on the investment grade index is above its 15 year historical median, at the 52%-percentile outcome
- Spread on high yield bonds is above the historical median, currently at the 60%-percentile outcome



# High Yield Bond Market



June 30, 2016	Weight	Qtr	Ytd	1 Yr	3 Yr
Barclays High Yield Index	100%	5.5	9.1	1.6	4.2
Quality Distribution					
Ba U.S. High Yield	45.5%	3.6	7.6	4.1	5.6
B U.S. High Yield	38.8%	4.8	7.4	-0.6	3.3
Caa U.S. High Yield	14.5%	11.8	16.0	-0.5	2.9
Ca to D U.S. High Yield	1.1%	33.2	39.4	-22.5	-26.9
Non-Rated U.S. High Yield	0.1%	10.4	6.4	-12.6	-1.8



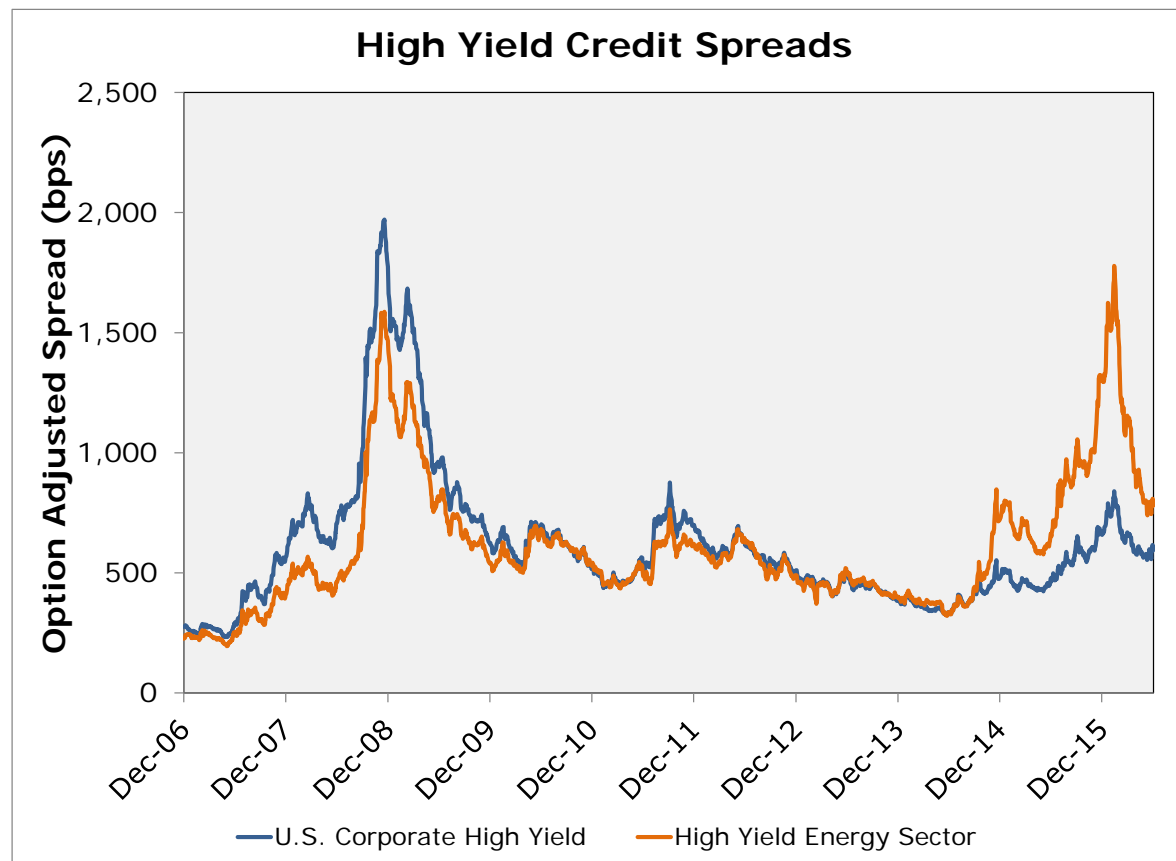
Data sources: Barclays Capital





## Energy Sector Credit Conditions

- Heavy borrowing within the Energy sector resulted in a debt squeeze when revenues fell
- Producers responded by slashing capital expenditures
- Although improving, energy spreads are still a bit wide due to meaningful debt and lower commodity prices

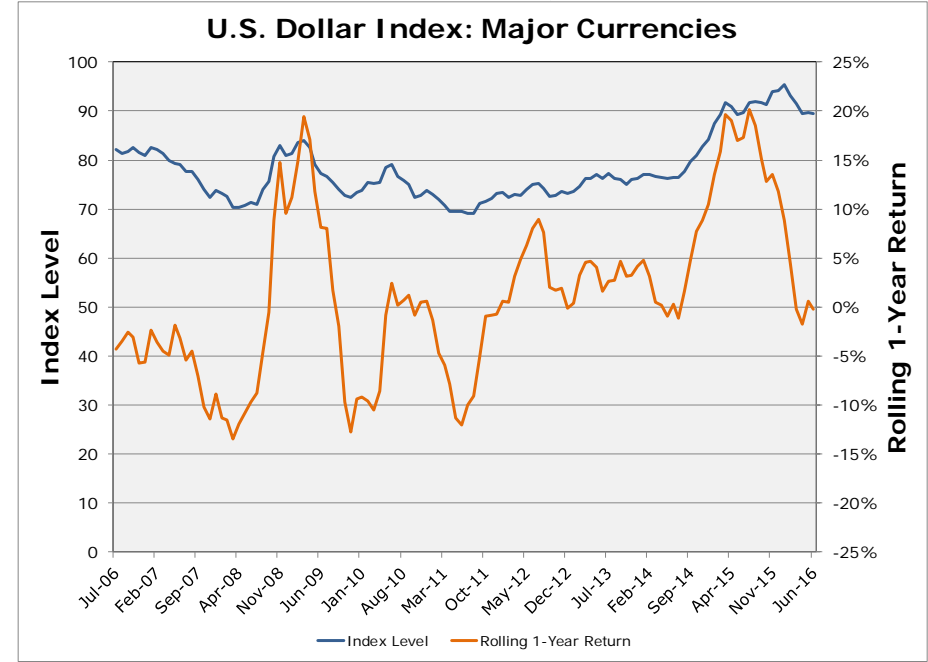
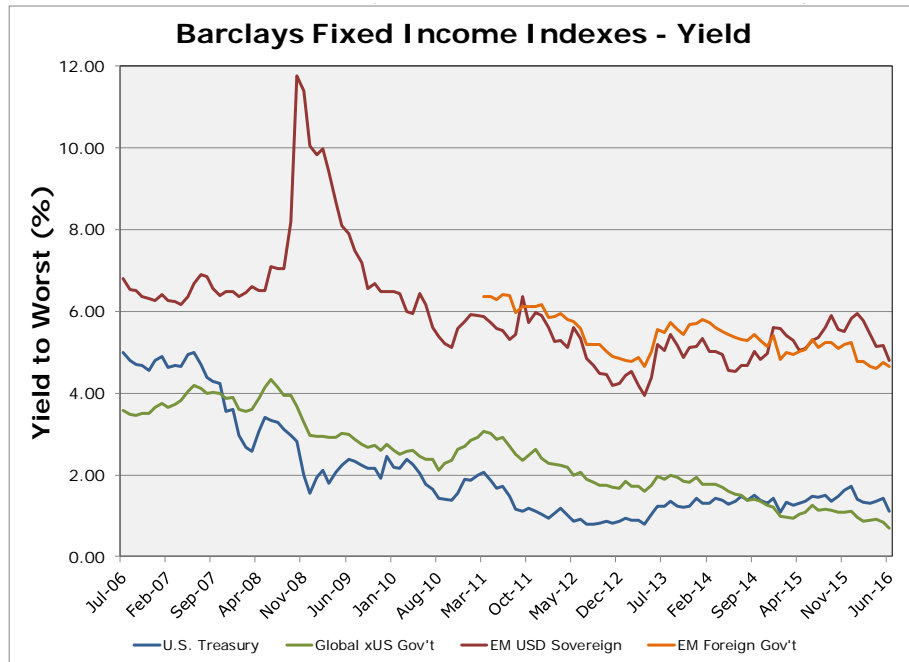




# Non-U.S. Fixed Income Market

June 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
<i>Developed Markets</i>						
Barclays Global Aggregate xUS	3.4	11.9	11.2	1.9	0.3	3.8
Barclays Global Aggregate xUS *	2.7	6.3	8.5	5.9	5.5	5.0
Barclays Wrld Govt xUS IL Bond	1.6	6.6	1.3	3.0	1.6	4.0
Barclays Wrld Govt xUS IL Bond *	6.3	10.1	9.8	7.6	6.3	5.8
<i>Emerging Mkts (Hard Currency)</i>						
Barclays EM USD Aggregate	4.7	9.4	7.8	6.0	6.0	7.7
<i>Emerging Mkts (Foreign Currency)</i>						
Barclays EM Local Currency Govt	2.2	11.0	2.9	-0.2	0.0	n.a.
Barclays EM Local Currency Govt *	1.9	5.2	5.3	3.2	3.5	n.a.
Euro vs. Dollar	-2.5	2.3	-0.3	-5.1	-5.2	-1.4
Yen vs. Dollar	9.6	17.3	19.3	-1.1	-4.7	1.1
Pound vs. Dollar	-7.0	-9.3	-15.0	-4.1	-3.6	-3.2

\* Returns are reported in terms of local market investors, which removes currency effects.

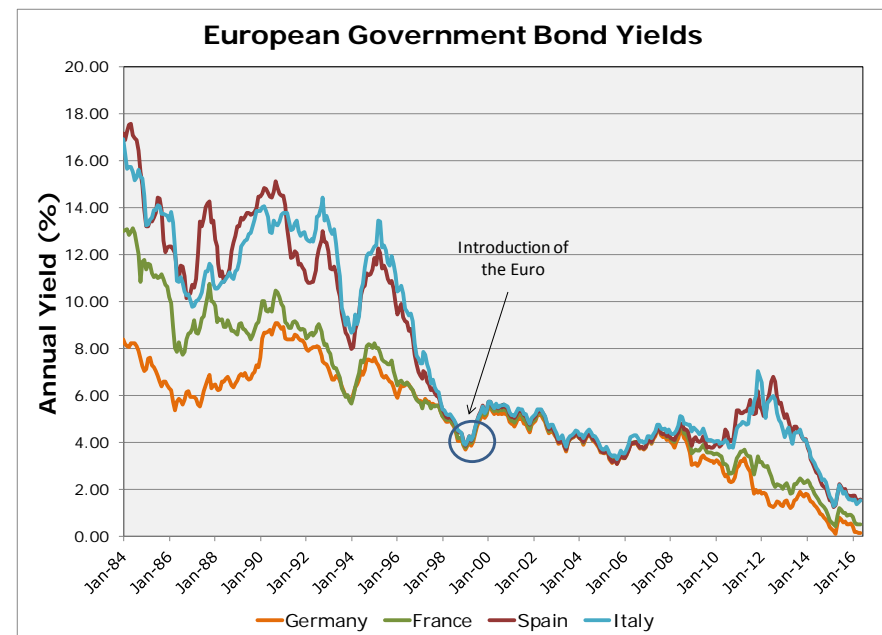
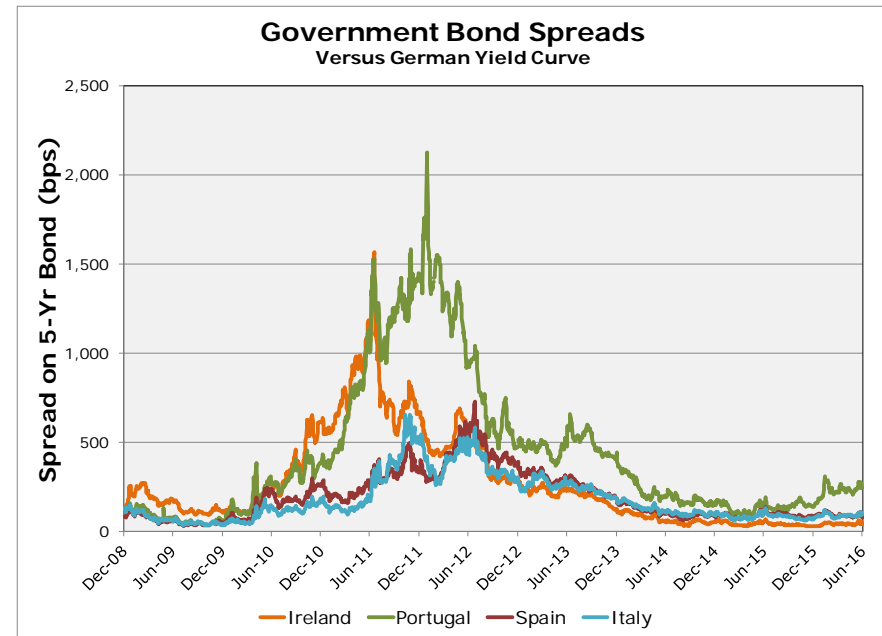


Data sources: Wilshire Compass, Barclays Capital



# European Debt

- Spreads on Portugal's government debt are on the rise as the country faces a banking crisis and the prospect of a downgrade
- Yields on government bonds are again falling after a brief uptick; Germany actually sold 10-year debt at a negative yield in July

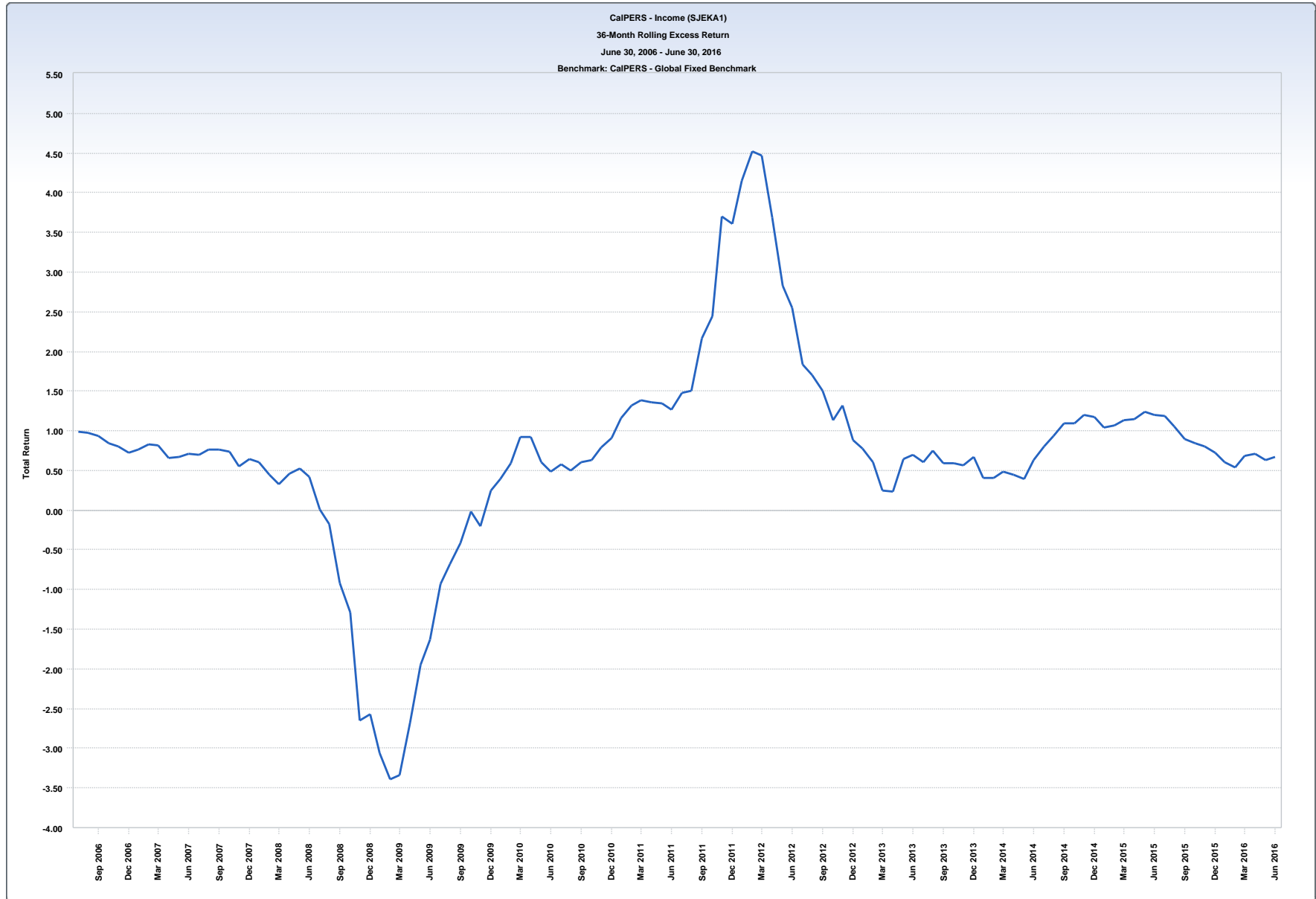




## Income – Performance

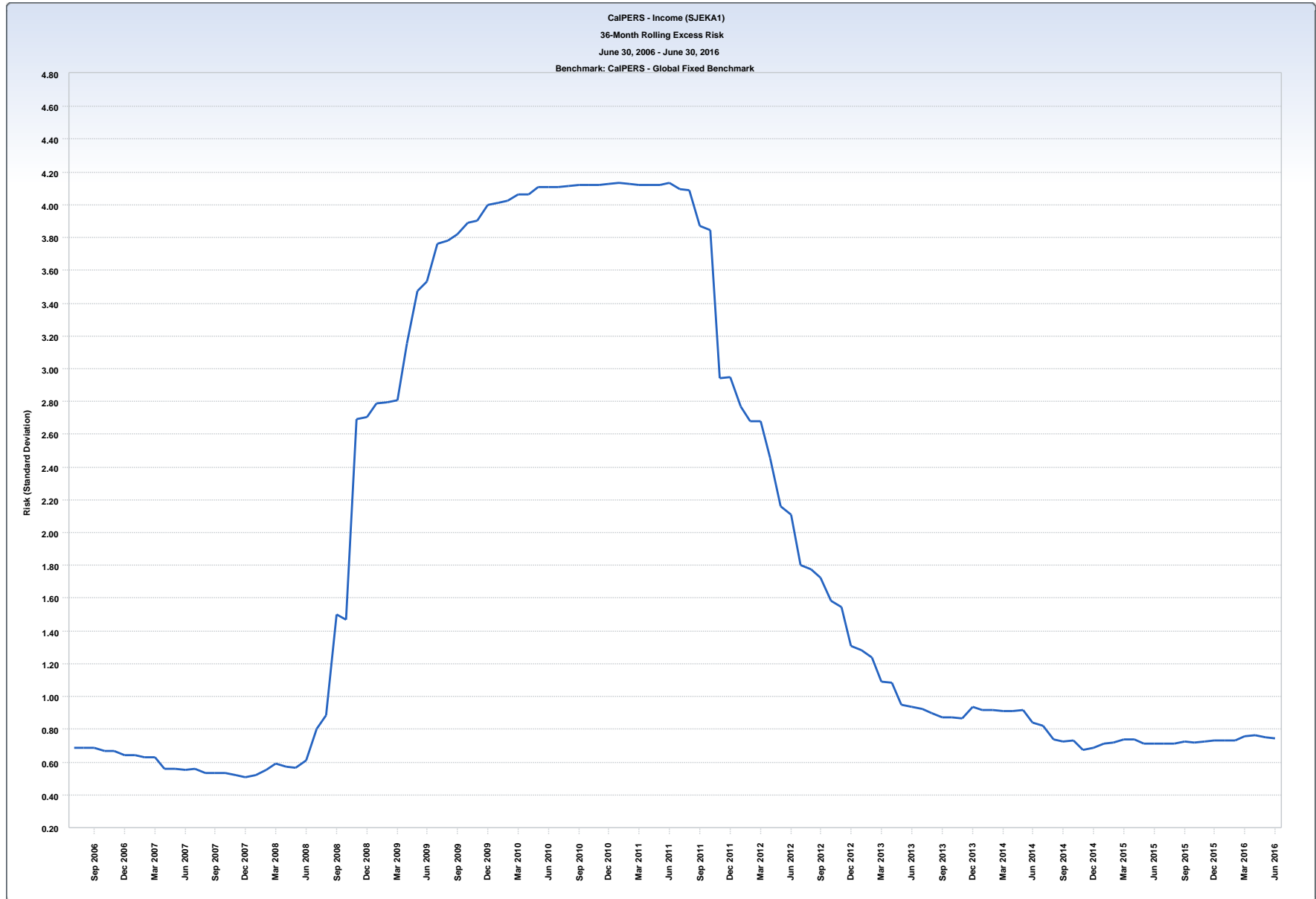
	<b>Market Value</b>	<b>Qtr</b>	<b>1-Year</b>	<b>3-Year</b>	<b>5-Year</b>	<b>10-Year</b>	<b>VaR</b>	<b>5-year Sharpe Ratio</b>	<b>5-year Info Ratio</b>
<b>INCOME</b>	<b>59.9</b>	<b>3.9%</b>	<b>9.3%</b>	<b>6.2%</b>	<b>5.9%</b>	<b>7.1%</b>	<b>\$7.6 bil</b>	<b>1.2</b>	<b>0.7</b>
<i>Income Policy Benchmark</i>		3.6%	9.3%	5.5%	5.3%	6.5%		1.0	0.0
<i>Value Added</i>		0.3%	0.0%	0.7%	0.6%	0.6%			
<b>U.S. Income</b>	<b>53.4</b>	<b>4.2%</b>	<b>9.6%</b>	<b>6.9%</b>	<b>6.6%</b>	<b>7.5%</b>		<b>1.3</b>	<b>0.6</b>
<i>U.S. Income Policy Benchmark</i>		3.8%	9.6%	6.2%	6.0%	6.8%		1.1	0.0
<i>Value Added</i>		0.4%	0.0%	0.7%	0.6%	0.7%			
<b>Non-U.S. Income</b>	<b>6.5</b>	<b>2.1%</b>	<b>6.7%</b>	<b>0.5%</b>	<b>-0.5%</b>	<b>4.0%</b>		<b>-0.1</b>	<b>0.9</b>
<i>Non-USIncome Policy Benchmark</i>		2.2%	6.7%	-0.1%	-1.2%	3.2%		-0.2	0.0
<i>Value Added</i>		-0.1%	0.0%	0.6%	0.7%	0.8%			

# Income – Rolling Excess Returns

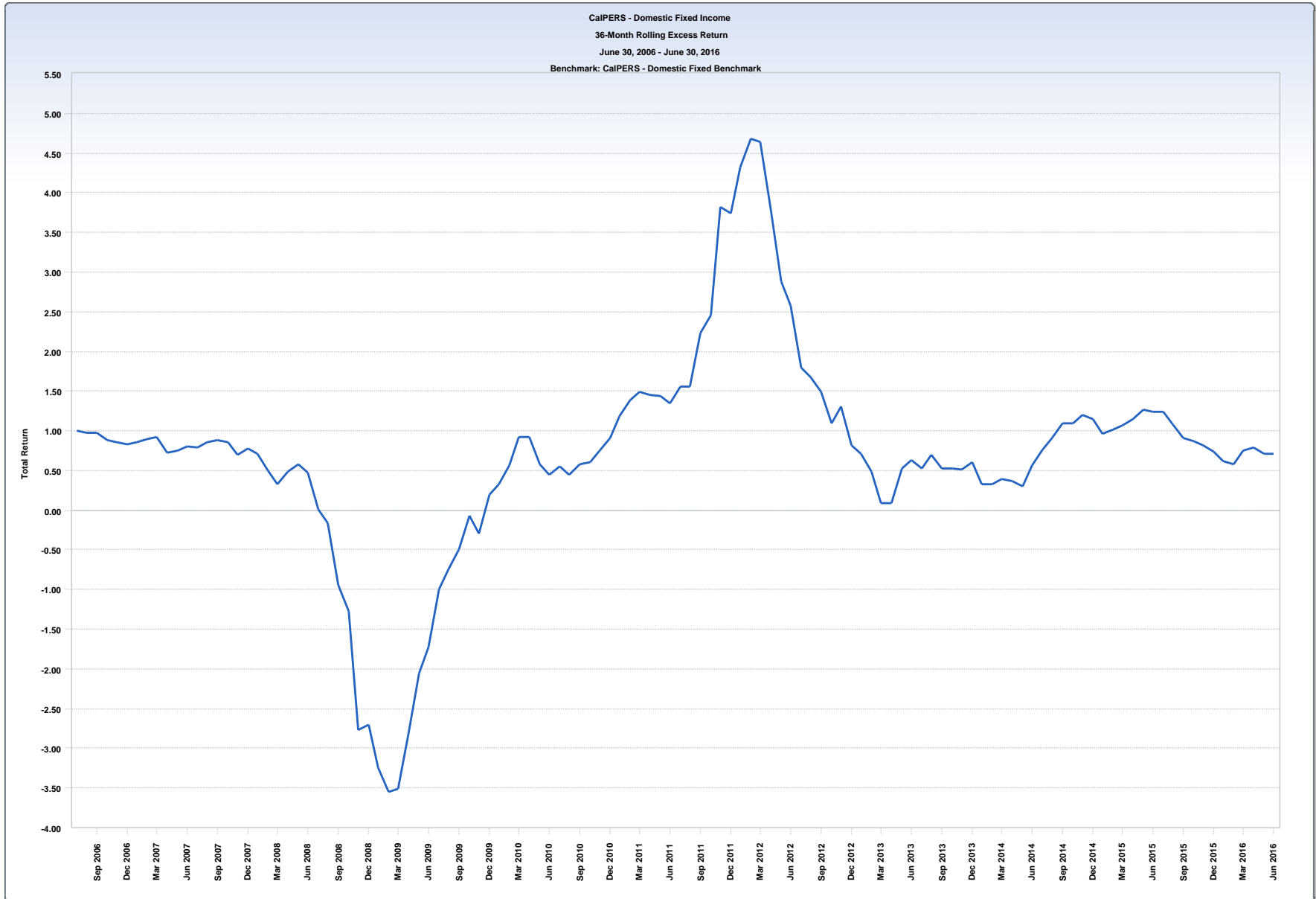




# Income – Rolling Tracking Error

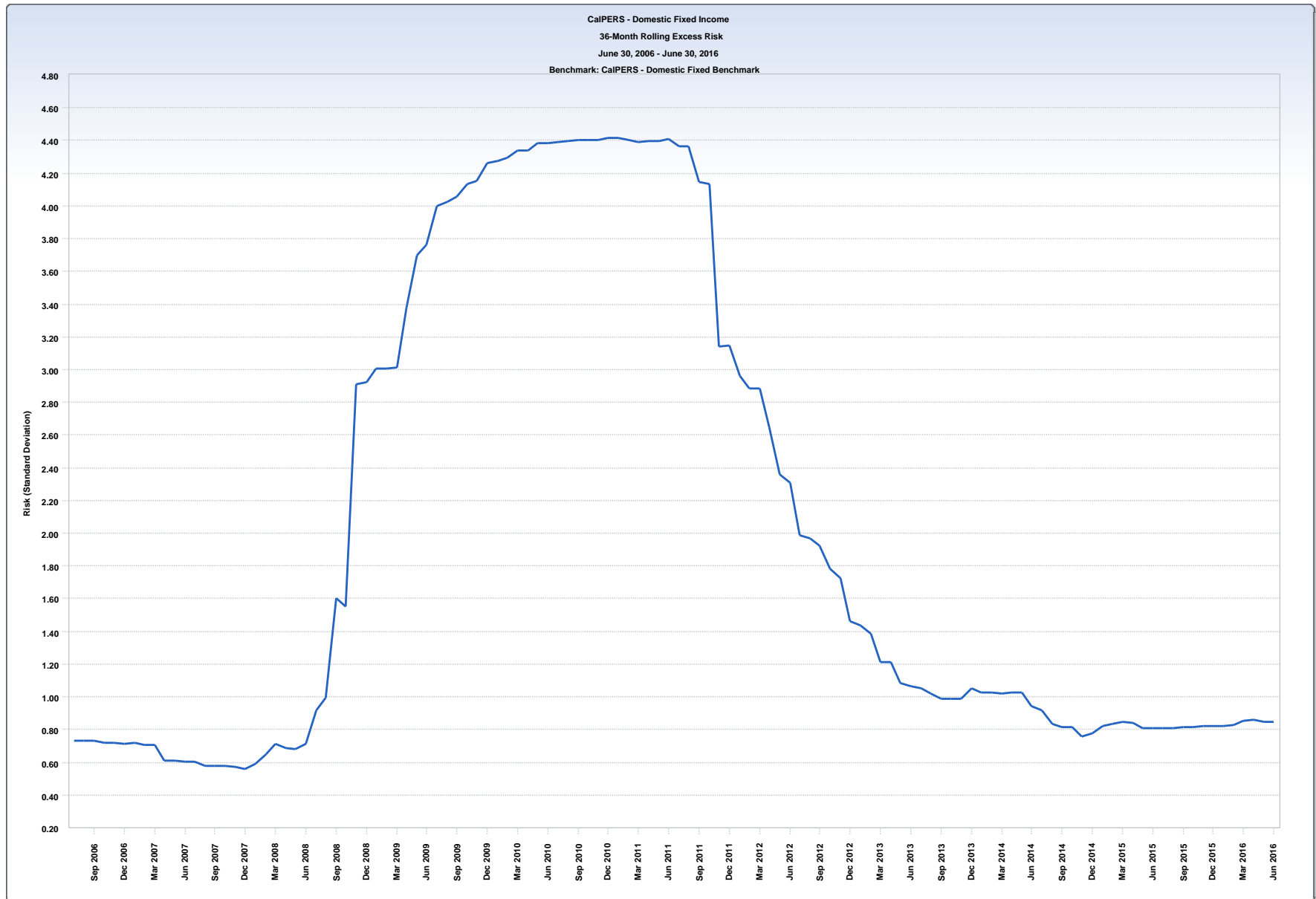


# US Income – Rolling Excess Returns



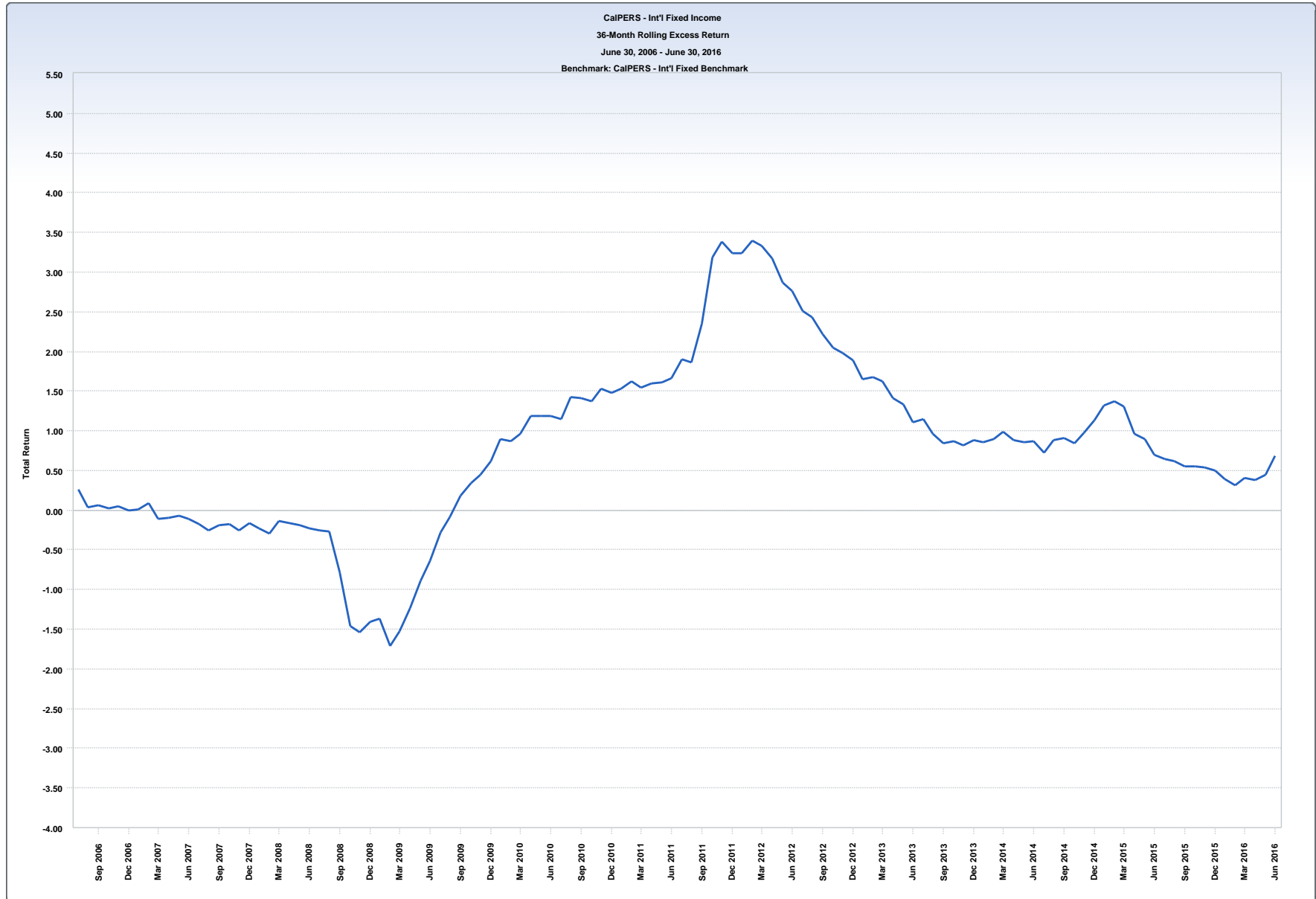


# US Income – Rolling Tracking Error

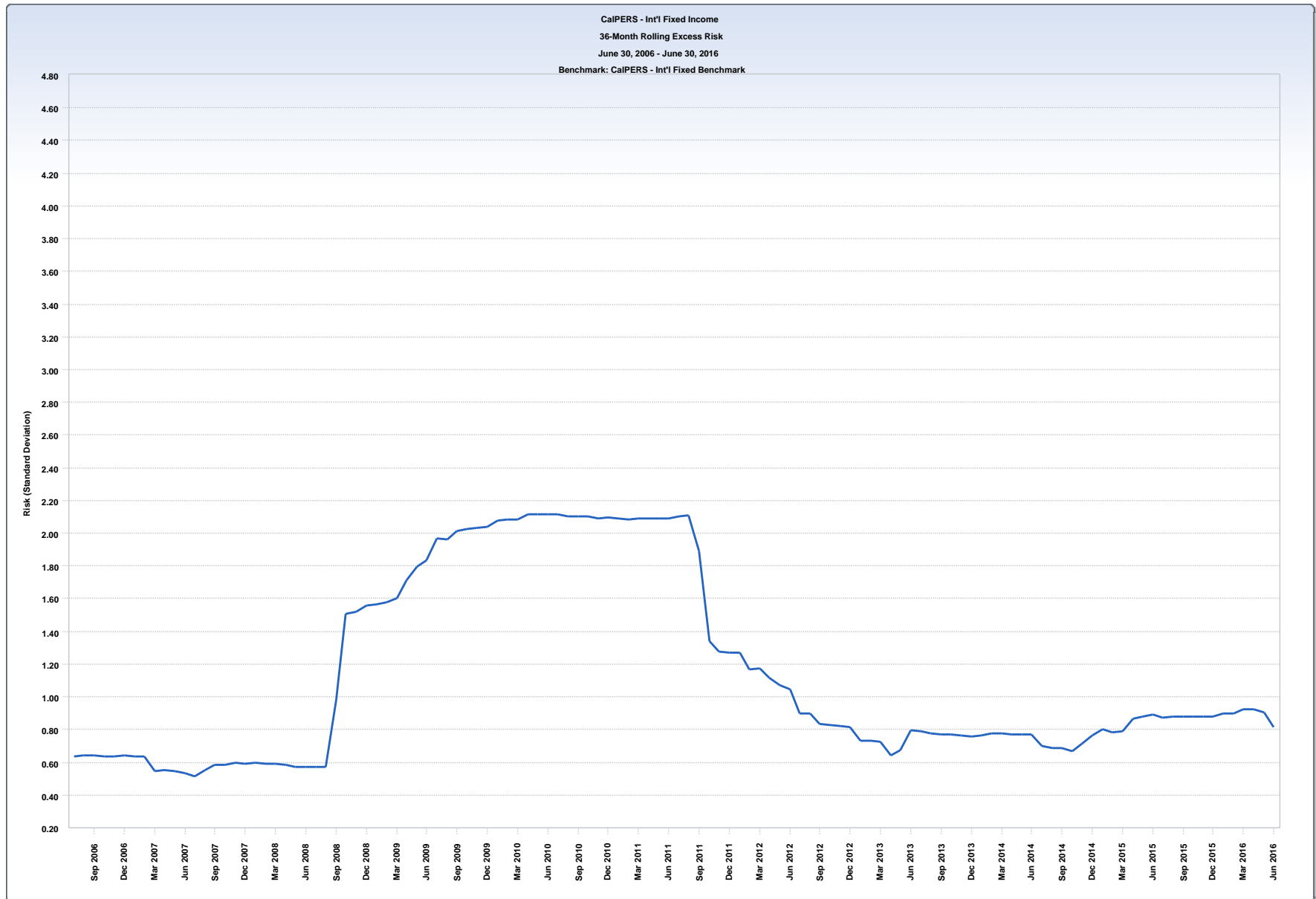




# International Income – Rolling Excess Returns



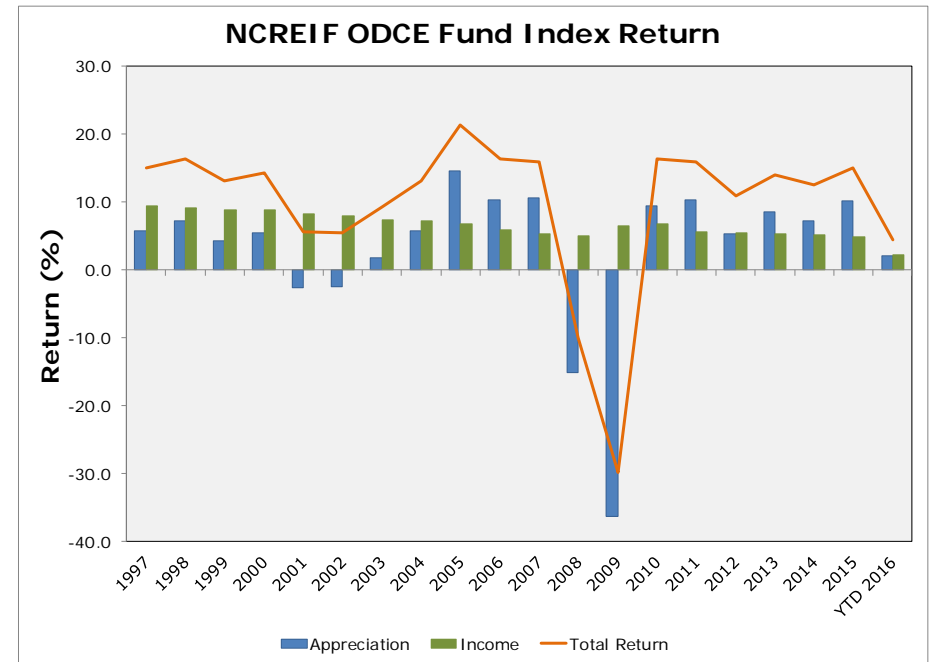
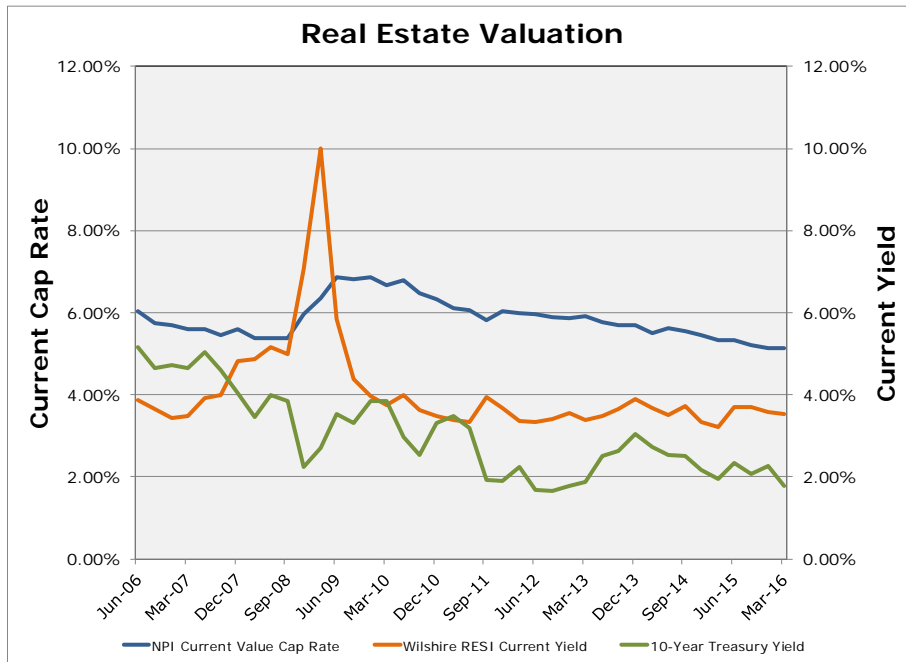
# International Income – Rolling Tracking Error





# Real Assets

June 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
Barclays U.S. TIPS Index	1.7	6.2	4.4	2.3	2.6	4.7
Bloomberg Commodity Index	12.8	13.3	-13.3	-10.6	-10.8	-5.6
Wilshire Global RESI Index	4.4	10.0	14.7	10.6	9.9	5.9
NCREIF ODCE Fund Index	2.1	4.4	11.8	13.0	12.7	6.2
NCREIF Timberland Index	1.1	0.8	3.5	7.8	6.7	6.4
Alerian MLP Index (Oil & Gas)	19.7	14.7	-13.1	-5.4	3.2	9.5

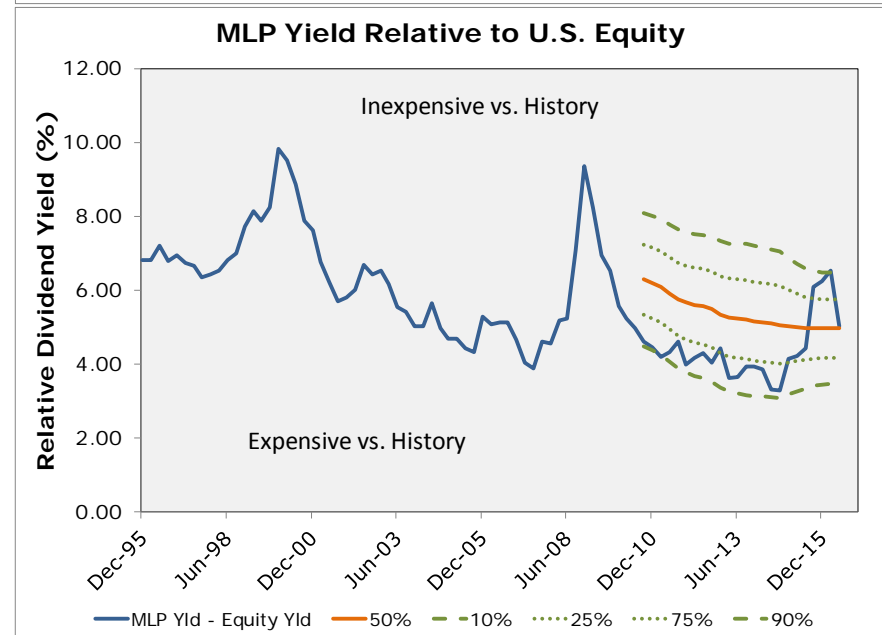
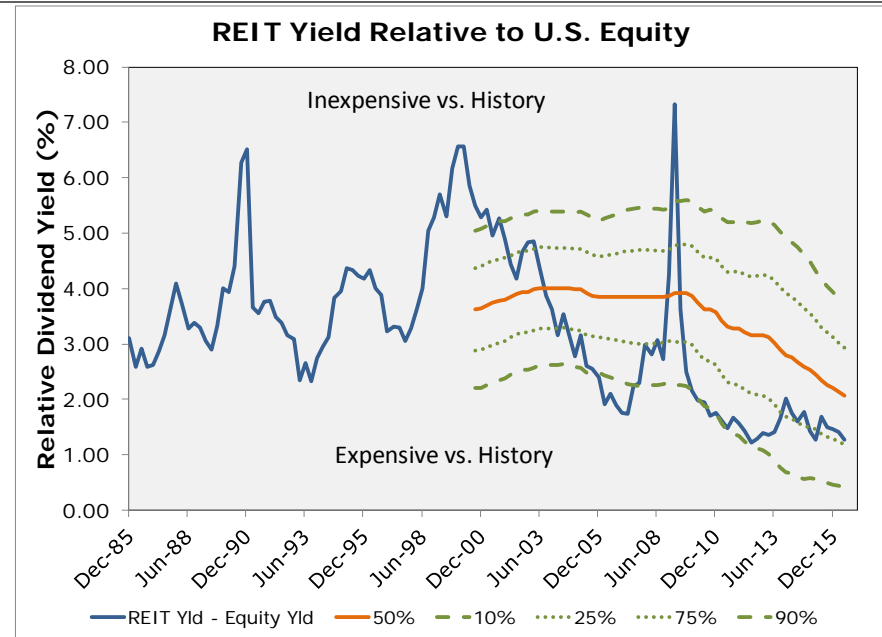


Data sources: Wilshire Compass, National Council of Real Estate Investment Fiduciaries



# Relative Yield on Real Assets

- REIT yields typically run higher than the earnings yield for the broad equity market
- Current relative yield at the 27%-percentile outcome
- Major swing in relative MLP yield since September of 2014
- Alerian MLP Index up ~20% during Q2
- Current relative yield at the 52%-percentile outcome



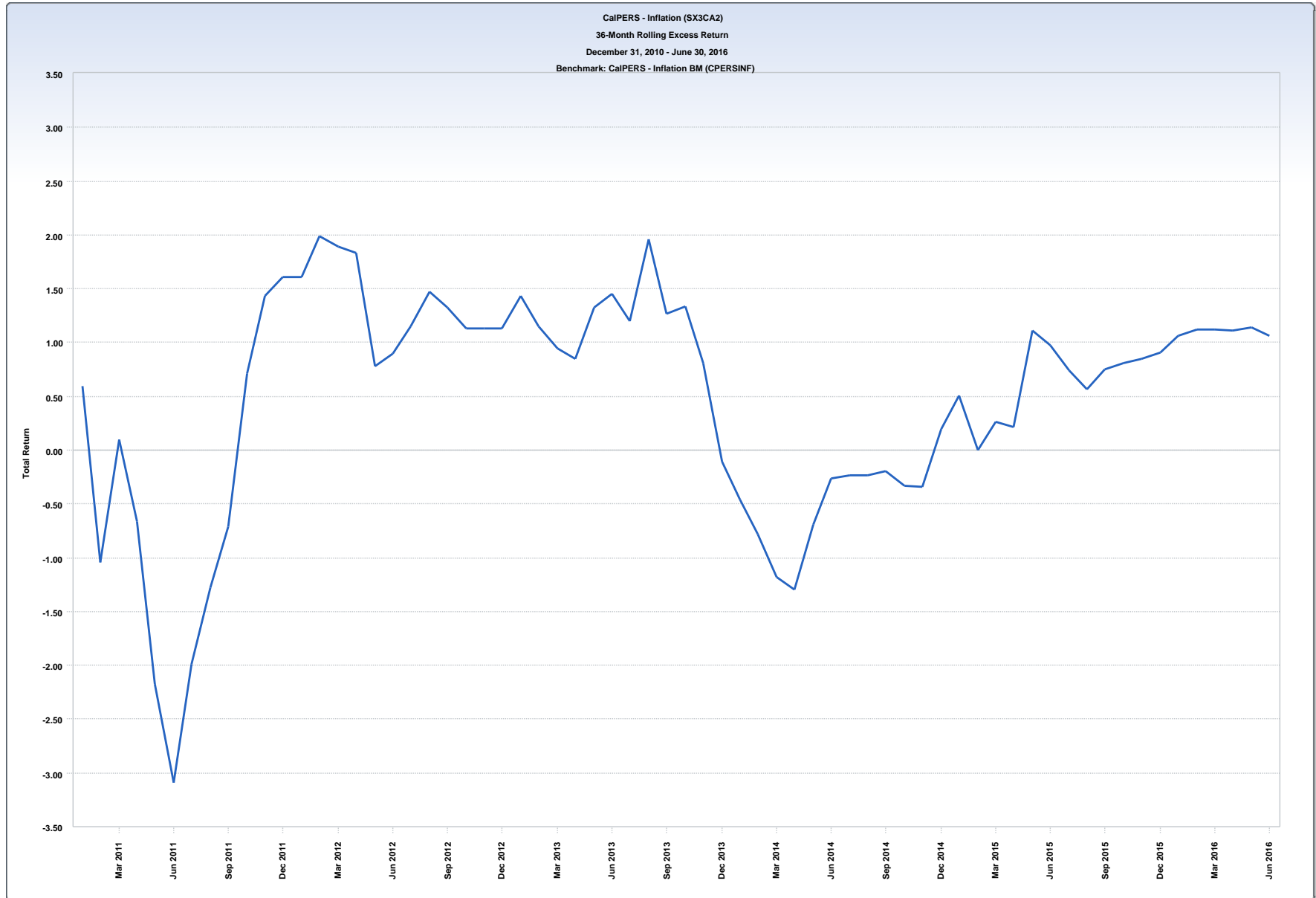
Source: Wilshire Compass, Wilshire Atlas, Alerian



## Inflation – Performance

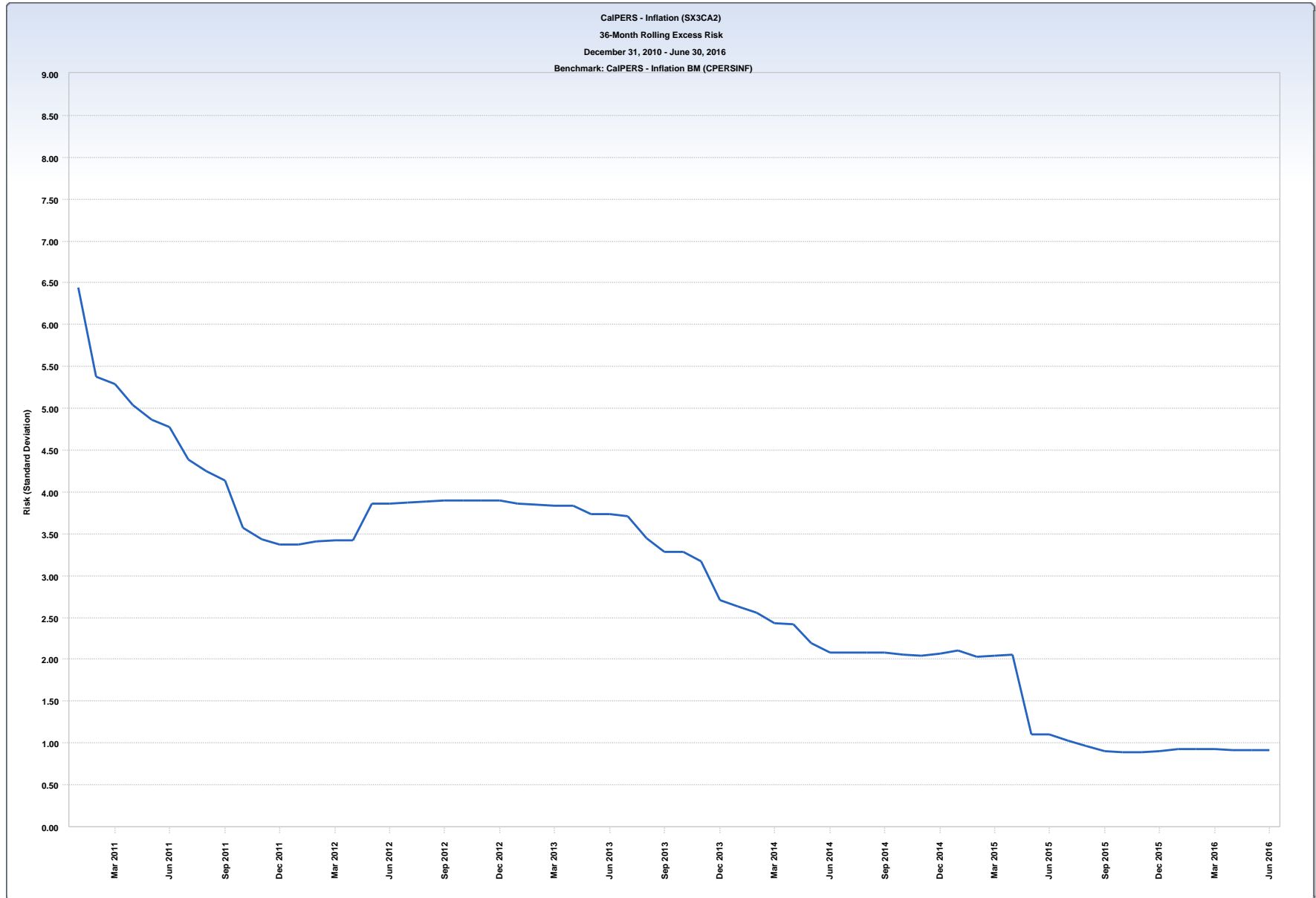
	<b>Market Value</b>	<b>Qtr</b>	<b>1-Year</b>	<b>3-Year</b>	<b>5-Year</b>	<b>10-Year</b>	<b>VaR</b>	<b>5-year Sharpe Ratio</b>	<b>5-year Info Ratio</b>
<b>INFLATION</b>	<b>17.8</b>	<b>4.6%</b>	<b>-3.6%</b>	<b>-2.6%</b>	<b>-1.5%</b>	<b>-.%</b>	<b>\$1.3 bil</b>	<b>-0.2</b>	<b>0.3</b>
<i>Inflation Policy Benchmark</i>		4.4%	-5.0%	-3.6%	-2.0%	-.%		-0.3	0.0
<i>Value Added</i>		0.2%	1.4%	1.0%	0.5%	-.%			
<b>Internal Commodities</b>	<b>3.0</b>	<b>12.6%</b>	<b>-26.0%</b>	<b>-20.0%</b>	<b>-14.3%</b>	<b>-.%</b>			
<i>GSCI Total Return Index</i>		12.7%	-26.1%	-19.8%	-14.0%	-.%			
<i>Value Added</i>		-0.1%	0.1%	-0.2%	-0.3%	-.%			
<b>Core Inflation Linked Bonds</b>	<b>12.1</b>	<b>1.5%</b>	<b>2.4%</b>	<b>2.3%</b>	<b>2.6%</b>	<b>-.%</b>			
<i>Custom Benchmark</i>		1.6%	2.4%	1.9%	2.2%	-.%			
<i>Value Added</i>		-0.1%	0.0%	0.4%	0.4%	-.%			
<b>Tactical Commodities</b>	<b>1.7</b>	<b>18.1%</b>	<b>-20.0%</b>	<b>-17.8%</b>	<b>-.%</b>	<b>-.%</b>			
<i>GSCI Total Return Index</i>		12.7%	-26.1%	-19.8%	-.%	-.%			
<i>Value Added</i>		5.4%	6.1%	2.0%	-.%	-.%			
<b>Tactical TIPS</b>	<b>1.0</b>	<b>1.7%</b>	<b>4.2%</b>	<b>2.1%</b>	<b>-.%</b>	<b>-.%</b>			
<i>CalPERS TIPS</i>		1.7%	4.4%	2.3%	-.%	-.%			
<i>Value Added</i>		0.0%	-0.2%	-0.2%	-.%	-.%			

# Inflation – Rolling Excess Returns





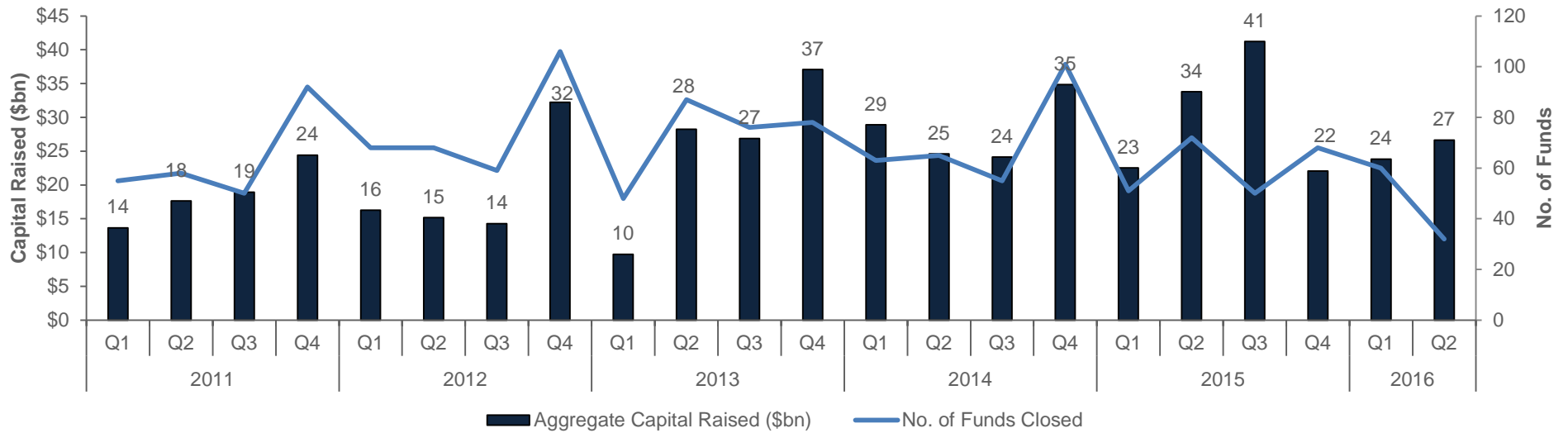
# Inflation – Rolling Tracking Error



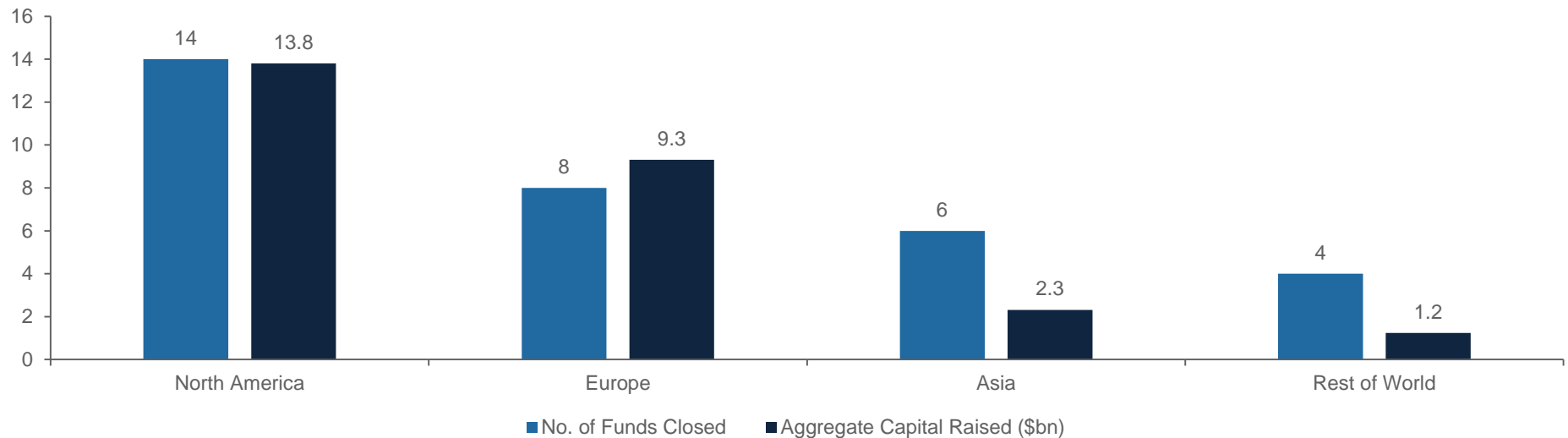
# Private Real Estate – Fundraising Activity



Global Quarterly Closed-End Private Real Estate Fundraising (Q1 2011 – Q2 2016)



Closed-End Private Real Estate Fundraising by Primary Geographic Focus (Q2 2016)

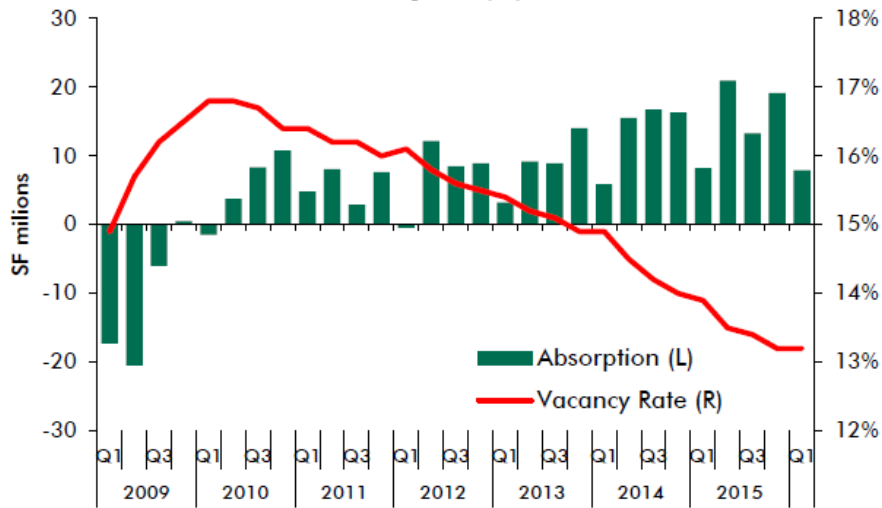




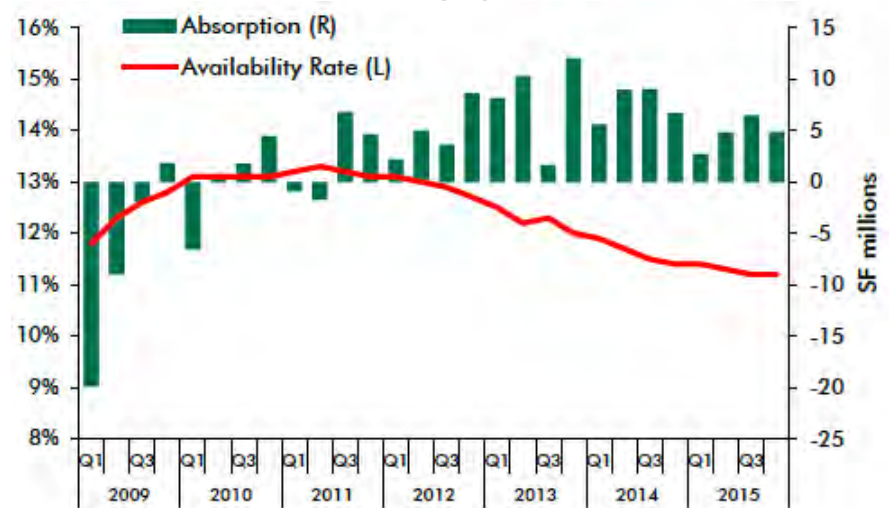


# Commercial Property (as of Q1 2016)

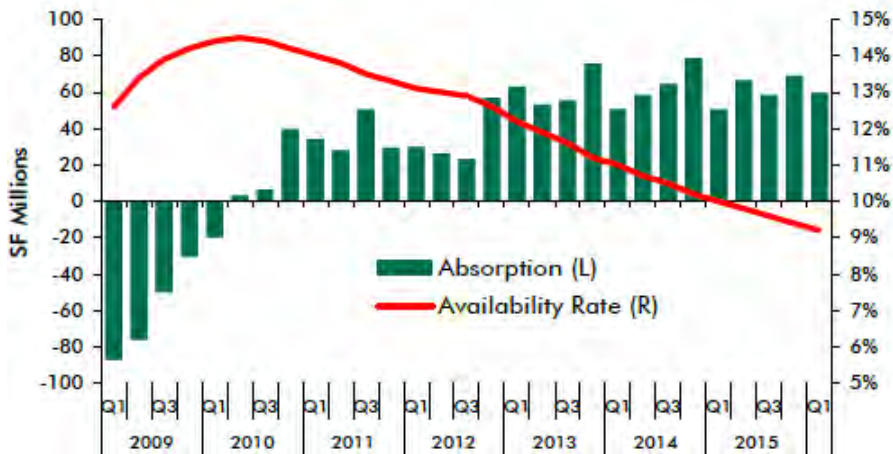
## Office



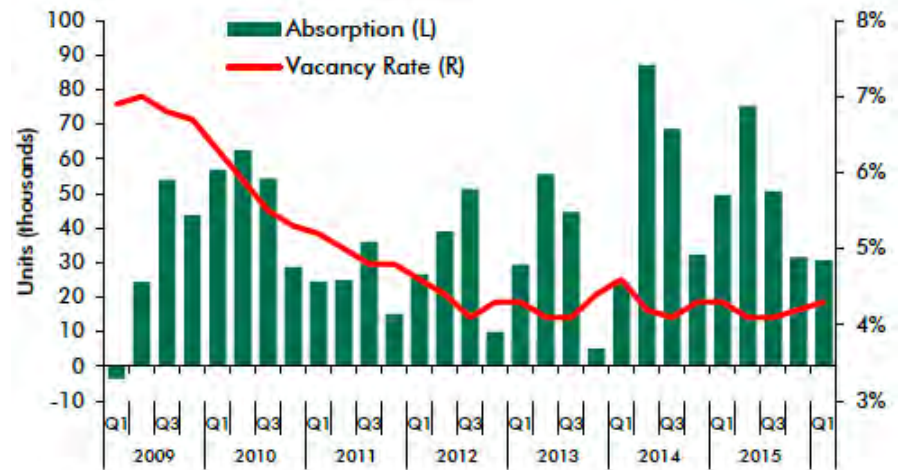
## Retail



## Industrial



## Apartment

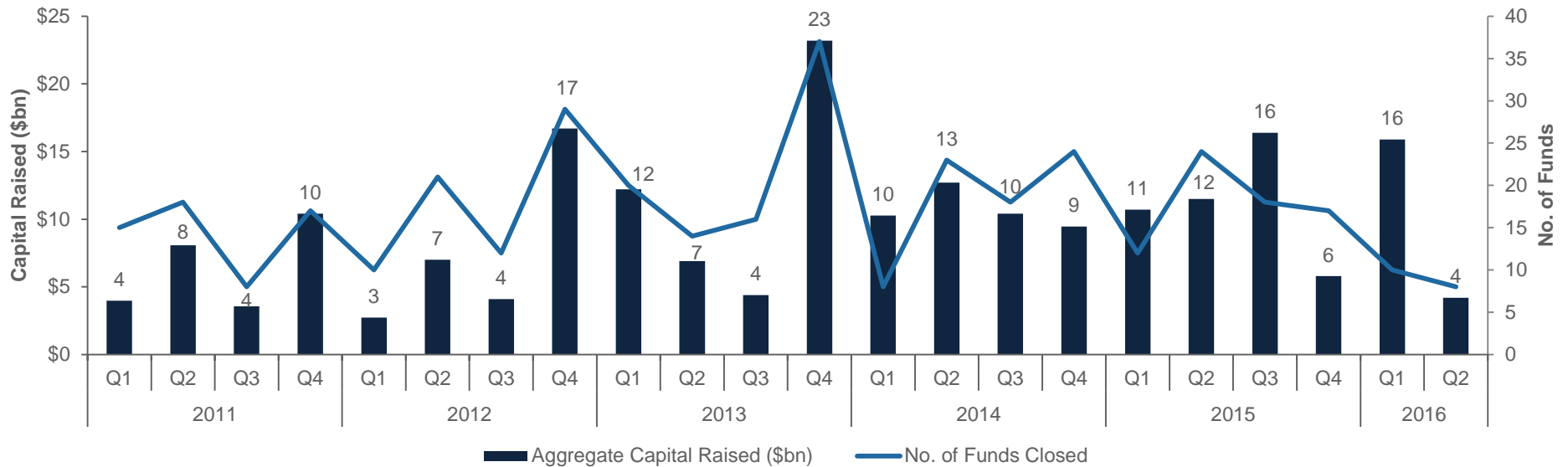


Source: CB Richard Ellis

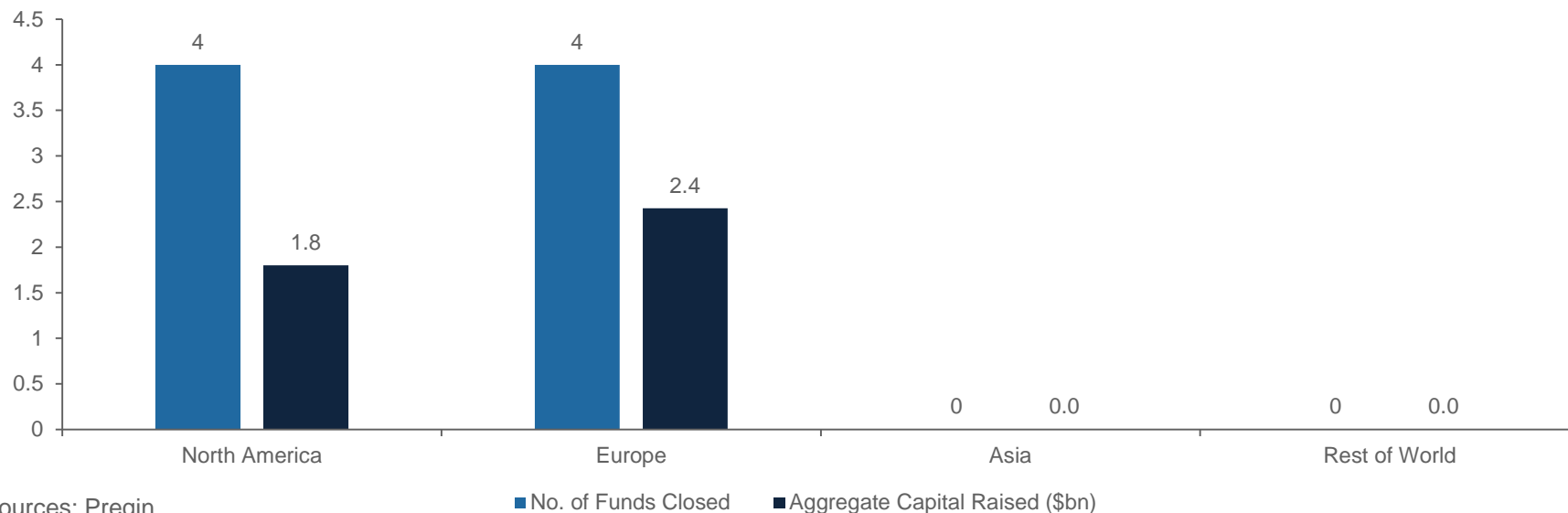
# Unlisted Infrastructure – Fundraising & Investment Activity



Unlisted Infrastructure Fundraising (Q1 2011 – Q2 2016)



Unlisted Infrastructure Fundraising by Geographic Focus (Q2 2016)

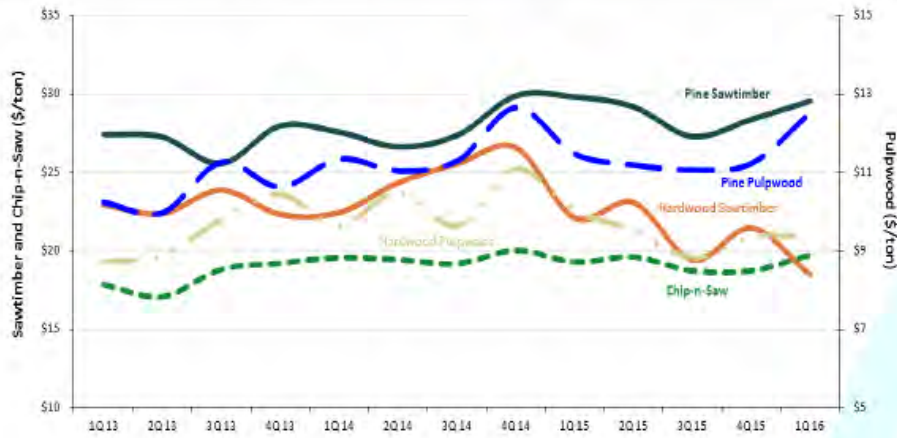


Sources: Preqin.

# Timber

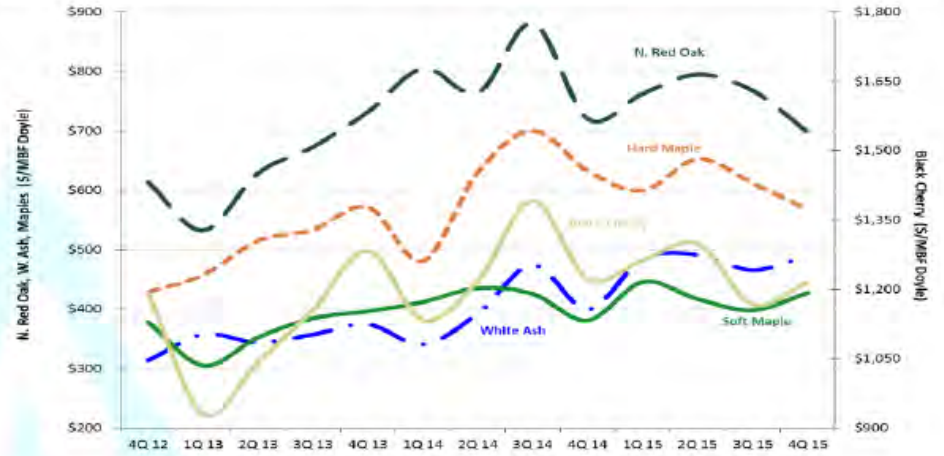


## Southeastern Timber Prices



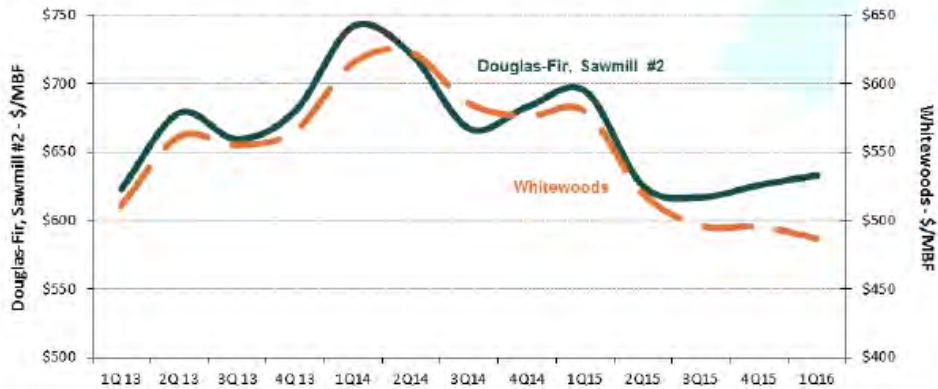
Source: Forest2Market®

## Northeastern Hardwood Timber Prices



Source: Pennsylvania Woodlands Timber Market Report - Northwest Region

## Pacific Northwest Timber Prices



Source: Log Lines®

Source: Forest Investment Associates

## Pulp and Paper



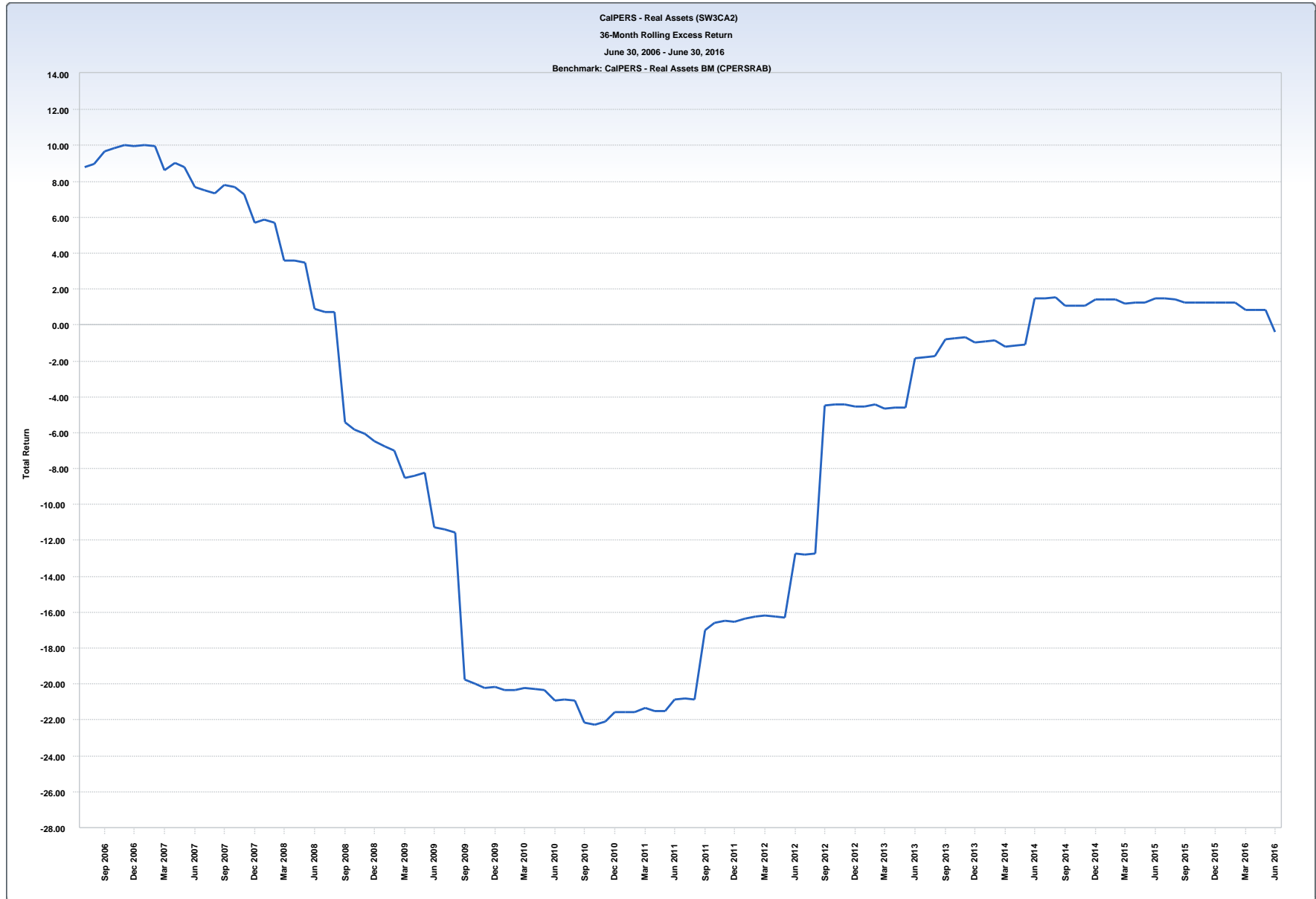
Source: FOEX Indexes, Ltd., RISI Pulp & Paper Week



## Real Assets – Performance

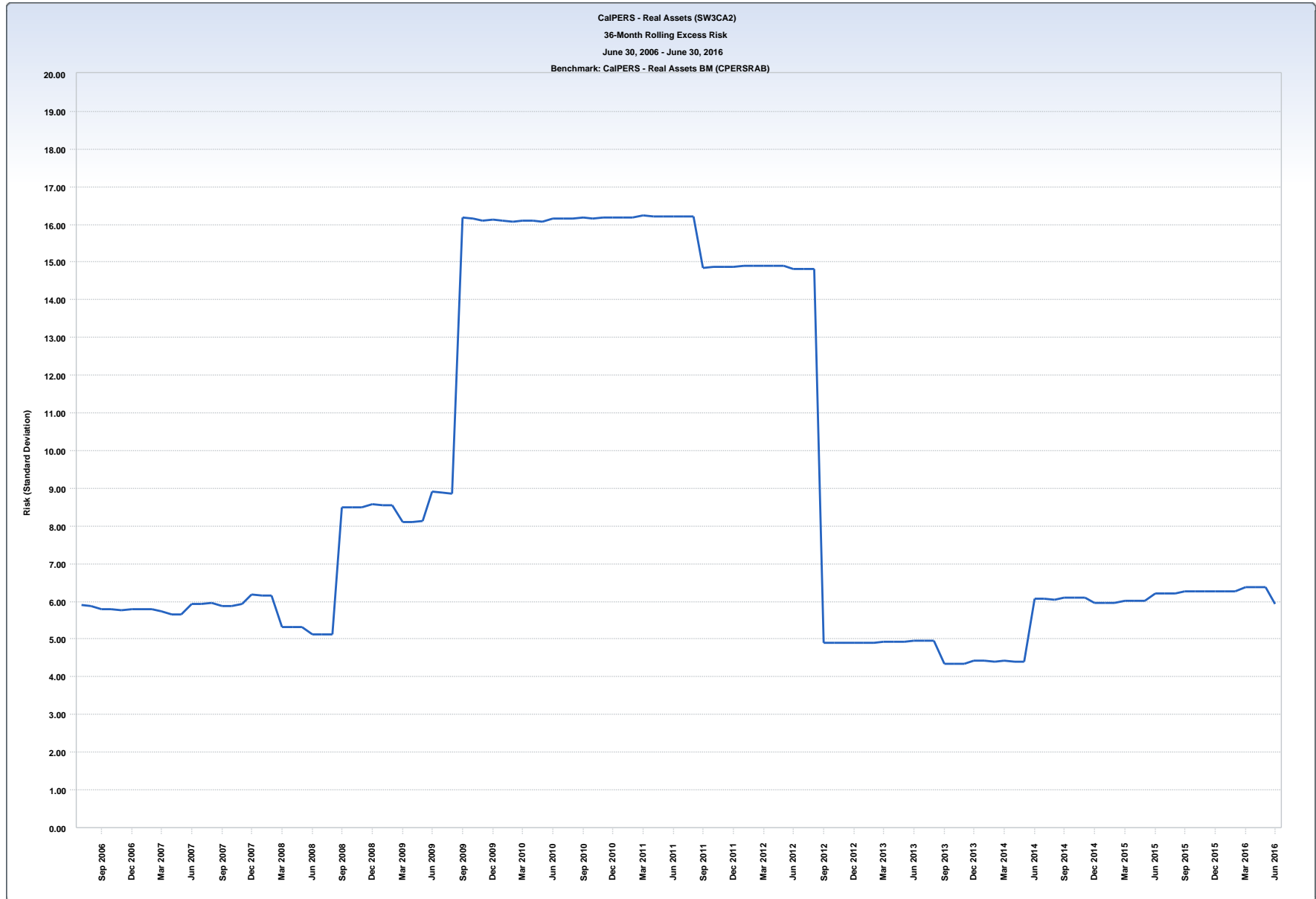
	<b>Market Value</b>	<b>Qtr</b>	<b>1-Year</b>	<b>3-Year</b>	<b>5-Year</b>	<b>10-Year</b>	<b>VaR</b>	<b>5-year Sharpe Ratio</b>	<b>5-year Info Ratio</b>
<b>REAL ASSETS</b>	<b>31.8</b>	<b>1.9%</b>	<b>6.0%</b>	<b>10.6%</b>	<b>11.1%</b>	<b>-0.1%</b>	<b>\$4.4 bil</b>	<b>1.6</b>	<b>0.0</b>
<i>Real Assets Policy Benchmark</i>		1.7%	11.1%	11.5%	11.0%	7.8%		2.6	0.0
<i>Value Added</i>		0.2%	-5.1%	-0.9%	0.1%	-7.9%			
<b>Real Estate</b>	<b>27.3</b>	<b>2.2%</b>	<b>7.1%</b>	<b>11.5%</b>	<b>12.4%</b>	<b>-0.5%</b>	<b>\$4.4 bil</b>	<b>1.6</b>	<b>0.0</b>
<i>Real Estate Policy Benchmark</i>		2.0%	12.6%	12.6%	12.1%	8.7%		2.5	0.0
<i>Value Added</i>		0.2%	-5.5%	-1.1%	0.3%	-9.2%			
<b>Forestland</b>	<b>2.0</b>	<b>-2.6%</b>	<b>-9.6%</b>	<b>-2.6%</b>	<b>-2.6%</b>	<b>-.-%</b>			
<i>NCREIF Timberland Index</i>		-0.3%	2.9%	7.7%	6.6%	-.-%			
<i>Value Added</i>		-2.3%	-12.5%	-10.3%	-9.2%	-.-%			
<b>Infrastructure</b>	<b>2.6</b>	<b>1.8%</b>	<b>9.0%</b>	<b>14.9%</b>	<b>11.7%</b>	<b>-.-%</b>			
<i>CPI + 400 BPS 1Qtr Lag</i>		1.7%	5.0%	4.8%	5.3%	-.-%			
<i>Value Added</i>		0.1%	4.0%	10.1%	6.4%	-.-%			

# Real Assets – Rolling Excess Returns

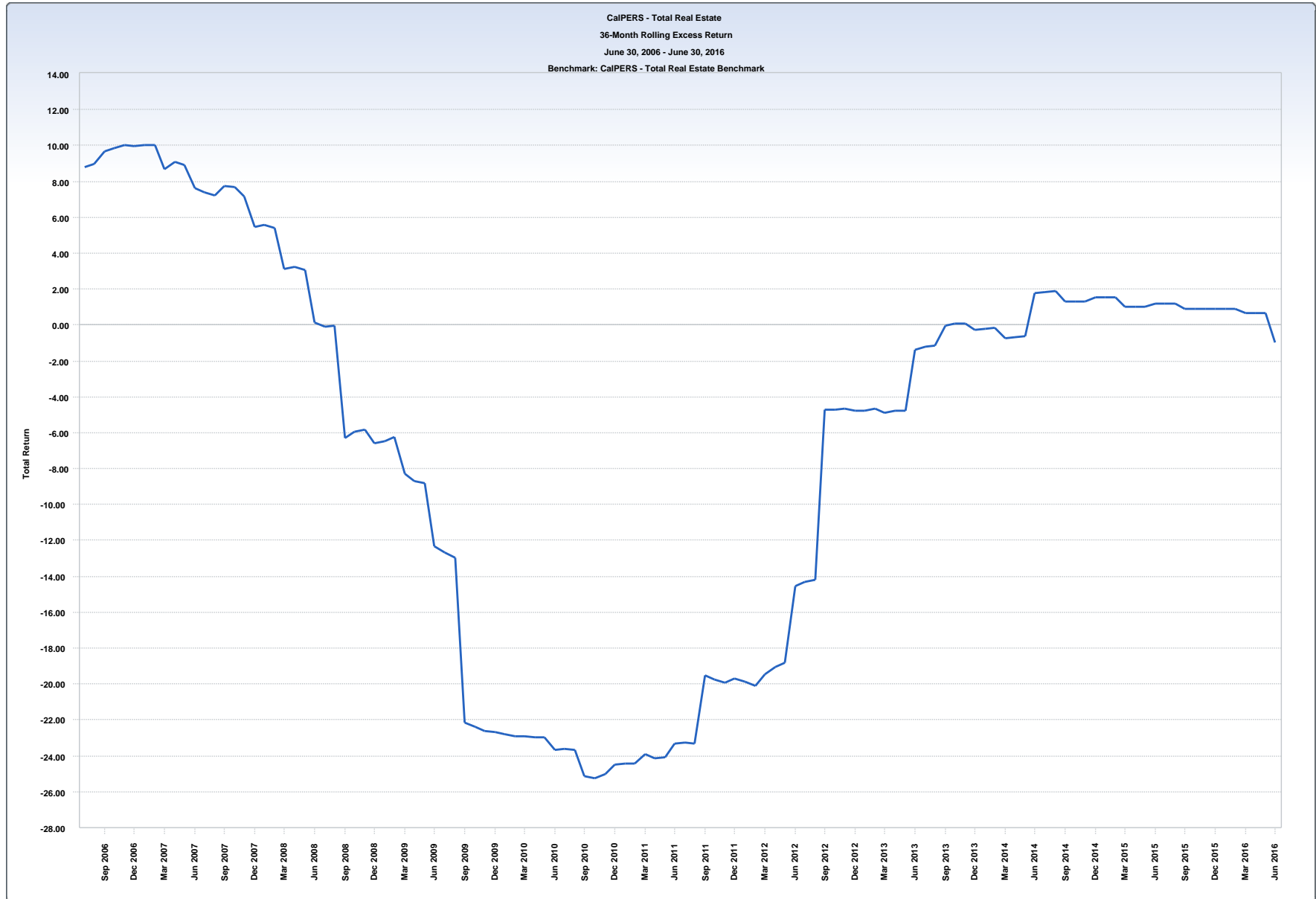




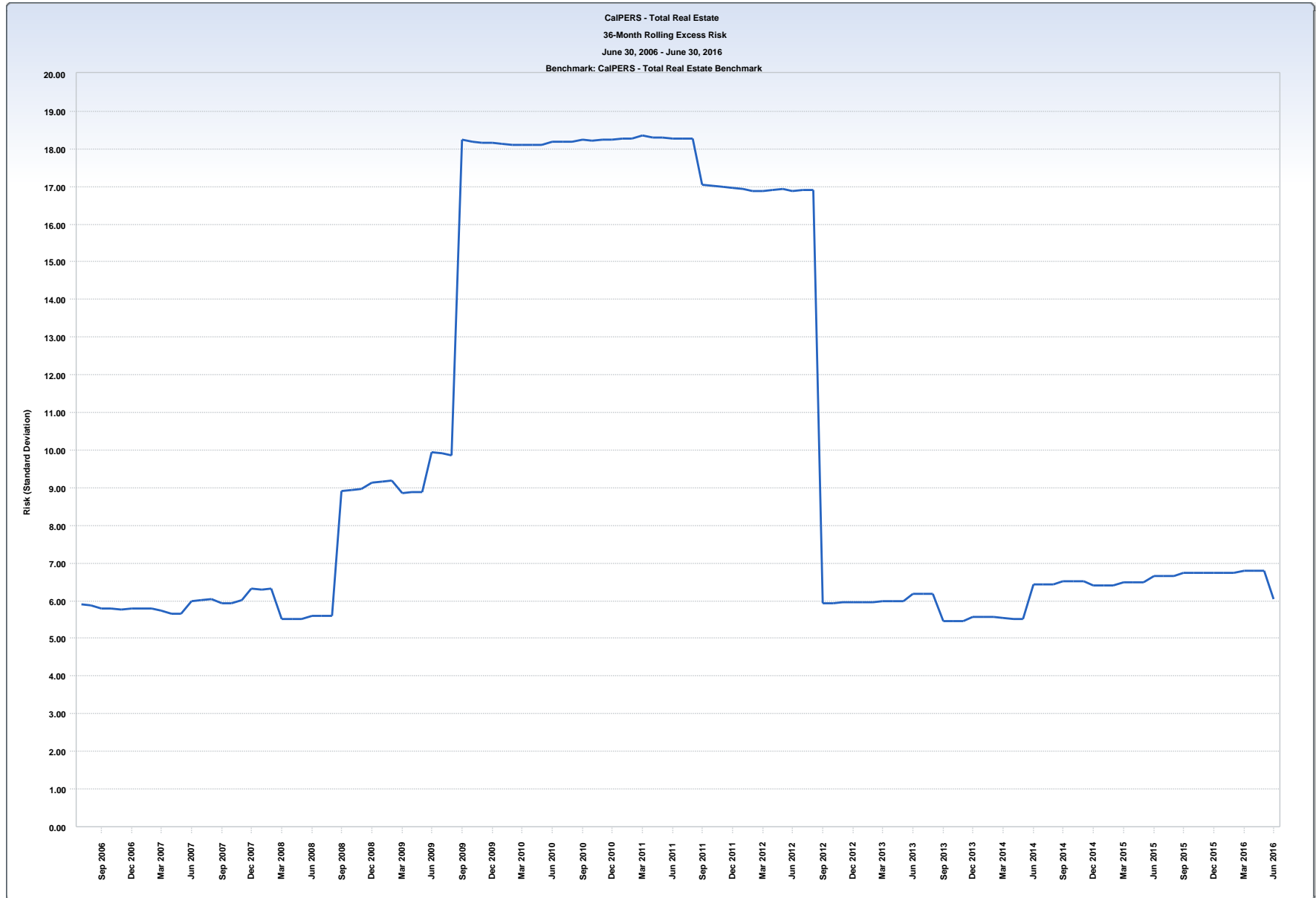
# Real Assets – Rolling Tracking Error



# Real Estate – Rolling Excess Returns



# Real Estate – Rolling Tracking Error

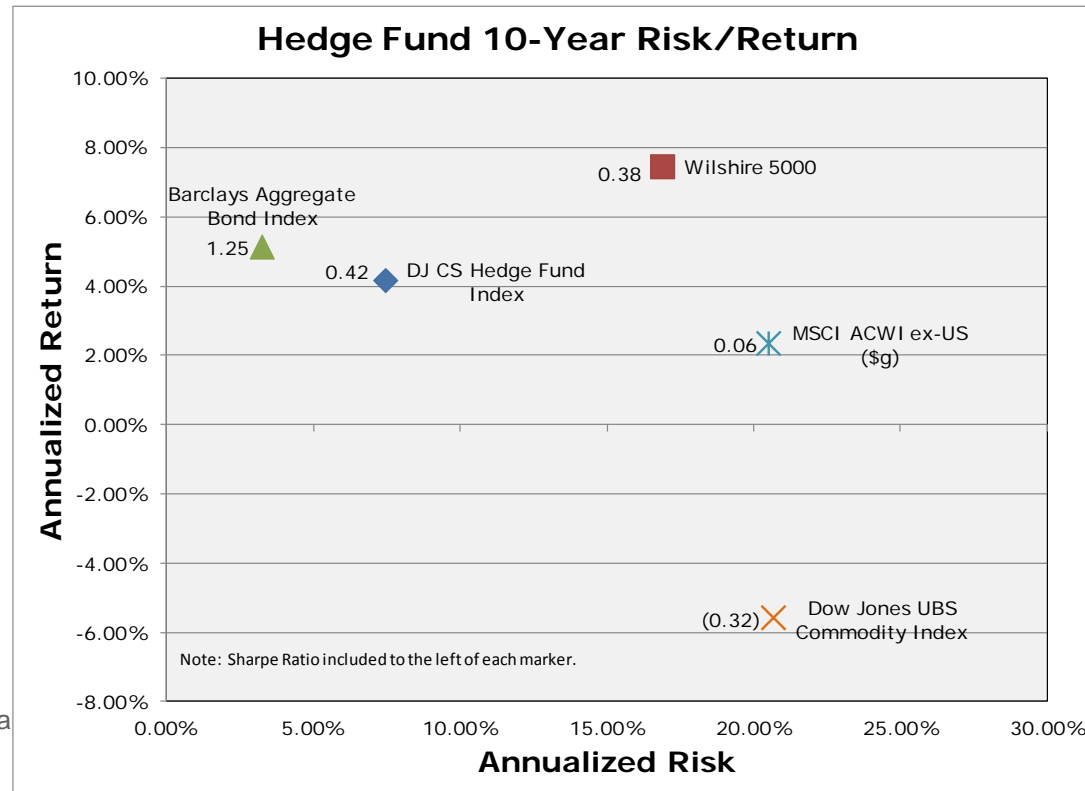




# Hedge Fund Performance



June 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
DJ CS Hedge Fund Index	0.6	-1.6	-4.2	2.5	2.9	4.2
Event Driven Index	2.1	-2.5	-10.4	0.1	1.3	3.9
Global Macro Index	0.7	-1.5	-3.8	1.5	3.1	5.7
Long/Short Equity Index	-1.2	-5.0	-5.0	4.5	4.0	4.7
Multi-Strategy Index	1.2	0.7	1.2	5.9	6.0	5.5
Wilshire 5000	2.8	4.0	3.0	11.3	11.6	7.5
MSCI ACWI ex-US (\$g)	-0.4	-0.7	-9.8	1.6	0.6	2.3
Barclays Aggregate Bond Index	2.2	5.3	6.0	4.1	3.8	5.1
Dow Jones UBS Commodity Index	12.8	13.3	-13.3	-10.6	-10.8	-5.6



Data sources: Wilshire Compa



## ARS – Distribution of Performance

	<u>Market</u>						<u>5-Year</u>	<u>5-Year Up</u>	<u>5-Year</u>	<u>5-Year</u>
	<u>Value</u>	<u>Qtr</u>	<u>1-Year</u>	<u>3-Year</u>	<u>5-Year</u>	<u>10-Year</u>	<u>Info</u>	<u>Capture</u>	<u>Sharpe</u>	<u>Sortino</u>
							<u>Ratio</u>	<u>Ratio</u>	<u>Ratio</u>	<u>Ratio</u>
<b>Absolute Return Strategies</b>	<b>0.4</b>	<b>-0.7%</b>	<b>-1.7%</b>	<b>4.1%</b>	<b>3.4%</b>	<b>3.3%</b>	<b>-0.5</b>	<b>0.6</b>	<b>1.0</b>	<b>1.4</b>
<i>ARSPolicy Benchmark</i>		1.5%	5.6%	5.4%	5.4%	6.8%				
<i>Value Added</i>		-2.2%	-7.3%	-1.3%	-2.0%	-3.5%				
<b>Total Direct Investments</b>	<b>0.4</b>	<b>-0.5%</b>	<b>-1.9%</b>	<b>4.3%</b>	<b>3.6%</b>	<b>3.7%</b>				
<b>Total Funds of Funds</b>	<b>0.0</b>	<b>-8.3%</b>	<b>-0.7%</b>	<b>4.1%</b>	<b>3.4%</b>	<b>2.5%</b>				
HFRI Fund of Funds Index		0.6%	-0.4%	3.9%	2.1%	2.3%				