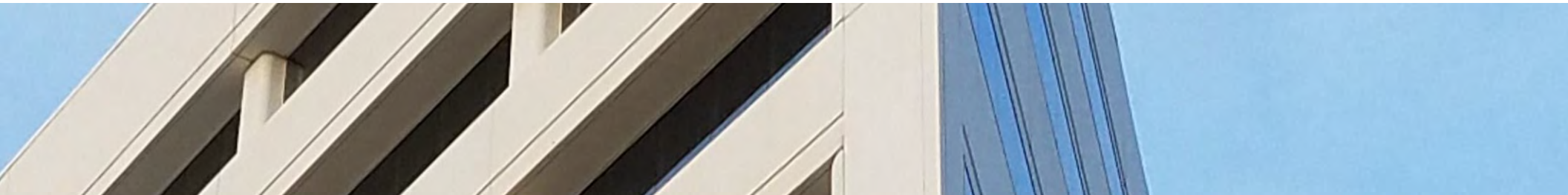




WILSHIRE ASSOCIATES

Wilshire Consulting



California Public Employees' Retirement System
Performance Review – June 30, 2018

Wilshire Consulting



JUNE 2018 ASSET CLASS ASSUMPTIONS

	EQUITY						FIXED INCOME						REAL ASSETS					
	US STOCK	DEV	EMG	GLOBAL		PRIVATE EQUITY	CASH	CORE BOND	LT	US TIPS	HIGH YIELD	NON-US BOND (HDG)	REAL ESTATE			CMDTY	REAL ASSETS	US CPI
		EX-US STOCK	MRKT STOCK	EX-US STOCK	GLOBAL STOCK				CORE BOND				US RES	GLOBAL RES	PRIVATE RE			
EXPECTED COMPOUND RETURN (%)	6.50	6.50	6.50	6.75	6.75	9.15	2.35	3.90	4.15	3.15	5.15	1.25	5.55	5.75	6.90	4.45	6.75	2.10
EXPECTED ARITHMETIC RETURN (%)	7.80	7.95	9.45	8.35	8.10	12.50	2.35	4.05	4.60	3.30	5.60	1.30	6.90	6.90	7.80	5.50	7.10	2.10
EXPECTED RISK (%)	17.00	18.00	26.00	18.75	17.15	28.00	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.50	1.75
CASH YIELD (%)	2.00	3.00	2.75	2.95	2.45	0.00	2.35	3.80	4.90	3.30	8.45	1.55	3.95	3.95	2.60	2.35	3.00	0.00
CORRELATIONS																		
US STOCK	1.00																	
DEV EX-US STOCK (USD)	0.81	1.00																
EMERGING MARKET STOCK	0.74	0.74	1.00															
GLOBAL EX-US STOCK	0.83	0.96	0.86	1.00														
GLOBAL STOCK	0.94	0.92	0.82	0.94	1.00													
PRIVATE EQUITY	0.74	0.64	0.62	0.67	0.74	1.00												
CASH EQUIVALENTS	-0.05	-0.09	-0.05	-0.08	-0.07	0.00	1.00											
CORE BOND	0.28	0.13	0.00	0.09	0.20	0.31	0.19	1.00										
LT CORE BOND	0.31	0.16	0.01	0.12	0.23	0.32	0.11	0.93	1.00									
US TIPS	-0.05	0.00	0.15	0.05	0.00	-0.03	0.20	0.60	0.47	1.00								
HIGH YIELD BOND	0.54	0.39	0.49	0.45	0.51	0.34	-0.10	0.25	0.32	0.05	1.00							
NON-US BOND (HDG)	0.16	0.25	-0.01	0.18	0.18	0.26	0.10	0.67	0.64	0.39	0.26	1.00						
US RE SECURITIES	0.59	0.47	0.44	0.49	0.56	0.50	-0.05	0.17	0.23	0.10	0.56	0.05	1.00					
GLOBAL RE SECURITIES	0.65	0.59	0.56	0.62	0.66	0.58	-0.05	0.17	0.22	0.11	0.62	0.03	0.94	1.00				
PRIVATE REAL ESTATE	0.54	0.44	0.44	0.47	0.52	0.51	-0.05	0.19	0.25	0.09	0.57	0.05	0.77	0.76	1.00			
COMMODITIES	0.25	0.34	0.39	0.38	0.32	0.27	0.00	-0.02	-0.02	0.25	0.29	-0.10	0.25	0.28	0.25	1.00		
REAL ASSET BASKET	0.42	0.43	0.50	0.48	0.47	0.43	0.01	0.24	0.25	0.41	0.53	0.06	0.65	0.69	0.69	0.59	1.00	
INFLATION (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	-0.08	0.05	0.03	0.05	0.44	0.26	1.00

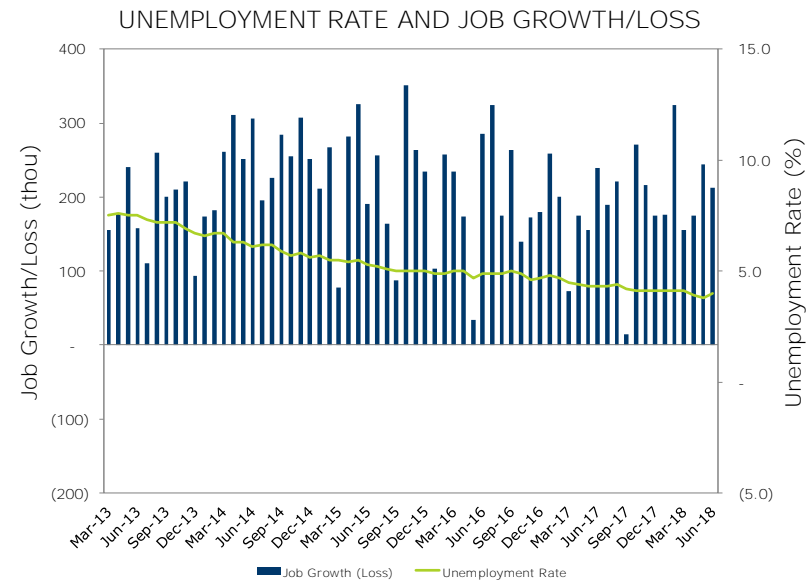
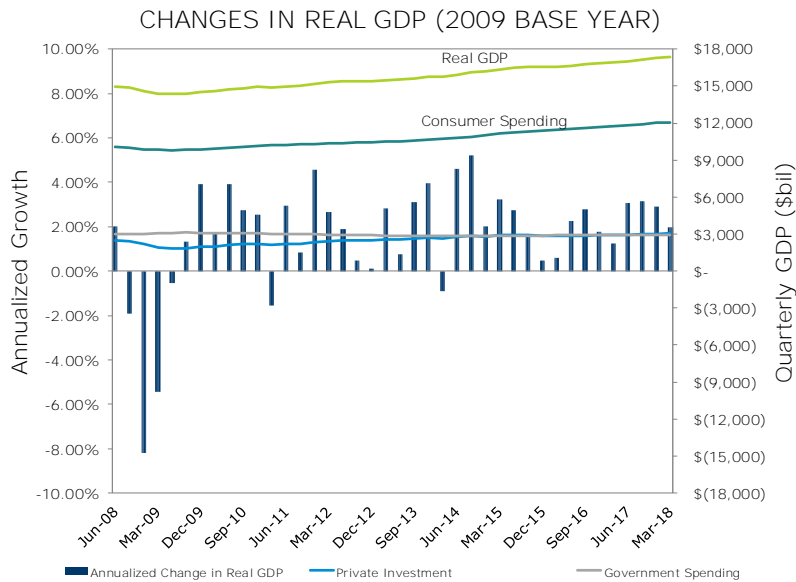
Wilshire ConsultingH ECONOMIC REVIEW



AS OF JUNE 30, 2018 KEY ECONOMIC INDICATORS

CPI (ALL ITEMS)	MONTHLY CHANGE		CUMULATIVE CHANGE	
SEASONALLY ADJUSTED	Jun-18	0.1	3-Mo.	0.6
	May-18	0.2	12-Mo.	2.8
	Apr-18	0.2	10-Yr. (Annual)	1.4
	10-Yr.	2.1		
BREAKEVEN INFLATION				
CONSUMER SENTIMENT	Jun-18	98.2		
U. OF MICHIGAN SURVEY	May-18	98.0		
	1-Yr. Ago	95.0	10-Yr. Avg	80.7
MANUFACTURING	Jun-18	60.2	CHANGE IN SECTOR	
INST. FOR SUPPLY MGMT	May-18	58.7	>50	Expansion
PURCHASING MNGRS' IDX	1-Yr. Avg.	59.0	<50	Contraction

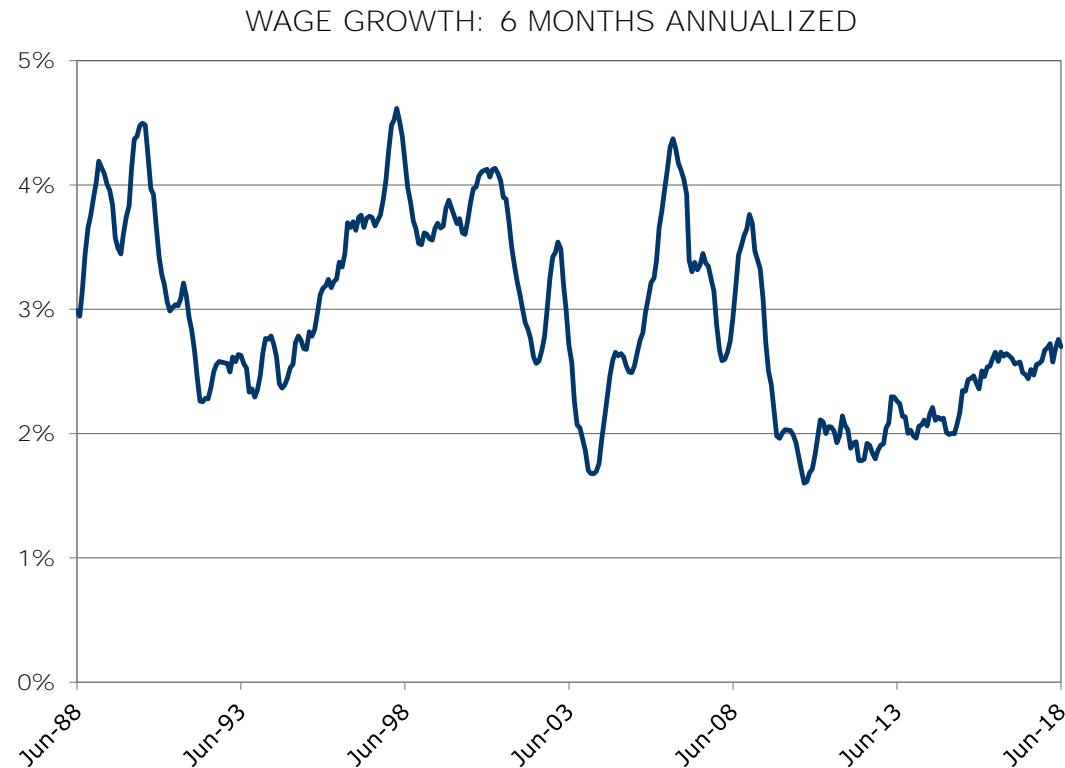
Note: Seasonally adjusted CPI data is utilized to better reflect short-term pricing activity.



Data sources: Bureau of Labor Statistics, U.S. Treasury, University of Michigan, Institute for Supply Management, Bureau of Economic Analysis

EMPLOYMENT CONDITIONS

- While the U.S. has averaged 200,000 new jobs a month for the past year and the unemployment rate is at 4%, wage growth is climbing slowly
- One reason is the labor force participation rate, which has been slow to recover



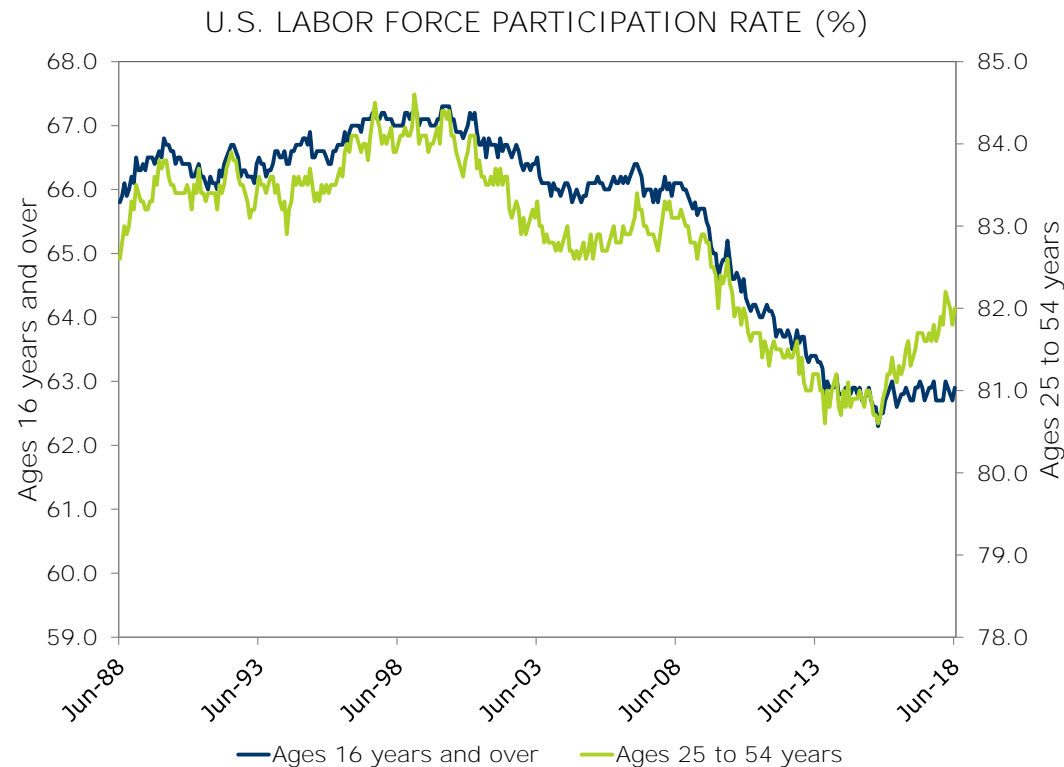
Data sources: U.S. Bureau of Labor Statistics



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EMPLOYMENT CONDITIONS

- Broad participation rate has stagnated; 25-54 years rate is recovering during the past 24 months
- Results, in total, suggest there may be more slack in the labor market than the unemployment rate indicates, which would decrease pressure on the Fed to raise rates much further



Data sources: U.S. Bureau of Labor Statistics

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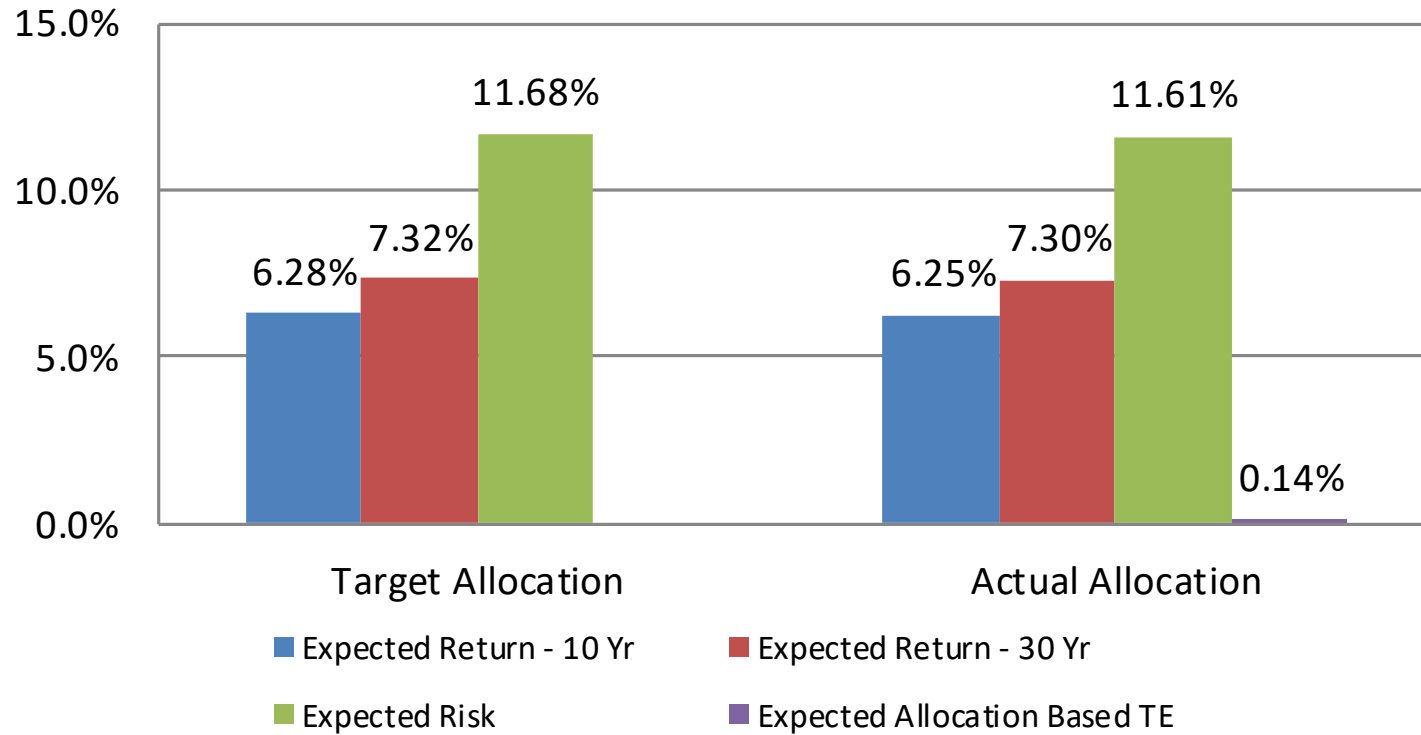
ASSET CLASS PERFORMANCE

ASSET CLASS RETURNS - BEST TO WORST						ANNUALIZED 5-YEAR AS OF 6/2018
2013	2014	2015	2016	2017	2018 YTD	
U.S. Equity 33.1%	REITs 31.8%	REITs 4.2%	MLPs 18.3%	Emrg Mrkts 37.7%	U.S. Equity 3.0%	U.S. Equity 13.4%
MLPs 27.6%	U.S. Equity 12.7%	U.S. Equity 0.7%	High Yield 17.1%	Developed 25.6%	REITs 1.5%	REITs 8.4%
Developed 23.3%	Core Bond 6.0%	Core Bond 0.6%	U.S. Equity 13.4%	U.S. Equity 21.0%	T-Bills 0.8%	Developed 6.9%
High Yield 7.4%	MLPs 4.8%	T-Bills 0.1%	Commodities 11.8%	High Yield 7.5%	High Yield 0.2%	High Yield 5.5%
REITs 1.9%	U.S. TIPS 3.6%	Developed -0.4%	Emrg Mrkts 11.6%	REITs 4.2%	Commodities 0.0%	Emrg Mrkts 5.4%
T-Bills 0.1%	High Yield 2.5%	U.S. TIPS -1.4%	REITs 7.2%	Core Bond 3.6%	U.S. TIPS 0.0%	Core Bond 2.3%
Core Bond -2.0%	T-Bills 0.0%	High Yield -4.5%	U.S. TIPS 4.7%	U.S. TIPS 3.0%	MLPs -0.6%	U.S. TIPS 1.7%
Emrg Mrkts -2.3%	Emrg Mrkts -1.8%	Emrg Mrkts -14.6%	Core Bond 2.6%	Commodities 1.7%	Core Bond -1.6%	T-Bills 0.4%
U.S. TIPS -8.6%	Developed -4.5%	Commodities -24.7%	Developed 1.5%	T-Bills 0.8%	Developed -2.4%	MLPs -4.1%
Commodities -9.5%	Commodities -17.0%	MLPs -32.6%	T-Bills 0.3%	MLPs -6.5%	Emrg Mrkts -6.5%	Commodities -6.4%

Data sources: Wilshire Compass

Note: Developed asset class is developed equity markets ex-U.S., ex-Canada

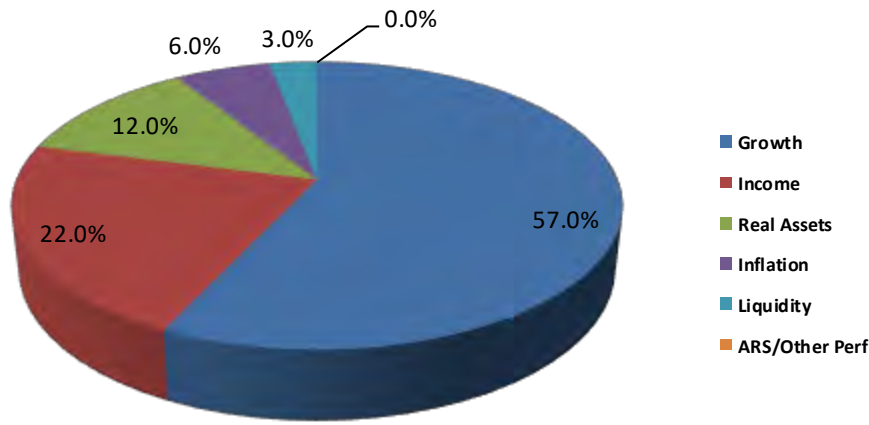
CalPERS Expected Return and Risk Estimates



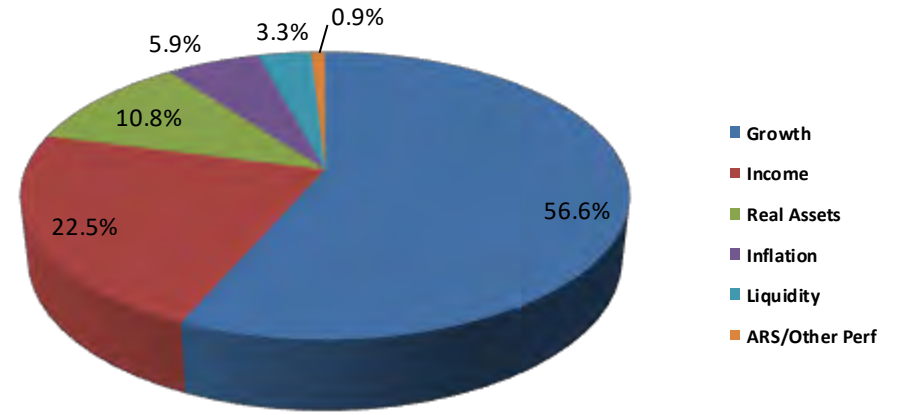
Wilshire Consulting Asset and Risk Allocation



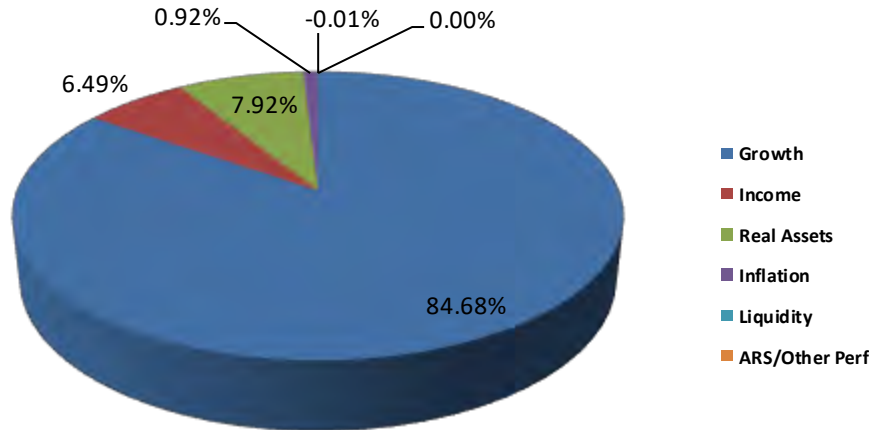
Target Asset Allocation



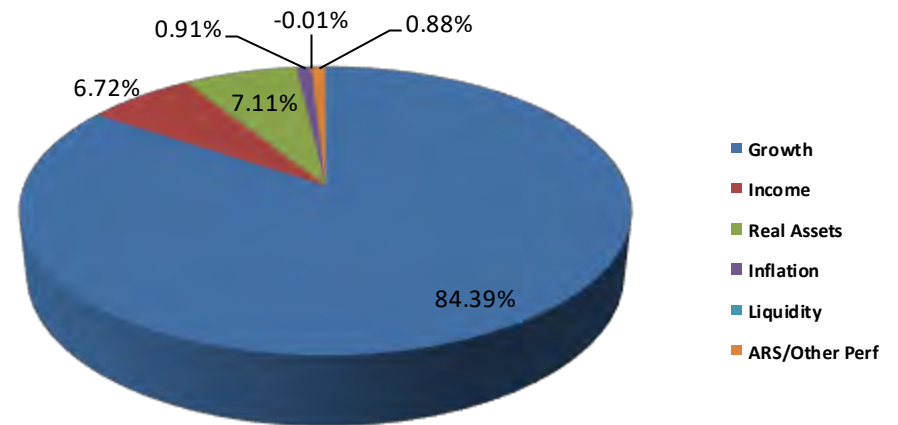
Actual Asset Allocation



Contribution to Total Risk - Target Allocation

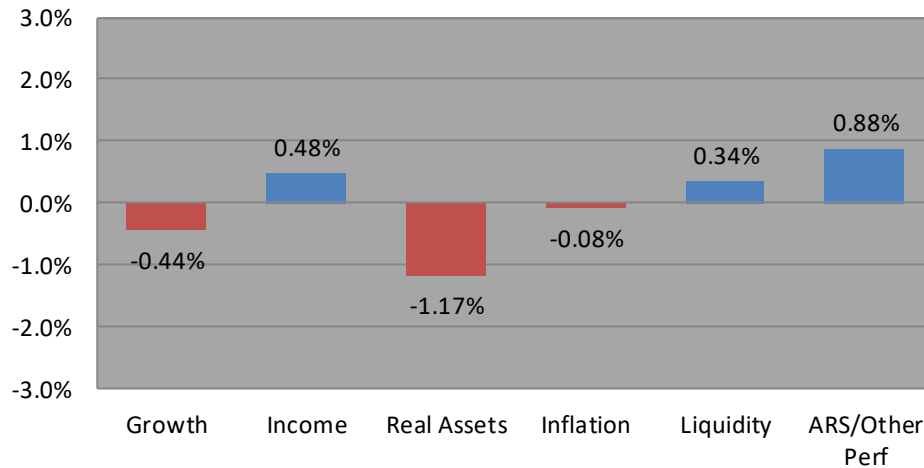


Contribution to Total Risk - Actual Allocation

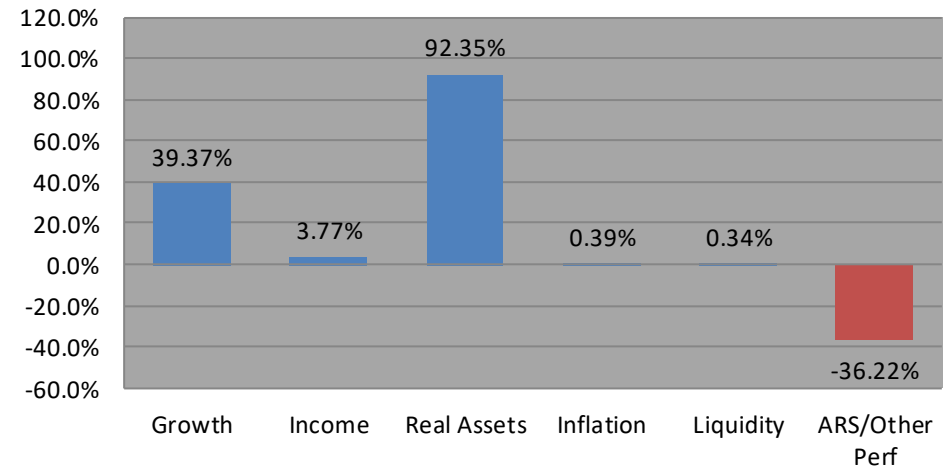


Drivers of Expected Excess Risk

CalPERS Asset Allocation Variance



Contribution to TF Tracking Error



- 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

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Total Fund – Performance

	Market Value	5-Year Ratios							
		Qtr	1-Year	3-Year	5-Year	10-Year	VaR	Sharpe	Info
TOTAL FUND	\$351.8 bil	0.6%	8.6%	6.7%	8.1%	5.6%	\$42.6 bil	1.4	-0.1
<i>Total Fund Policy Benchmark</i>		0.6%	8.6%	6.9%	8.1%	6.7%		1.4	0.0
<i>Actuarial Rate</i>		1.8%	7.4%	7.5%	7.5%	7.6%			
GROWTH	199.0	0.9%	12.1%	9.1%	10.4%	7.0%	\$43.7 bil	1.2	-0.2
<i>Growth Policy Benchmark</i>		0.9%	12.9%	9.5%	10.9%	8.2%		1.2	0.0
PUBLIC EQUITY		171.8	0.6%	11.5%	8.8%	10.2%		6.7%	\$35.4 bil
<i>Public Equity Policy Benchmark</i>	1.0%		11.9%	8.8%	10.1%	7.0%	1.0	0.0	
PRIVATE EQUITY	27.2	3.1%	16.1%	10.4%	11.9%	9.0%	\$10.8 bil	3.4	-0.2
<i>Private Equity Policy Benchmark</i>		0.0%	18.6%	12.3%	14.2%	13.5%		1.4	0.0
INCOME	79.1	-0.8%	0.4%	3.2%	3.8%	5.7%	\$7.2 bil	0.8	1.2
<i>Income Policy Benchmark</i>		-0.9%	0.0%	2.7%	3.1%	4.9%		0.6	0.0
REAL ASSETS	38.1	1.6%	8.0%	7.1%	9.4%	-0.5%	\$5.4 bil	1.6	-0.1
<i>Real Assets Policy Benchmark</i>		1.9%	6.8%	8.3%	9.6%	6.3%		2.4	0.0
INFLATION	20.8	0.8%	9.3%	0.8%	-0.4%	-1.8%	\$1.5 bil	-0.1	0.7
<i>Inflation Policy Benchmark</i>		0.8%	8.9%	0.5%	-0.9%	-1.0%		-0.2	0.0
LIQUIDITY	11.8	0.6%	1.7%	0.9%	0.9%	1.0%	\$0.0 bil	0.5	-0.3
<i>Liquidity Policy Benchmark</i>		0.4%	1.3%	0.7%	1.0%	1.1%		0.5	0.0
ABSOLUTE RETURN STRATEGIES	0.2	-4.4%	-3.6%	-2.5%	1.2%	1.3%		0.2	-0.9
<i>Absolute Return Strategies Policy Benchmark</i>		1.6%	6.0%	5.7%	5.5%	5.8%		20.9	0.0
EXTERNAL MULTI-ASSET CLASS COMPOSITE	1.5	-3.0%	2.9%	2.8%	5.1%	-.-%		N/A	N/A
<i>Absolute 7.5%</i>		1.8%	7.5%	7.5%	7.5%	-.-%		N/A	N/A
TRUST LEVEL PORTFOLIO MANAGEMENT / OTHER	1.3	-1.3%	3.0%	-.-%	-.-%	-.-%		N/A	N/A
TERMINATED AGENCY POOL	0.1	0.8%	2.3%	3.3%	3.3%	-.-%		N/A	N/A
TOTAL FUND PLUS TAP	351.9	0.6%	8.6%	6.7%	8.1%	5.6%		N/A	N/A

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Total Fund – Attribution (Quarter)

**California Public Employees' Retirement System
Total Fund Attribution - Quarter
As of 6/30/2018**

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
Growth	56.74	0.94	57.00	0.89	-0.26	0.05	0.00	-0.01	0.02	0.01
Public Equity	49.03	0.58	49.00	1.01	0.03	-0.43	0.00	0.00	-0.21	-0.21
Private Equity	7.71	3.14	8.00	0.02	-0.29	3.12	0.00	-0.01	0.23	0.22
Income	20.54	-0.80	22.00	-0.85	-1.46	0.05	0.04	0.00	0.01	0.05
Real Assets	10.66	1.56	12.00	1.91	-1.34	-0.35	-0.02	0.00	-0.04	-0.06
Inflation	6.91	0.77	6.00	0.79	0.91	-0.02	-0.01	0.00	0.00	-0.01
Ext. MAC/ARS/TLPM/Other	1.04	-3.05	0.00	1.82	1.04	-4.87	0.02	-0.06	0.00	-0.04
Liquidity	4.11	0.55	3.00	0.40	1.11	0.16	0.00	0.00	0.00	0.00
Monthly Linked Return	100.00	0.58	100.00	0.62		-0.04	0.02	-0.06	-0.01	-0.04
Trading/Hedging/Other		0.02		0.00		0.02				0.02
Total		0.60		0.62		-0.01				-0.01

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Total Fund – Attribution (Calendar YTD)

**California Public Employees' Retirement System
Total Fund Attribution - Calendar Year-to-Date
As of 6/30/2018**

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
Growth	57.20	0.68	55.50	1.25	1.70	-0.58	-0.06	0.01	-0.28	-0.32
Public Equity	49.57	-0.13	47.50	0.24	2.07	-0.37	-0.02	0.00	-0.18	-0.21
Private Equity	7.63	5.80	8.00	6.73	-0.37	-0.93	-0.03	0.01	-0.09	-0.12
Income	19.85	-2.30	21.00	-2.56	-1.15	0.26	0.07	0.00	0.05	0.12
Real Assets	10.54	3.33	12.50	3.69	-1.96	-0.36	-0.06	0.00	-0.04	-0.10
Inflation	7.34	1.75	7.50	1.79	-0.16	-0.04	-0.02	0.00	0.00	-0.02
Ext. MAC/ARS/TLPM/Other	0.89	-6.05	0.00	3.68	0.89	-9.73	0.03	-0.10	0.00	-0.07
Liquidity	4.18	0.99	3.50	0.76	0.68	0.23	0.00	0.00	0.01	0.01
Monthly Linked Return	100.00	0.46	100.00	0.84		-0.38	-0.04	-0.09	-0.26	-0.38
Trading/Hedging/Other		0.00		0.00		0.00				0.00
Total		0.46		0.84		-0.38				-0.38

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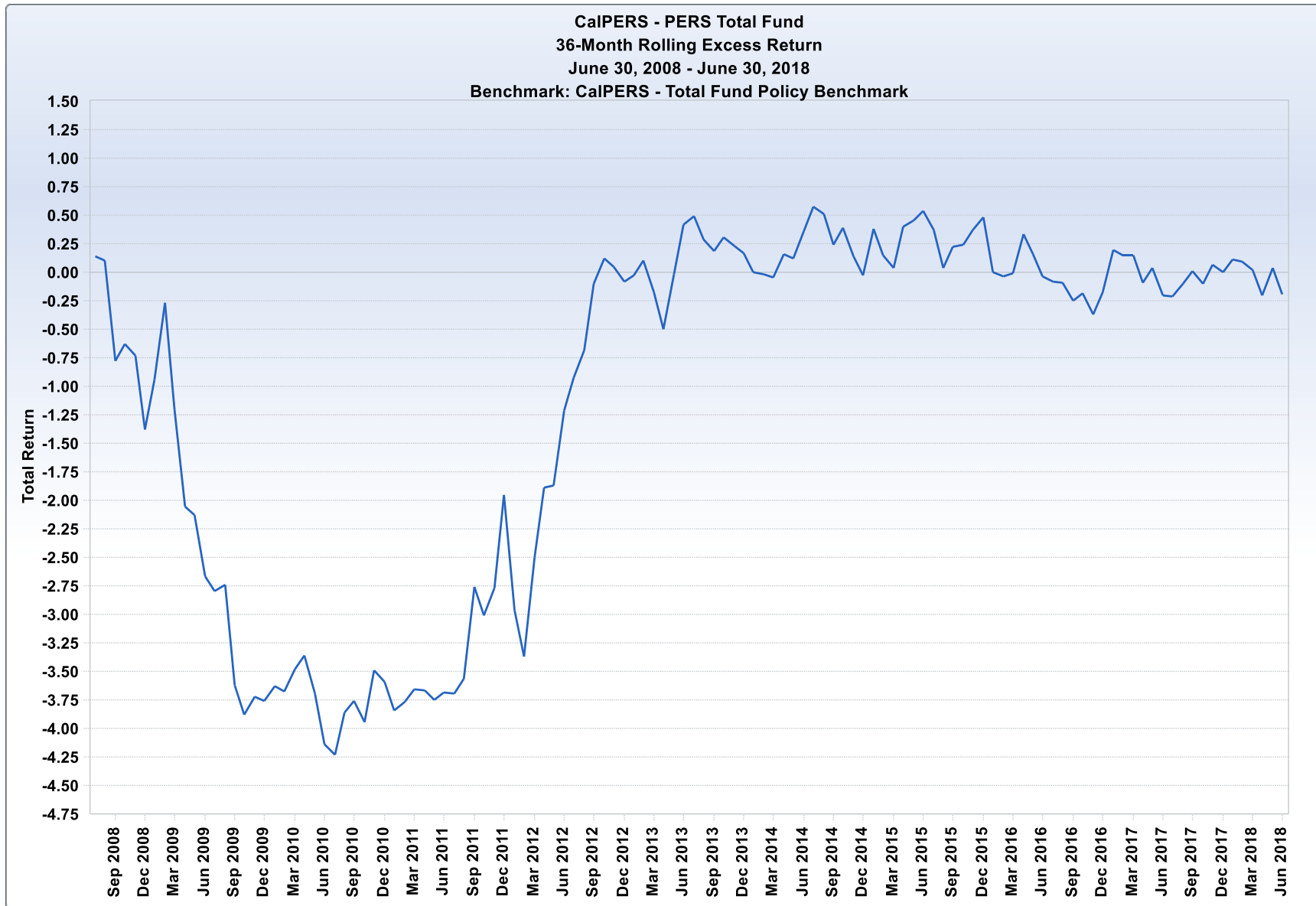


Total Fund – Attribution (Fiscal YTD)

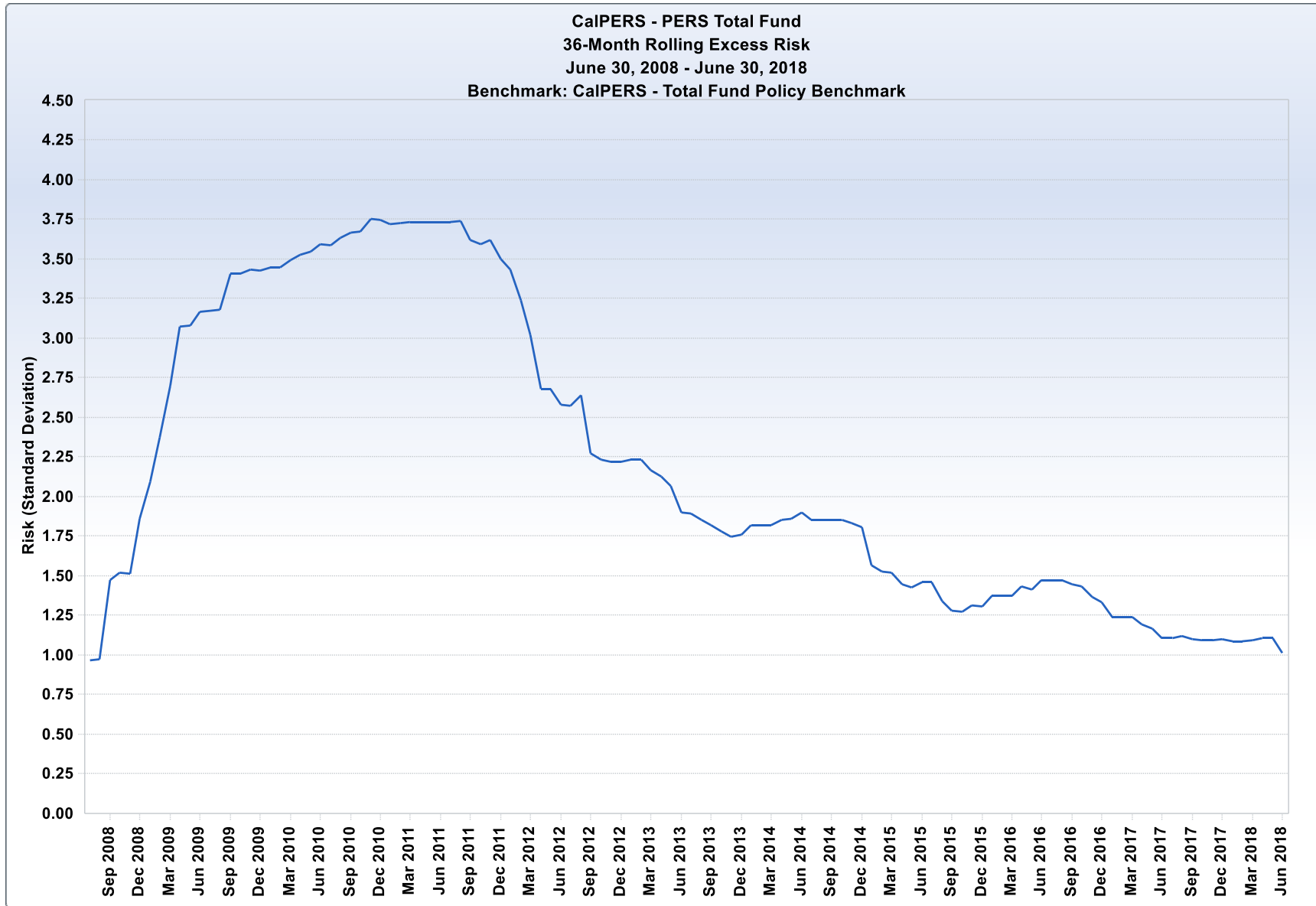
California Public Employees' Retirement System
Total Fund Attribution - Fiscal Year-to-Date
As of 6/30/2018

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
Growth	57.23	12.11	54.75	12.95	2.48	-0.84	0.06	0.01	-0.41	-0.34
Public Equity	49.45	11.47	46.75	11.89	2.70	-0.42	0.10	0.00	-0.20	-0.10
Private Equity	7.79	16.09	8.00	18.59	-0.21	-2.50	-0.04	0.01	-0.21	-0.24
Income	19.53	0.35	20.50	-0.03	-0.97	0.38	0.11	0.00	0.08	0.19
Real Assets	10.65	7.99	12.75	6.81	-2.10	1.19	0.03	-0.04	0.16	0.16
Inflation	7.58	9.26	8.25	8.90	-0.67	0.36	-0.01	0.00	0.03	0.02
Ext. MAC/ARS/TLPM/Other	0.72	2.46	0.00	7.50	0.72	-5.04	0.01	-0.08	0.00	-0.07
Liquidity	4.28	1.67	3.75	1.31	0.53	0.37	-0.02	0.00	0.01	-0.01
Monthly Linked Return	100.00	8.60	100.00	8.64		-0.04	0.18	-0.11	-0.12	-0.04
Trading/Hedging/Other		-0.02		0.00		-0.02				-0.02
Total		8.58		8.64		-0.06				-0.06

Total Fund – Rolling Excess Returns



Total Fund – Rolling Tracking Error

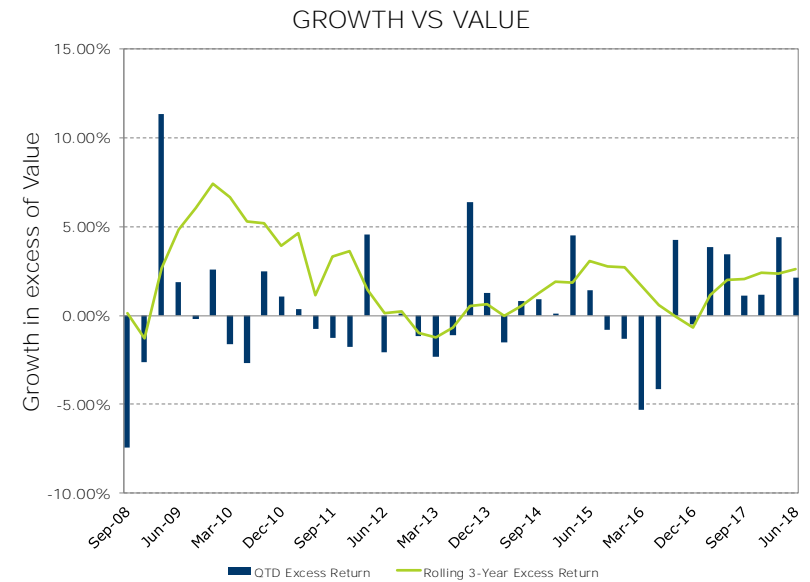
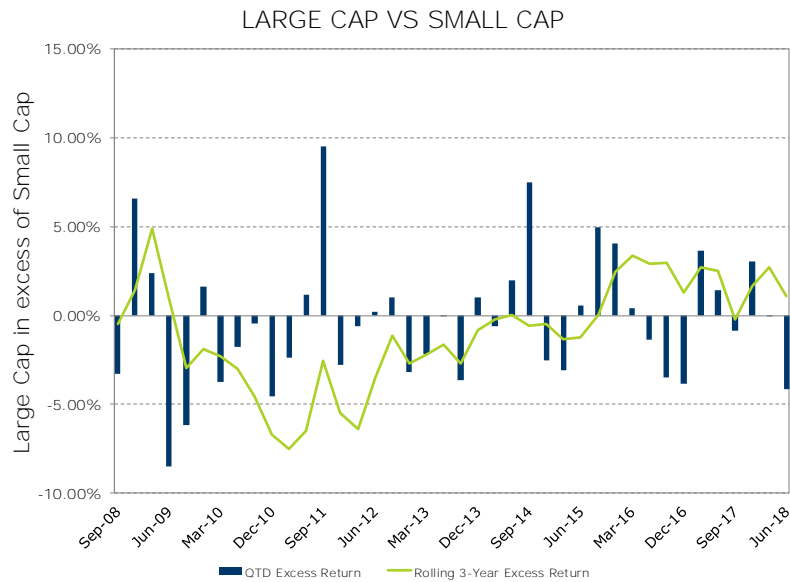
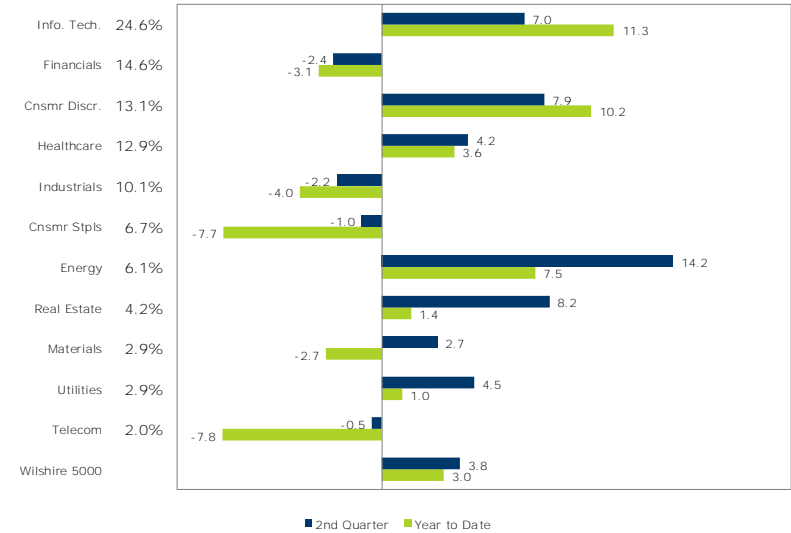


Wilshire Consulting U.S. EQUITY MARKET



AS OF JUNE 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
WILSHIRE 5000 INDEX	3.8	3.0	14.7	11.8	13.4	10.2
WILSHIRE U.S. LARGE CAP	3.4	2.6	14.4	12.0	13.5	10.1
WILSHIRE U.S. SMALL CAP	7.9	7.1	16.9	10.8	12.6	11.7
WILSHIRE U.S. LARGE GROWTH	4.8	6.2	19.7	13.5	16.2	11.3
WILSHIRE U.S. LARGE VALUE	2.1	-0.9	9.4	10.2	10.9	8.9
WILSHIRE U.S. SMALL GROWTH	6.4	7.9	19.9	10.2	12.8	11.6
WILSHIRE U.S. SMALL VALUE	9.3	6.1	13.7	11.1	12.2	11.7
WILSHIRE REIT INDEX	9.7	1.5	3.9	7.8	8.4	7.8
MSCI USA MIN. VOL. INDEX	2.7	1.4	10.2	11.3	12.0	10.4
FTSE RAFI U.S. 1000 INDEX	2.9	0.4	11.6	10.2	11.9	11.3

WILSHIRE 5000 SECTOR WEIGHT & RETURN (%)

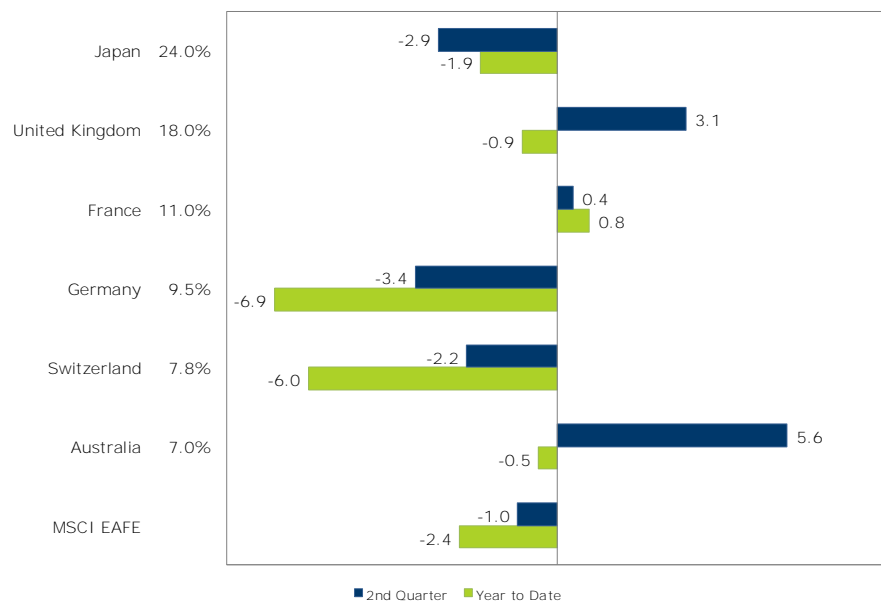


Data sources: Wilshire Compass, Wilshire Atlas

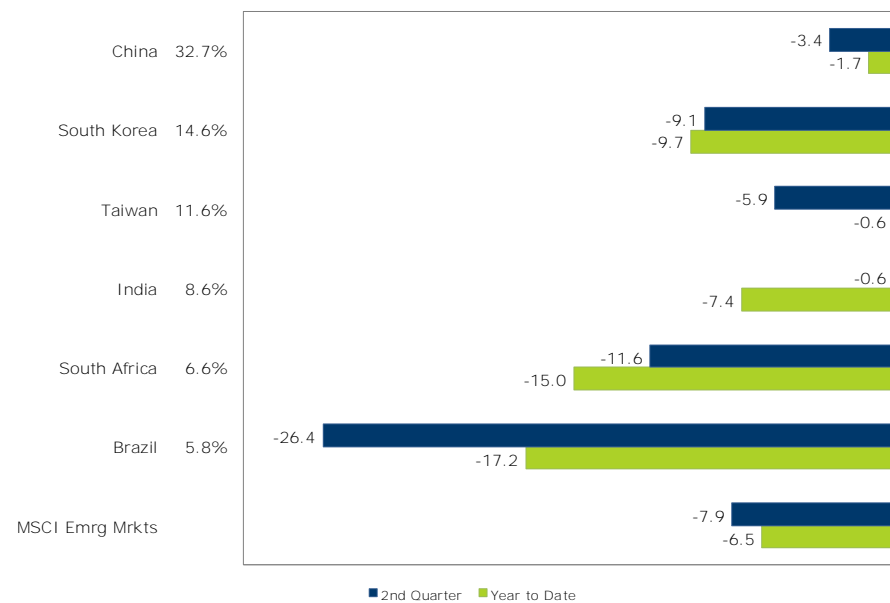
NON-U.S. EQUITY MARKET

AS OF JUNE 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI EX-US (\$G)	-2.4	-3.4	7.8	5.6	6.5	3.0
MSCI EAFE (\$G)	-1.0	-2.4	7.4	5.4	6.9	3.3
MSCI EMERGING MARKETS (\$G)	-7.9	-6.5	8.6	6.0	5.4	2.6
MSCI FRONTIER MARKETS (\$G)	-15.1	-10.7	2.0	2.5	4.9	-1.9
MSCI ACWI EX-US GROWTH (\$G)	-1.2	-2.0	10.3	6.9	7.6	3.4
MSCI ACWI EX-US VALUE (\$G)	-3.6	-4.9	5.3	4.1	5.3	2.6
MSCI ACWI EX-US SMALL (\$G)	-2.4	-2.7	11.0	8.5	9.5	6.2
MSCI ACWI MINIMUM VOLATILITY	0.6	0.0	8.0	9.0	9.7	8.3
MSCI EAFE MINIMUM VOLATILITY	-0.5	0.0	6.5	6.8	8.4	6.3
FTSE RAFI DEVELOPED EX-US	-1.6	-3.5	7.6	5.9	7.4	3.8
MSCI EAFE LC (G)	3.8	-0.6	6.6	5.7	9.4	5.5

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)



Data sources: Wilshire Compass



Wilshire Consulting

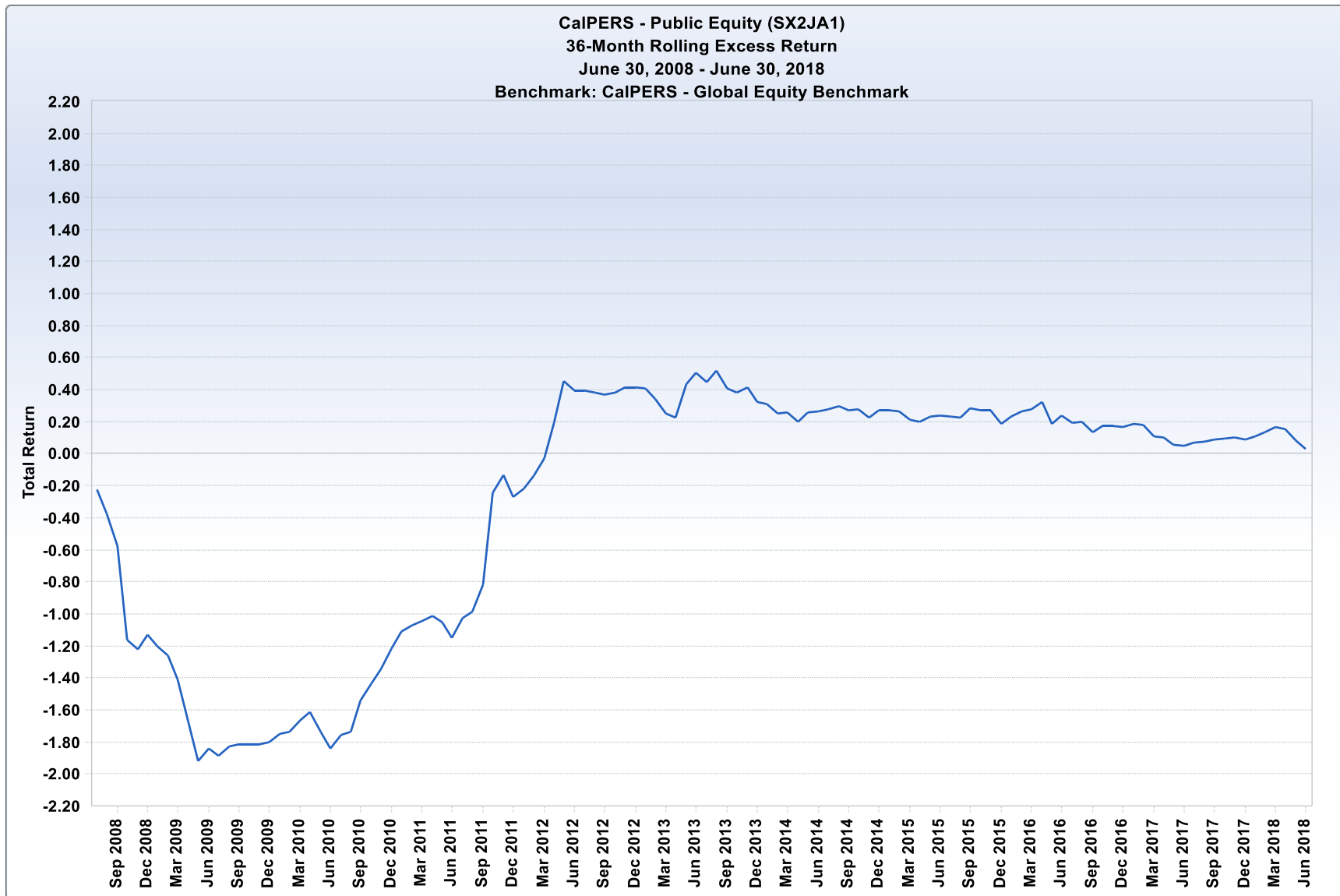
Growth: Public Equity – Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR	5-year Sharpe Ratio	5-year Info Ratio
PUBLIC EQUITY	171.8	0.6%	11.5%	8.8%	10.2%	6.7%	\$35.4 bil	1.0	0.1
<i>Public Equity Policy Benchmark</i>		1.0%	11.9%	8.8%	10.1%	7.0%		1.0	0.0
<i>Value Added</i>		-0.4%	-0.4%	0.0%	0.1%	-0.3%			
US Equity Composite	79.9	3.5%	14.7%	11.3%	13.1%	10.1%		1.5	0.3
<i>Custom US Equity Benchmark</i>		4.1%	15.4%	11.5%	13.2%	10.1%		1.5	0.0
<i>Value Added</i>		-0.6%	-0.7%	-0.2%	-0.1%	0.0%			
Total Int'l Equity	92.0	-2.1%	8.5%	6.3%	7.3%	3.5%		0.7	-0.2
<i>Custom Int'l Equity Benchmark</i>		-1.9%	8.6%	6.0%	7.2%	3.4%		0.7	0.0
<i>Value Added</i>		-0.2%	-0.1%	0.3%	0.1%	0.1%			



Wilshire Consulting

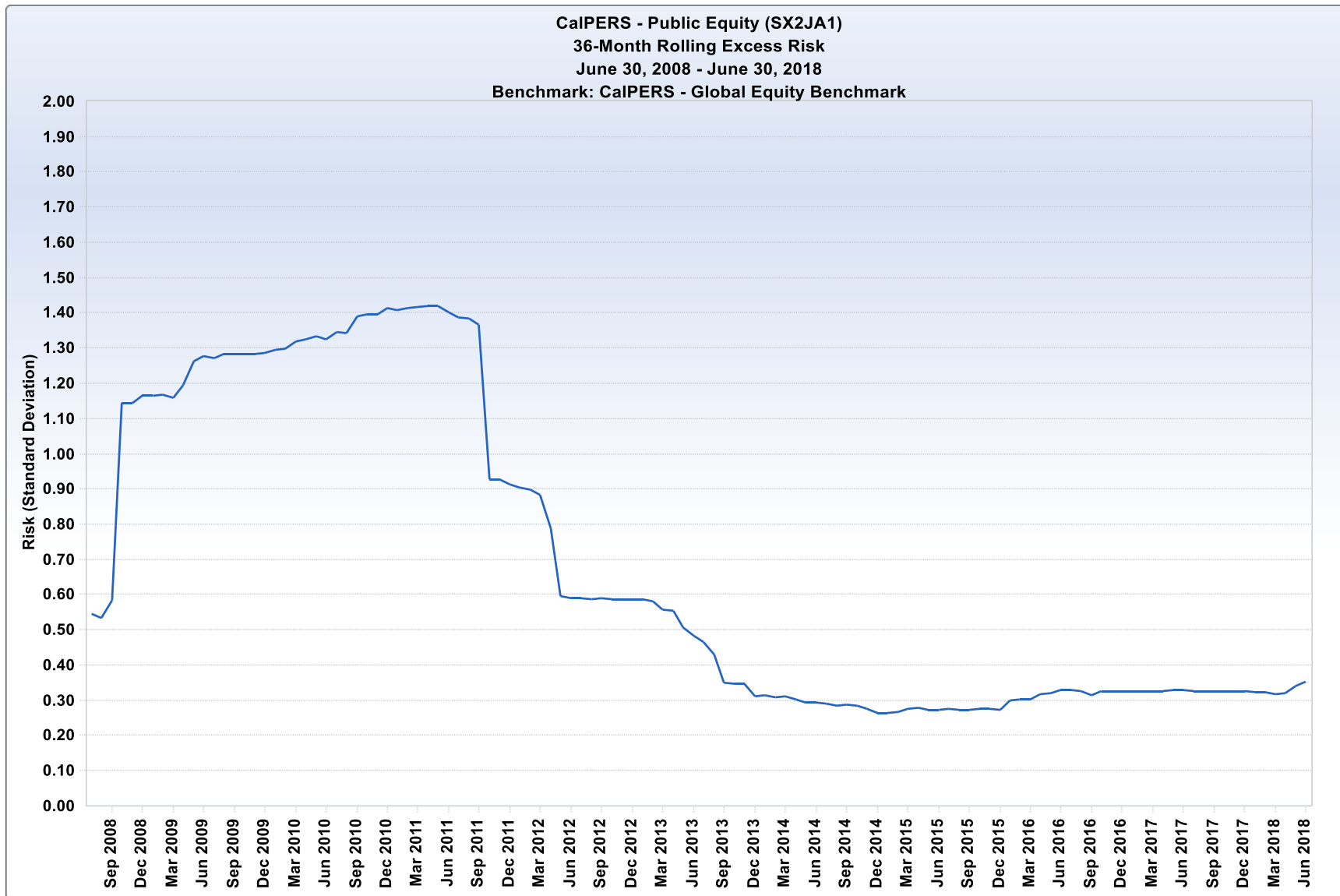
Growth: Public Equity – Rolling Excess Returns





Wilshire Consulting

Growth: Public Equity – Rolling Tracking Error

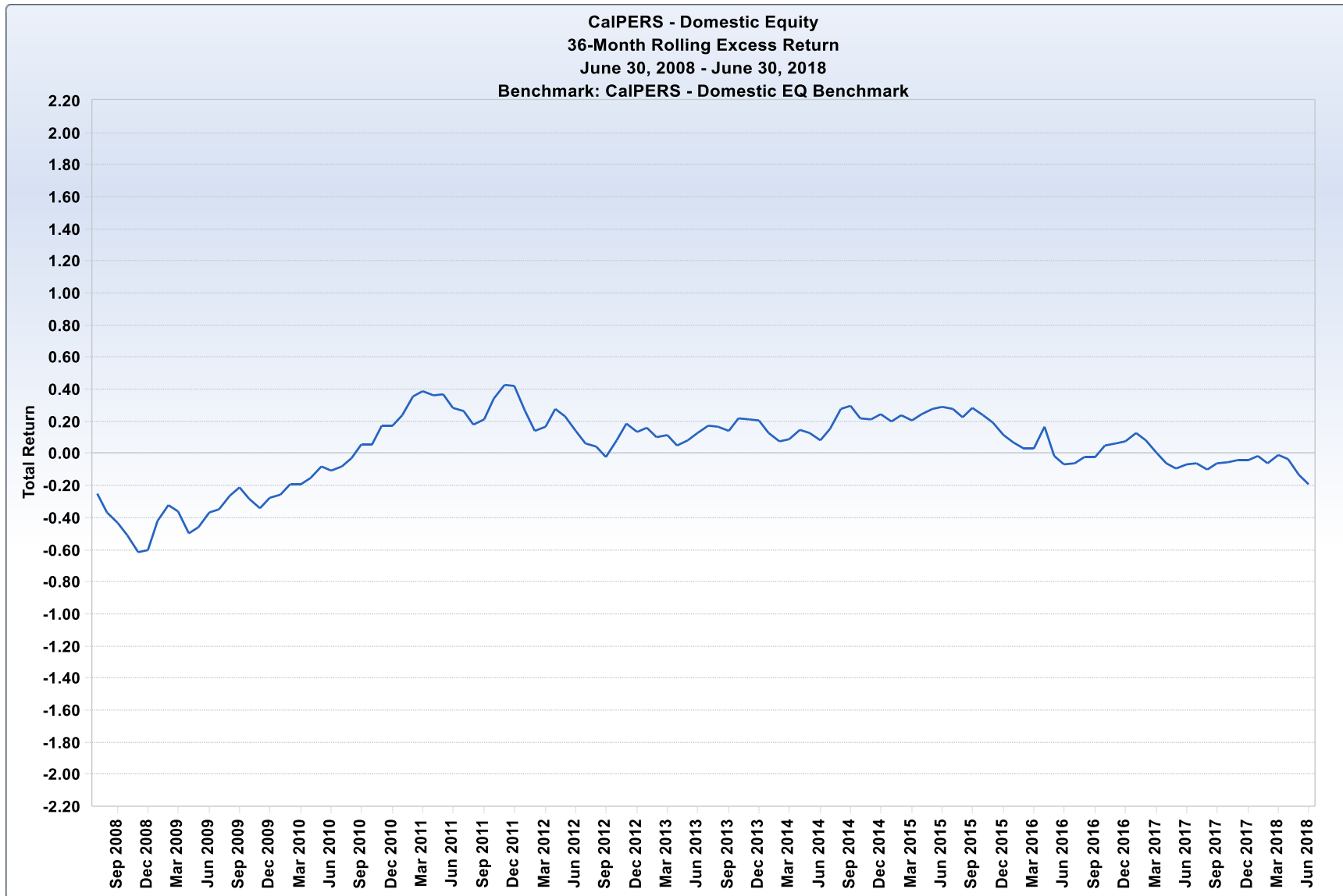




Wilshire Consulting

Growth:

U.S. Equity – Rolling Excess Returns

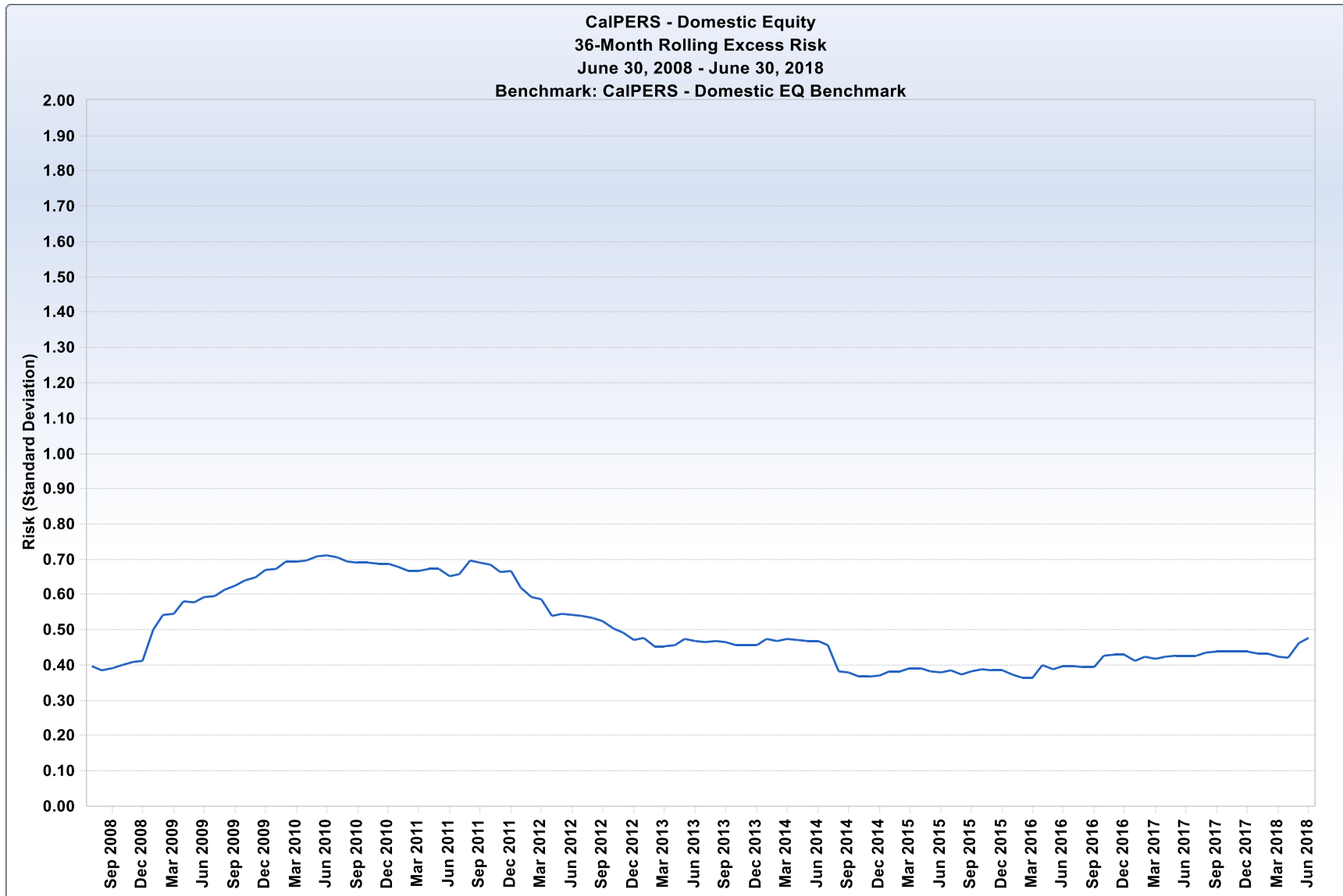




Wilshire Consulting

Growth:

U.S. Equity – Rolling Tracking Error

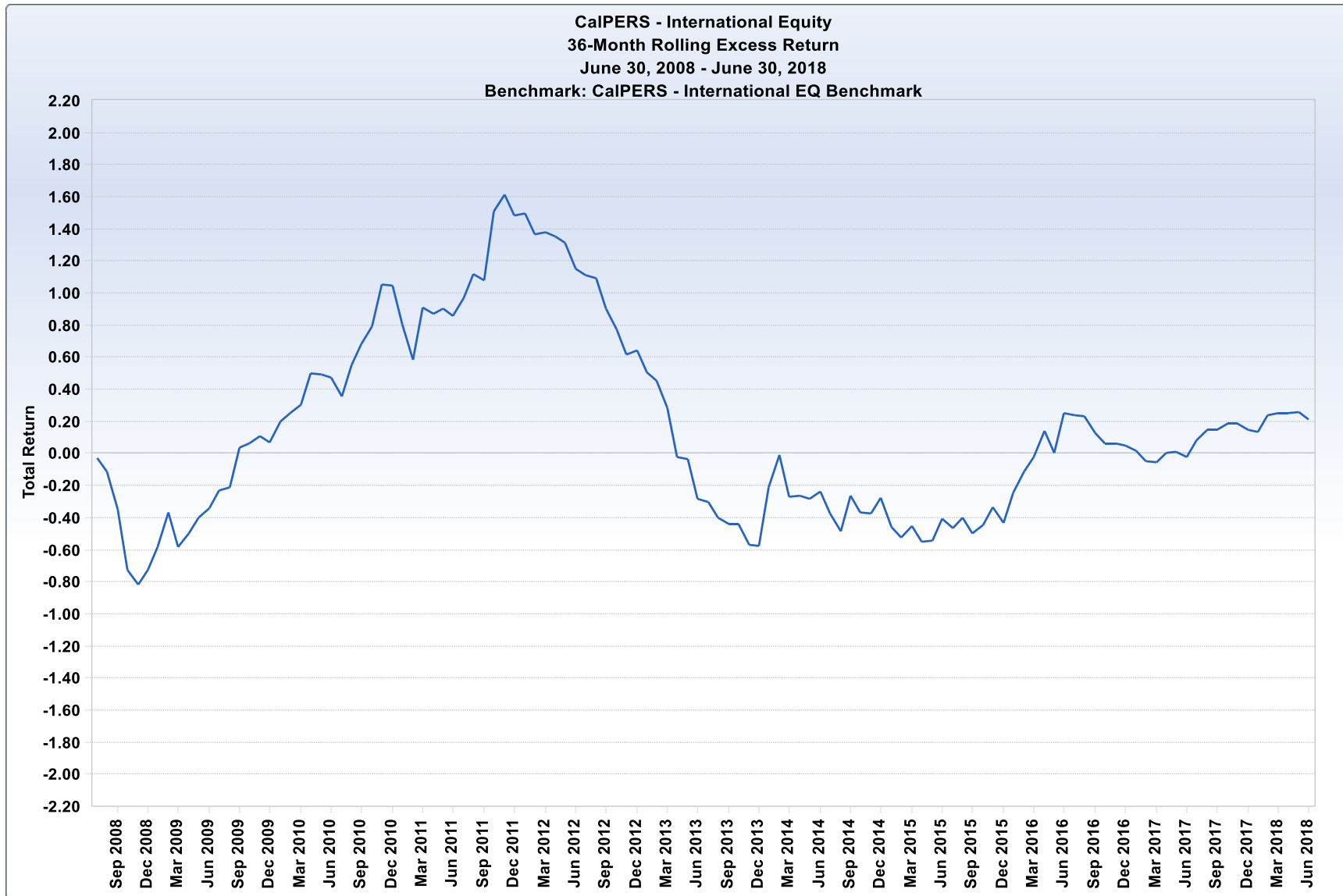




Wilshire Consulting

Growth:

International Equity – Rolling Excess Returns

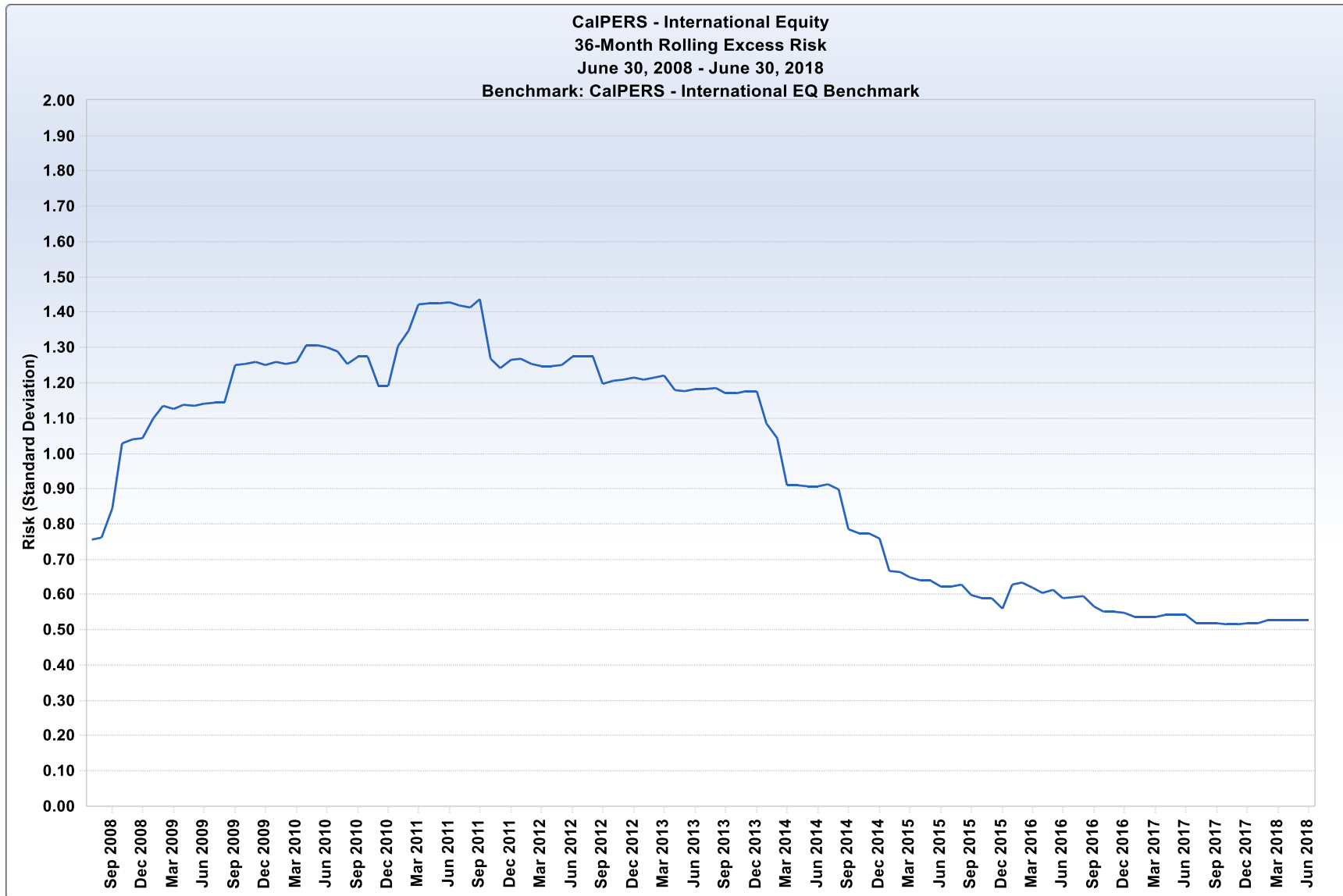




Wilshire Consulting

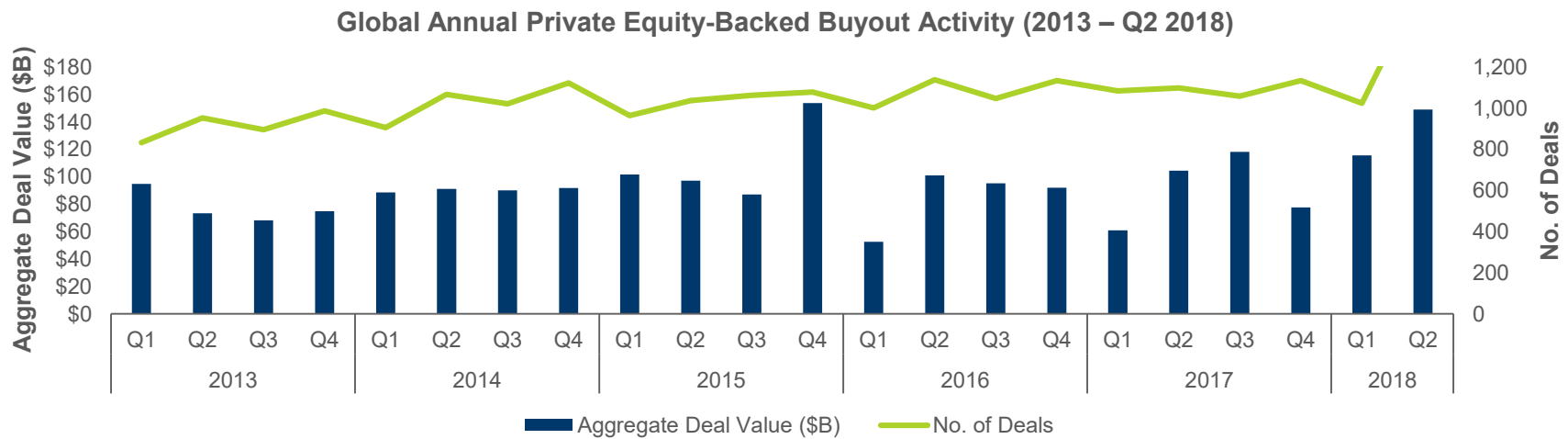
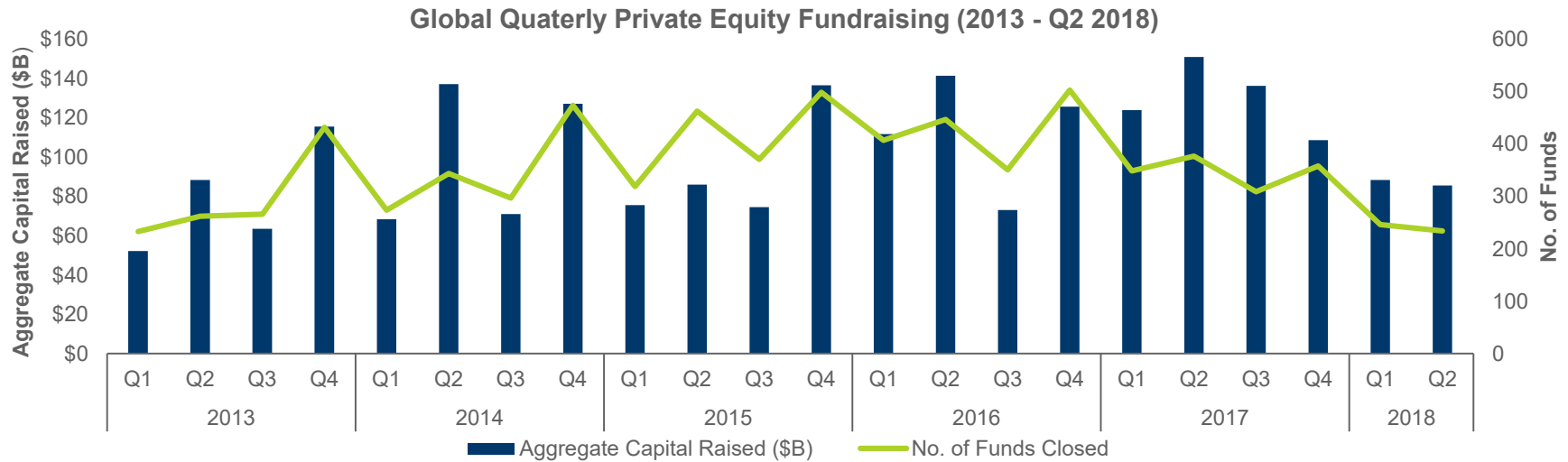
Growth:

International Equity – Rolling Tracking Error





PRIVATE EQUITY – FUNDRAISING & INVESTMENT ACTIVITY



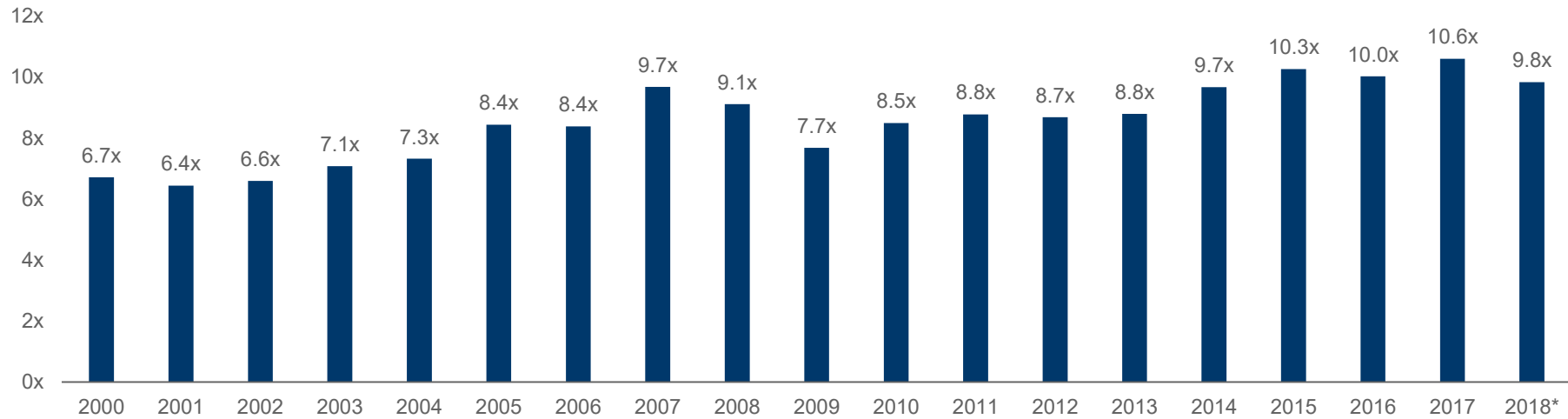
Source: Preqin, as of June 30, 2018.
©2018 Wilshire Associates.



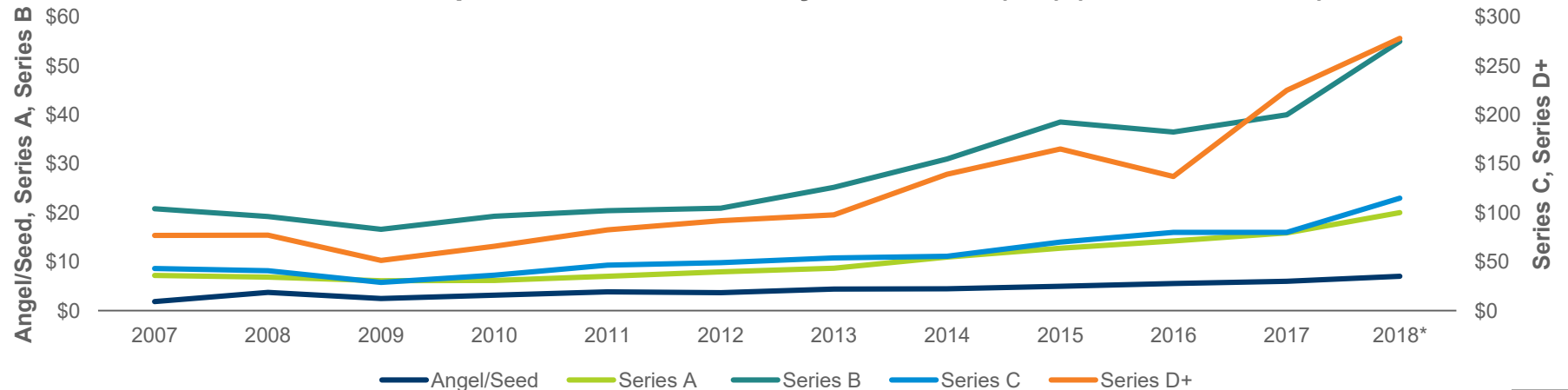
Wilshire Private Markets

PRIVATE EQUITY – PRICING & VALUATIONS

LBO Purchase Price Multiples (2000 – Q2 2018)



Venture Capital Median Pre-Money Valuations (\$M) (2007 – Q2 2018)

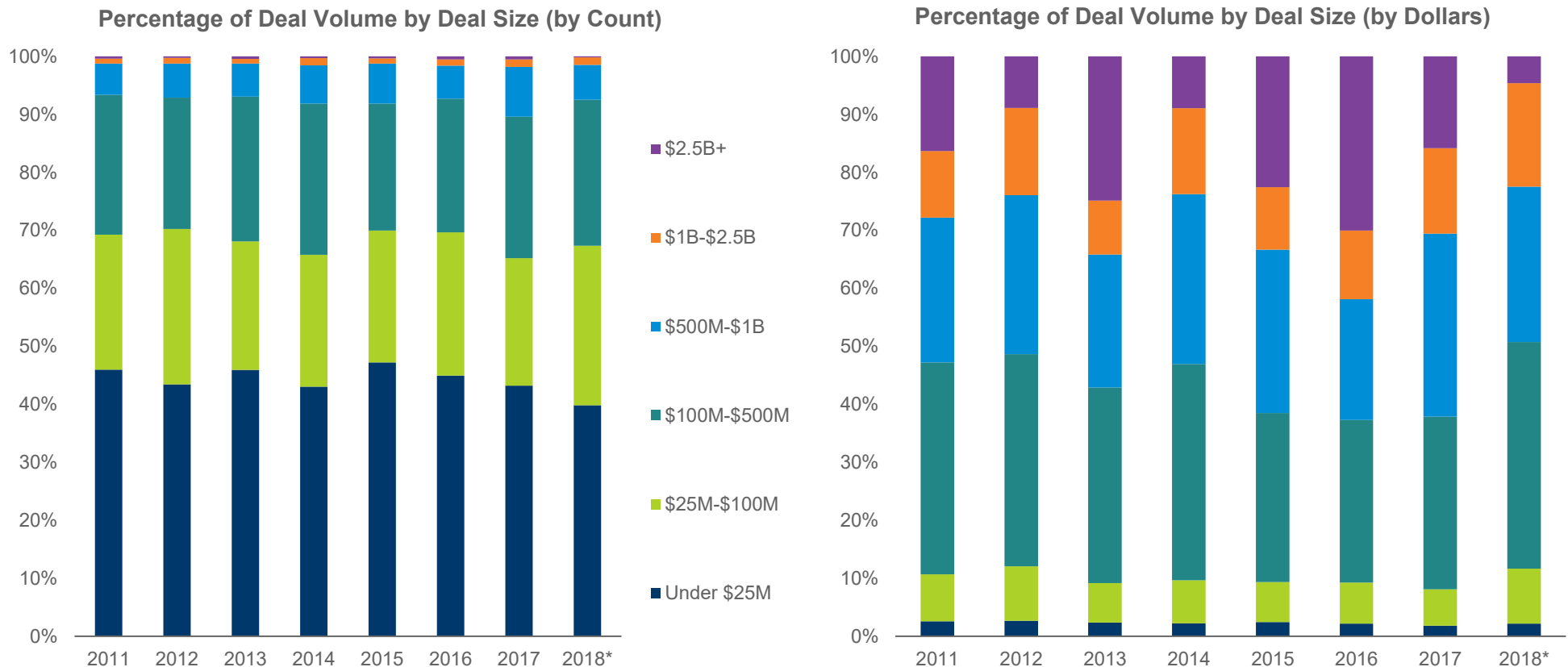


Source: S&P LBO; Pitchbook, *as of June 30, 2018.
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Wilshire Private Markets

U.S. INVESTMENT ACTIVITY BY DEAL SIZE



- Deal volume continues to be dominated by lower middle market deals with investments sizes below \$100 million through the second quarter of 2018
- However, deals with below \$100 million check sizes comprised only 13% of all deal volume by amount of capital invested in the second quarter of 2018

Source: PitchBook, *as of June 30, 2018.

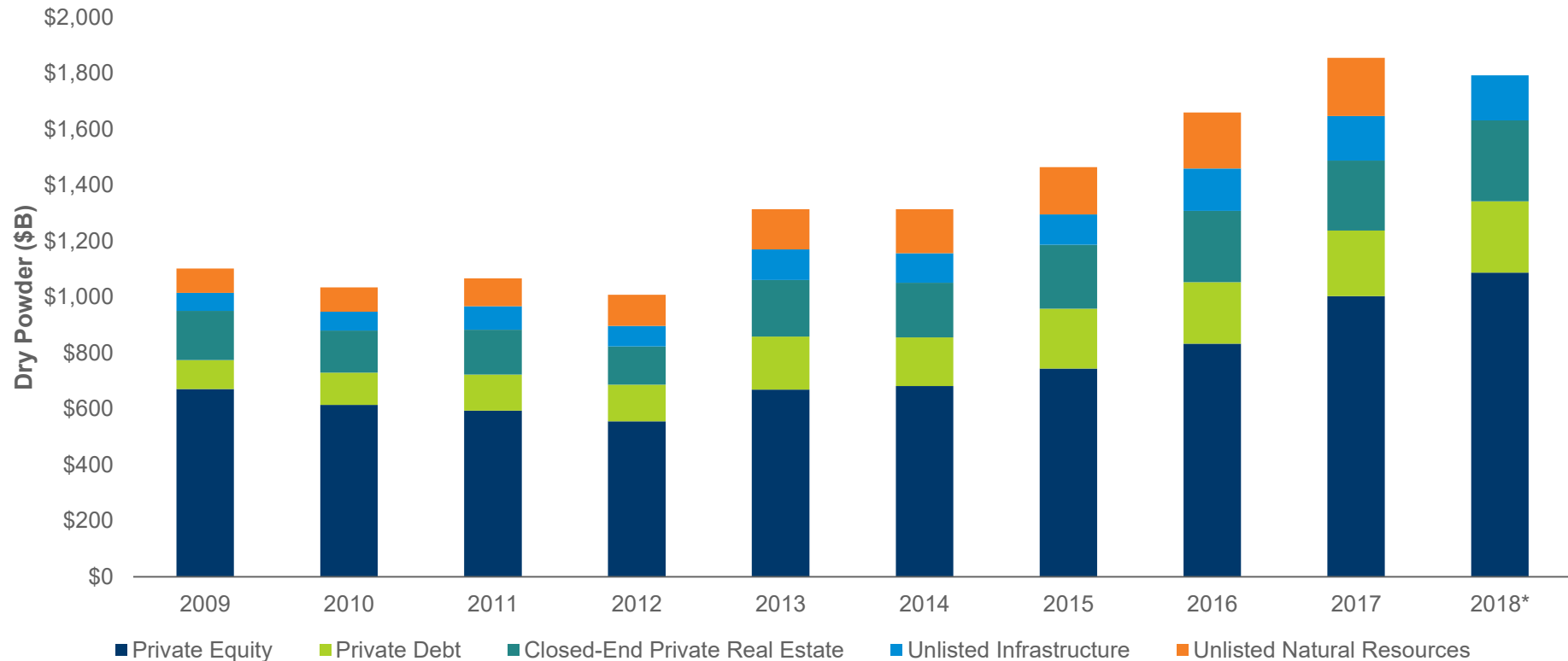
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Wilshire Private Markets

PRIVATE CAPITAL DRY POWDER

Private Capital Dry Powder by Fund Type
(2009 - Q2 2018)



- Global private capital dry powder continues to increase, topping \$1.7 trillion across all fund types
- Private equity comprised over 60% of total dry powder in the market as of Q2 2018

Source: Preqin, *as of June 30, 2018.

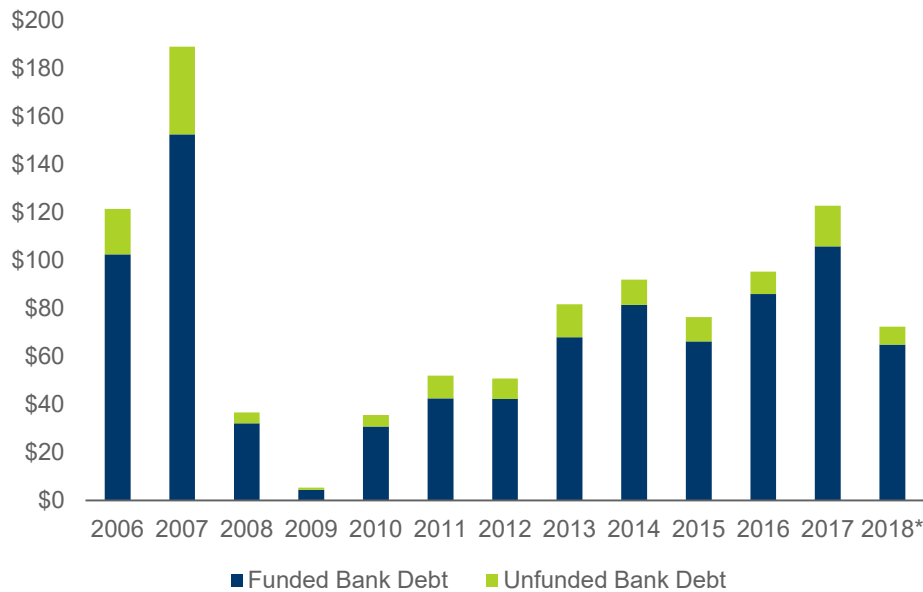
©2018 Wilshire Associates.



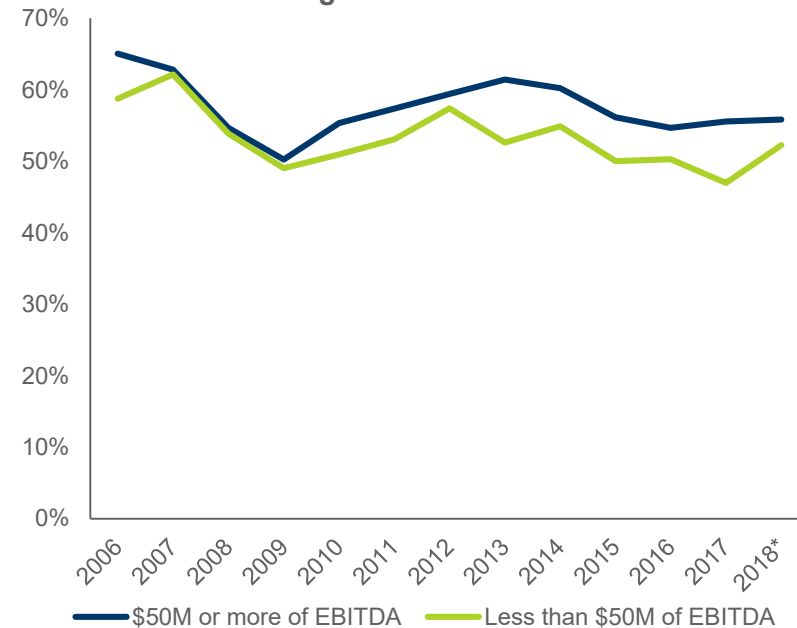
Wilshire Private Markets

PRIVATE EQUITY - U.S. DEBT MARKETS

Total U.S. LBO Loan Volume (\$B) (2006 – Q2 2018)



Percentage of Debt Used in LBOs



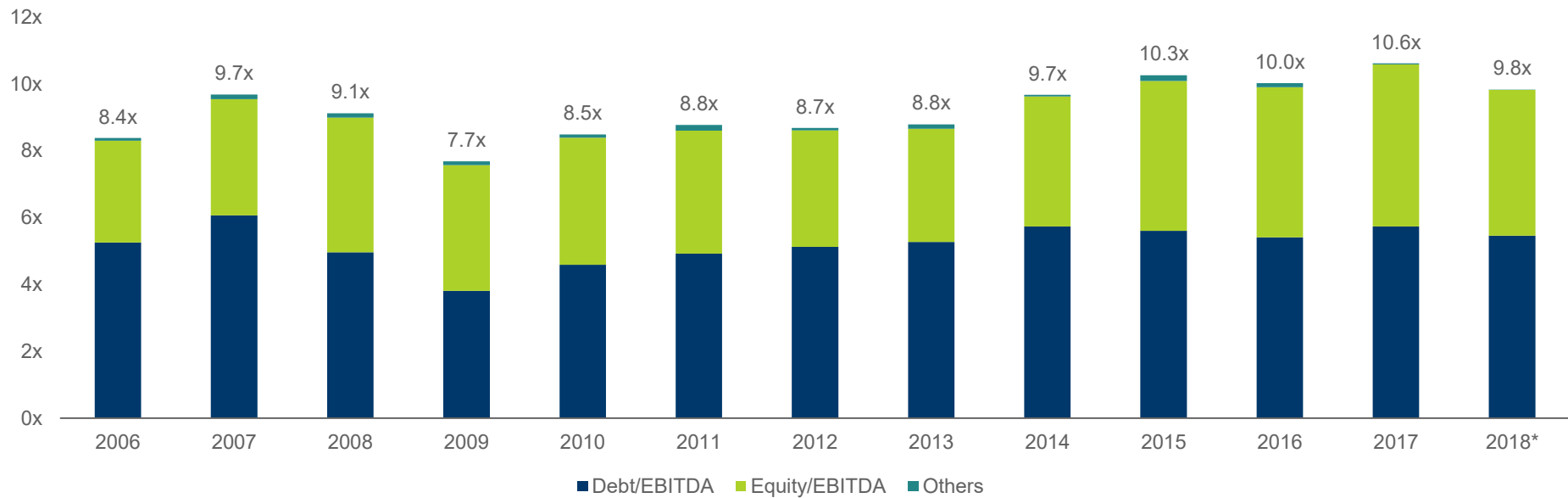
- Loan volume in 2017 increased by approximately \$27 billion from the prior year and is on pace to once again increase year-over-year through the second quarter of 2018
- Availability of debt capital has slightly driven up the percentage of debt used to finance leveraged buyouts through the second quarter of 2018



Wilshire Private Markets

PRIVATE EQUITY - U.S. LBO PURCHASE PRICE MULTIPLES

Purchase Price Multiples of U.S. LBO Transactions (2006 – Q2 2018)



- Despite the amount of debt that is readily available, purchase price multiples for U.S. LBOs decreased slightly through Q2 2018 relative to 2017 levels



Wilshire Consulting

Growth: Private Equity – Performance

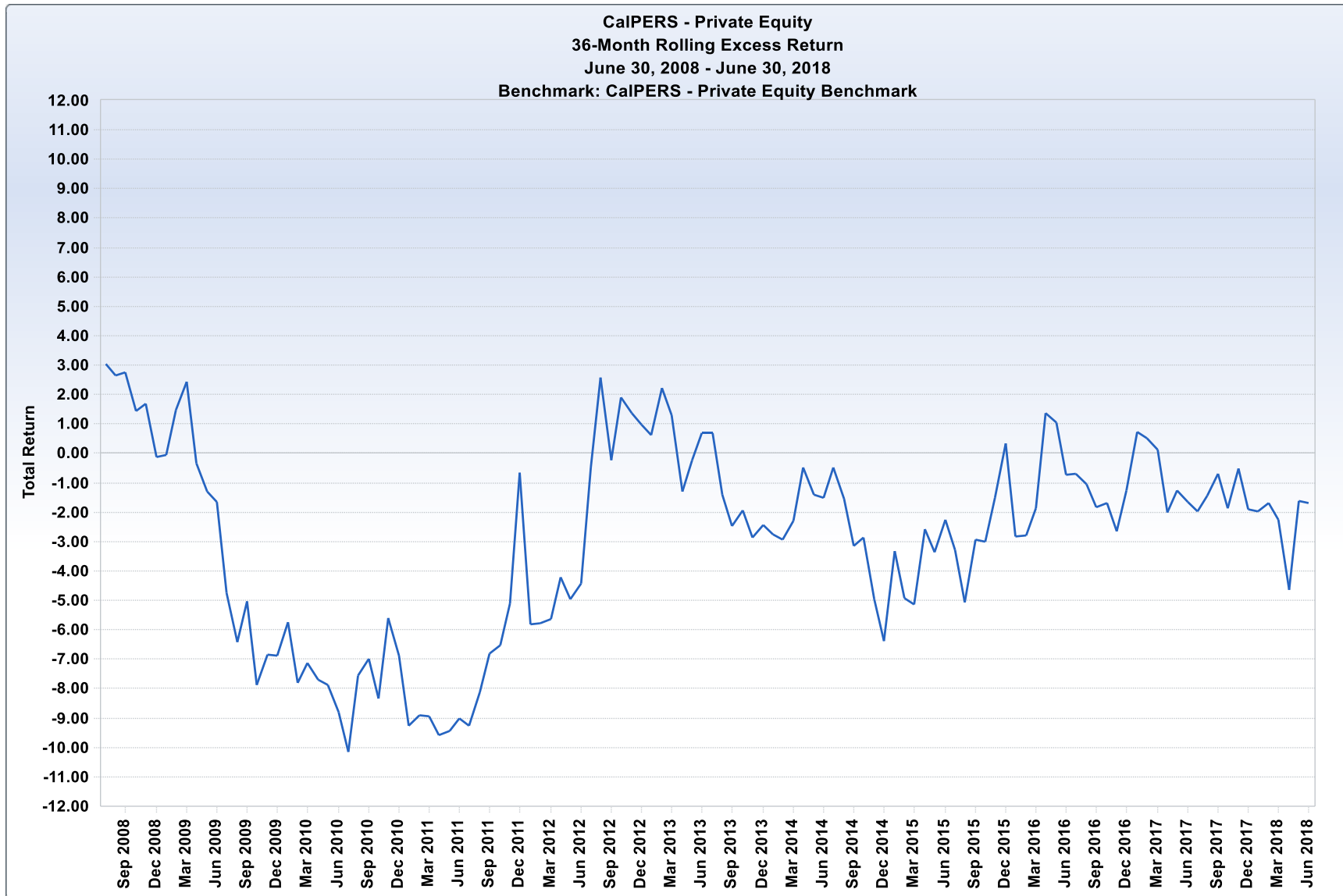
	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR	5-year Sharpe Ratio	5-year Info Ratio
PRIVATE EQUITY	27.2	3.1%	16.1%	10.4%	11.9%	9.0%	\$10.8 bil	3.4	-0.2
<i>PE Policy Benchmark</i>		0.0%	18.6%	12.3%	14.2%	13.5%		1.4	0.0
<i>Value Added</i>		3.1%	-2.5%	-1.9%	-2.3%	-4.5%			
Private Equity Partnership Investments	27.1	3.2%	16.1%	10.5%	12.0%	9.1%			
Private Equity Distribution Stock	0.0	3.4%	45.6%	-9.4%	-12.1%	-5.3%			



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Growth:

Private Equity – Rolling Excess Returns

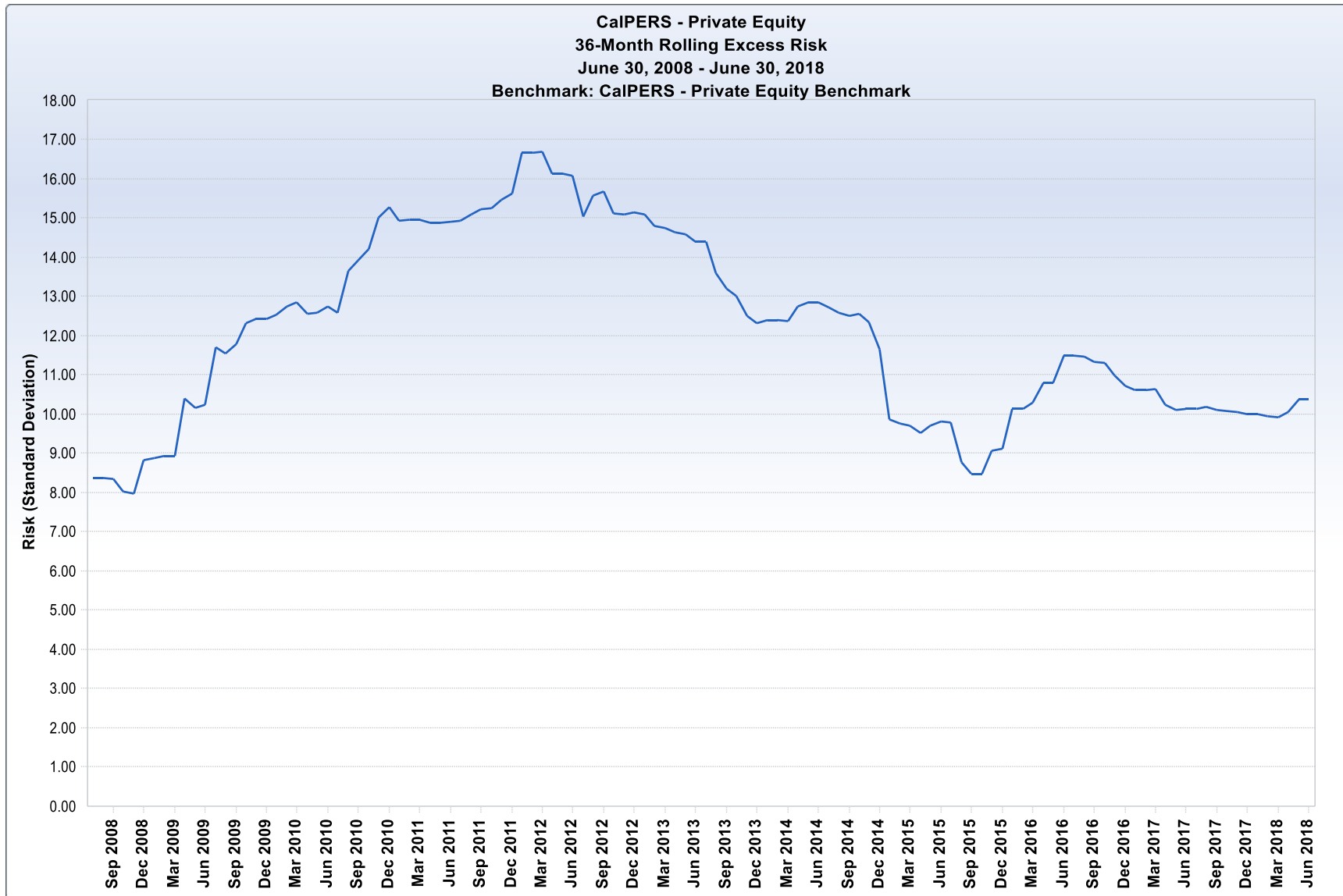




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Growth:

Private Equity – Rolling Tracking Error

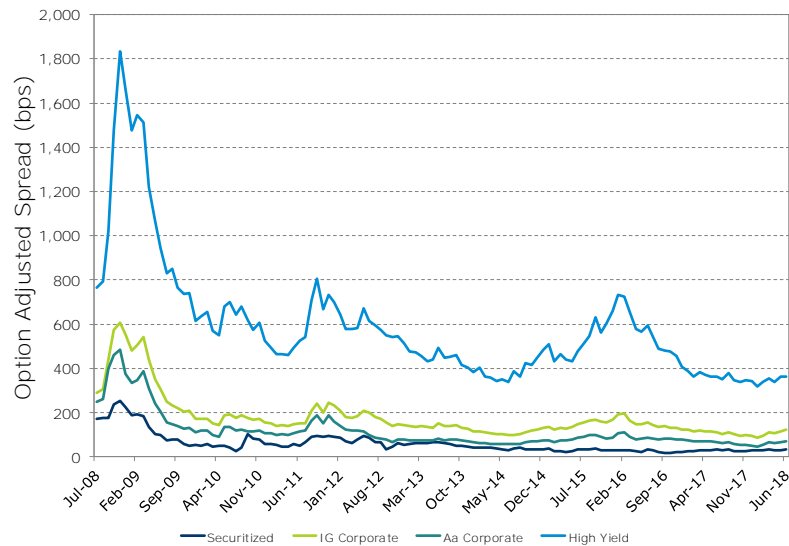


U.S. FIXED INCOME

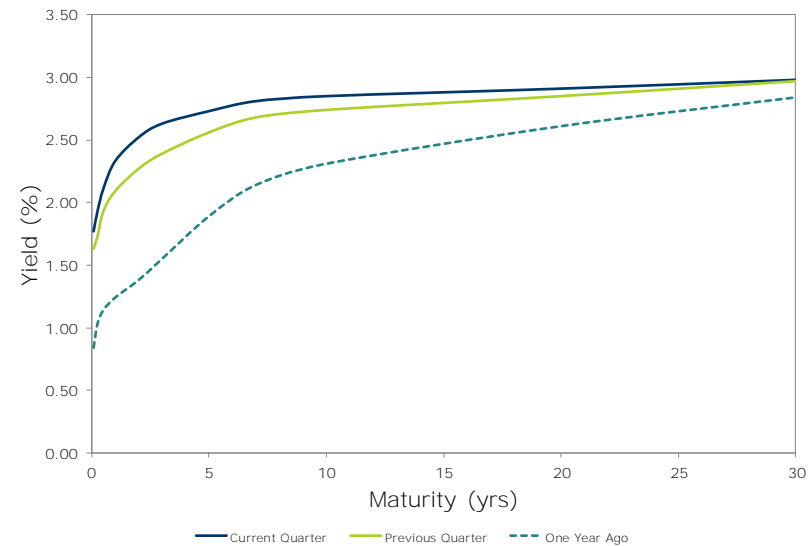
AS OF JUNE 30, 2018	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	3.3	6.0	-0.2	-1.6	-0.4	1.7	2.3	3.7
BLOOMBERG BARCLAYS TREASURY	2.7	6.1	0.1	-1.1	-0.7	1.0	1.5	3.0
BLOOMBERG BARCLAYS GOV'T-REL.	3.3	5.3	-0.3	-1.3	0.1	1.7	2.3	3.4
BLOOMBERG BARCLAYS SECURITIZED	3.4	5.0	0.2	-1.0	0.1	1.5	2.2	3.6
BLOOMBERG BARCLAYS CORPORATE	4.0	7.3	-1.0	-3.3	-0.8	3.1	3.5	5.4
BLOOMBERG BARCLAYS LT G/C	4.0	14.9	-1.5	-5.0	-0.8	4.3	5.1	6.8
BLOOMBERG BARCLAYS LT TREASURY	3.0	17.2	0.3	-3.0	-0.1	3.4	4.5	6.1
BLOOMBERG BARCLAYS LT GOV't-REL.	4.5	12.1	-1.4	-3.7	1.2	4.3	5.4	6.6
BLOOMBERG BARCLAYS LT CORP.	4.7	13.6	-2.8	-6.8	-1.8	5.1	5.5	7.4
BLOOMBERG BARCLAYS U.S. TIPS *	2.8	7.6	0.8	0.0	2.1	1.9	1.7	3.0
BLOOMBERG BARCLAYS HIGH YIELD	6.7	3.9	1.0	0.2	2.6	5.5	5.5	8.2
TREASURY BILLS	1.9	0.25	0.5	0.8	1.4	0.7	0.4	0.4

* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index

BLOOMBERG BARCLAYS FIXED INCOME INDEXES



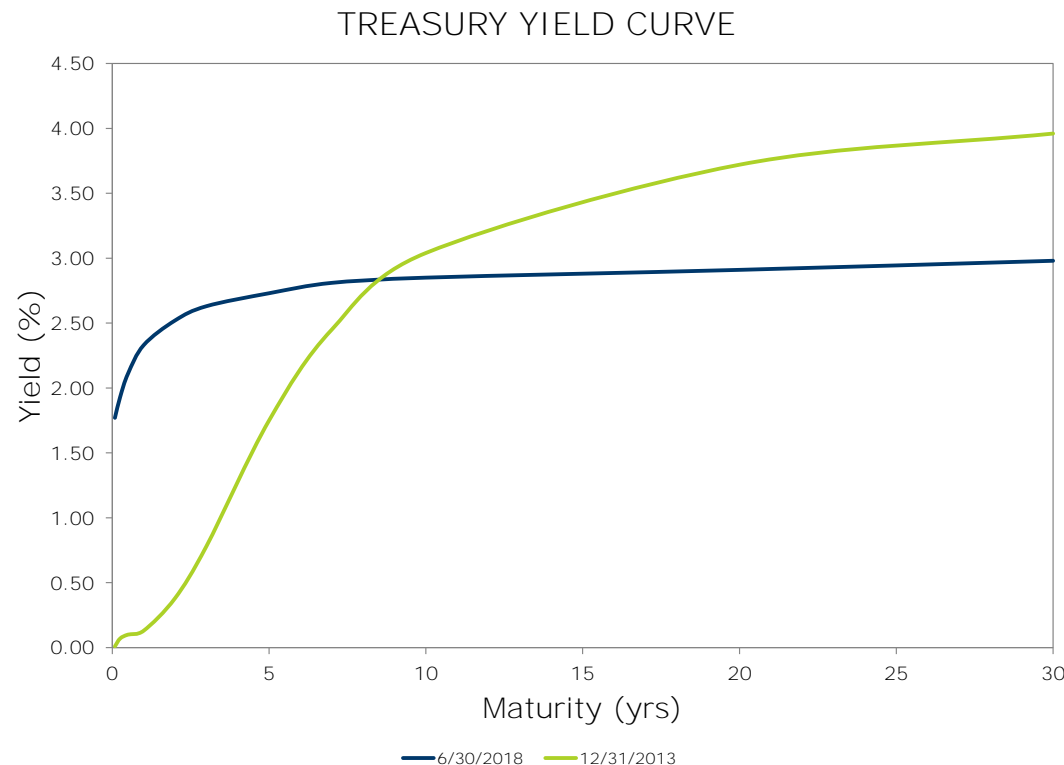
TREASURY YIELD CURVE



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

FLATTENING YIELD CURVE

- U.S. yield curve has changed dramatically during the past 5 years
 - Last time the slope peaked was year-end 2013; 10 minus 2-Year Treasury = 2.6%
 - Currently flatter than any time in the previous decade; yield difference now at 0.4%
- Continued economic growth without upward movement in long rates could be an indication that market participants are expecting a slowdown on the horizon

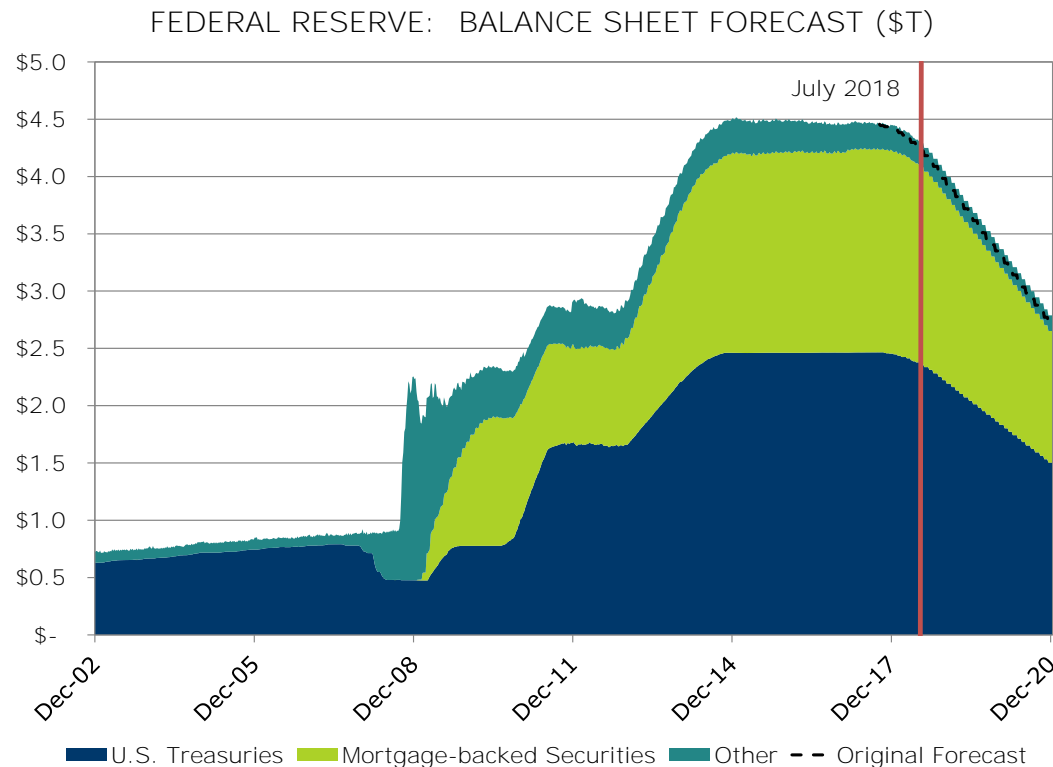


Data source: Federal Reserve

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FEDERAL RESERVE

- Federal Reserve began their balance sheet normalization program during October 2017; targeting \$10B in reductions per month while increasing to \$50B per month in Q4 2018
- European Central Bank has announced their intention to end their quantitative easing program this year; Bank of Japan reduced their bond purchases for the third time in June



Data sources: Federal Reserve

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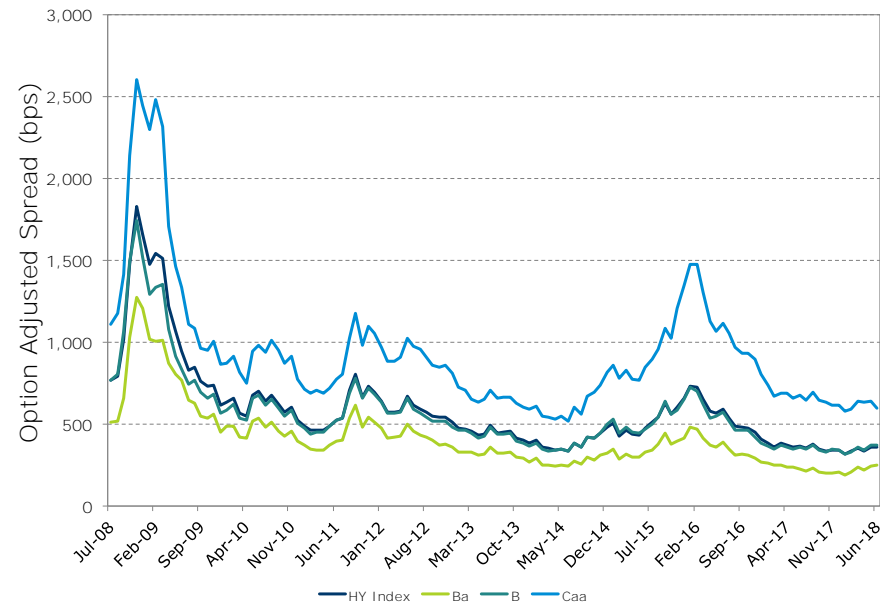
Wilshire Consulting



HIGH YIELD BOND MARKET

AS OF JUNE 30, 2018		QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS HIGH YIELD		1.0	0.2	2.6	5.5	5.5	8.2
CREDIT SUISSE LEVERAGED LOAN		0.8	2.4	4.7	4.3	4.2	5.0
HIGH YIELD QUALITY DISTRIBUTION	WEIGHT						
Ba U.S. HIGH YIELD	43.2%	-0.2	-1.8	0.6	4.8	5.4	8.2
B U.S. HIGH YIELD	42.2%	1.4	0.9	3.0	4.8	5.0	6.8
Caa U.S. HIGH YIELD	13.5%	2.9	3.2	6.8	8.7	7.1	8.3
Ca to D U.S. HIGH YIELD	0.9%	18.9	21.6	24.1	12.1	-6.6	5.5
Non-Rated U.S. HIGH YIELD	0.2%	1.2	1.4	2.0	-1.3	0.8	2.0

BLOOMBERG BARCLAYS HIGH YIELD INDEXES



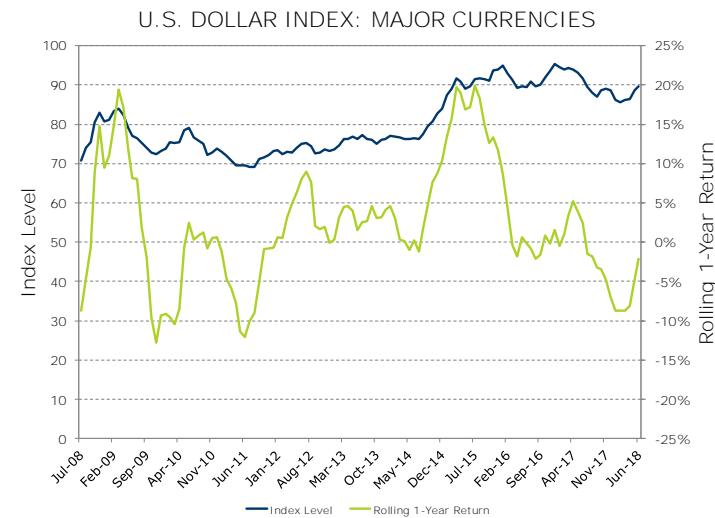
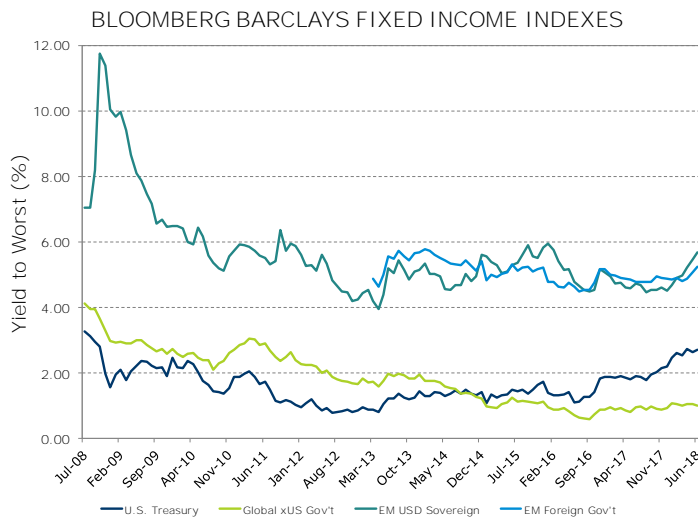
Data sources: Wilshire Compass, Bloomberg Barclays

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NON-U.S. FIXED INCOME

AS OF JUNE 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DEVELOPED MARKETS						
BLMBRG BRCLYS GBL AGGREGATE xUS	-4.8	-1.3	2.8	3.2	0.9	1.8
BLMBRG BRCLYS GBL AGGREGATE xUS *	0.5	1.4	3.3	3.6	4.0	4.4
BLMBRG BRCLYS GLOBAL INF LNKD xUS	-5.8	-2.8	4.2	2.5	3.0	2.2
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	0.0	0.7	4.3	5.9	6.2	5.6
EMERGING MARKETS (HARD CURRENCY)						
BLMBRG BRCLYS EM USD AGGREGATE	-2.4	-3.8	-1.1	4.0	4.5	6.6
EMERGING MARKETS (FOREIGN CURRENCY)						
BLMBRG BRCLYS EM LOCAL CURR. GOV'T	-8.2	-5.5	-0.8	1.9	0.5	2.6
BLMBRG BRCLYS EM LOCAL CURR. GOV'T *	-1.4	-0.4	0.7	2.2	2.2	3.7
EURO vs. DOLLAR	-5.1	-2.8	2.4	1.6	-2.1	-3.0
YEN vs. DOLLAR	-4.0	1.7	1.4	3.4	-2.2	-0.4
POUND vs. DOLLAR	-5.9	-2.4	1.7	-5.7	-2.7	-4.0

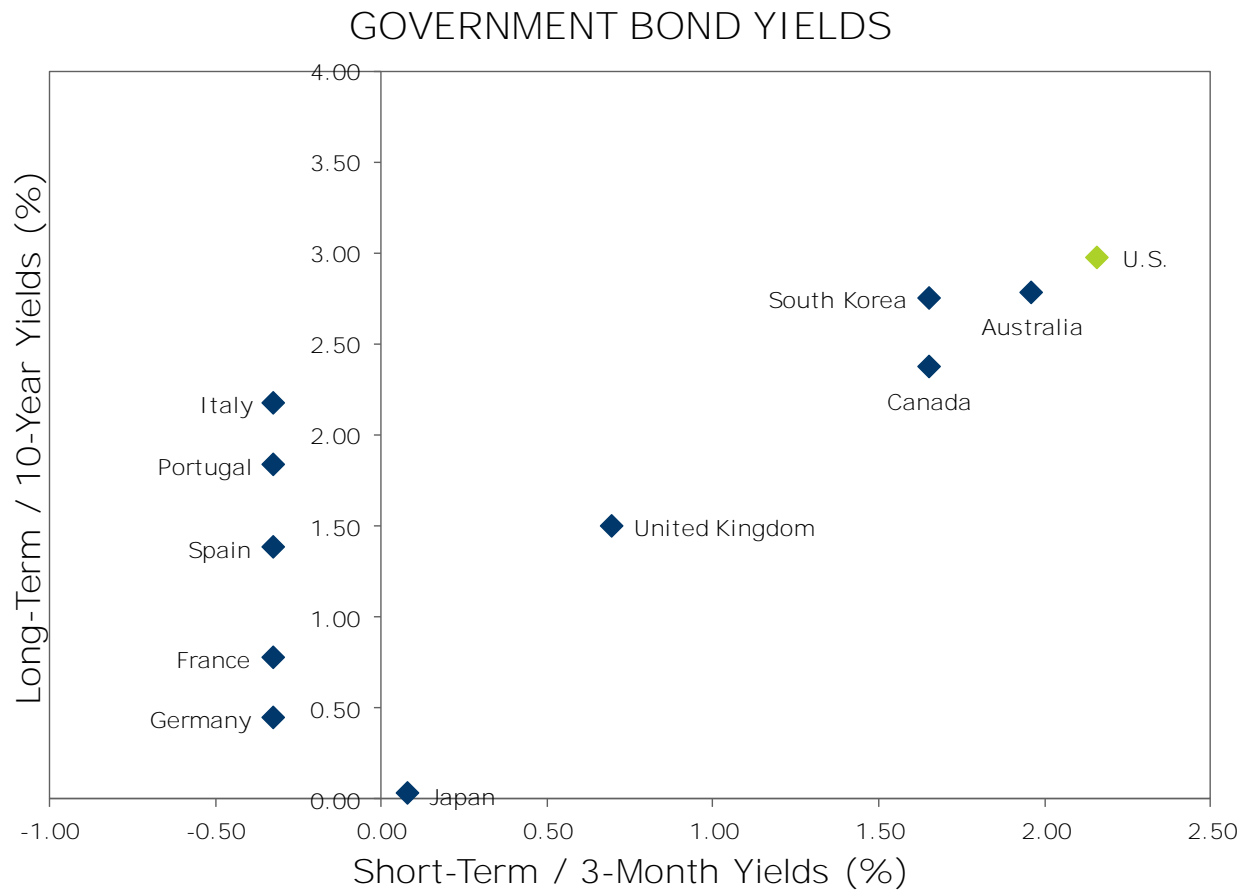
* Returns are reported in terms of local market investors, which removes currency effects.



Data sources: Wilshire Compass, Bloomberg Barclays, Federal Reserve Bank of St. Louis

GLOBAL INTEREST RATES

Negative short-term rates remain in Europe while the major economies of France and Germany also offer long-term rates below 1%



Data sources: Organization for Economic Co-operation and Development

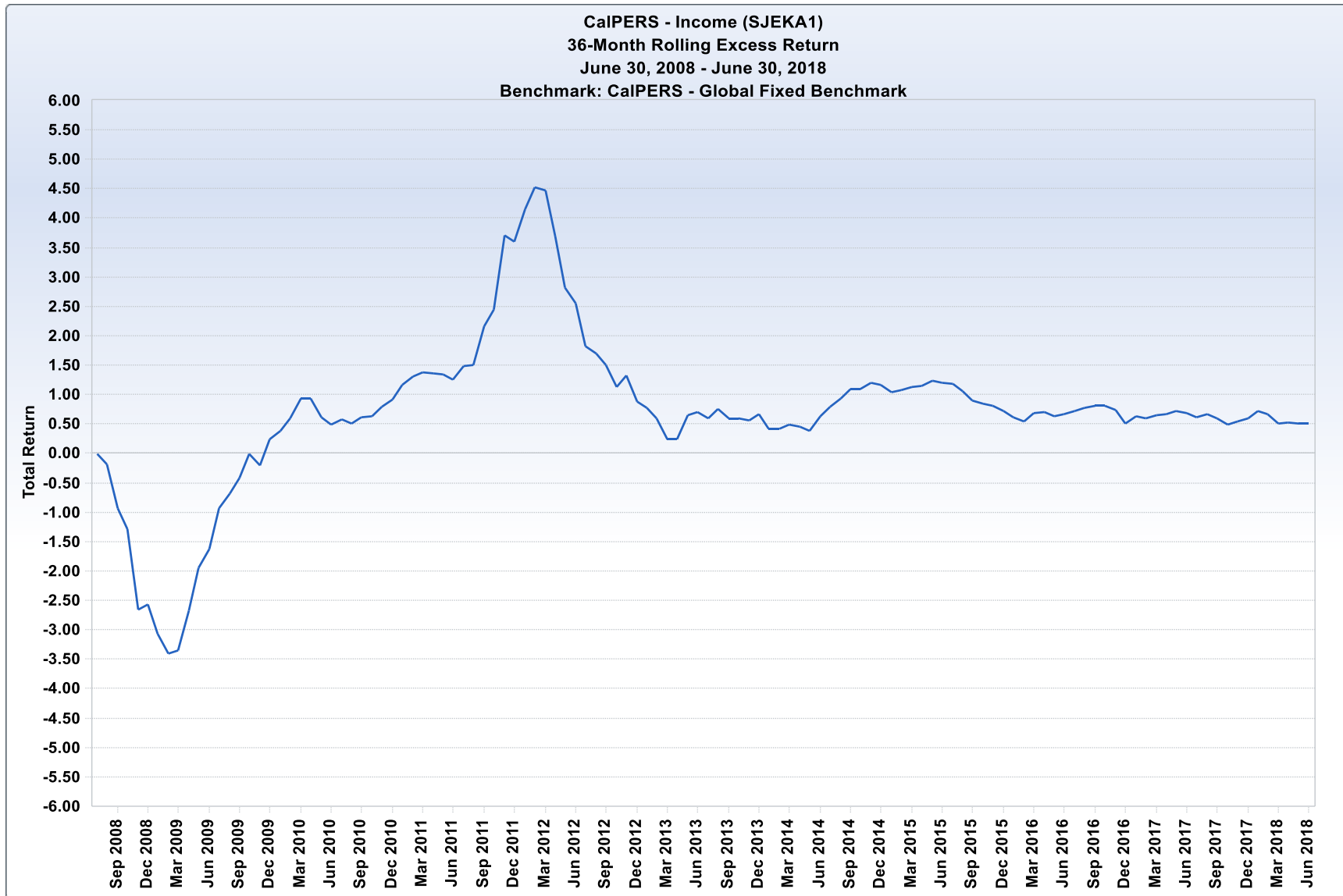


Wilshire Consulting

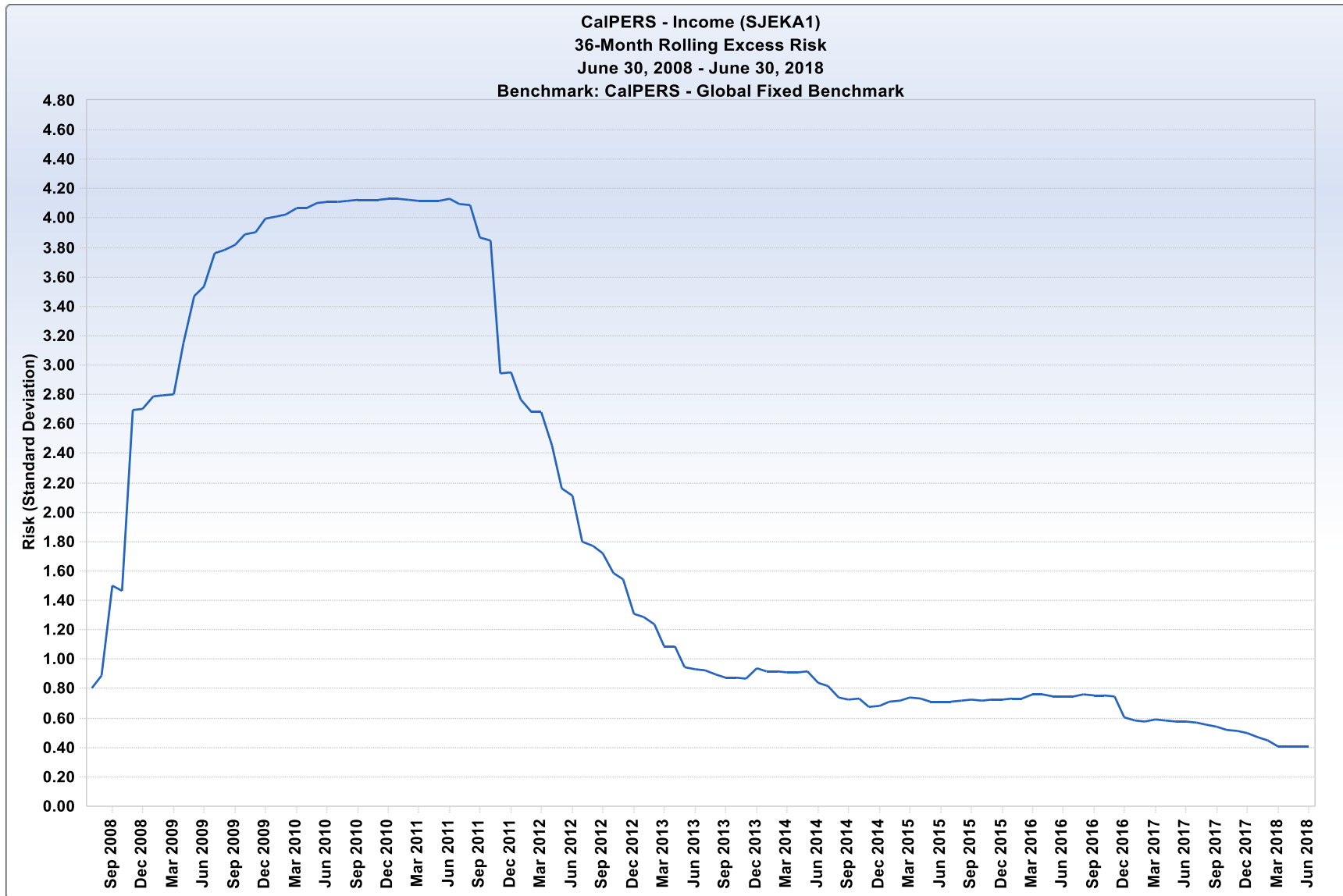
Income – Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR	5-year Sharpe Ratio	5-year Info Ratio
INCOME	79.1	-0.8%	0.4%	3.2%	3.8%	5.7%	\$7.2 bil	0.8	1.2
<i>Income Policy Benchmark</i>		-0.9%	0.0%	2.7%	3.1%	4.9%		0.6	0.0
<i>Value Added</i>		0.1%	0.4%	0.5%	0.7%	0.8%			
U.S. Income	72.4	-0.3%	0.3%	3.3%	4.2%	6.1%		0.8	1.4
<i>U.S. Income Policy Benchmark</i>		-0.3%	-0.2%	2.7%	3.4%	5.3%		0.5	0.0
<i>Value Added</i>		0.0%	0.5%	0.6%	0.8%	0.8%			
Non-U.S. Income	6.6	-6.0%	1.5%	2.7%	0.6%	2.3%		-0.2	0.8
<i>Non-US Income Policy Benchmark</i>		-5.6%	1.7%	2.4%	0.0%	1.3%		-0.2	0.0
<i>Value Added</i>		-0.4%	-0.2%	0.3%	0.6%	1.0%			

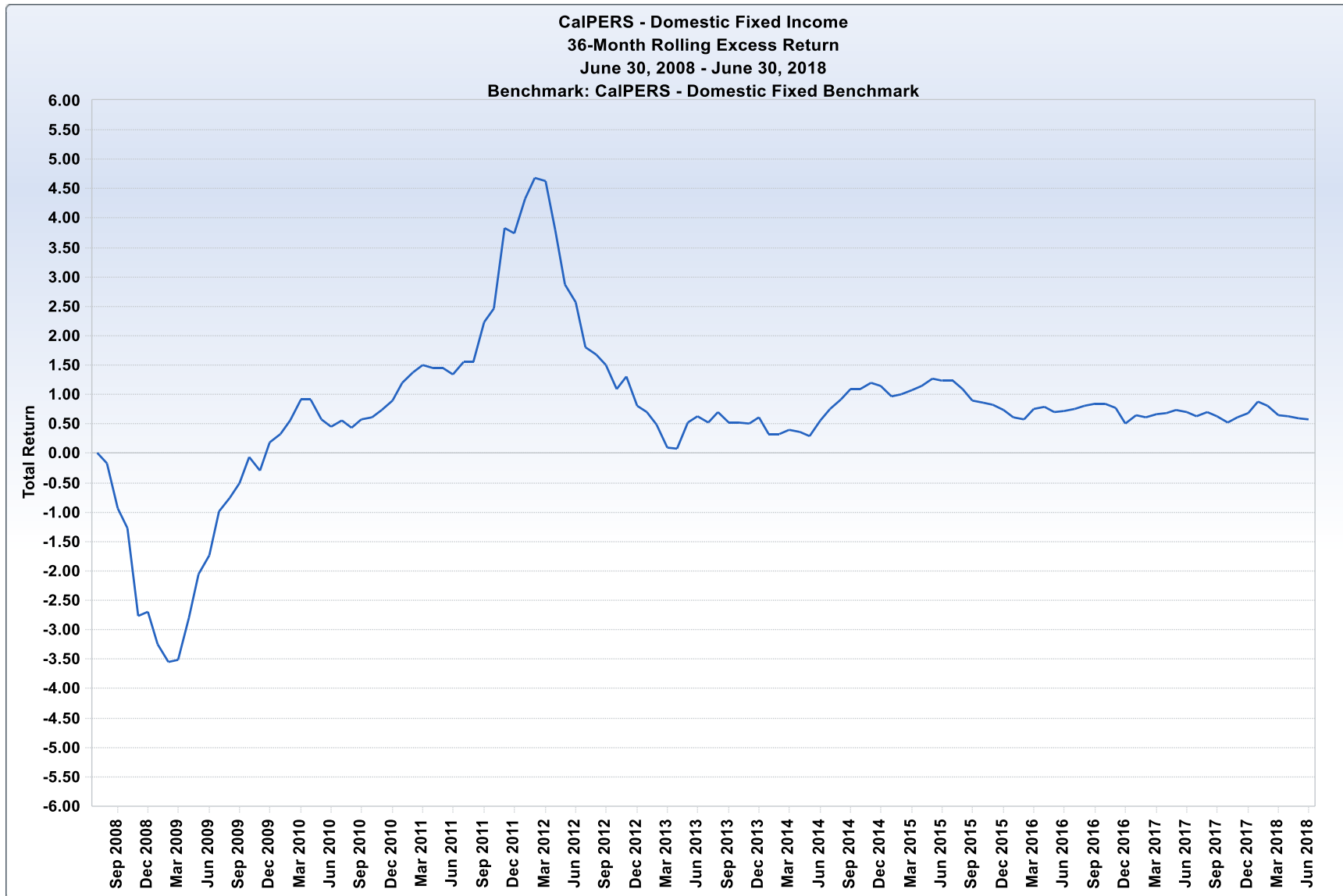
Income – Rolling Excess Returns



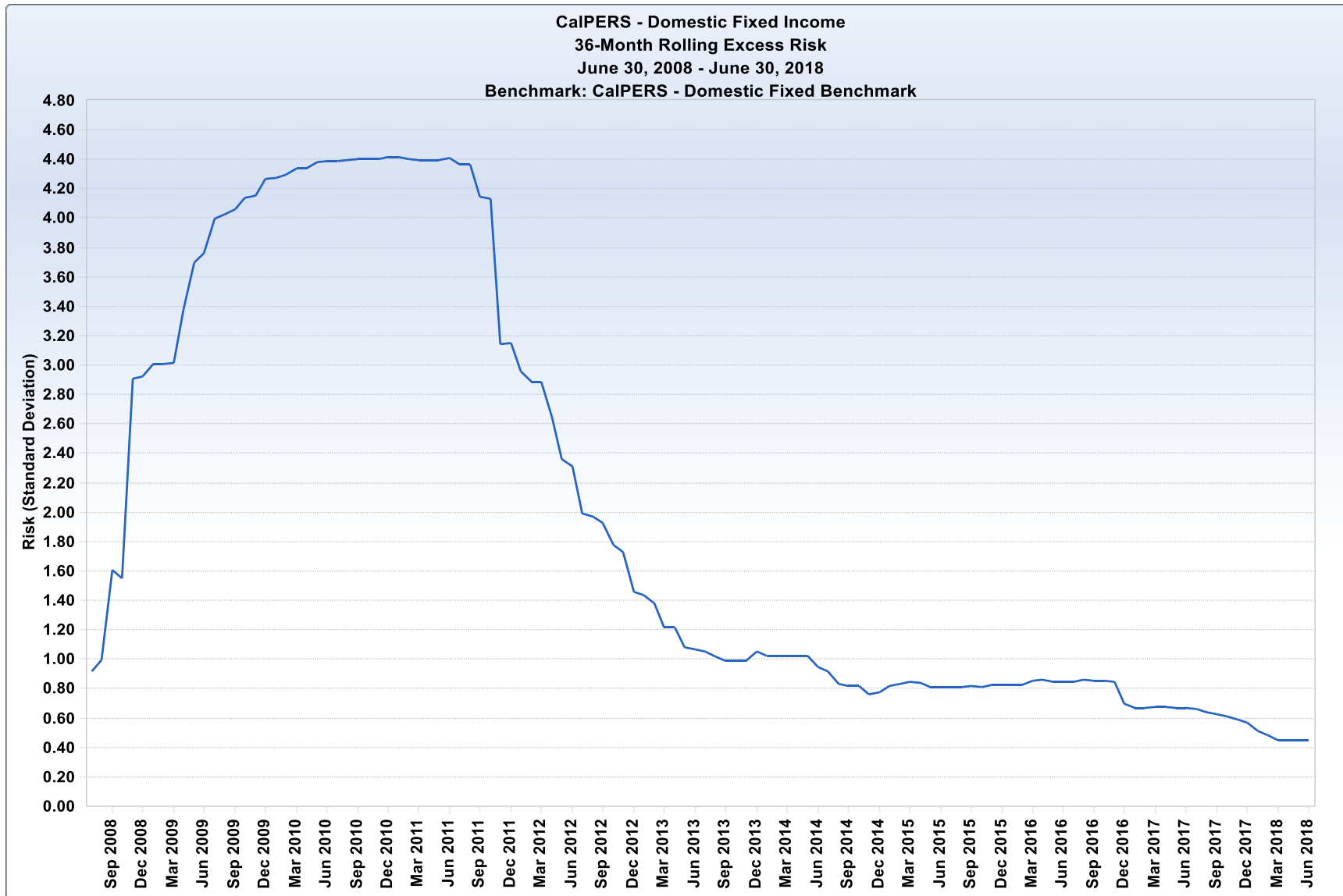
Income – Rolling Tracking Error



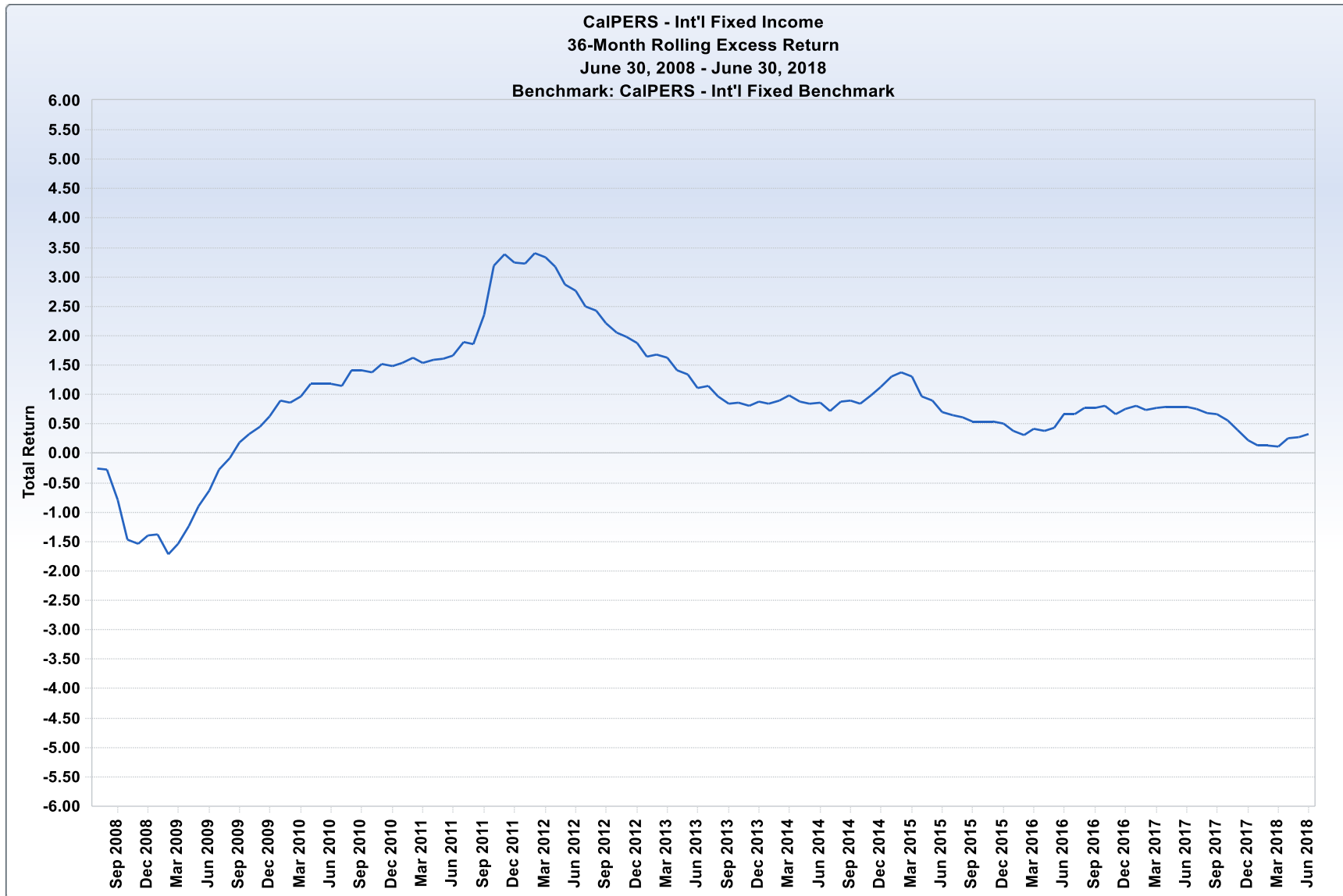
U.S. Income – Rolling Excess Returns



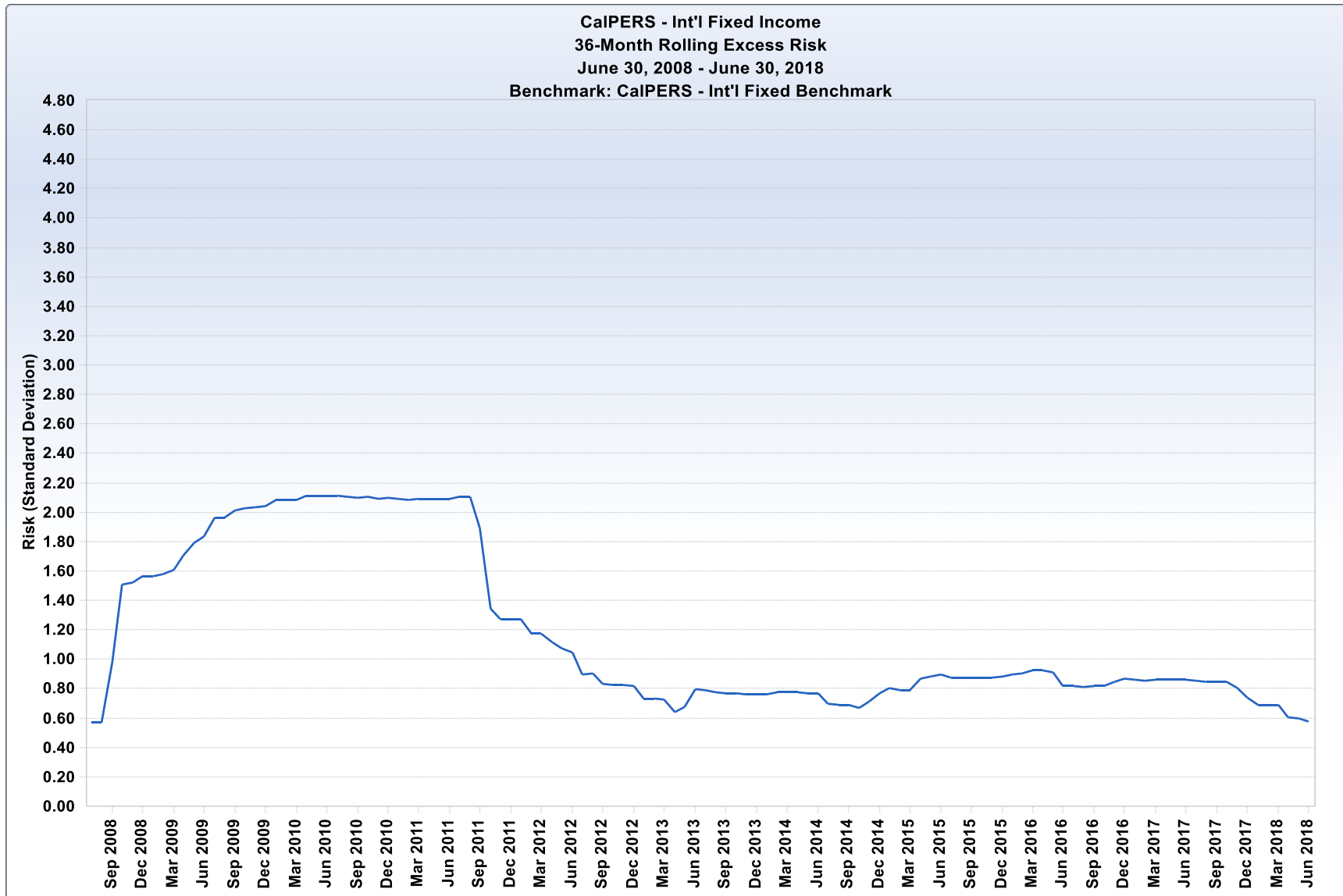
U.S. Income – Rolling Tracking Error



International Income – Rolling Excess Returns



International Income – Rolling Tracking Error

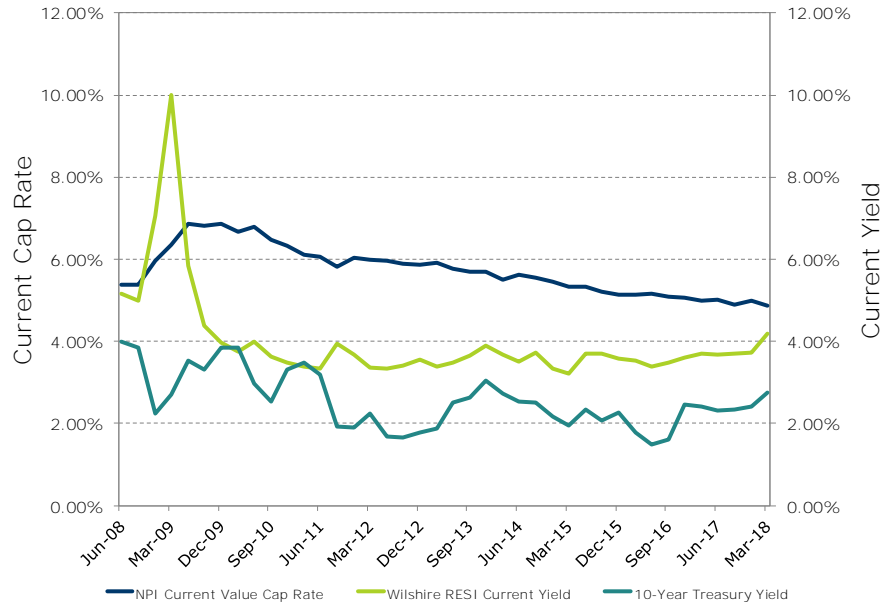


Wilshire Consulting REAL ASSETS

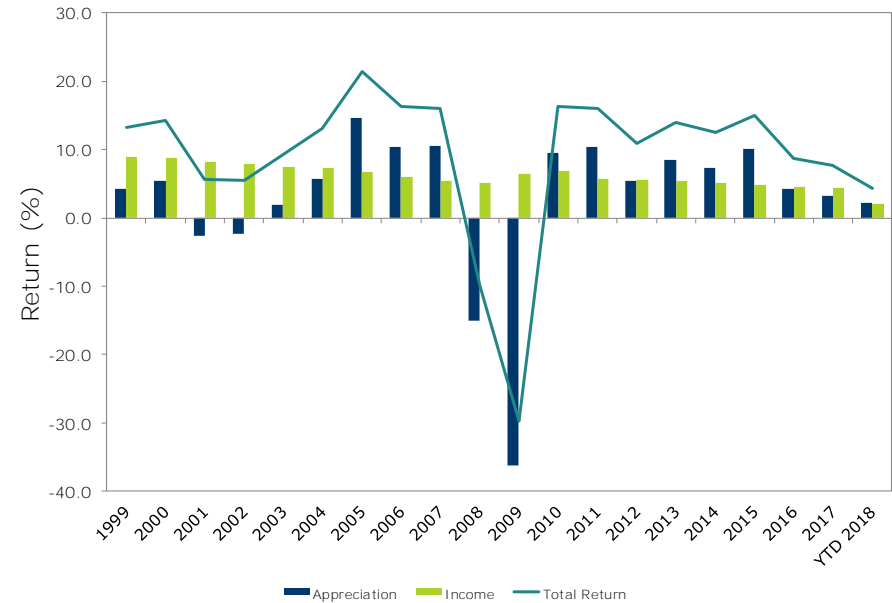


AS OF JUNE 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS U.S. TIPS	0.8	0.0	2.1	1.9	1.7	3.0
BLOOMBERG COMMODITY INDEX	0.4	0.0	7.3	-4.5	-6.4	-9.0
WILSHIRE GLOBAL RESI INDEX	6.0	0.5	5.1	6.8	7.5	6.6
NCREIF ODCE FUND INDEX	2.0	4.3	8.4	9.4	11.0	5.3
NCREIF TIMBERLAND INDEX	0.5	1.4	3.6	3.4	6.0	4.0
ALERIAN MLP INDEX (OIL & GAS)	11.8	-0.6	-4.6	-5.9	-4.1	6.5

REAL ESTATE VALUATION



NCREIF ODCE FUND INDEX RETURN



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



Wilshire Consulting

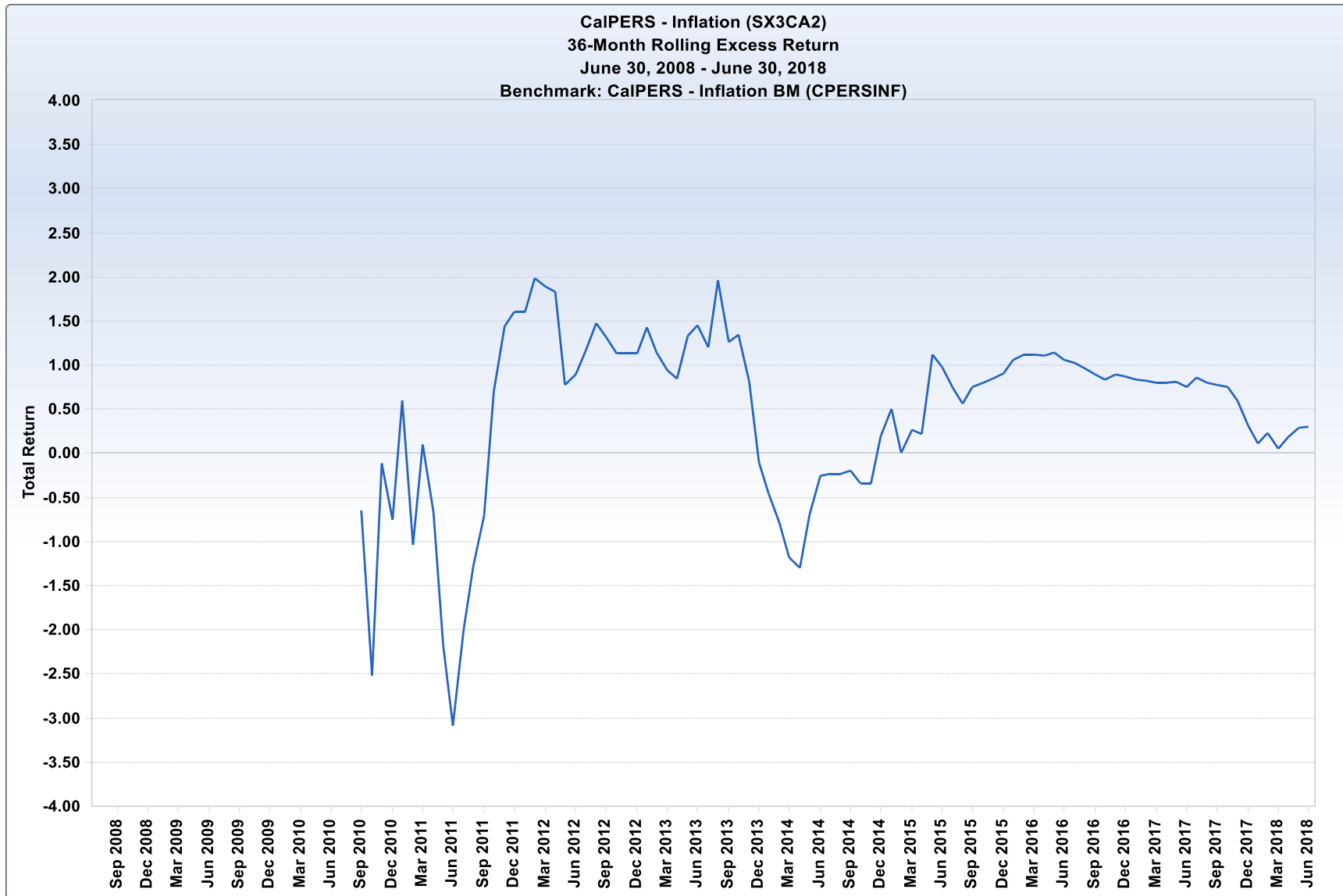
Inflation – Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR	5-year Sharpe Ratio	5-year Info Ratio
INFLATION	20.8	0.8%	9.3%	0.8%	-0.4%	-1.8%	\$1.5 bil	-0.1	0.7
<i>Inflation Policy Benchmark</i>		0.8%	8.9%	0.5%	-0.9%	-1.0%		-0.2	0.0
<i>Value Added</i>		0.0%	0.4%	0.3%	0.5%	-0.8%			
Internal Commodities	3.7	8.2%	30.3%	-4.3%	-9.5%	-12.4%			
<i>GSCI Total Return Index</i>		8.0%	30.0%	-4.4%	-9.4%	-12.4%			
<i>Value Added</i>		0.2%	0.3%	0.1%	-0.1%	0.0%			
Core Inflation Linked Bonds	14.0	-2.0%	2.6%	1.8%	2.0%	2.9%			
<i>Custom Benchmark</i>		-1.9%	2.6%	1.8%	1.8%	2.7%			
<i>Value Added</i>		-0.1%	0.0%	0.0%	0.2%	0.2%			
Tactical Commodities	1.6	8.7%	32.5%	-4.8%	-9.7%	-.-%			
<i>GSCI Total Return Index</i>		8.0%	30.0%	-4.4%	-9.4%	-.-%			
<i>Value Added</i>		0.7%	2.5%	-0.4%	-0.3%	-.-%			
Tactical TIPS	1.6	0.8%	2.1%	1.8%	1.5%	-.-%			
<i>CalPERS TIPS</i>		0.8%	2.1%	1.9%	1.7%	-.-%			
<i>Value Added</i>		0.0%	0.0%	-0.1%	-0.2%	-.-%			



Wilshire Consulting

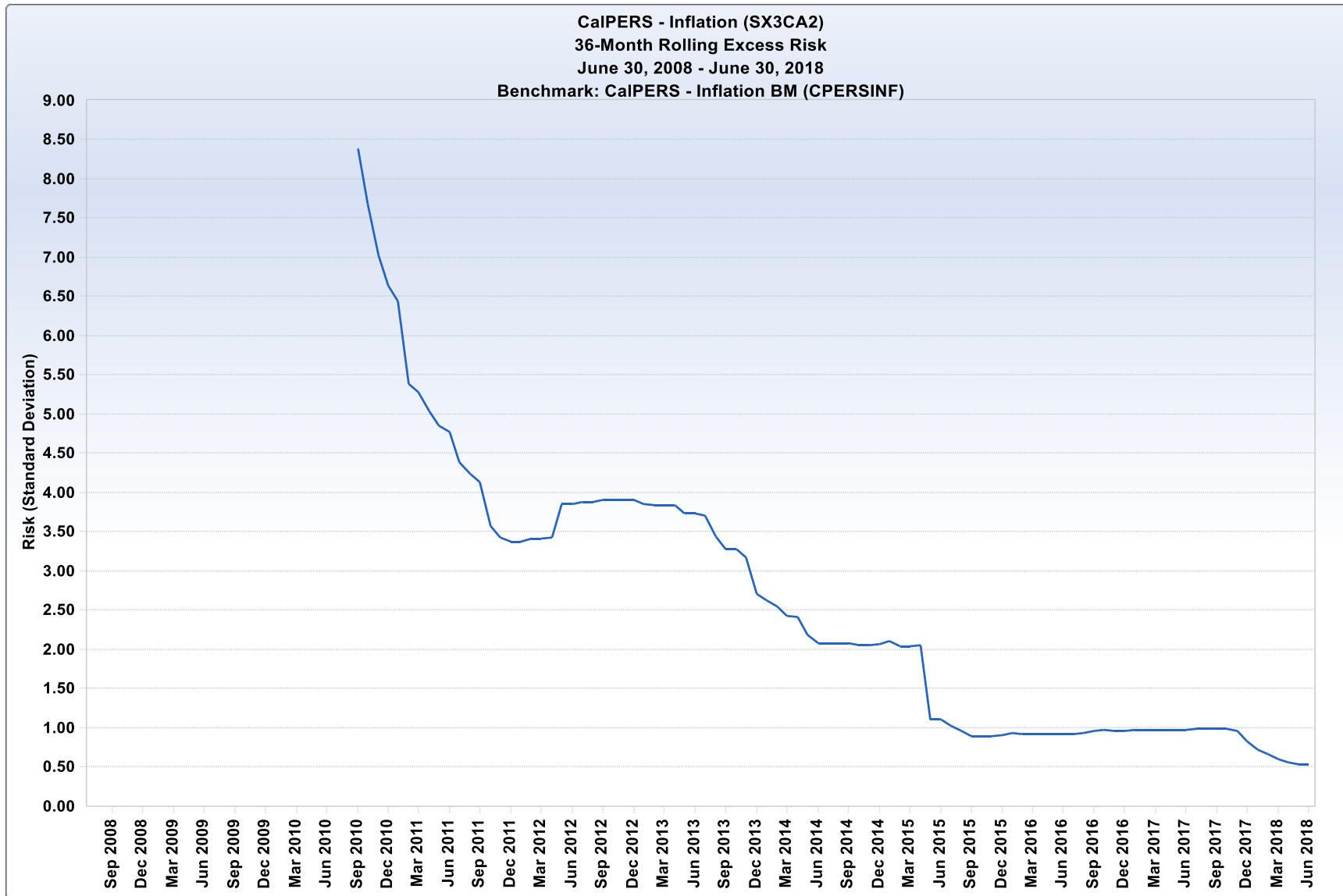
Inflation – Rolling Excess Returns





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Inflation – Rolling Tracking Error

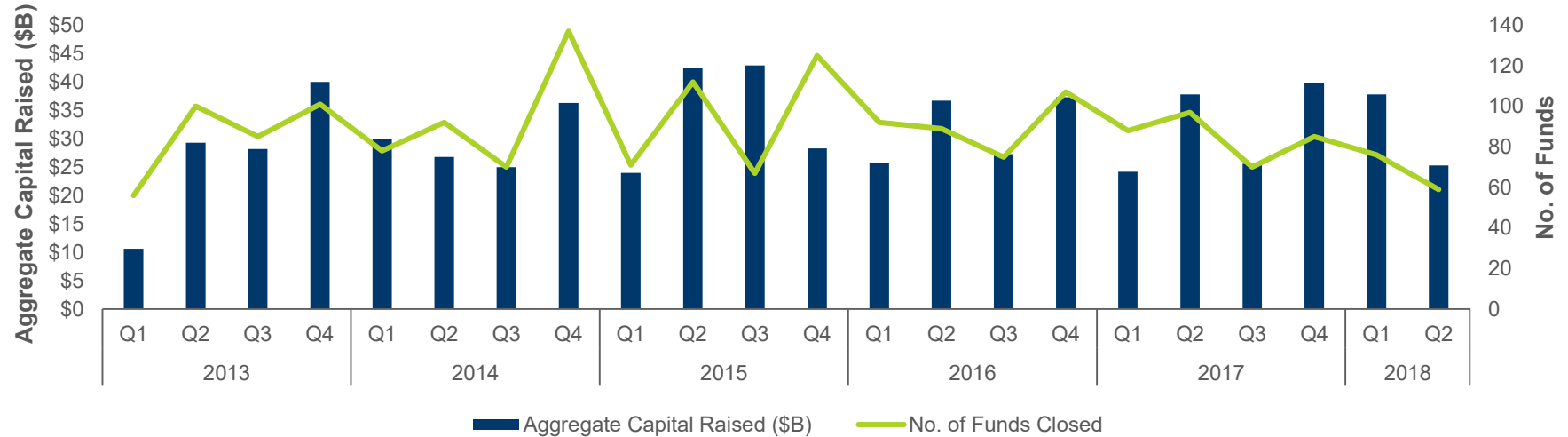




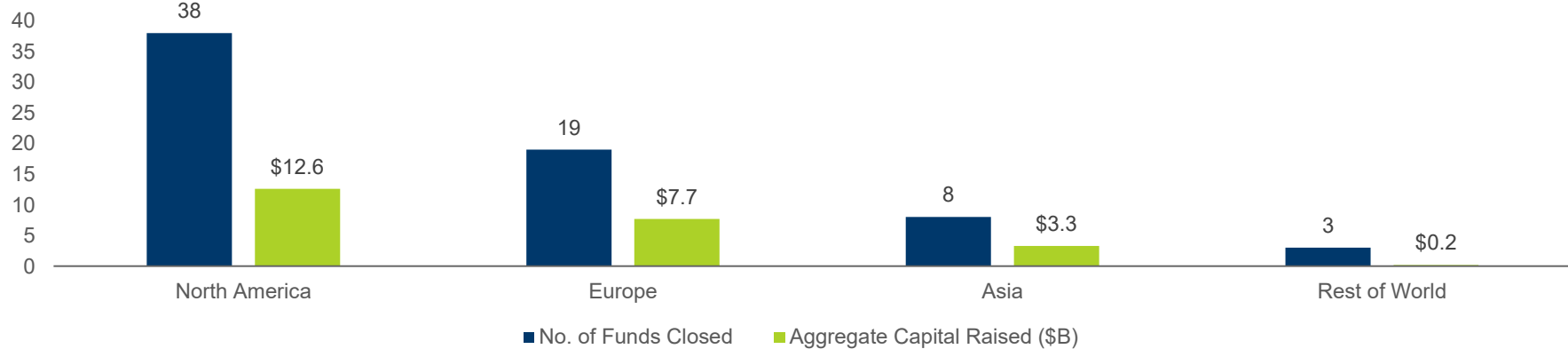
Wilshire Private Markets

PRIVATE REAL ESTATE – FUNDRAISING ACTIVITY

Quarterly Global Closed-End Private Real Estate Fundraising (2013 - Q2 2018)

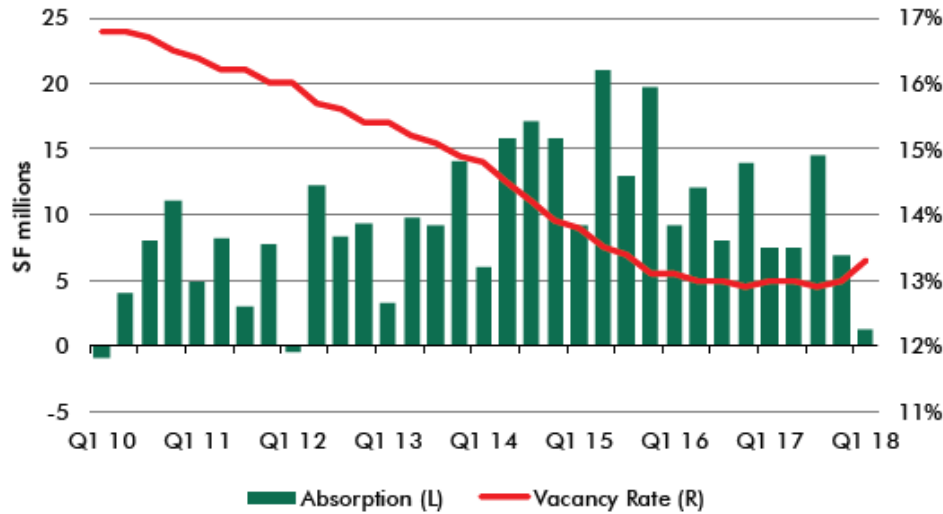


Closed-End Private Real Estate Fundraising in Q2 2018 by Primary Geographic Focus

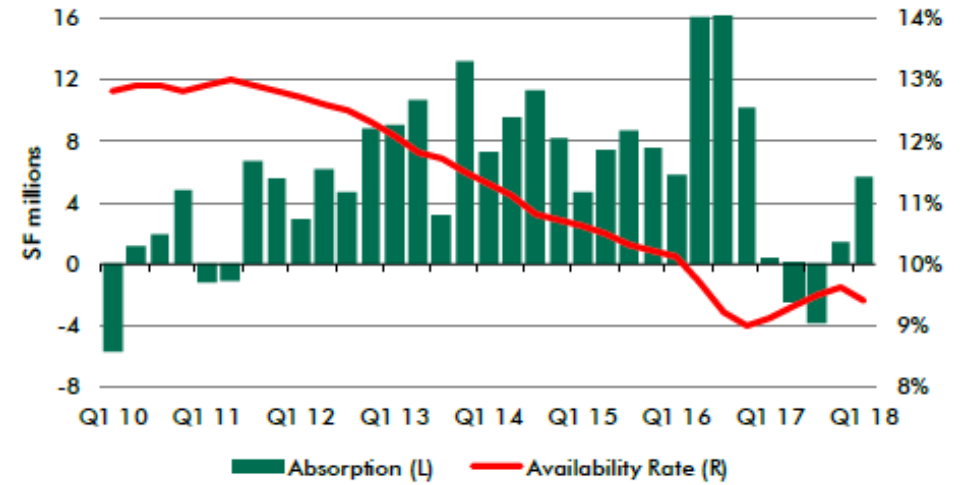


COMMERCIAL PROPERTY

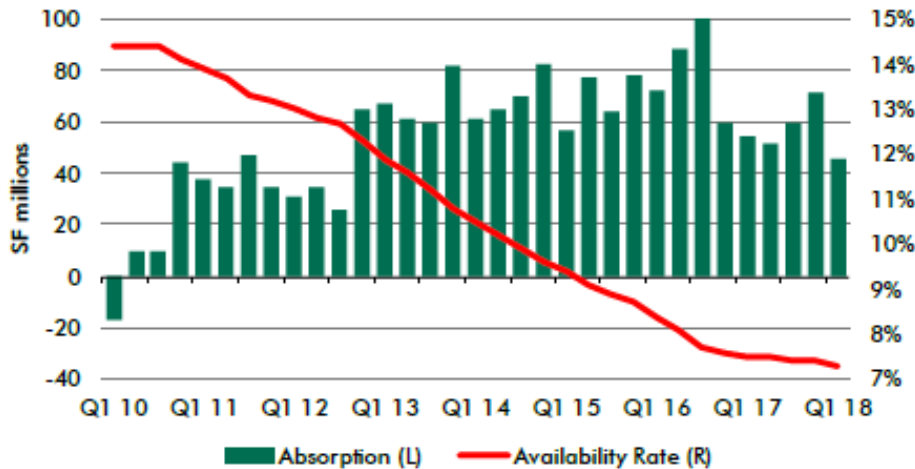
OFFICE



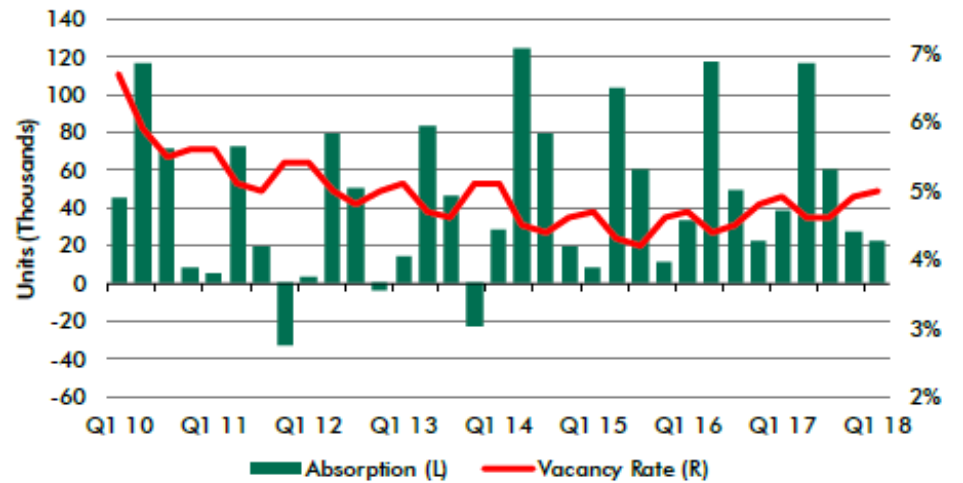
RETAIL



INDUSTRIAL



APARTMENTS

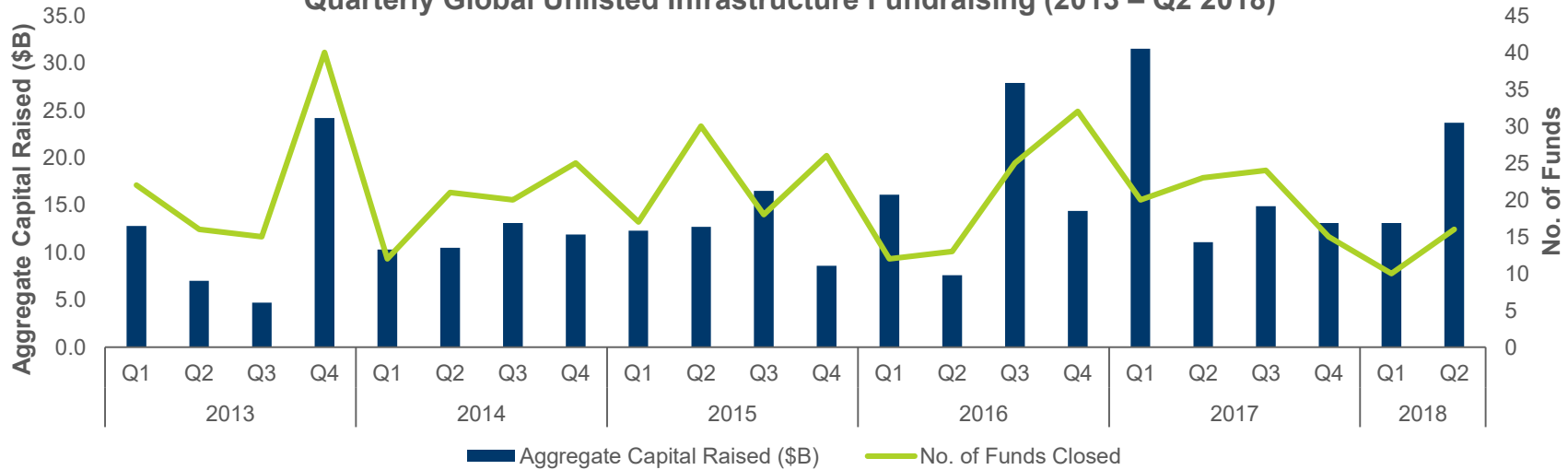


Data sources: CB Richard Ellis

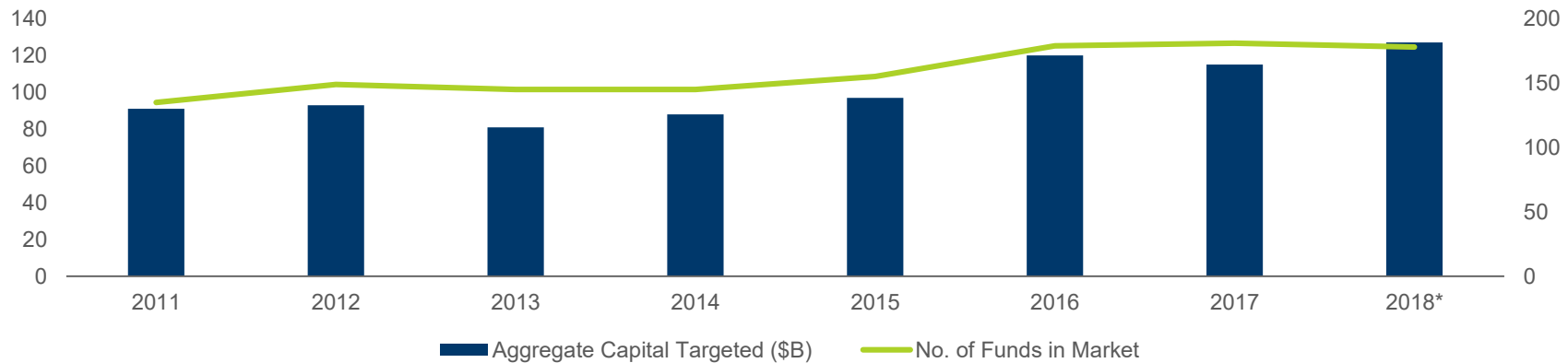


UNLISTED INFRASTRUCTURE – FUNDRAISING & INVESTMENT ACTIVITY

Quarterly Global Unlisted Infrastructure Fundraising (2013 – Q2 2018)



Unlisted Infrastructure Funds in Market over Time (2011 – Q2 2018)

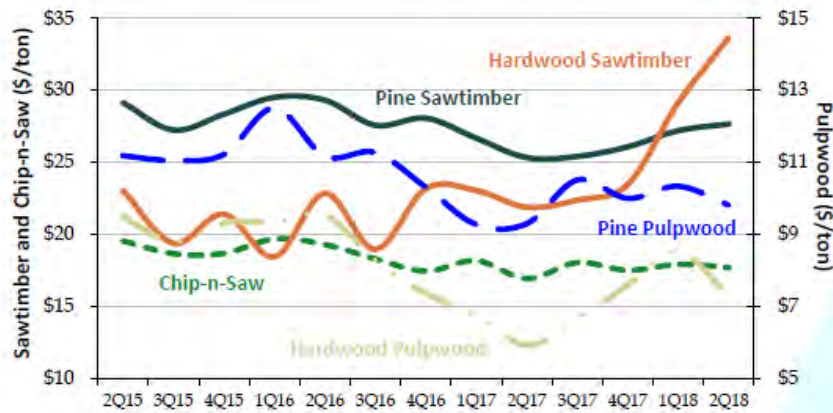


Source: Preqin, as of June 30, 2018.
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Wilshire Consulting TIMBER

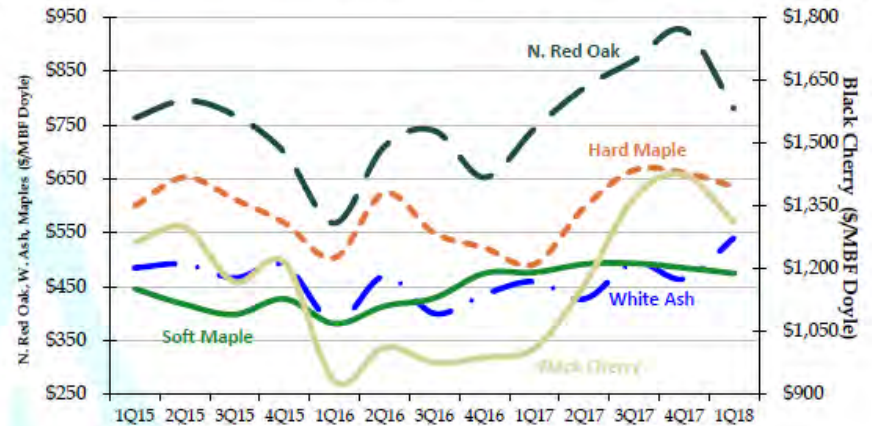


Southeastern Timber Prices



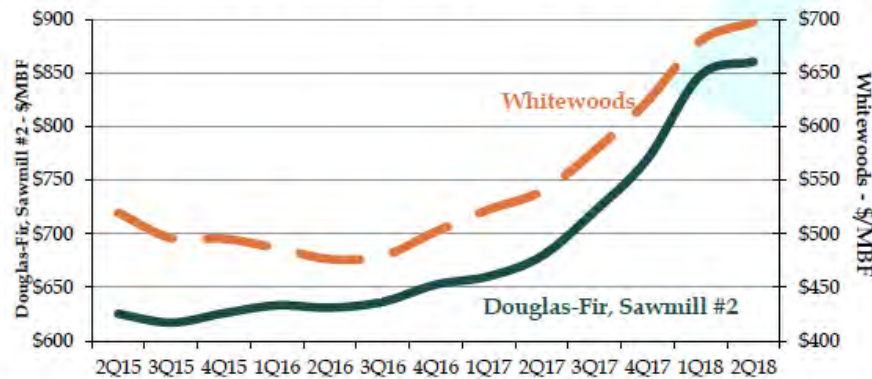
Source: Forest2Market®

Northeastern Hardwood Timber Prices



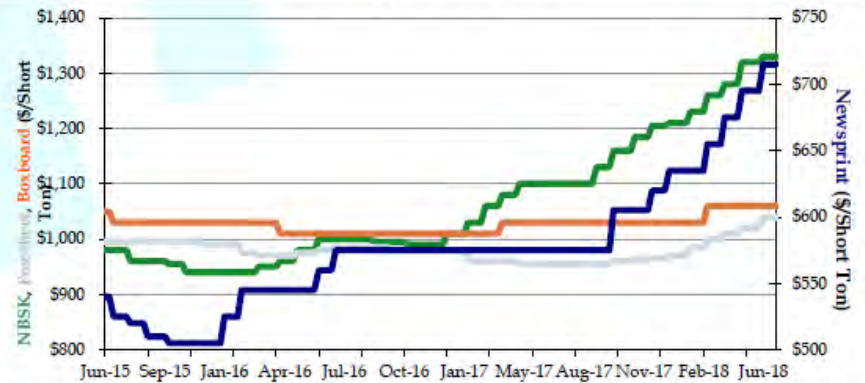
Source: Pennsylvania Woodlands Timber Market Report - Northwest Region

Pacific Northwest Timber Prices



Source: Log Lines®

Pulp and Paper



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

Data sources: Forest Investment Associates

Wilshire Consulting
TIMBER



- Wilshire would like to note that while note reflected in this quarter's performance, one of the Timber portfolio's main investments, Crown Pine Timber, was successfully sold off shortly after the end of the quarter. While the transaction represented a markdown of the portfolio value, the sale alleviated the program from further financial stress in the near future, and Wilshire commends staff for working out a solution to a challenging issue that was a holdover from the pre-financial crisis era investment. Challenges of this investment included onerous debt arrangements, unfavorable supply agreements, and sawtimber market pricing below pro forma causing an increasingly heavy drag on cash flow. Selling the investment better aligns the Real Assets program with its intended role. Also to be noted is that the current staff has no role in making the original investments and has been working out this investment over the past three years. The negative impact on total performance of Real Assets prior to the sale of Crown Pine over the trailing five-year period as of 6/30/2018 was -52 bps. This execution allows staff to continue turning focus towards building income-driven strategies that can sustain CalPERS during periods of falling value.

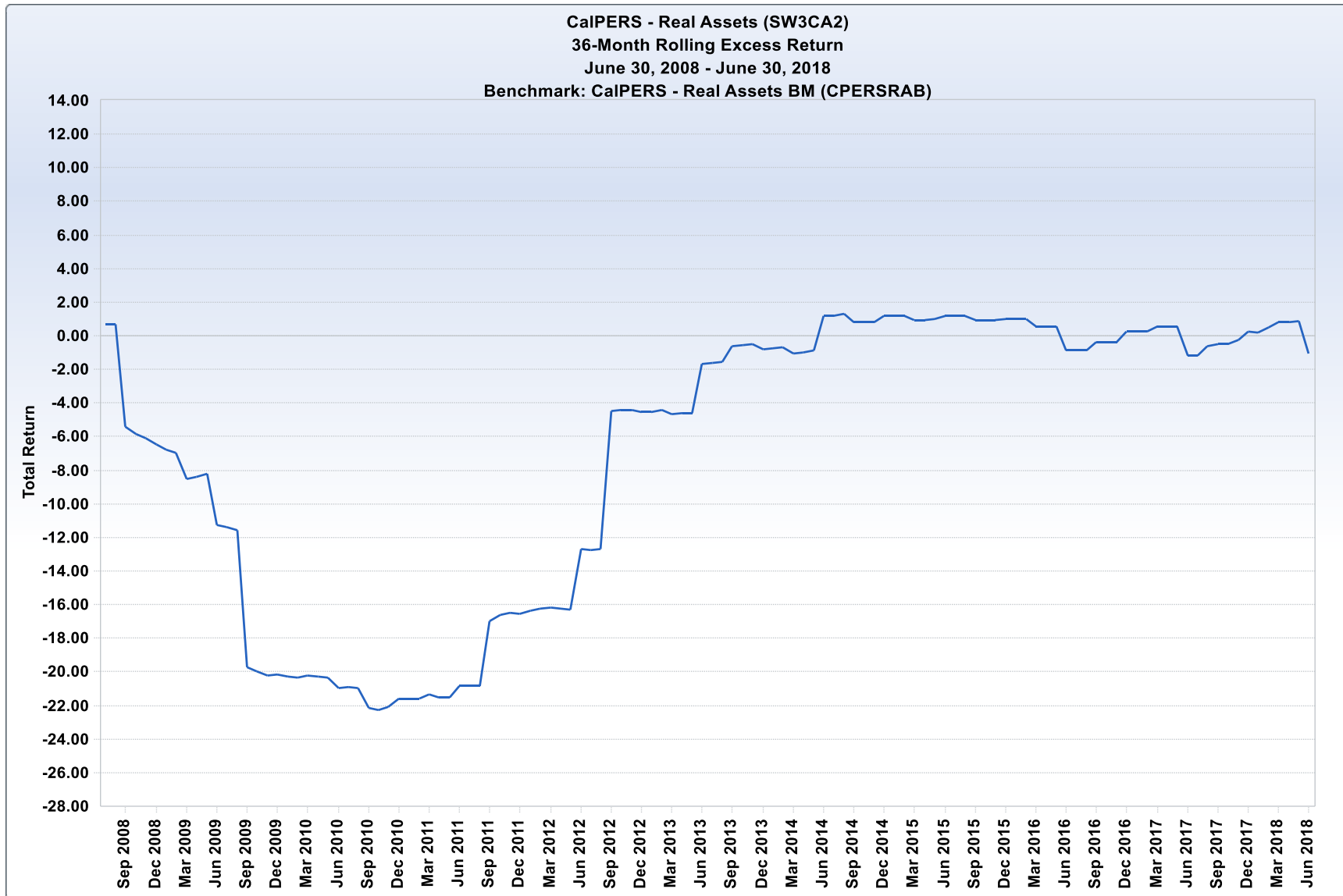


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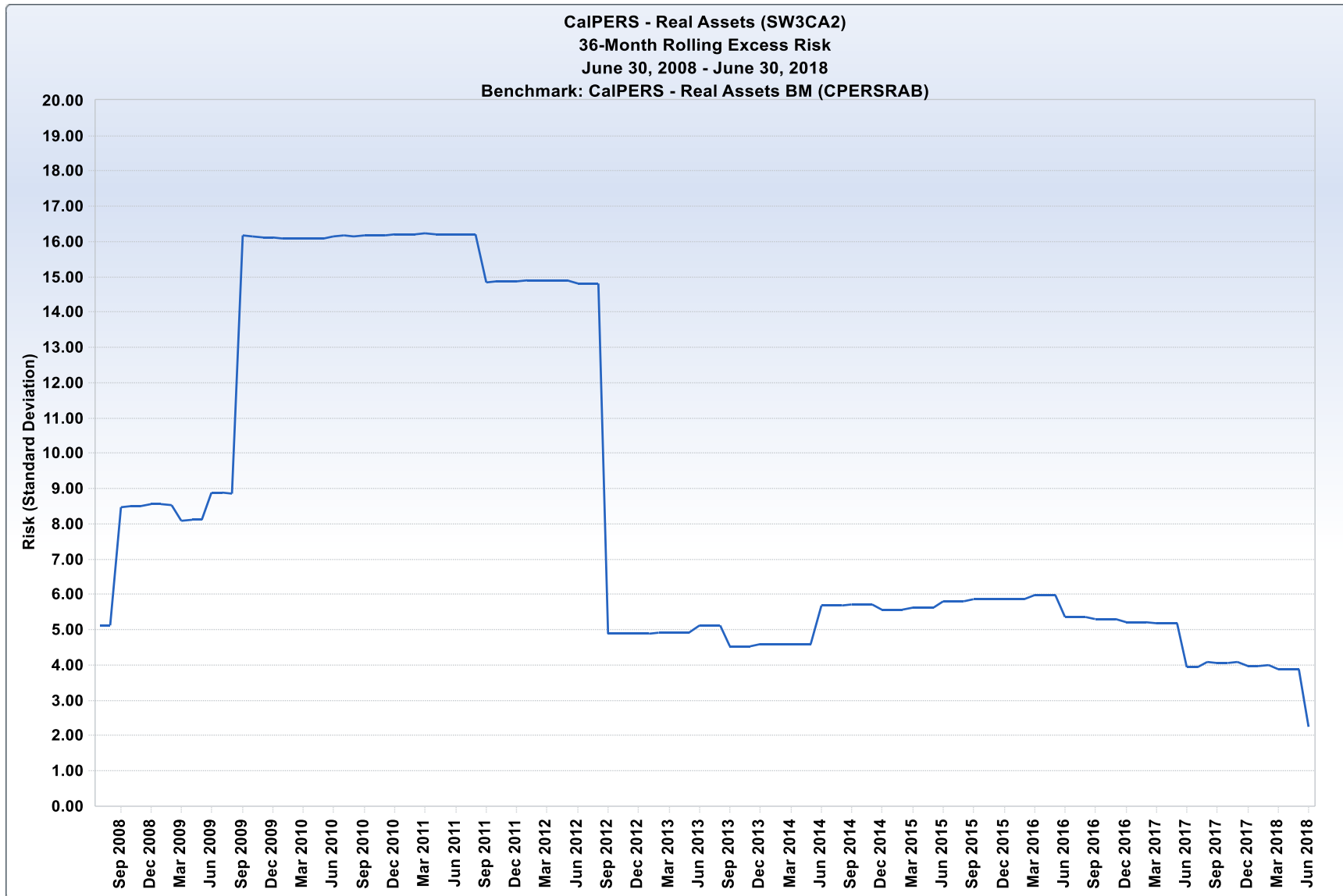
Real Assets – Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR	5-year Sharpe Ratio	5-year Info Ratio
REAL ASSETS	38.1	1.6%	8.0%	7.1%	9.4%	-0.5%	\$5.4 bil	1.6	-0.1
<i>Real Assets Policy Benchmark</i>		1.9%	6.8%	8.3%	9.6%	6.3%		2.4	0.0
<i>Value Added</i>		-0.3%	1.2%	-1.2%	-0.2%	-6.8%			
Real Estate	31.8	1.3%	6.8%	7.2%	9.8%	-1.0%	\$4.5 bil	1.6	-0.1
<i>Real Estate Policy Benchmark</i>		2.0%	7.1%	9.0%	10.4%	7.1%		2.3	0.0
<i>Value Added</i>		-0.7%	-0.3%	-1.8%	-0.6%	-8.1%			
Forestland	2.0	0.2%	1.9%	-2.4%	-1.0%	-1.1%			
<i>NCREIF Timberland Index</i>		0.9%	3.8%	3.4%	6.1%	4.1%			
<i>Value Added</i>		-0.7%	-1.9%	-5.8%	-7.1%	-5.2%			
Infrastructure	4.3	4.1%	20.6%	13.0%	15.0%	14.4%			
<i>CPI + 400 BPS 1Qtr Lag</i>		2.2%	6.4%	5.9%	5.5%	5.9%			
<i>Value Added</i>		1.9%	14.2%	7.1%	9.5%	8.5%			

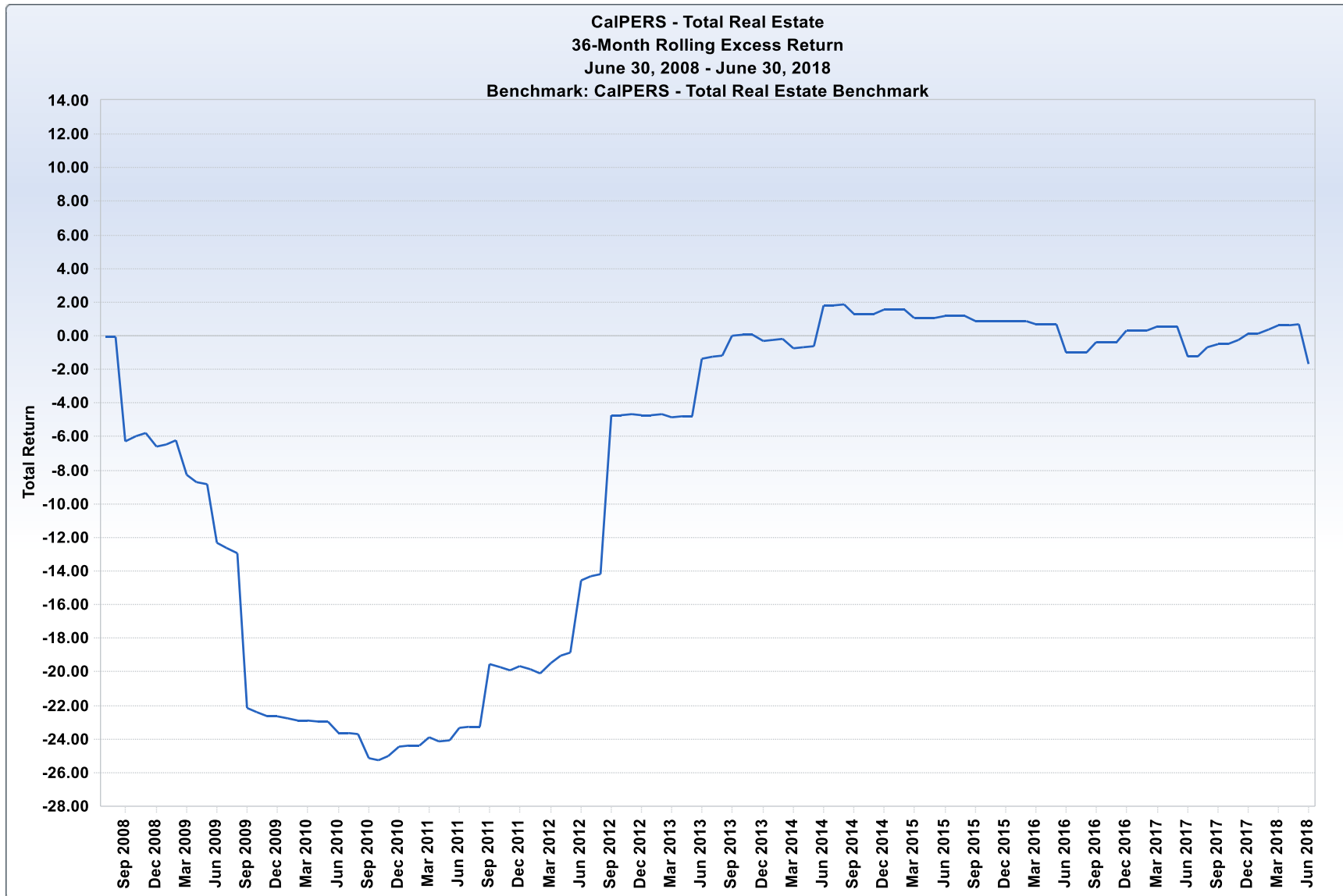
Real Assets – Rolling Excess Returns



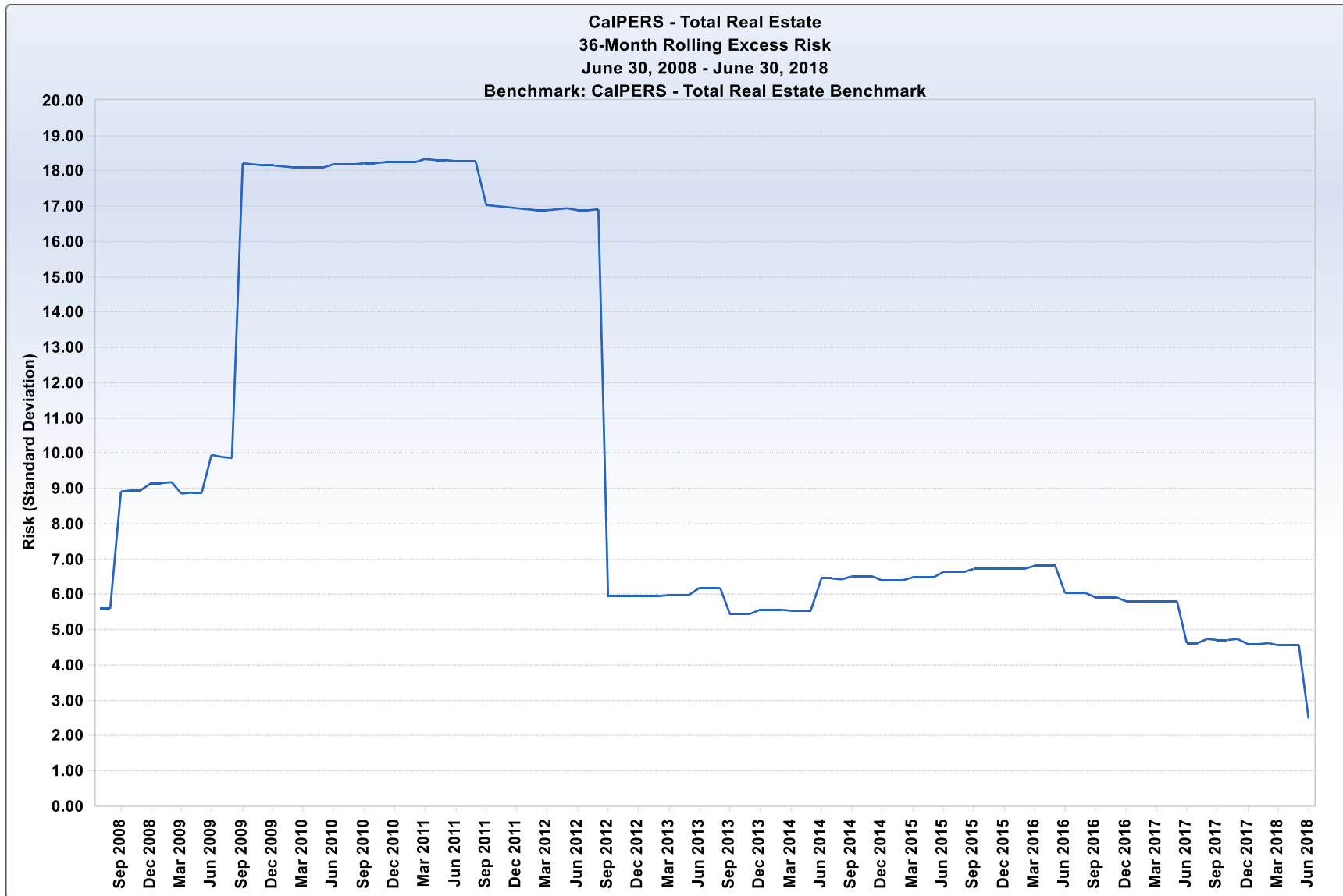
Real Assets – Rolling Tracking Error



Real Estate – Rolling Excess Returns



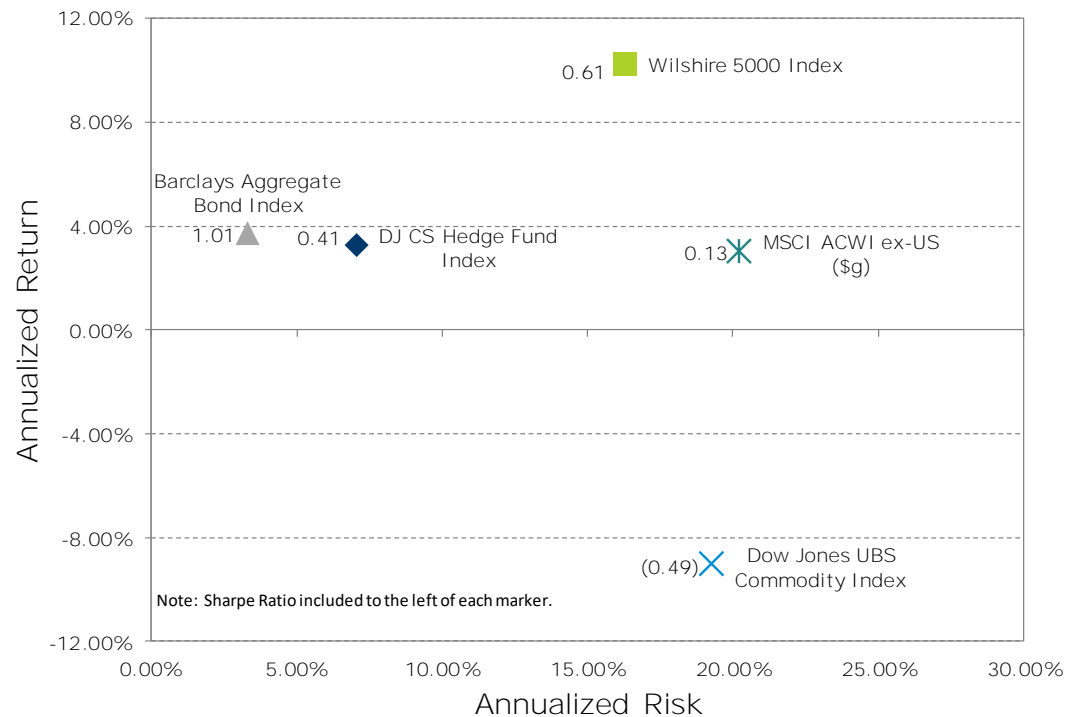
Real Estate – Rolling Tracking Error



HEDGE FUND PERFORMANCE

AS OF JUNE 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DJ CS HEDGE FUND INDEX	0.1	0.6	4.7	2.0	3.6	3.2
EVENT DRIVEN	1.6	1.3	3.8	0.5	2.6	3.3
GLOBAL MACRO	1.3	1.8	5.7	1.7	2.8	3.6
LONG/SHORT EQUITY	-0.4	0.7	7.1	3.3	5.8	4.1
MULTI-STRATEGY	0.1	1.8	3.5	4.5	6.0	5.3
WILSHIRE 5000	3.8	3.0	14.7	11.8	13.4	10.2
MSCI ACWI EX-US (\$G)	-2.4	-3.4	7.8	5.6	6.5	3.0
BLOOMBERG BARCLAYS AGGREGATE	-0.2	-1.6	-0.4	1.7	2.3	3.7
DOW JONES UBS COMMODITY	0.4	0.0	7.3	-4.5	-6.4	-9.0

HEDGE FUND 10-YEAR RISK/RETURN



Data sources: Wilshire Compass

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ARS – Distribution of Performance

	<u>Market</u> <u>Value</u>	<u>Qtr</u>	<u>1-Year</u>	<u>3-Year</u>	<u>5-Year</u>	<u>10-Year</u>	<u>5-Year</u> <u>Info</u> <u>Ratio</u>	<u>5-Year Up</u> <u>Capture</u> <u>Ratio</u>	<u>5-Year</u> <u>Sharpe</u> <u>Ratio</u>	<u>5-Year</u> <u>Sortino</u> <u>Ratio</u>
Absolute Return Strategies	0.2	-4.4%	-3.6%	-2.5%	1.2%	1.3%	-0.9	0.2	0.2	0.3
<i>ARS Policy Benchmark</i>		1.6%	6.0%	5.7%	5.5%	5.8%				
<i>Value Added</i>		-6.0%	-9.6%	-8.2%	-4.3%	-4.5%				
Total Direct Investments	0.2	-4.5%	-3.8%	-2.8%	1.2%	1.6%				
HFRI Fund of Funds Index		0.9%	5.6%	2.1%	3.6%	1.4%				

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