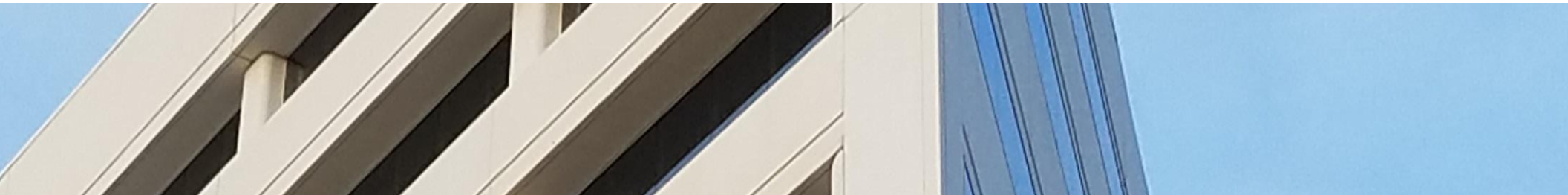




WILSHIRE ASSOCIATES

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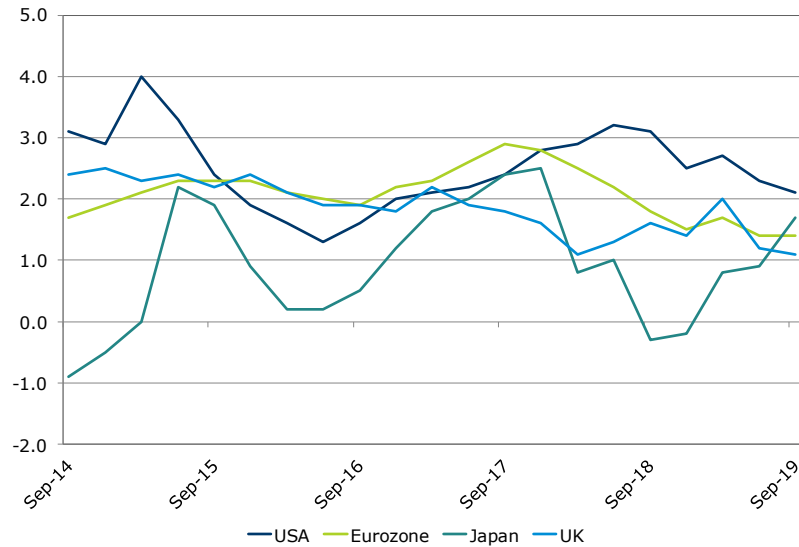
California Public Employees' Retirement System
Performance Review – December 31, 2019

Wilshire Consulting

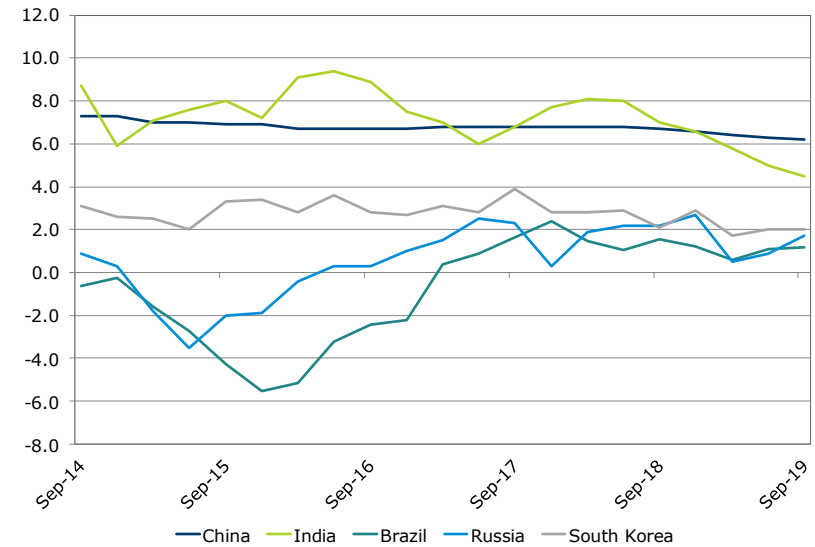


GROWTH AND INFLATION

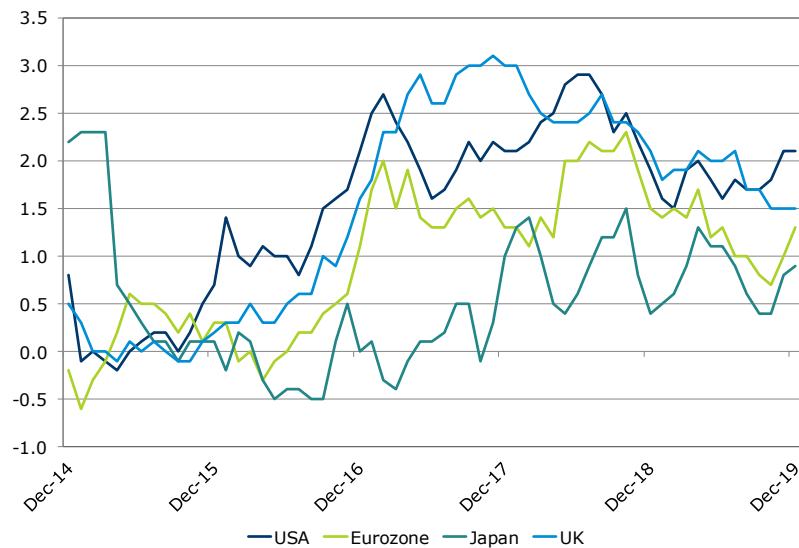
DEVELOPED MARKETS REAL GDP GROWTH YoY (%)



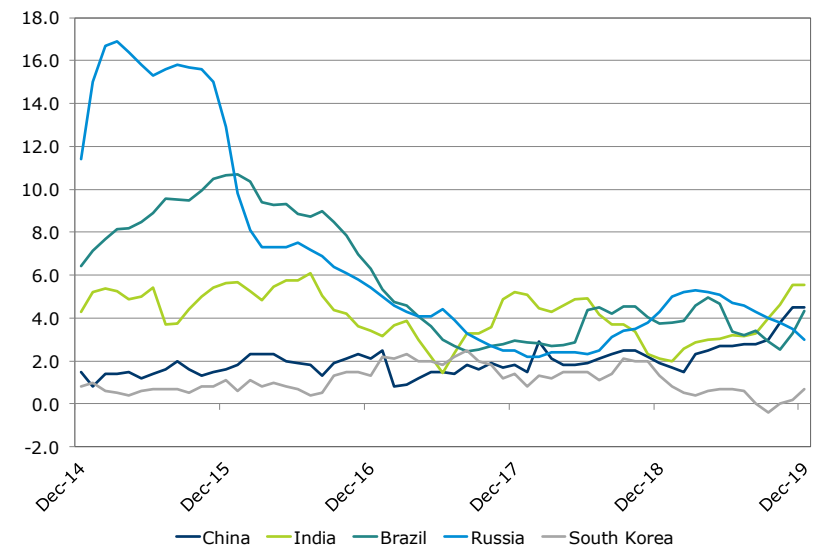
EMERGING MARKETS REAL GDP GROWTH YoY (%)



DEVELOPED MARKETS CPI GROWTH YoY (%)



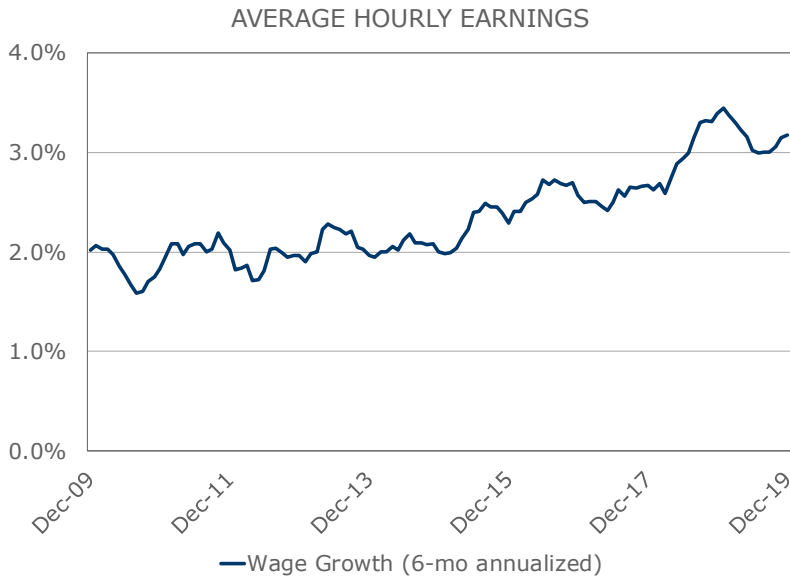
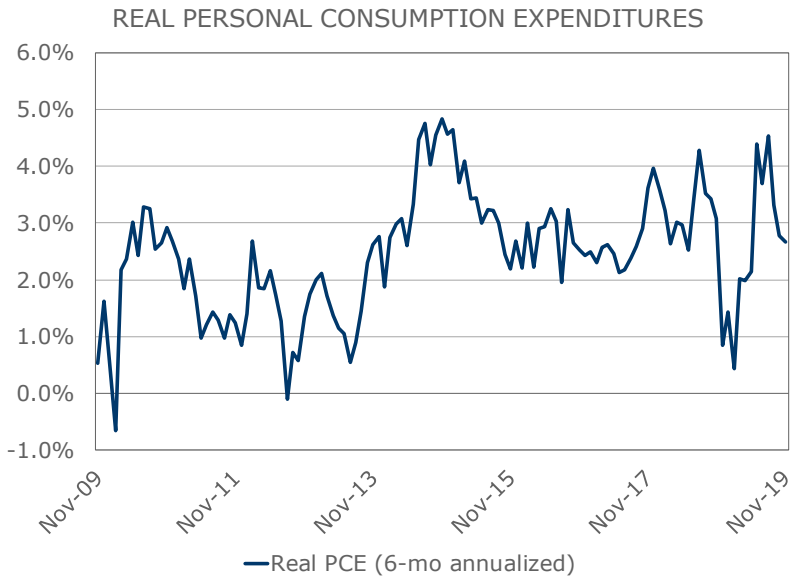
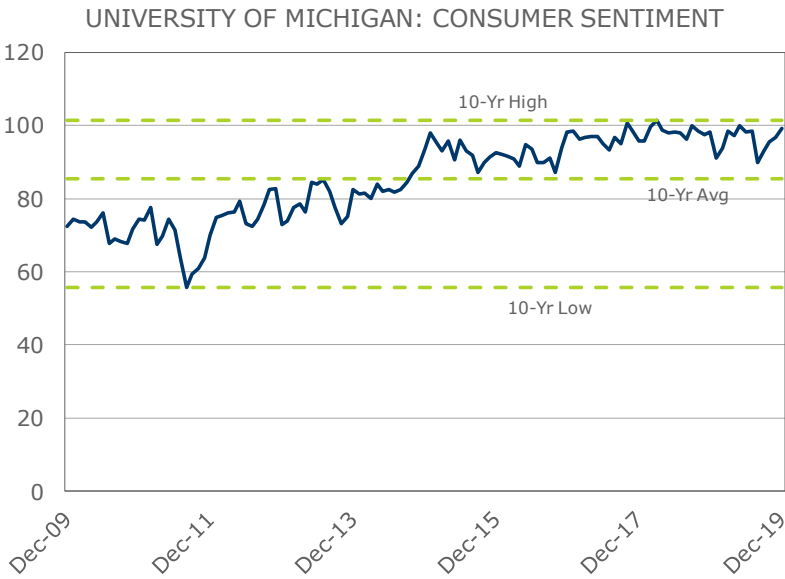
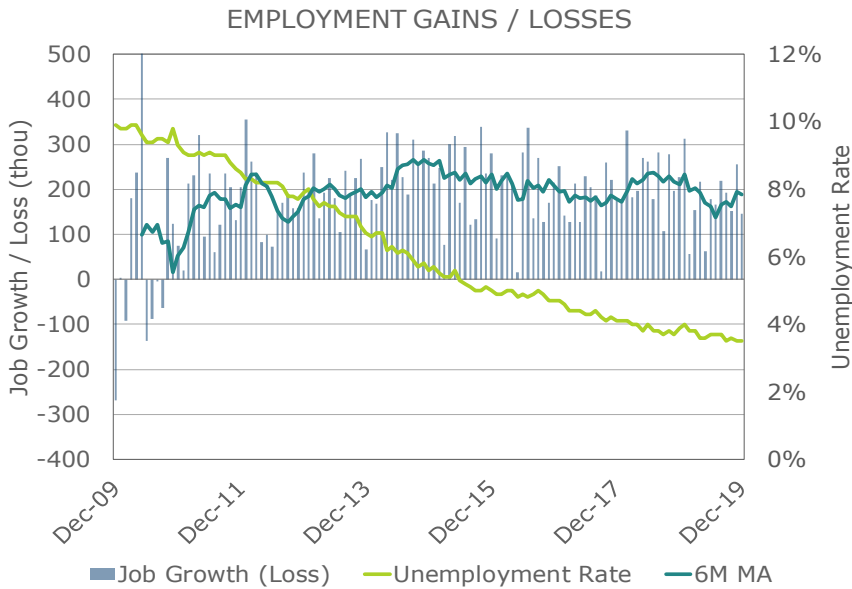
EMERGING MARKETS CPI GROWTH YoY (%)



Data sources: Bloomberg

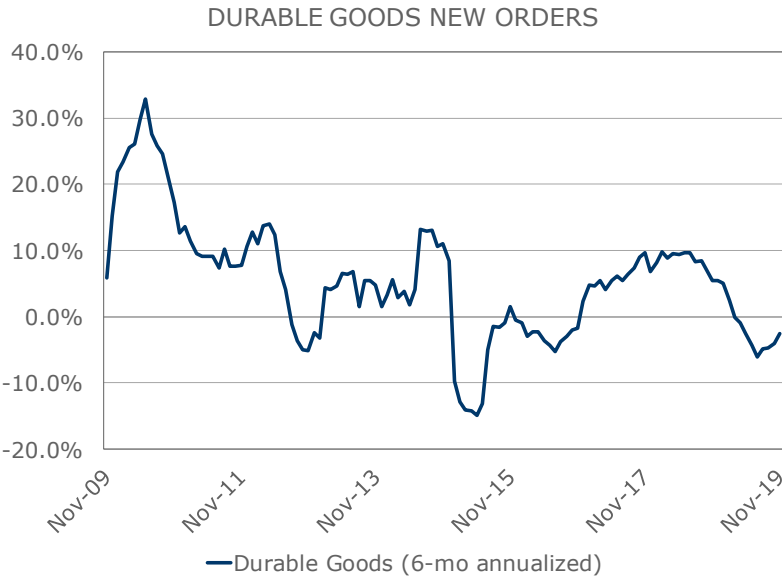
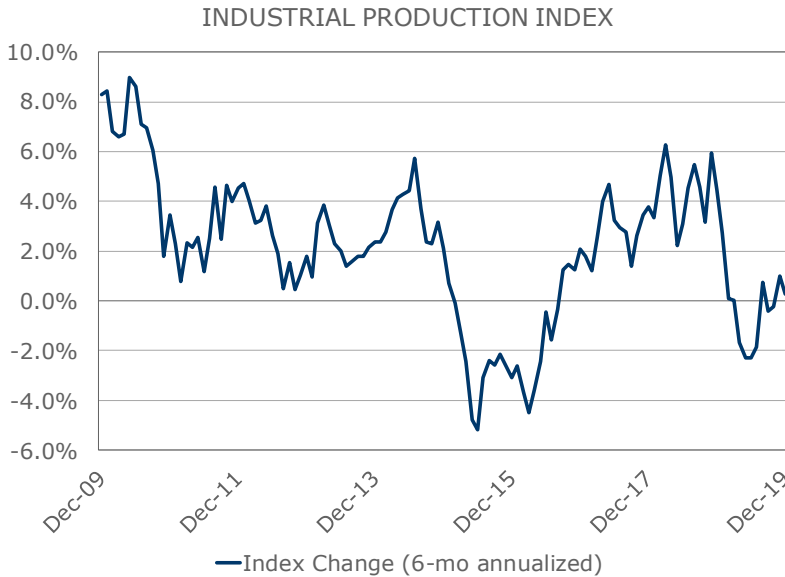
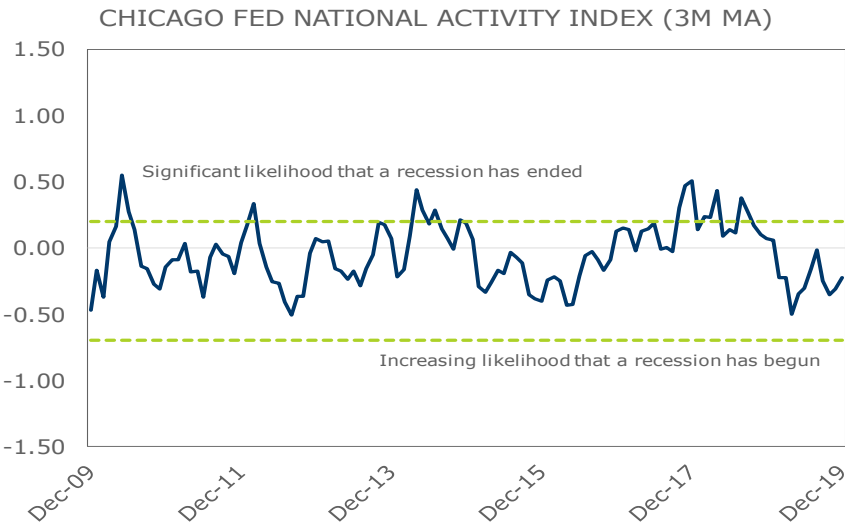
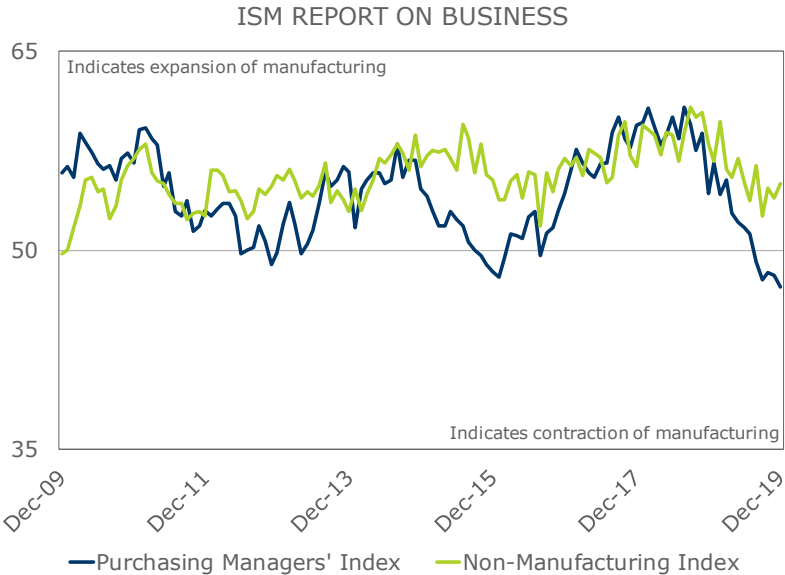
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CONSUMER ACTIVITY



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BUSINESS ACTIVITY

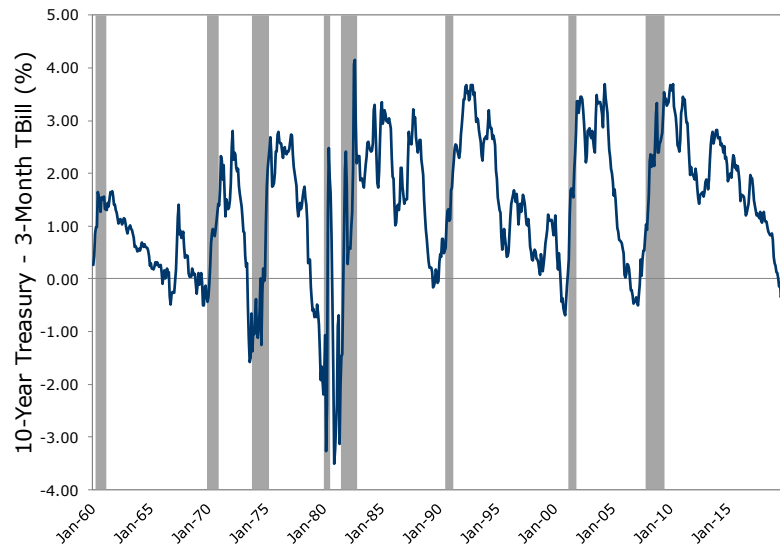


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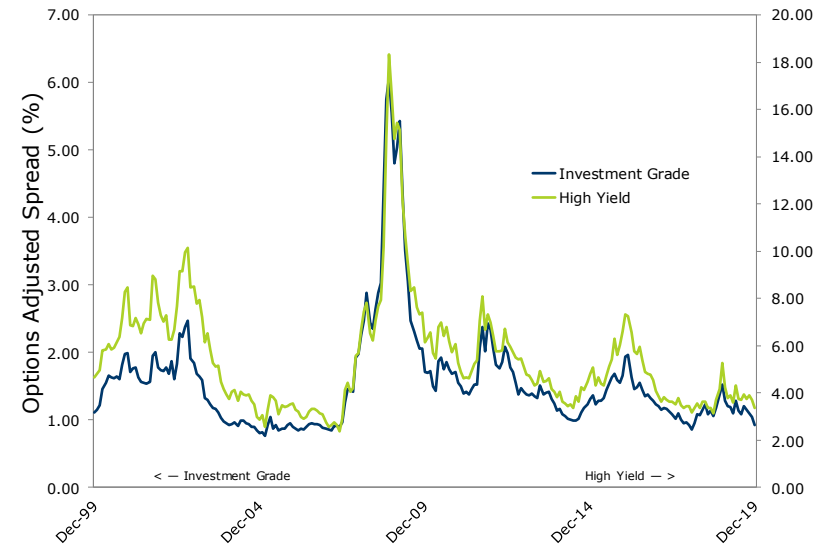


RISK MONITOR

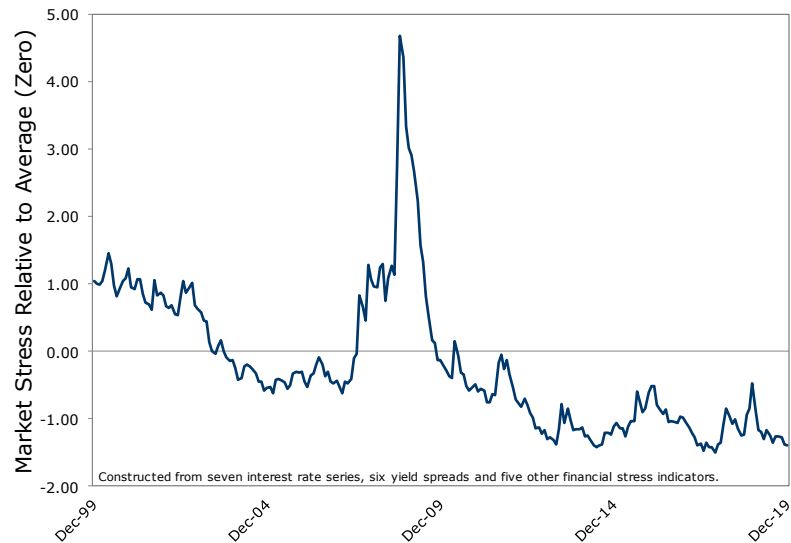
YIELD CURVE SLOPE VS RECESSIONS (IN GRAY)



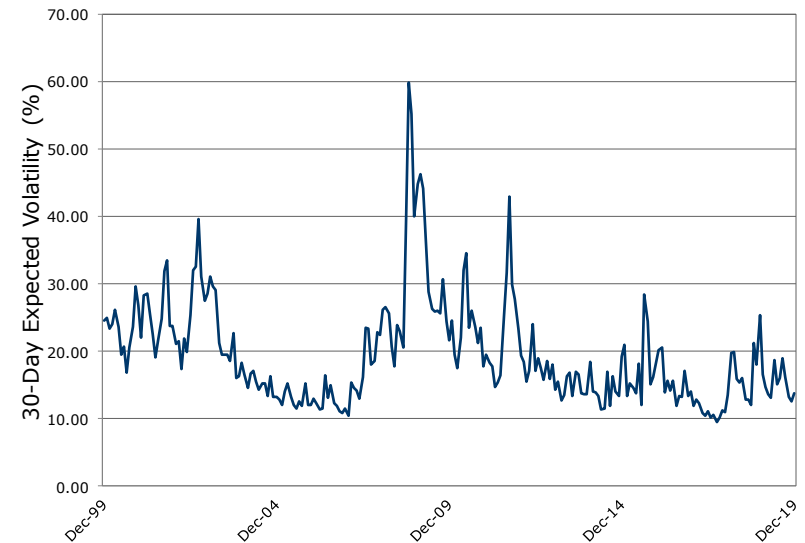
BLOOMBERG BARCLAYS CREDIT INDEXES



ST. LOUIS FED FINANCIAL STRESS INDEX



CBOE VOLATILITY INDEX

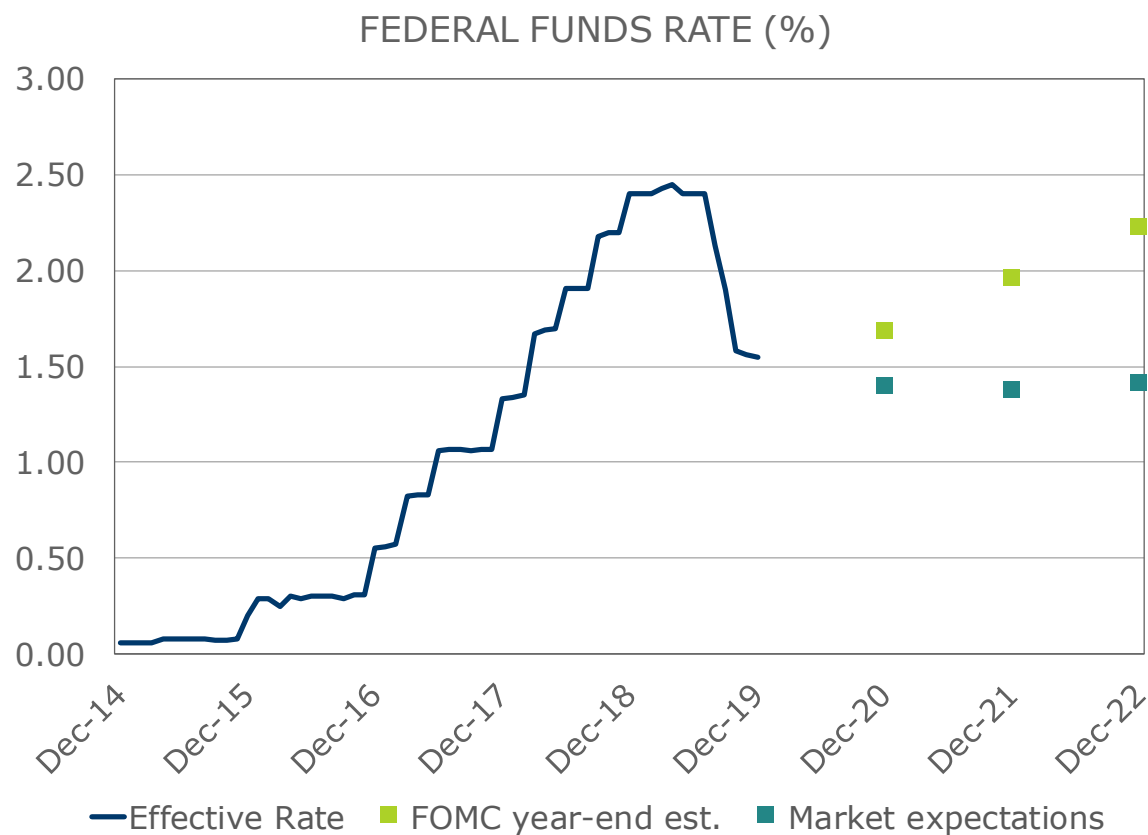


Data sources: Federal Reserve, Bloomberg Barclays

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SHORT-TERM RATES

- Federal Reserve decreased their short-term rate 3 times during the second half of 2019
- Markets aren't expecting the overnight rate to move at all during the next few years



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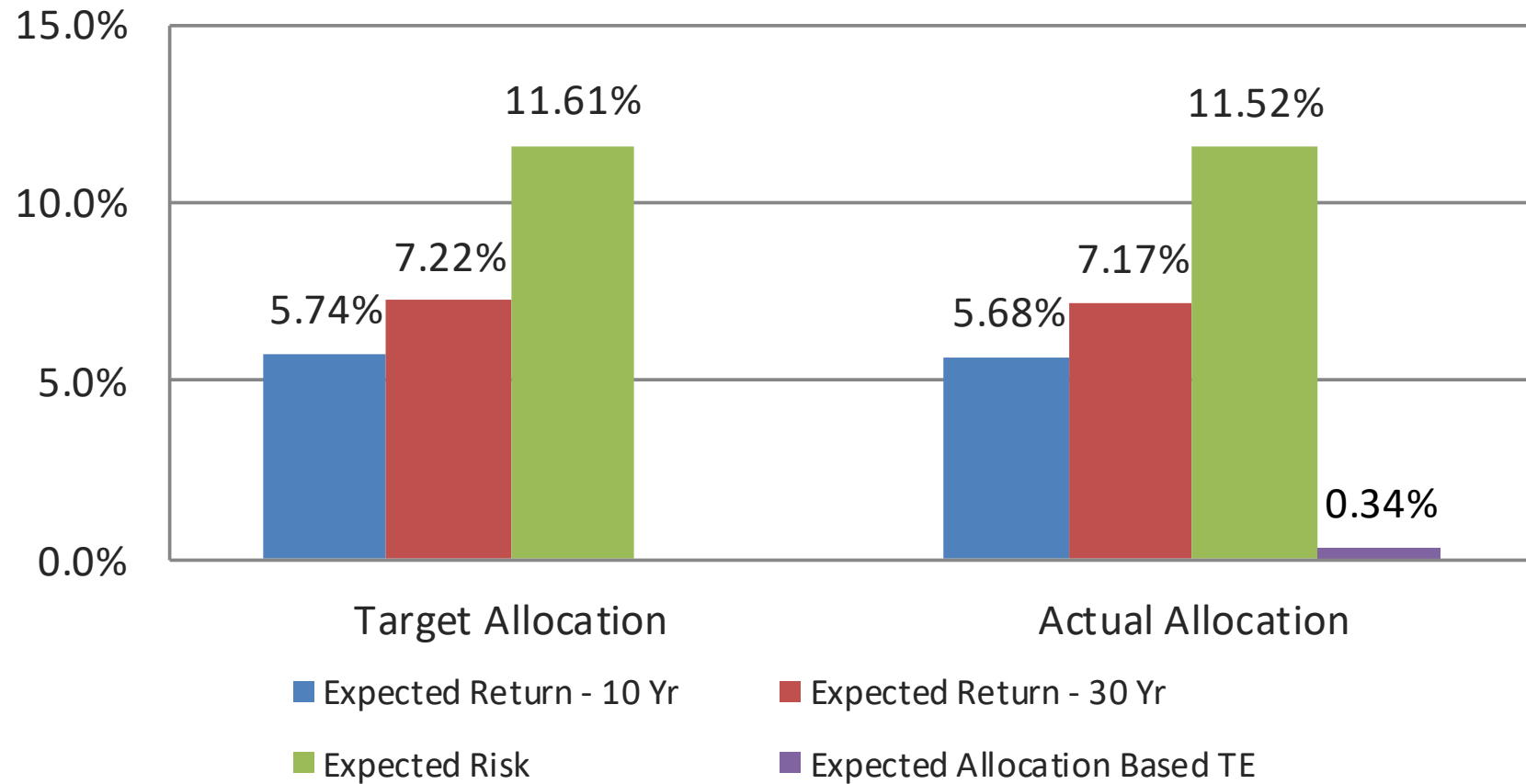
DECEMBER 2019 ASSET CLASS ASSUMPTIONS

	EQUITY						FIXED INCOME					REAL ASSETS						
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Dev ex-US Bond (Hdg)	Real Estate			Cmdty	Real Assets	US CPI
COMPOUND RETURN (%)	5.75	6.25	6.25	6.50	6.20	7.95	1.85	2.85	3.25	2.15	4.30	1.05	5.00	5.20	6.60	3.60	5.90	1.75
ARITHMETIC RETURN (%)	7.05	7.70	9.20	8.10	7.55	11.30	1.85	3.00	3.70	2.35	4.75	1.10	6.35	6.35	7.50	4.65	6.25	1.75
EXPECTED RISK (%)	17.00	18.00	26.00	18.95	17.10	28.00	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.75	1.75
CASH YIELD (%)	1.75	3.25	2.50	3.05	2.30	0.00	1.85	3.10	4.30	2.45	7.80	1.70	3.70	3.70	2.55	1.85	2.50	0.00
CORRELATIONS																		
US Stock	1.00																	
Dev ex-US Stock (USD)	0.81	1.00																
Emerging Mkt Stock	0.74	0.74	1.00															
Global ex-US Stock	0.83	0.96	0.87	1.00														
Global Stock	0.95	0.92	0.83	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									
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							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.18	0.18	0.26	0.10	0.67	0.66	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	0.78	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 Assets	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

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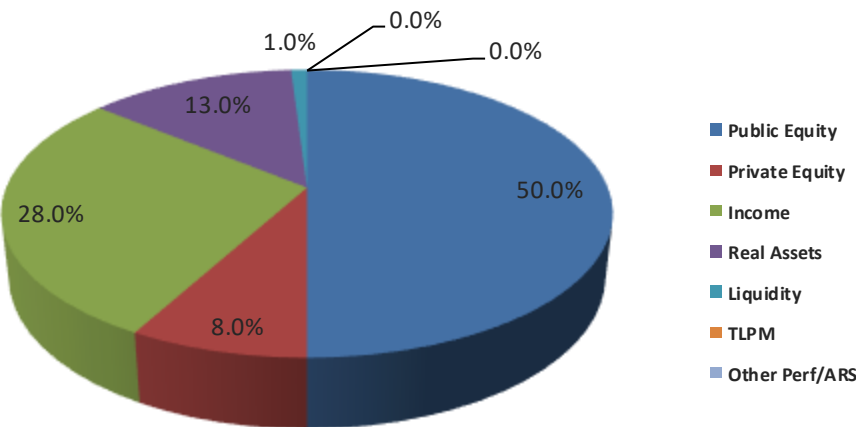


CalPERS Expected Return and Risk Estimates

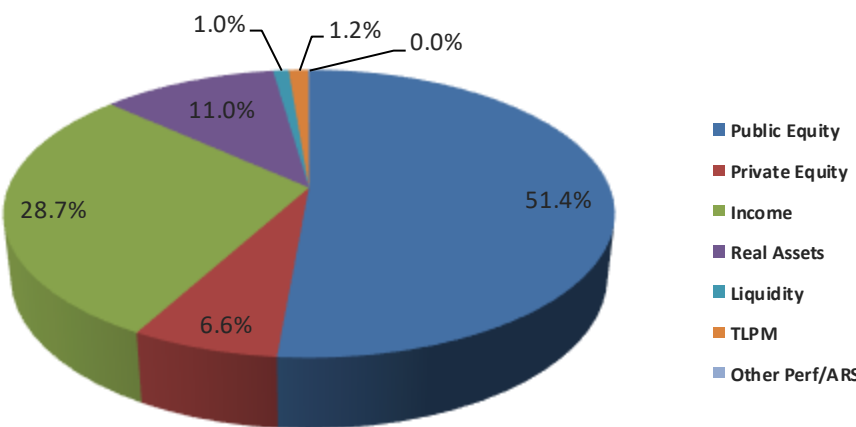


CalPERS Asset and Risk Allocation

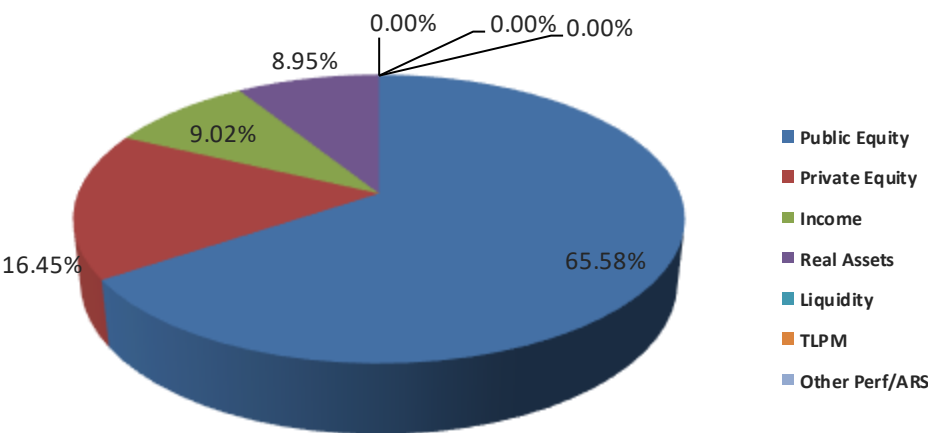
Target Asset Allocation



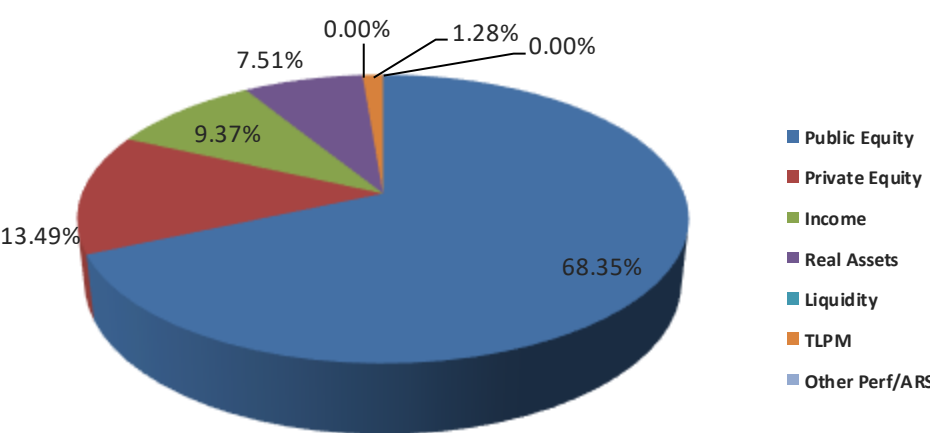
Actual Asset Allocation



Contribution to Total Risk - Target Allocation

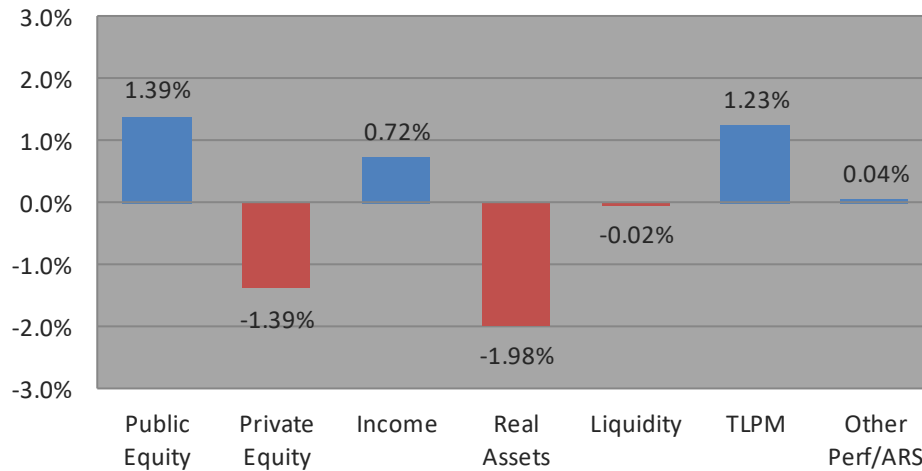


Contribution to Total Risk - Actual Allocation

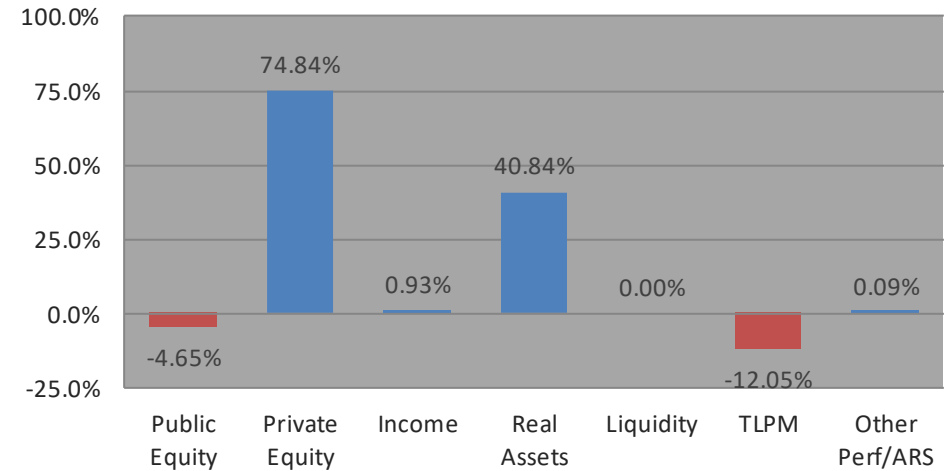


CalPERS Drivers of Expected Excess Risk

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

Total Fund – Performance

	Asset Value						VaR	5-Year Ratios	
	(\$Billion)	Quarter	1-Year	3-Year	5-Year	10-Year		Sharpe	Info
TOTAL FUND	\$ 394.8	4.0%	17.3%	9.4%	7.1%	8.4%	\$ 52.7	1.0	-0.2
Total Fund Policy Benchmark		3.8%	17.3%	9.6%	7.3%	8.5%		1.1	0.0
Actuarial Rate		1.8%	7.3%	7.3%	7.4%	7.5%			
PUBLIC EQUITY	\$ 202.9	7.5%	25.8%	12.4%	8.8%	9.5%	\$ 40.6	0.7	-0.2
Public Equity Policy Benchmark		7.5%	26.0%	12.7%	8.9%	9.4%		0.7	0.0
PRIVATE EQUITY	\$ 26.1	0.2%	2.9%	11.0%	9.0%	12.4%	\$ 10.7	2.2	-0.1
Private Equity Policy Benchmark		0.3%	2.6%	12.5%	10.3%	13.4%		0.8	0.0
INCOME	\$ 113.4	-0.3%	12.8%	5.9%	4.3%	5.8%	\$ 10.7	0.7	1.3
Income Policy Benchmark		-0.3%	12.4%	5.4%	3.8%	5.0%		0.5	0.0
REAL ASSETS	\$ 43.5	1.6%	6.3%	6.3%	7.7%	8.1%	\$ 6.2	1.5	0.0
Real Assets Policy Benchmark		1.0%	4.6%	6.2%	7.9%	9.2%		2.0	0.0
LIQUIDITY	\$ 3.9	0.5%	2.6%	2.0%	1.4%	1.2%	\$ 0.01	0.5	0.7
Liquidity Policy Benchmark		0.4%	2.1%	1.6%	1.2%	1.3%		0.1	0.0
TRUST LEVEL PORTFOLIO MGMT *	\$ 4.9	NM	NM	-.-%	-.-%	-.-%	\$ 0.7	N/A	N/A
CalPERS Reference Portfolio Benchmark		5.0%	22.5%	-.-%	-.-%	-.-%		N/A	N/A
OTHER PERF **	\$ 0.2	NM	NM	NM	NM	NM		N/A	N/A
TERMINATED AGENCY POOL	\$ 0.2	-0.8%	11.7%	4.9%	3.5%	-.-%		N/A	N/A
TOTAL FUND PLUS TAP	\$ 395.0	4.0%	17.3%	9.4%	7.1%	8.4%		N/A	N/A

* More detail of the TLPM return can be found in the program section, page 43.

** More detail of the OTHER PERF return can be found in the program section, page 44.

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Total Fund – Attribution (Calendar 2019)

As of 12/31/2019

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)		
	Weight *	Return	Weight *	Return	Weight	Return	Actual Allocation	Active Management	Total
Public Equity	49.71	25.75	49.89	26.00	-0.18	-0.25	-0.11	-0.13	-0.23
Public Equity - Cap Weighted	37.06	26.71	36.68	27.03	0.38	-0.31	-0.09	-0.12	-0.21
Public Equity - Factor Weighted	12.65	22.54	13.21	22.63	-0.56	-0.09	-0.01	-0.01	-0.02
Private Equity	7.30	2.92	8.00	2.58	-0.70	0.34	-0.06	-0.01	-0.06
Income	28.57	12.81	27.96	12.38	0.61	0.43	-0.11	0.14	0.03
Treasury	10.42	12.11	10.00	12.03	0.42	0.08	-0.04	0.01	-0.03
Spread	15.13	12.95	15.03	12.21	0.11	0.74	-0.05	0.12	0.07
High Yield	3.02	15.13	2.93	14.67	0.09	0.46	-0.01	0.01	-0.00
Real Assets	11.19	6.30	12.80	4.55	-1.61	1.75	0.15	0.21	0.37
Inflation	0.29	3.67	0.32	10.99	-0.03	-7.32	-0.00	-0.01	-0.01
Liquidity	1.10	2.55	1.03	2.07	0.06	0.47	-0.00	0.01	0.00
TLPM	1.78	NM**	0.00	22.53	1.78	NM**	0.07	-0.16	-0.08
Other PERF/ARS	0.05	NM***	0.00	0.00	0.05	NM***	-0.01	-0.00	-0.01
Monthly Linked Return	100.00	17.31	100.00	17.32	-0.01		-0.06	0.06	-0.01
Residual		0.00		0.00		0.00			0.00
Total		17.31		17.32		-0.01			-0.01

* Average period weight displayed.

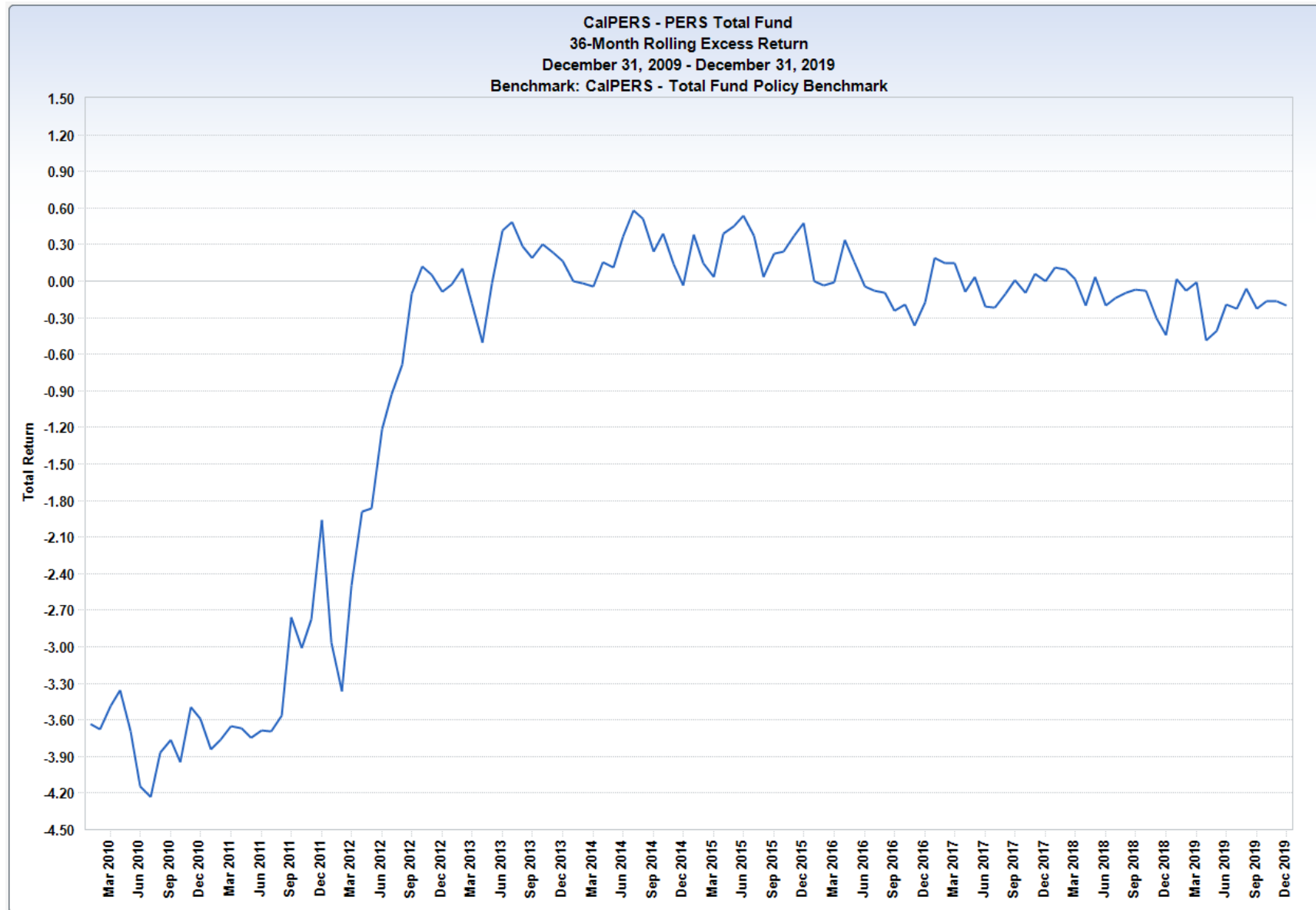
** More detail of the TLPM return can be found in the program section, page 43.

*** More detail of the OTHER PERF return can be found in the program section, page 44.

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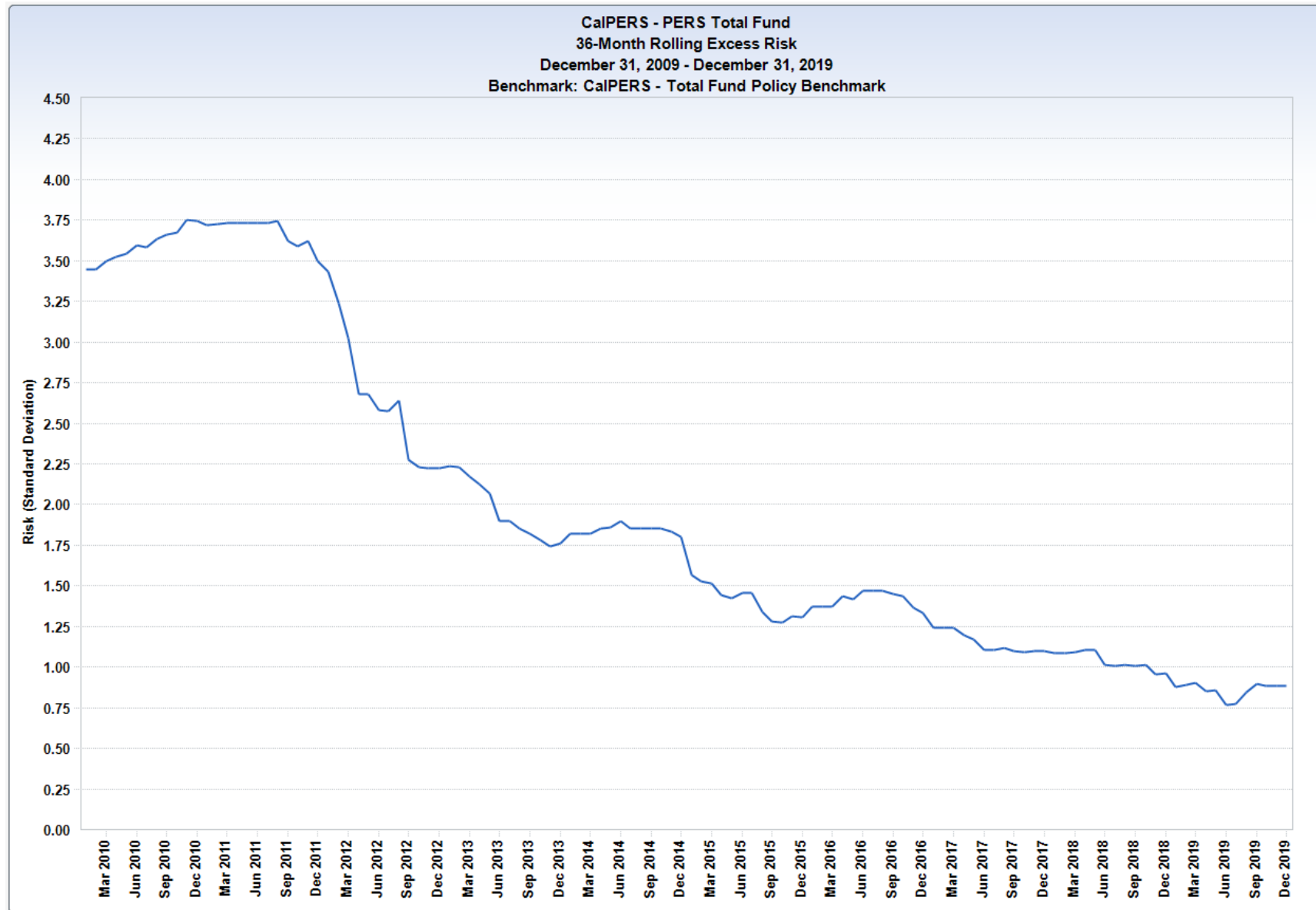
Total Fund – Rolling Excess Returns



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Total Fund – Rolling Tracking Error





APPENDIX: PERFORMANCE DETAIL

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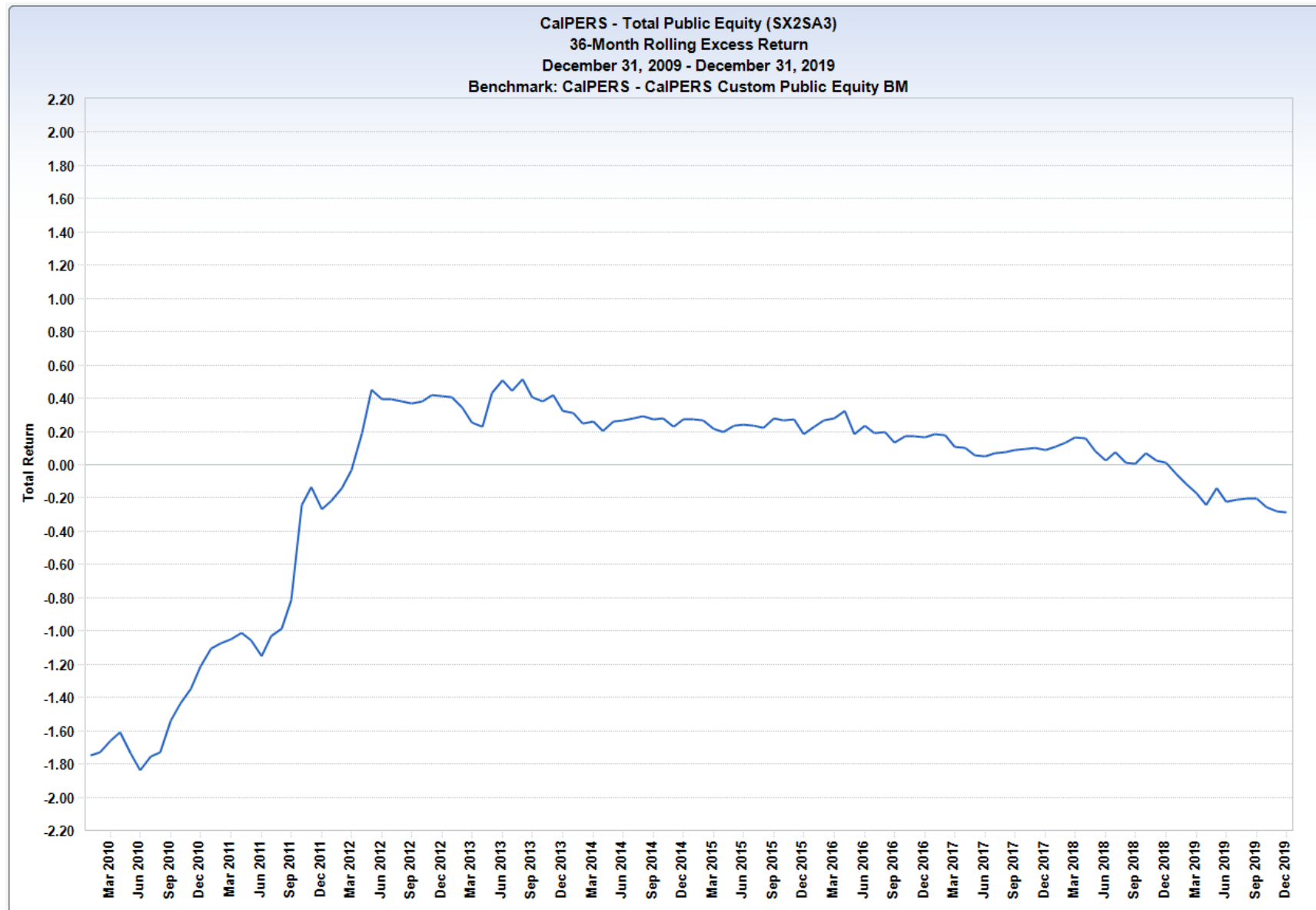
CalPERS Public Equity – Performance

	Asset Value						VaR	5-Year Ratios	
	(\$Billion)	Quarter	1-Year	3-Year	5-Year	10-Year		Sharpe	Info
PUBLIC EQUITY	\$ 202.9	7.5%	25.8%	12.4%	8.8%	9.5%	\$ 40.6	0.7	-0.2
<i>Public Equity Policy Benchmark</i>		7.5%	26.0%	12.7%	8.9%	9.4%		0.7	0.0
Public Equity - Cap Weighted	\$ 143.8	9.1%	26.7%	12.3%	8.7%	9.5%	\$ 31.5	0.6	-0.2
<i>FTSE Global All Cap Custom Index Net</i>		9.1%	27.0%	12.7%	8.8%	9.3%		0.6	0.0
Public Equity - Factor Weighted	\$ 59.2	3.9%	22.5%	-.-%	-.-%	-.-%	\$ 9.5	N/A	N/A
<i>MSCI ACWI Select Factor Weighted Index</i>		3.9%	22.6%	-.-%	-.-%	-.-%		N/A	N/A

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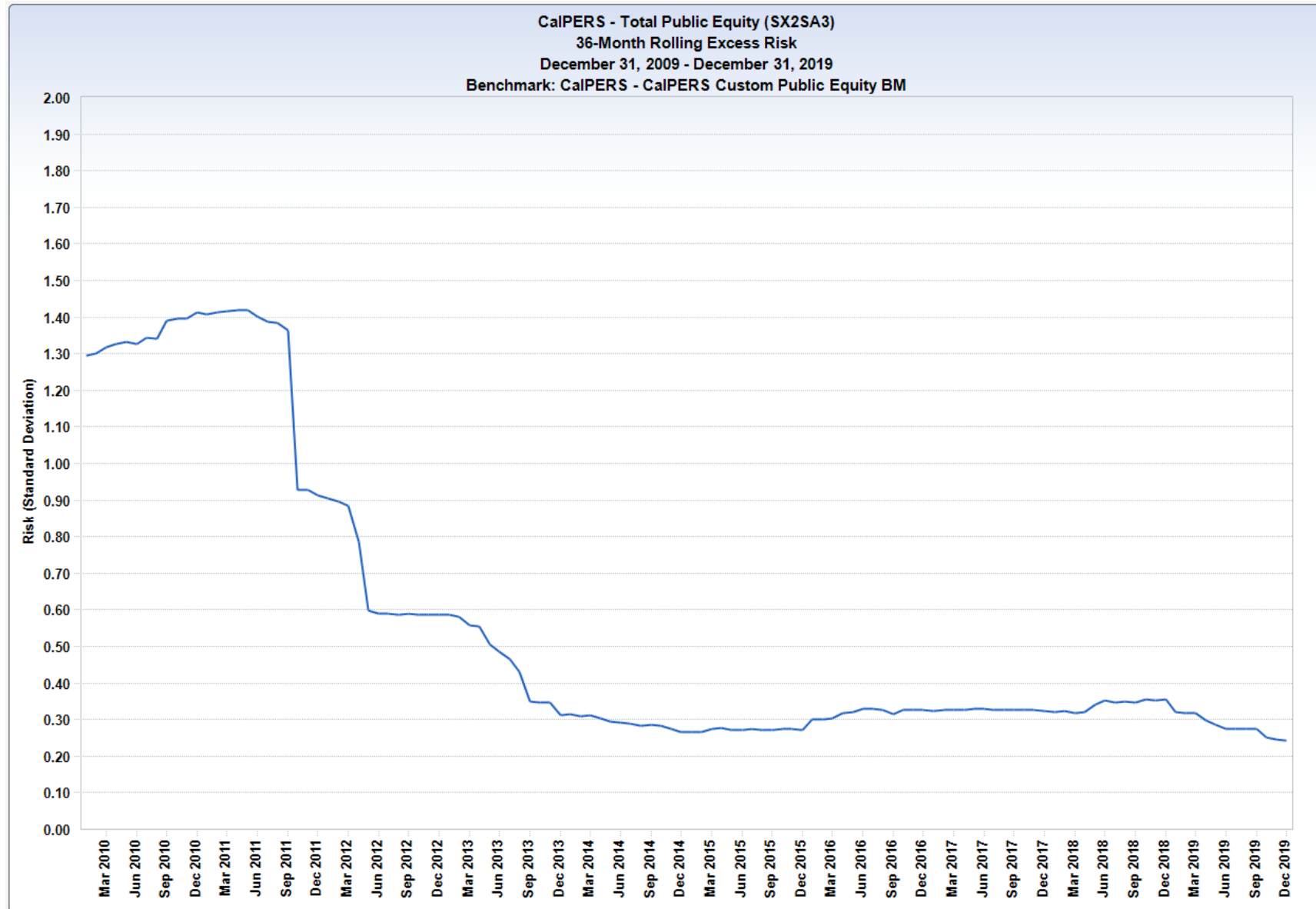
CalPERS Public Equity – Rolling Excess Returns



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CalPERS Public Equity – Rolling Tracking Error



Wilshire Private Markets



PRIVATE EQUITY – FUNDRAISING & INVESTMENT ACTIVITY

Global Quarterly Equity Fundraising (Q1 2014 - Q4 2019)



Global Quarterly Private Equity-Backed Buyout Deals (Q1 2014 – Q4 2019)



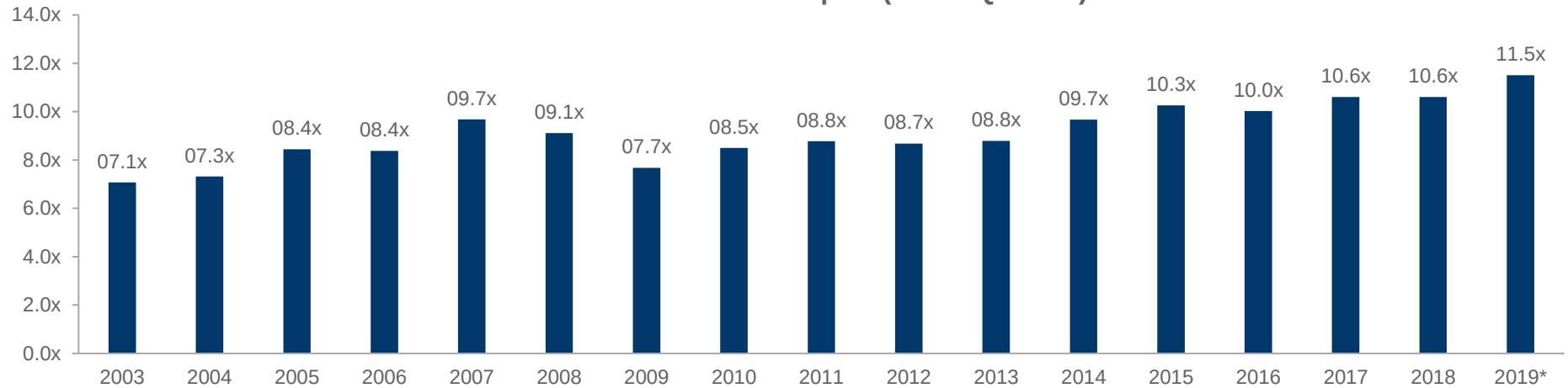
Source: Preqin, as of December 31, 2019.

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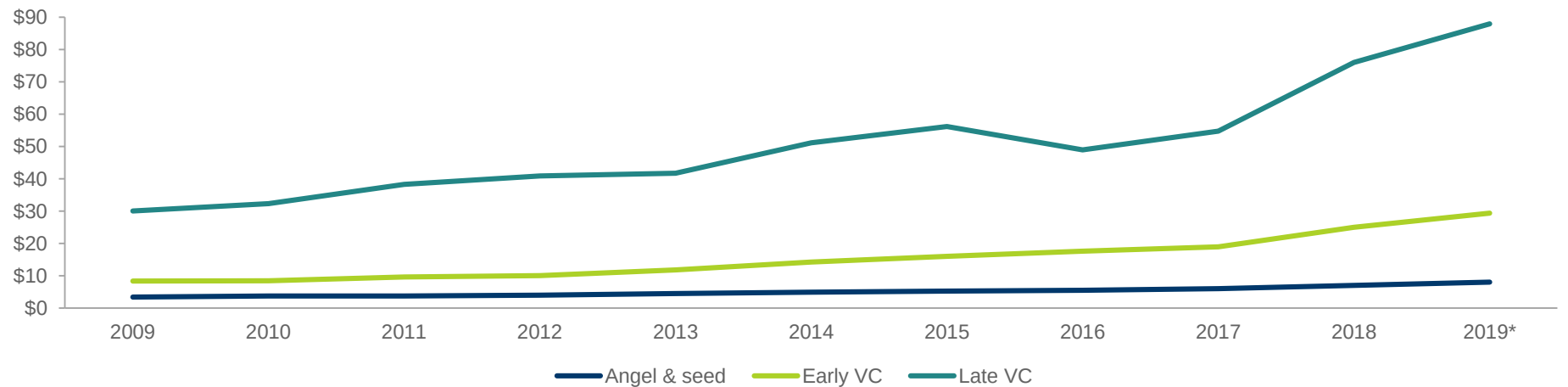


PRIVATE EQUITY – PRICING & VALUATIONS

LBO Purchase Price Multiples (2003 - Q4 2019)



Venture Capital Pre-Money Valuations (\$M) (2009 – Q4 2019)



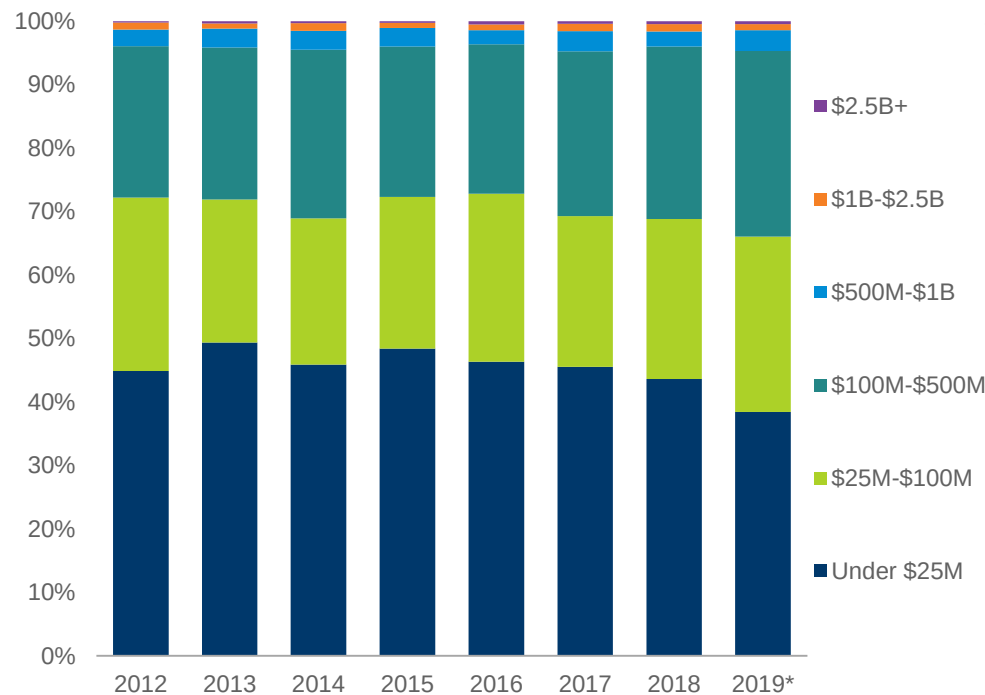
Source: S&P LBO; PitchBook, *as of December 31, 2019.

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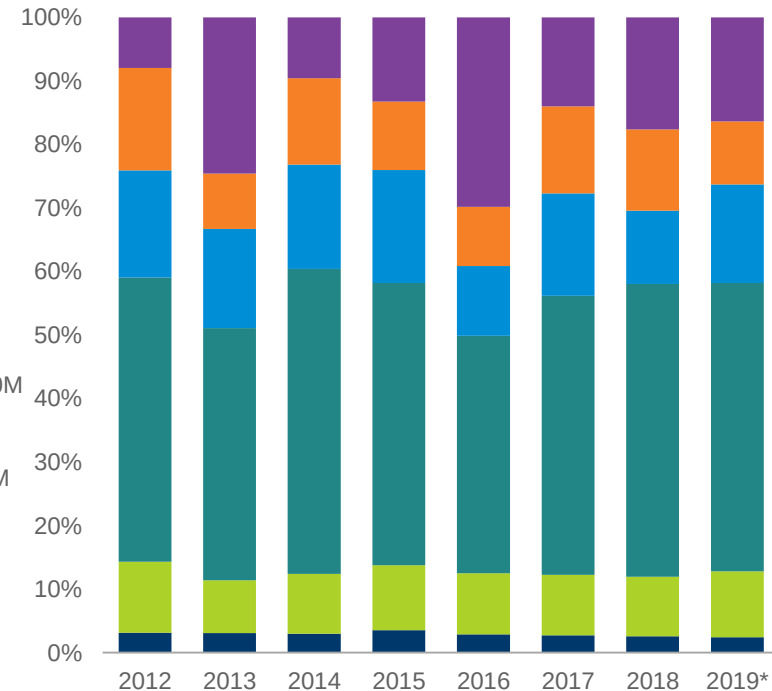


U.S. INVESTMENT ACTIVITY BY DEAL SIZE

Percentage of Deal Volume by Deal Size (by Count)*



Percentage of Deal Volume by Deal Size (by Dollars)*



- Deal volume continues to be dominated by lower middle market deals with investment sizes below \$100 million through the fourth quarter of 2019
- However, deals with below \$100 million check sizes comprised only 12% of all deal volume by amount of capital invested in the fourth quarter of 2019

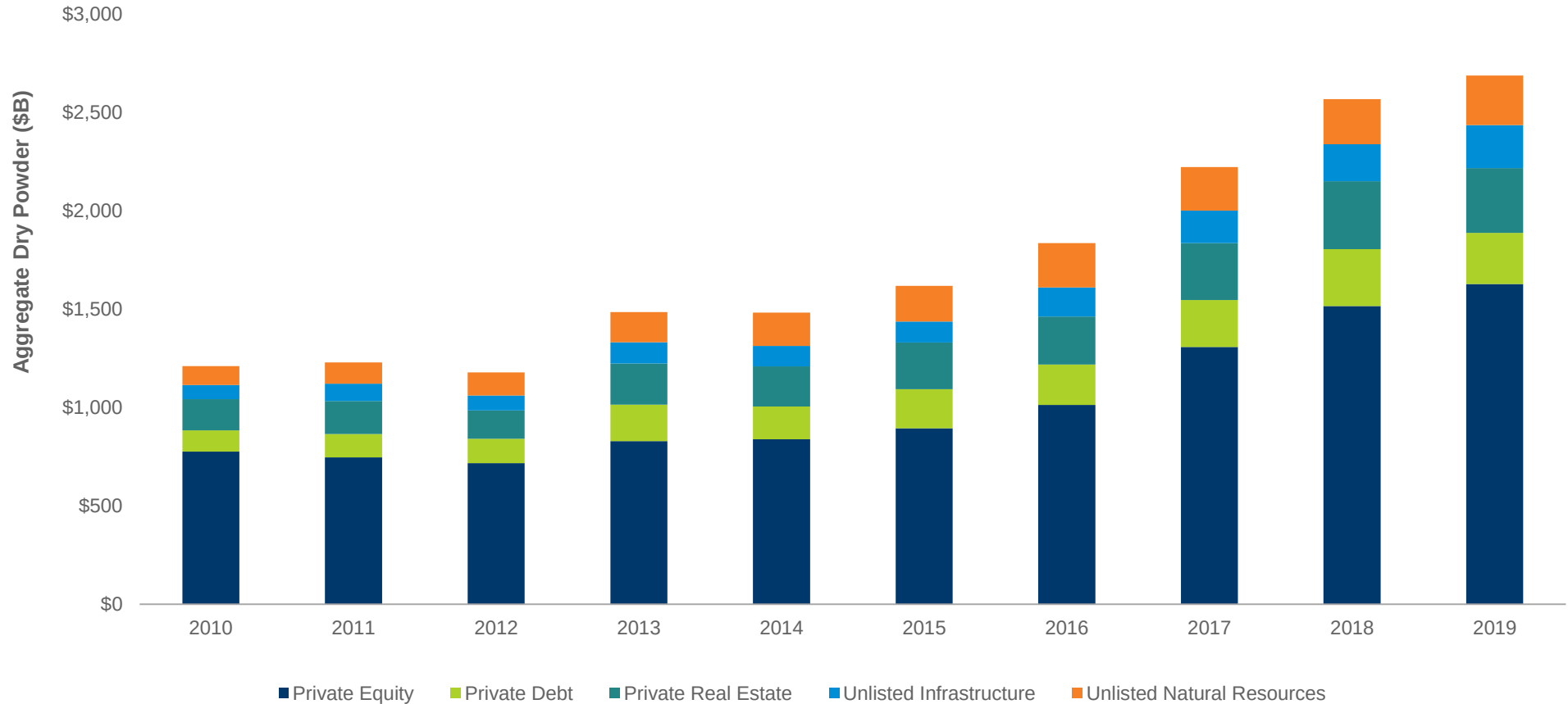
Source: PitchBook, *as of December 31, 2019.

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PRIVATE CAPITAL DRY POWDER

Private Capital Dry Powder by Fund Type (2010 - Q4 2019)



- Global private capital dry powder continues to increase, topping \$2.6 trillion across all fund types
- Private equity comprises just over 60% of total dry powder in the market as of Q4 2019

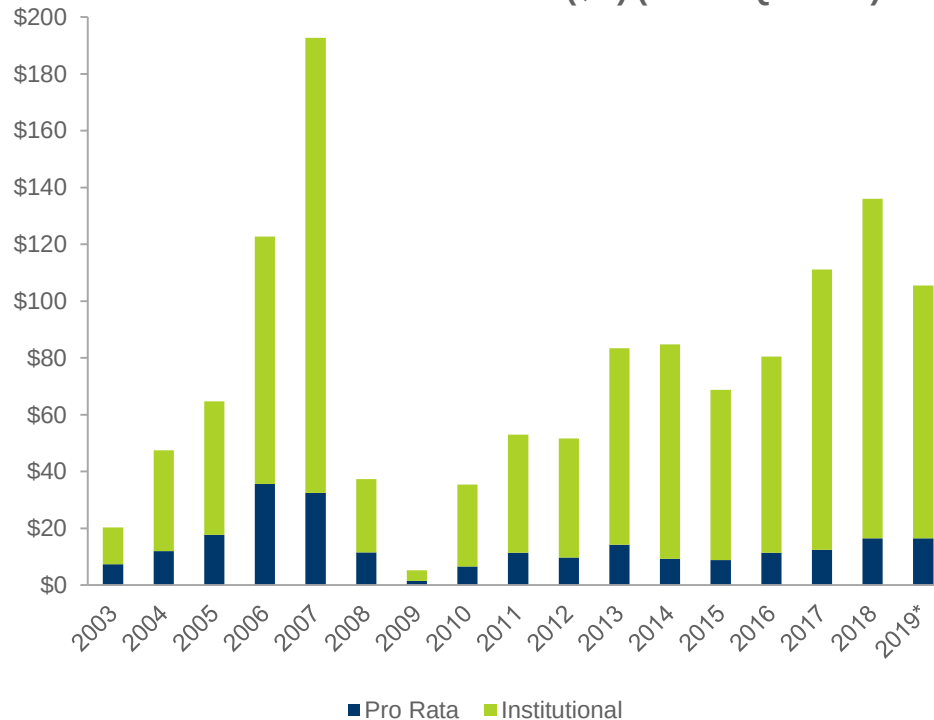
Source: Preqin, as of December 31, 2019.



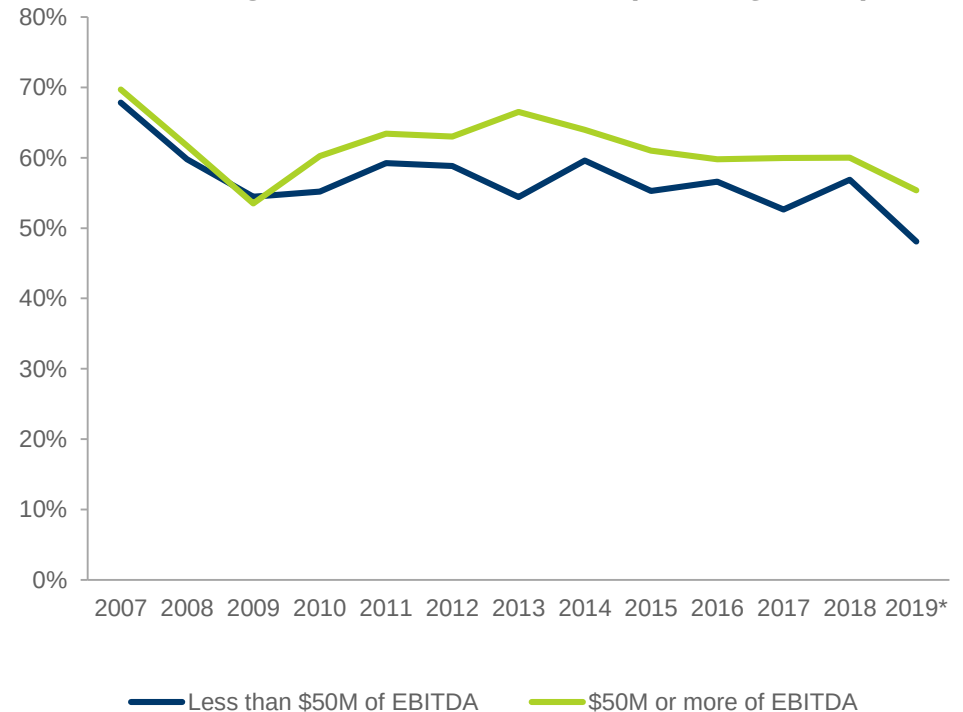
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PRIVATE EQUITY - U.S. DEBT MARKETS

Total U.S. LBO Loan Volume (\$B) (2003 - Q4 2019)



Percentage of Debt Used in LBOs (2007 - Q4 2019)



- 2019 has generated approximately \$106 billion in loan volume and for the first time since 2015, LBO's did not see an increase in loan volume from the prior year
- As debt capital becomes less available, the percentage of debt used to finance leveraged buyouts through the fourth quarter of 2019 has dropped from 2018 marks

Source: S&P LBO, *as of December 31, 2019.

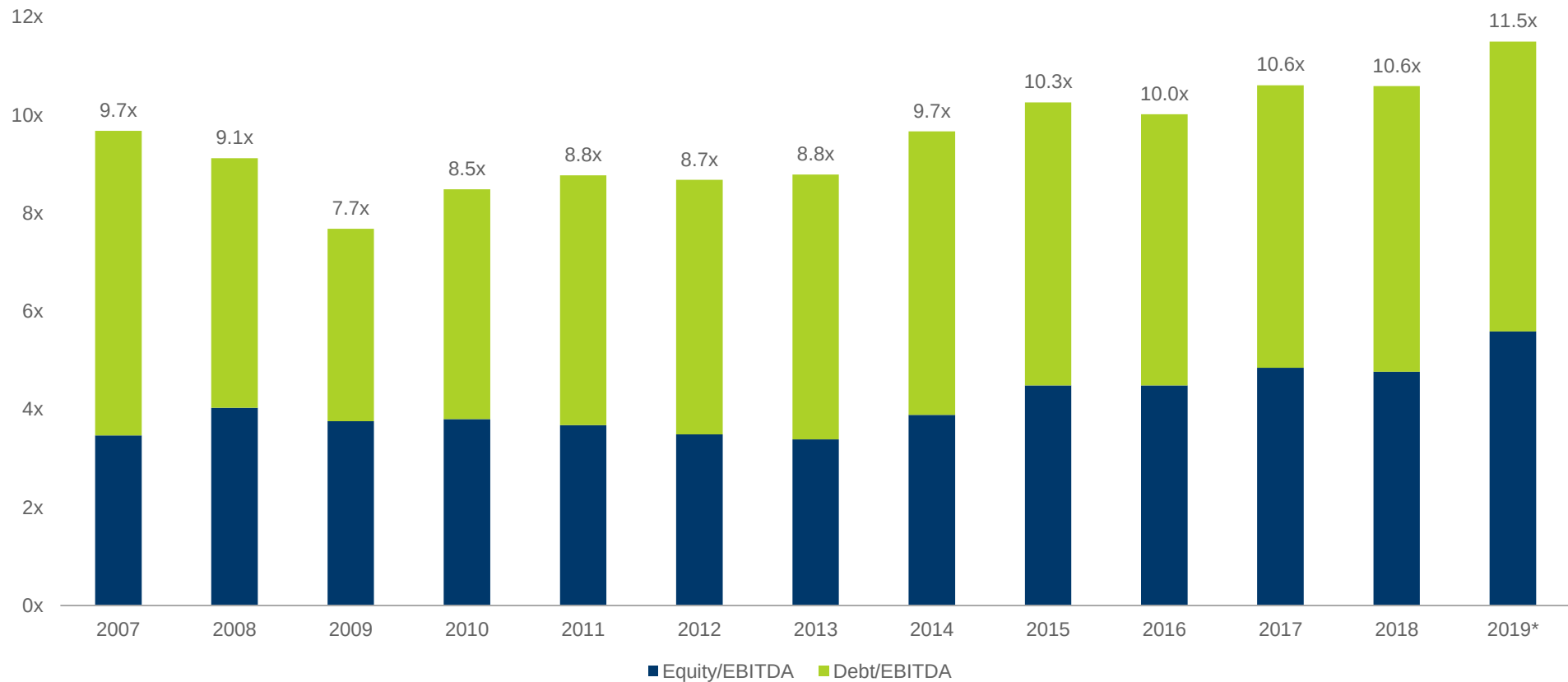
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PRIVATE EQUITY - U.S. LBO PURCHASE PRICE MULTIPLES

Purchase Price Multiples of U.S. LBO Transactions (2007 - Q4 2019)



- Due to the amount of equity that is readily available, purchase price multiples for U.S. LBOs have continued to rise through Q4 2019, relative to 2018 levels

Source: S&P LBO, *as of December 31, 2019.

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CalPERS Private Equity – Performance

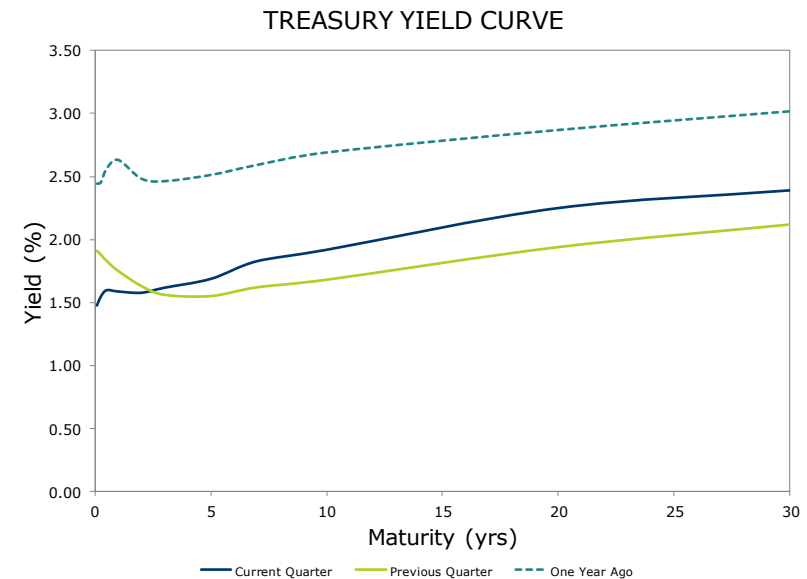
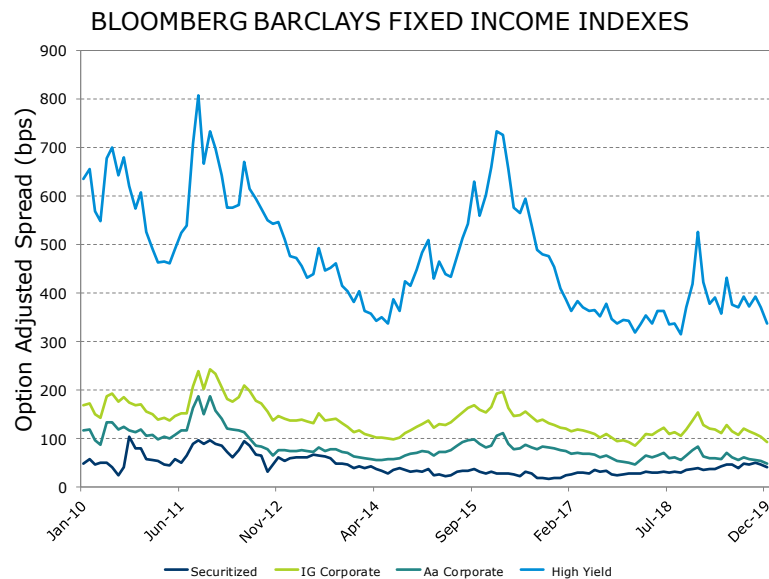
	Asset Value						VaR	5-Year Ratios	
	(\$Billion)	Quarter	1-Year	3-Year	5-Year	10-Year		Sharpe	Info
PRIVATE EQUITY	\$ 26.1	0.2%	2.9%	11.0%	9.0%	12.4%	\$ 10.7	2.2	-0.1
<i>CalPERS Custom Private Equity Benchmark</i>		0.3%	2.6%	12.5%	10.3%	13.4%		0.8	0.0

	Asset Value							VaR	5-Year Ratios	
	(\$Billion)	<u>Quarter</u>	<u>1-Year</u>	<u>3-Year</u>	<u>5-Year</u>	<u>10-Year</u>	(\$Billion)	<u>Sharpe</u>	<u>Info</u>	
Private Equity										
Private Equity Partnership Investments	\$ 26.1	0.2%	3.0%	11.0%	9.0%	12.4%		N/A	N/A	
Private Equity Distribution Stock	\$ 0.0	24.4%	68.9%	42.3%	0.1%	-5.8%		N/A	N/A	

U.S. FIXED INCOME

AS OF DEC 31, 2019	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	2.3	5.9	0.2	8.7	8.7	4.0	3.1	3.7
BLOOMBERG BARCLAYS TREASURY	1.8	6.5	-0.8	6.9	6.9	3.3	2.4	3.1
BLOOMBERG BARCLAYS GOV'T-REL.	2.4	5.9	0.2	9.0	9.0	4.4	3.1	3.5
BLOOMBERG BARCLAYS SECURITIZED	2.5	3.3	0.6	6.4	6.4	3.3	2.6	3.3
BLOOMBERG BARCLAYS CORPORATE	2.9	7.9	1.2	14.5	14.5	5.9	4.6	5.5
BLOOMBERG BARCLAYS LT G/C	3.1	15.8	-1.1	19.6	19.6	8.1	5.4	7.6
BLOOMBERG BARCLAYS LT TREASURY	2.3	18.1	-4.1	14.8	14.8	7.0	4.1	7.0
BLOOMBERG BARCLAYS LT GOV'T-REL.	3.6	12.7	-0.1	18.7	18.7	8.8	5.6	7.7
BLOOMBERG BARCLAYS LT CORP.	3.6	14.5	1.3	23.9	23.9	8.8	6.4	8.0
BLOOMBERG BARCLAYS U.S. TIPS *	1.9	7.6	0.8	8.4	8.4	3.3	2.6	3.4
BLOOMBERG BARCLAYS HIGH YIELD	6.0	3.0	2.6	14.3	14.3	6.4	6.1	7.6
TREASURY BILLS	1.6	0.25	0.5	2.3	2.3	1.7	1.1	0.6

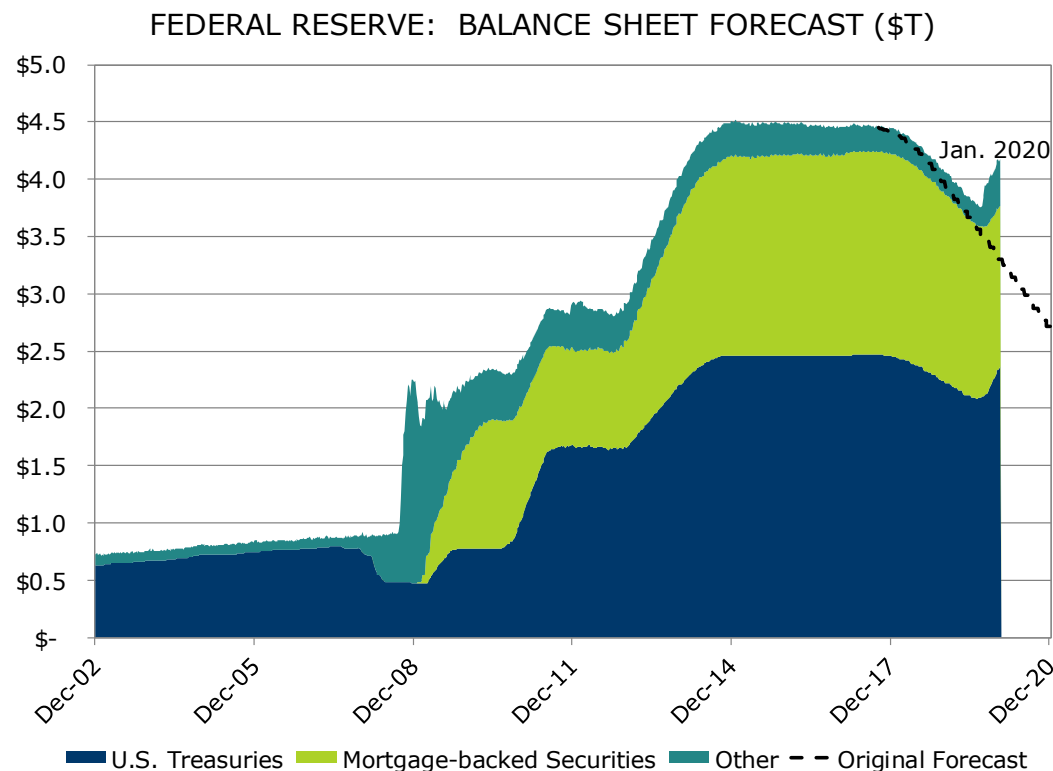
* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index



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

FED BALANCE SHEET

- 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
- Began buying Treasury bills in September to address a liquidity shortage in the repo market
- Fed stated purchases will continue “at least into the second quarter,” potentially reversing their previous balance sheet contraction efforts



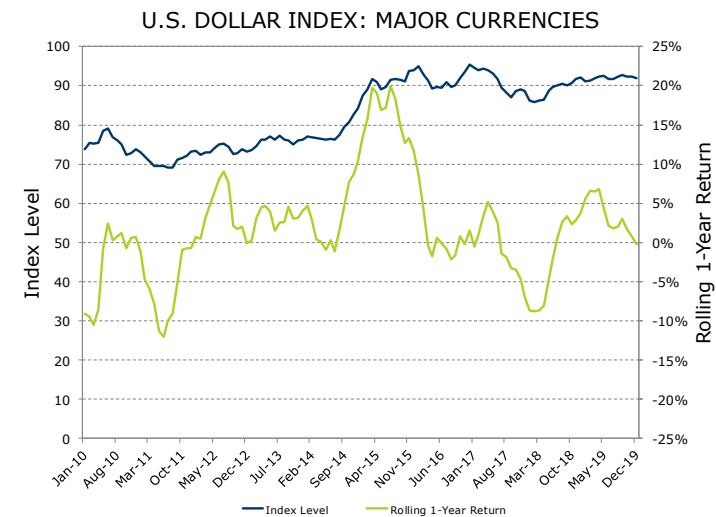
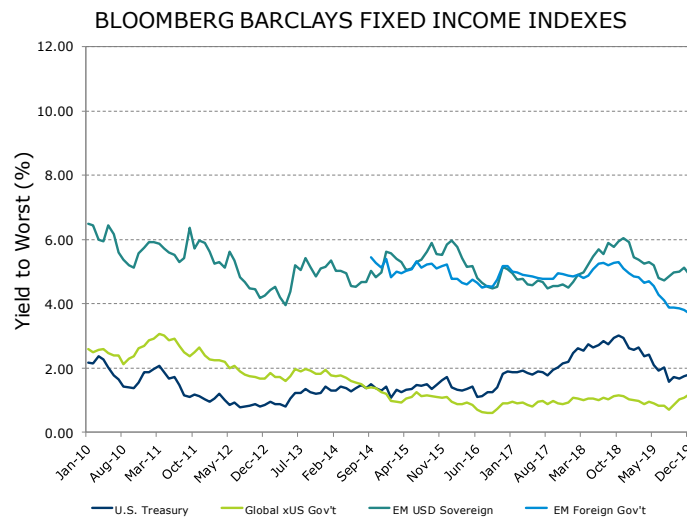
Data sources: Federal Reserve

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NON-U.S. FIXED INCOME

AS OF DEC 31, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DEVELOPED MARKETS						
BLMBRG BRCLYS GLBL AGGREGATE xUS	0.7	5.1	5.1	4.4	1.6	1.5
BLMBRG BRCLYS GLBL AGGREGATE xUS *	-1.1	7.6	7.6	4.4	3.9	4.3
BLMBRG BRCLYS GLOBAL INF LNKD xUS	-0.6	7.8	7.8	4.6	1.8	3.2
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	-5.2	8.0	8.0	4.2	5.3	5.8
EMERGING MARKETS (HARD CURRENCY)						
BLMBRG BRCLYS EM USD AGGREGATE	2.1	13.1	13.1	6.1	5.8	6.6
EMERGING MARKETS (FOREIGN CURRENCY)						
BLMBRG BRCLYS EM LOCAL CURR. GOV'T	4.0	9.5	9.5	6.5	2.8	3.4
BLMBRG BRCLYS EM LOCAL CURR. GOV'T *	0.5	8.5	8.5	4.9	3.6	3.7
EURO vs. DOLLAR	3.0	-1.8	-1.8	2.1	-1.5	-2.4
YEN vs. DOLLAR	-0.6	1.0	1.0	2.4	2.0	-1.5
POUND vs. DOLLAR	7.5	4.0	4.0	2.4	-3.2	-2.0

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

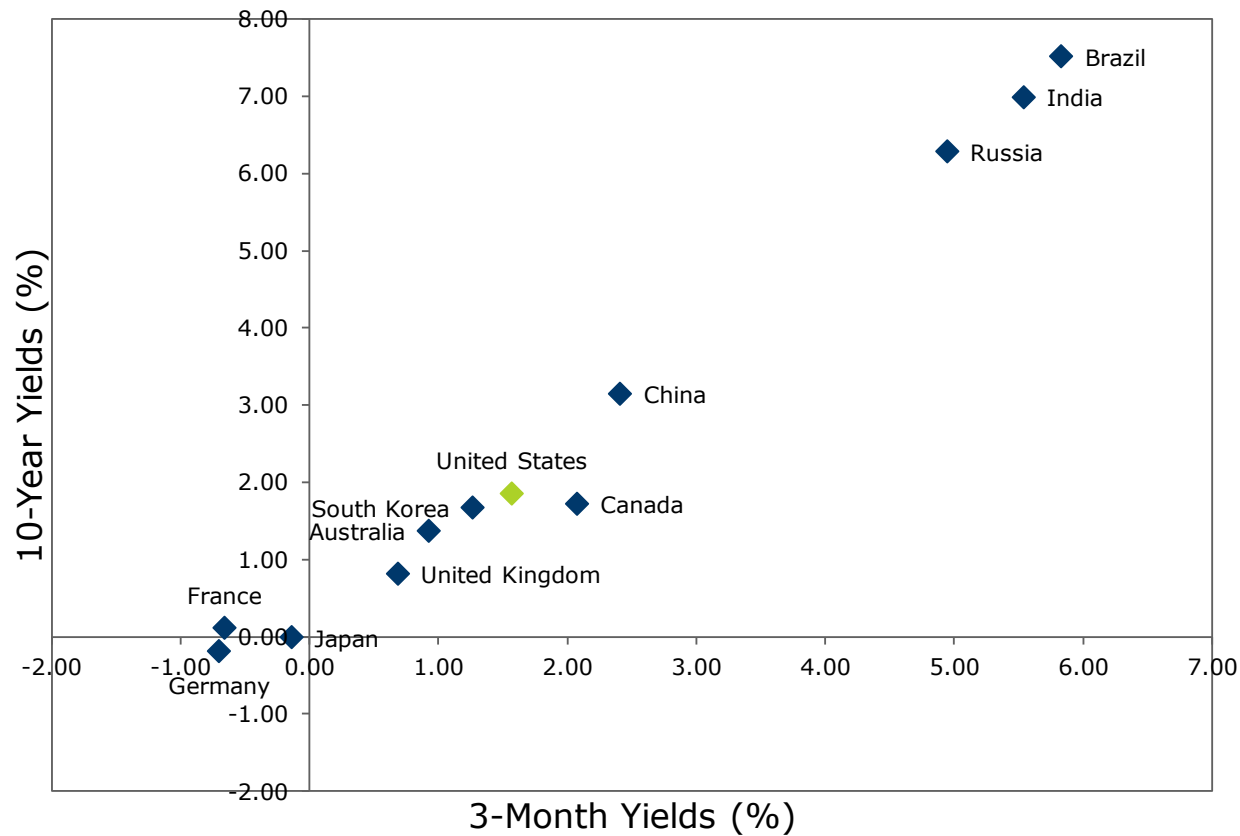


Data sources: Wilshire Compass, Bloomberg Barclays, Federal Reserve Bank of St. Louis

GLOBAL INTEREST RATES

Much of Europe and Japan exhibit negative rates; Long rates are up, however, in those same regions during the past six months

GOVERNMENT BOND YIELDS



Data sources: Bloomberg

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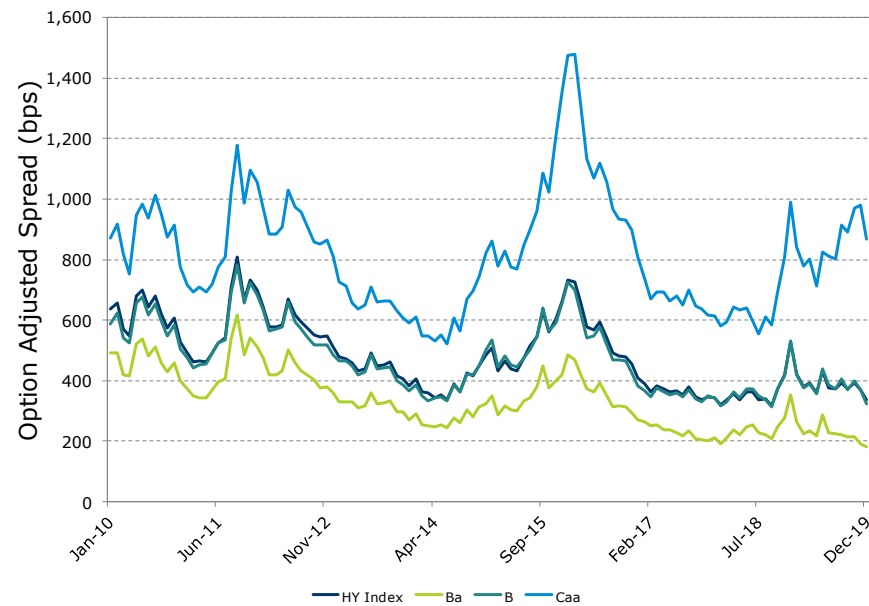
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HIGH YIELD BOND MARKET

AS OF DEC 31, 2019		YTW	QTR	YTD	1 YR	3 YR	5 YR
BLOOMBERG BARCLAYS HIGH YIELD		5.2	2.6	14.3	14.3	6.4	6.1
S&P LSTA LEVERAGE LOAN INDEX		0.0	0.0	8.2	8.2	3.6	3.7
HIGH YIELD QUALITY DISTRIBUTION	WEIGHT						
Ba U.S. HIGH YIELD	47.7%	3.6	2.5	15.5	15.5	6.6	6.2
B U.S. HIGH YIELD	38.8%	5.1	2.6	14.8	14.8	6.5	5.9
Caa U.S. HIGH YIELD	12.5%	10.4	3.7	9.5	9.5	5.1	6.1
Ca to D U.S. HIGH YIELD	0.7%	21.0	-7.3	-0.3	-0.3	3.9	-2.1
Non-Rated U.S. HIGH YIELD	0.3%	6.6	1.9	6.3	6.3	5.5	-0.1

BLOOMBERG BARCLAYS HIGH YIELD INDEXES



Data sources: Wilshire Compass, Bloomberg Barclays

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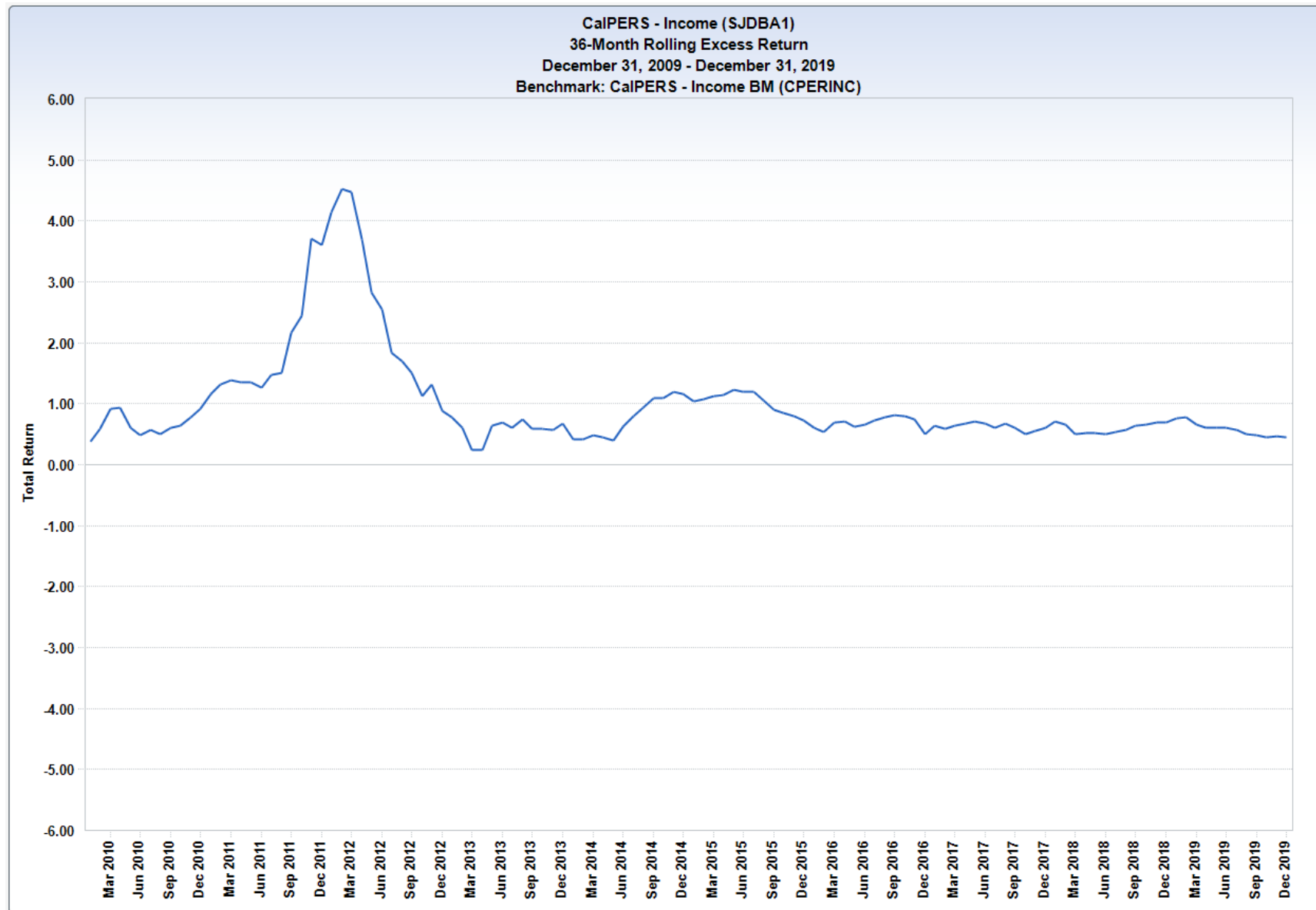
CalPERS Income – Performance

	Asset Value						VaR	5-Year Ratios	
	(\$Billion)	Quarter	1-Year	3-Year	5-Year	10-Year		Sharpe	Info
INCOME	\$ 113.4	-0.3%	12.8%	5.9%	4.3%	5.8%	\$ 10.7	0.7	1.3
<i>Income Policy Benchmark</i>		-0.3%	12.4%	5.4%	3.8%	5.0%		0.5	0.0
Treasury	\$ 43.2	-3.1%	12.1%	-.-%	-.-%	-.-%	\$ 6.0	N/A	N/A
<i>CalPERS Custom Treasury Benchmark</i>		-3.2%	12.0%	-.-%	-.-%	-.-%		N/A	N/A
Spread	\$ 58.4	1.2%	13.0%	-.-%	-.-%	-.-%	\$ 4.9	N/A	N/A
<i>BBG Barc Custom Global Long Spread Index</i>		1.0%	12.2%	-.-%	-.-%	-.-%		N/A	N/A
High Yield	\$ 11.8	2.7%	15.1%	-.-%	-.-%	-.-%	\$ 1.4	N/A	N/A
<i>BBG Barclays US High Yield BB/B Liquid Index</i>		2.7%	14.7%	-.-%	-.-%	-.-%		N/A	N/A

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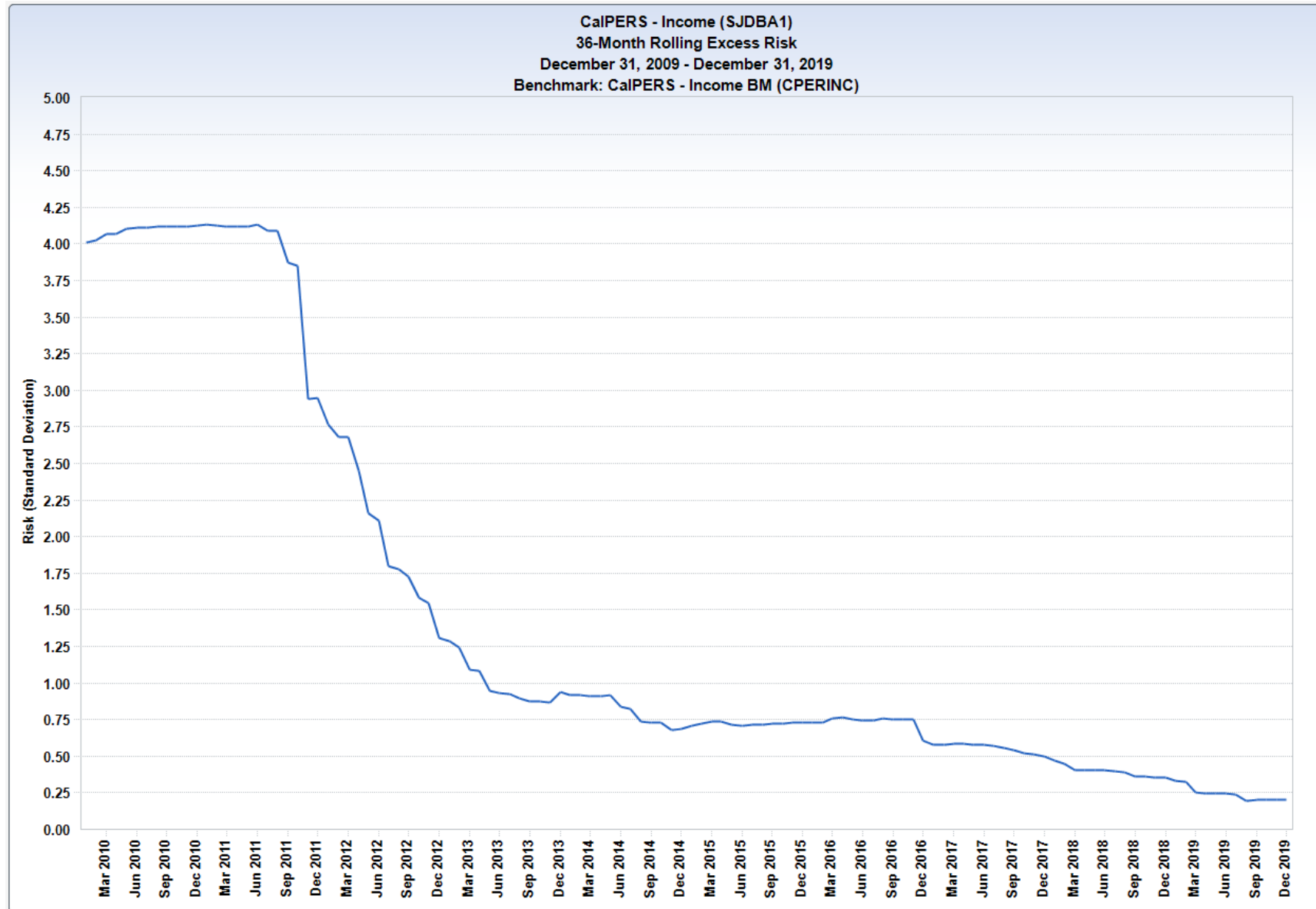
CalPERS Income – Rolling Excess Returns



Wilshire Consulting



CalPERS Income – Rolling Tracking Error



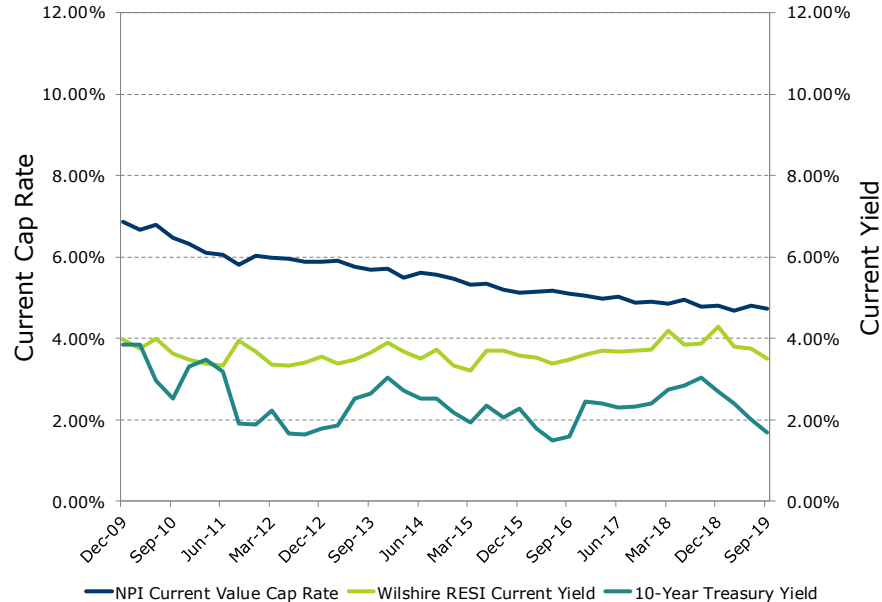
Wilshire Consulting

REAL ASSETS

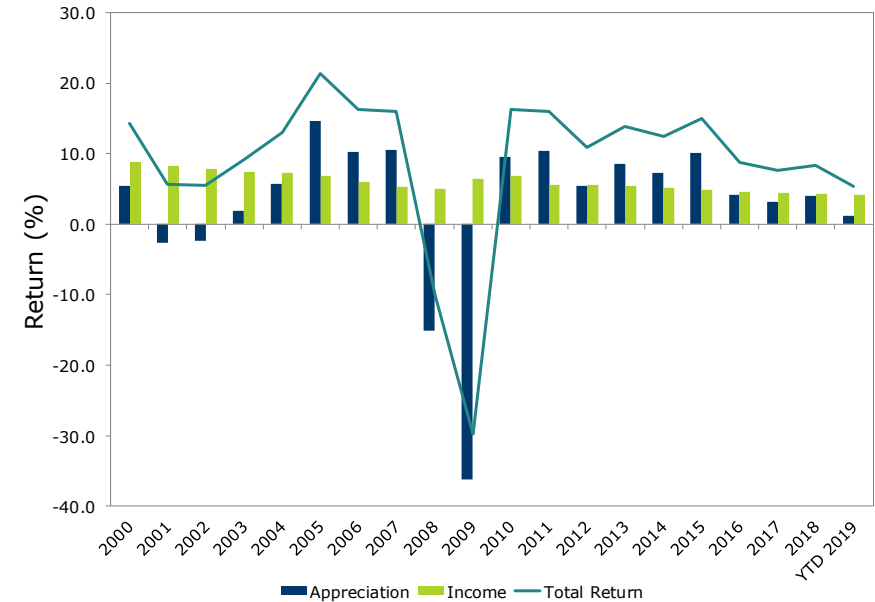


AS OF DEC 31, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS U.S. TIPS	0.8	8.4	8.4	3.3	2.6	3.4
BLOOMBERG COMMODITY INDEX	4.4	7.7	7.7	-0.9	-3.9	-4.7
WILSHIRE GLOBAL RESI INDEX	1.2	24.2	24.2	9.0	6.8	10.5
NCREIF ODCE FUND INDEX	1.5	5.4	5.4	7.1	9.0	11.4
NCREIF TIMBERLAND INDEX	0.0	1.3	1.3	2.7	3.1	4.4
ALERIAN MLP INDEX (OIL & GAS)	-4.1	6.6	6.6	-4.4	-7.0	4.2

REAL ESTATE VALUATION



NCREIF ODCE FUND INDEX RETURN



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

Wilshire Private Markets

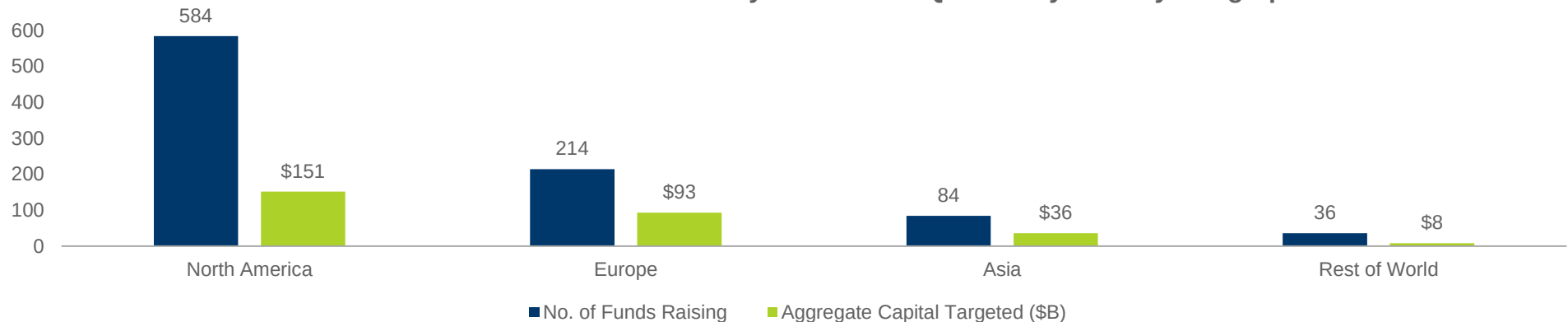


PRIVATE REAL ESTATE – FUNDRAISING ACTIVITY

Global Quarterly Closed-End Private Real Estate Fundraising (Q1 2014 - Q4 2019)



Closed-End Private Real Estate Funds Actively in Market in Q4 2019 by Primary Geographic Focus



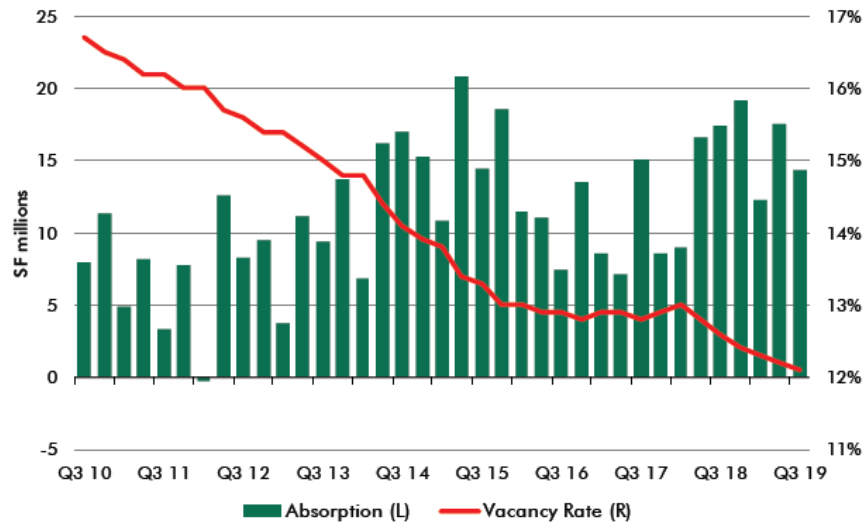
Source: Preqin, as of December 31, 2019.

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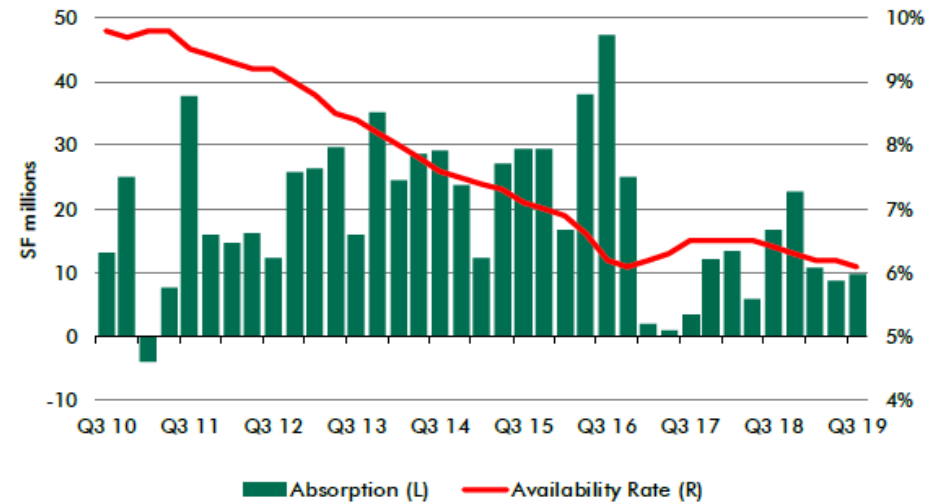


COMMERCIAL PROPERTY

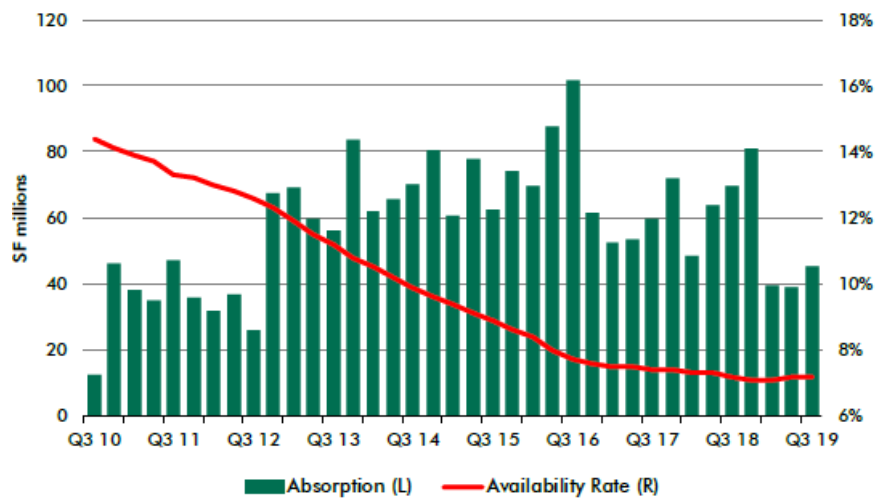
OFFICE



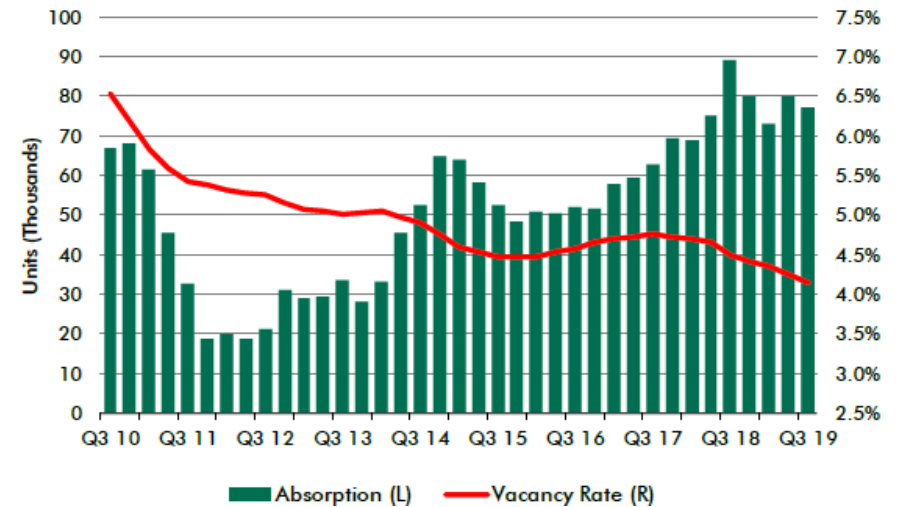
RETAIL



INDUSTRIAL



APARTMENTS



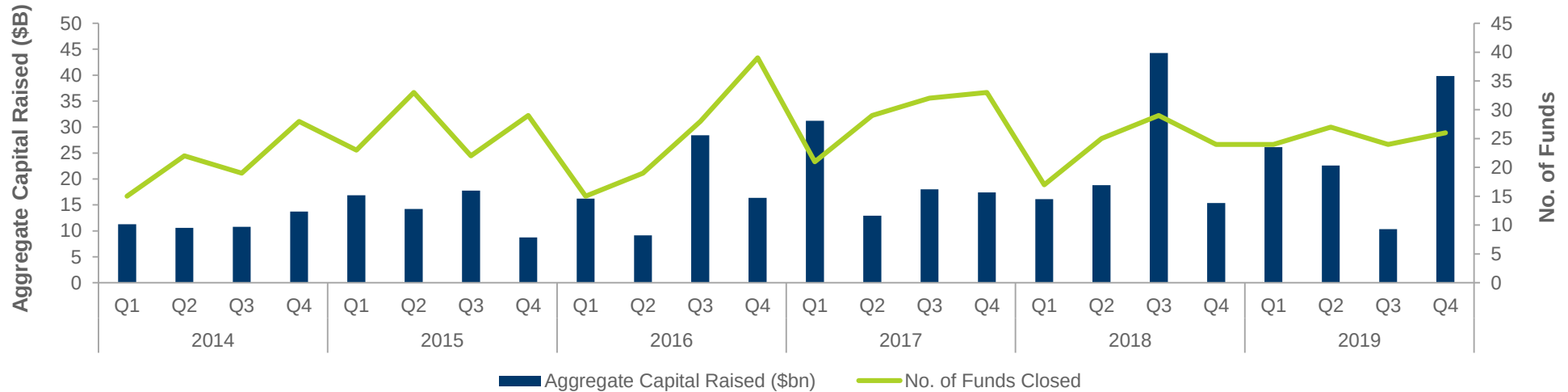
Data sources: CB Richard Ellis

Wilshire Private Markets

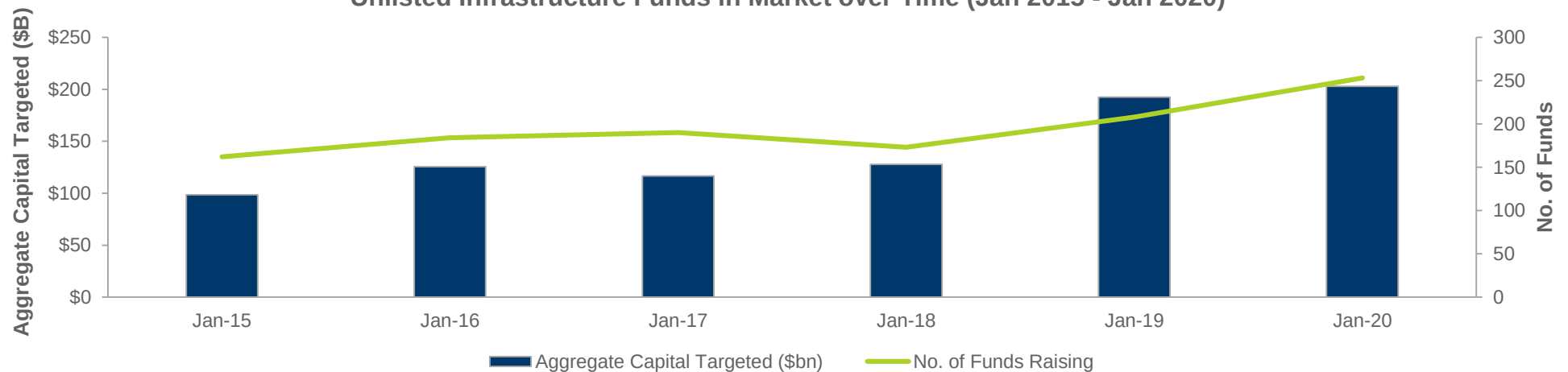


UNLISTED INFRASTRUCTURE – FUNDRAISING & INVESTMENT ACTIVITY

Global Quarterly Unlisted Infrastructure Fundraising (Q1 2014 - Q4 2019)



Unlisted Infrastructure Funds in Market over Time (Jan 2015 - Jan 2020)



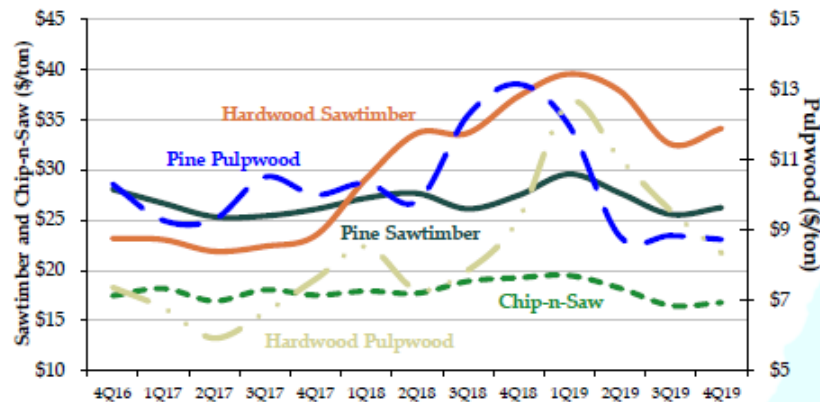
Source: Preqin, as of December 31, 2019.

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TIMBER

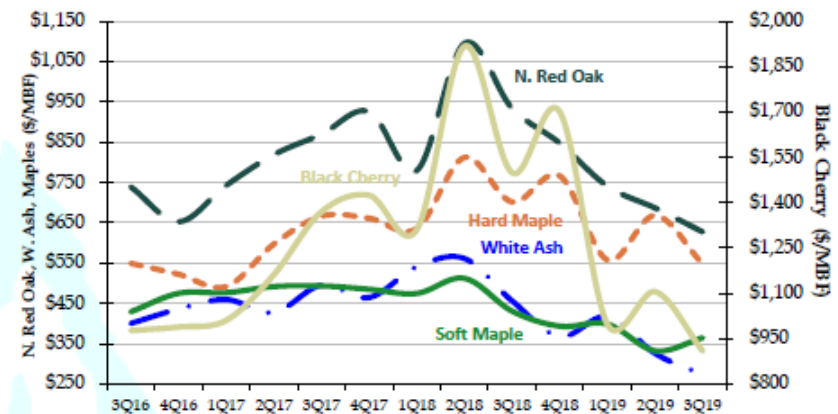


Southeastern Timber Prices



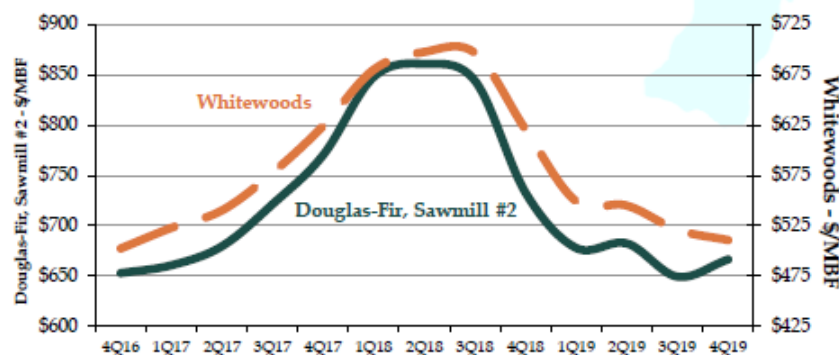
Source: Forest2Market®

Northeastern Hardwood Timber Prices



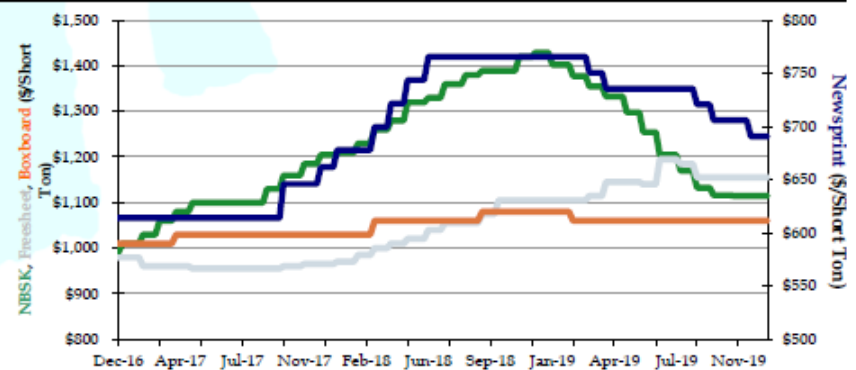
Source: Pennsylvania Woodlands Timber Market Report - Northwest Region

Pacific Northwest Timber Prices



Source: Fastmarkets RISI - Log Lines®

Pulp and Paper



Source: Fastmarkets RISI

Data sources: Forest Investment Associates

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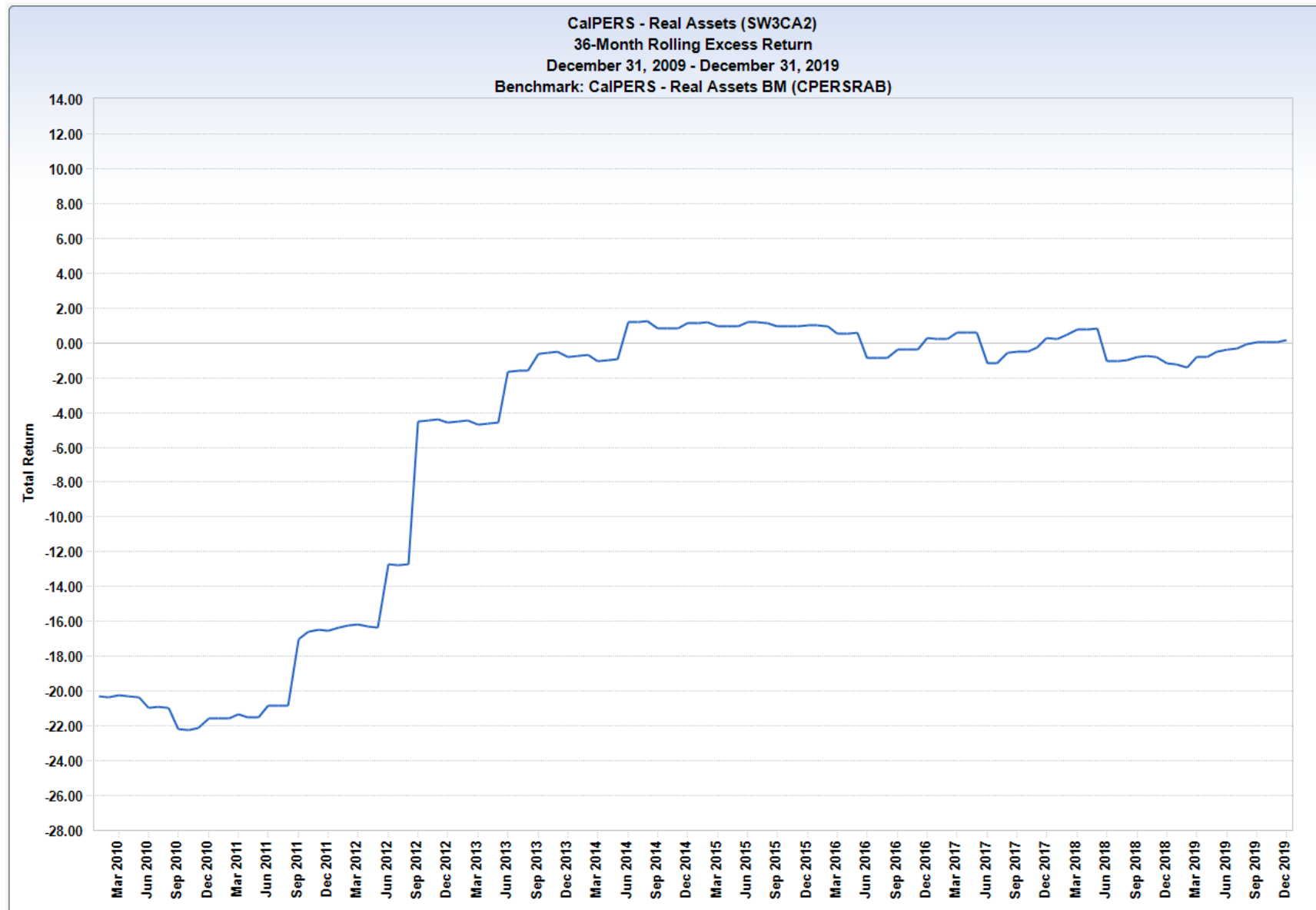
CalPERS Real Assets – Performance

Asset Value								VaR	5-Year Ratios	
	(\$Billion)	Quarter	1-Year	3-Year	5-Year	10-Year	(\$Billion)	Sharpe	Info	
REAL ASSETS	\$ 43.5	1.6%	6.3%	6.3%	7.7%	8.1%	\$ 6.2	1.5	0.0	
Real Assets Policy Benchmark		1.0%	4.6%	6.2%	7.9%	9.2%		2.0	0.0	
Real Estate	\$ 36.6	2.1%	6.3%	6.0%	8.0%	8.5%	\$ 5.2	1.4	-0.1	
CalPERS Custom Real Estate Benchmark		1.0%	4.6%	6.3%	8.3%	10.2%		2.0	0.0	
Infrastructure	\$ 5.6	-1.5%	7.3%	12.2%	11.2%	14.6%	\$ 0.8	1.8	1.0	
CalPERS Custom Infrastructure Benchmark		1.0%	4.6%	5.9%	5.5%	6.0%		2.7	0.0	
Forestland	\$ 1.3	1.3%	3.8%	-2.4%	-3.4%	-2.0%	\$ 0.2	-0.7	-1.2	
CalPERS Custom Forestland Benchmark		1.0%	4.6%	4.7%	5.3%	4.4%		1.3	0.0	

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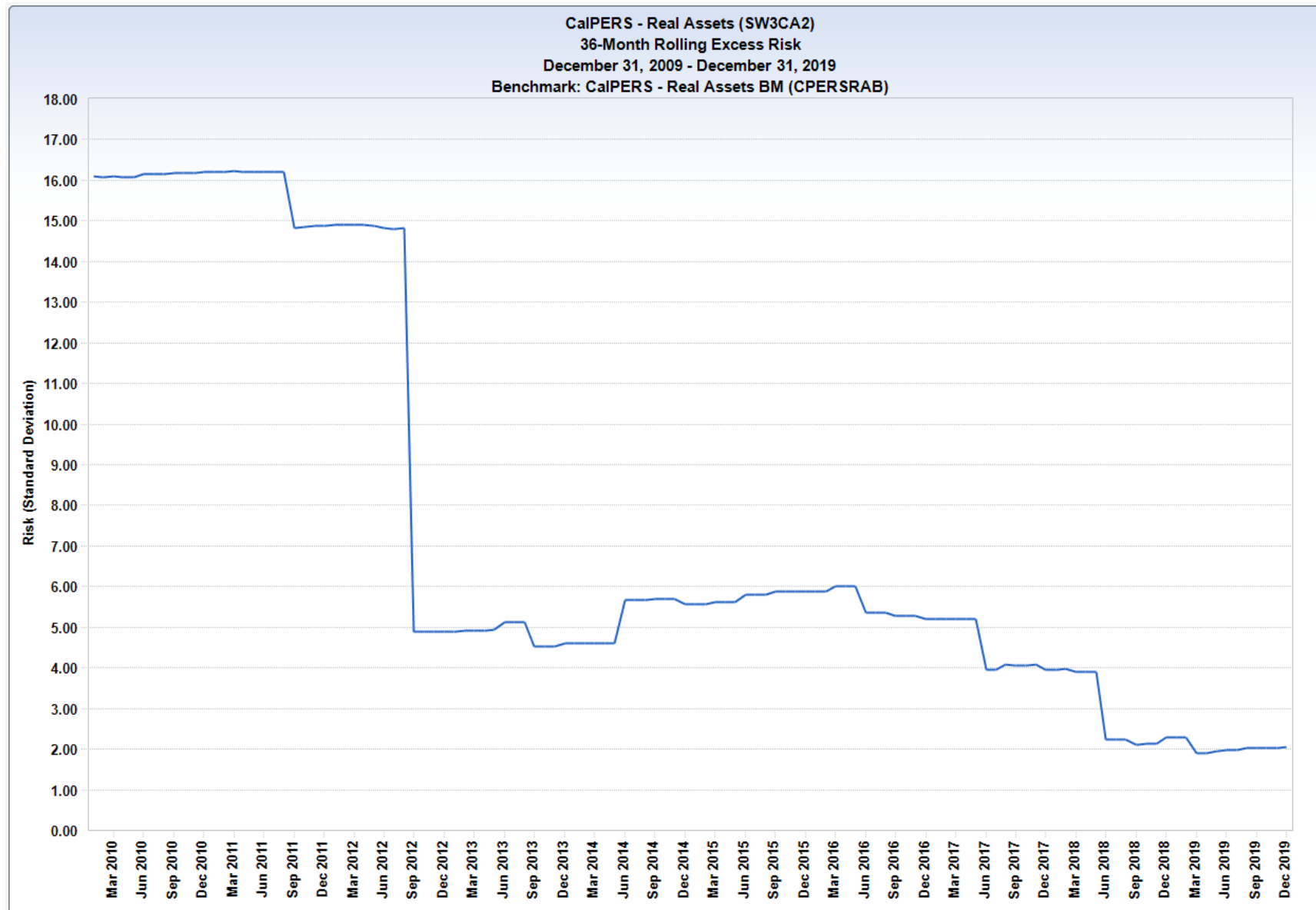
CalPERS Real Assets – Rolling Excess Returns



Wilshire Consulting



CalPERS Real Assets – Rolling Tracking Error



Wilshire Consulting



CalPERS Liquidity – Performance

	Asset Value							VaR	5-Year Ratios	
	(\$Billion)	Quarter	1-Year	3-Year	5-Year	10-Year	(\$Billion)	Sharpe	Info	
LIQUIDITY	\$	3.9	0.5%	2.6%	2.0%	1.4%	1.2%	\$ 0.01	0.5	0.7
Liquidity Policy Benchmark			0.4%	2.1%	1.6%	1.2%	1.3%		0.1	0.0
Internal Short Term Cash Portfolio	\$	3.9	0.5%	2.6%	2.0%	1.3%	0.8%	\$ 0.01	0.5	0.7
CalPERS Short Term Benchmark			0.4%	2.1%	1.6%	1.1%	0.6%		0.1	0.0

Trust Level Portfolio Management – Performance

Asset Value								VaR	5-Year Ratios	
	(\$Billion)	Quarter	1-Year	3-Year	5-Year	10-Year	(\$Billion)	Sharpe	Info	
TRUST LEVEL PORTFOLIO MGMT	\$	4.9	3.4%	2.5%	-.-%	-.-%	-.-%	\$ 0.7	N/A	N/A
CalPERS Reference Portfolio Benchmark			5.0%	22.5%	-.-%	-.-%	-.-%		N/A	N/A
External Multi-Asset Class	\$	1.1	1.7%	13.9%	5.2%	3.9%	-.-%		N/A	N/A
CalPERS Reference Portfolio Benchmark			5.0%	22.5%	9.8%	7.0%	-.-%		N/A	N/A
TLPM Risk Mitigation *	\$	0.1	-39.3%	-78.7%	-.-%	-.-%	-.-%		N/A	N/A
TLPM Transition	\$	3.0	-.-%	-.-%	-.-%	-.-%	-.-%		N/A	N/A
GE Emerging Managers Program	\$	0.7	8.5%	-.-%	-.-%	-.-%	-.-%		N/A	N/A
FTSE Global All Cap Custom Index			9.1%	-.-%	-.-%	-.-%	-.-%		N/A	N/A

* The Risk Mitigation portfolio is a small component whose average monthly market values over the 2019 calendar year represented 0.036% of CalPERS total assets.

Due to its relative size, performance contribution to CalPERS Total Fund is estimated to be -0.028%, over the same period.

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Other Perf – Performance

	Asset Value							VaR	5-Year Ratios	
	(\$Billion)	Quarter	1-Year	3-Year	5-Year	10-Year	(\$Billion)	Sharpe	Info	
OTHER PERF	\$ 0.2	NM	NM	NM	NM	NM	\$ -	N/A	N/A	
Absolute Return Strategies *	\$ 0.2	0.9%	-12.6%	-3.7%	-3.1%	0.6%		-0.6	-1.4	
Total ARS Program Blended Benchmark		1.8%	8.1%	6.9%	6.3%	5.9%		12.4	0.0	

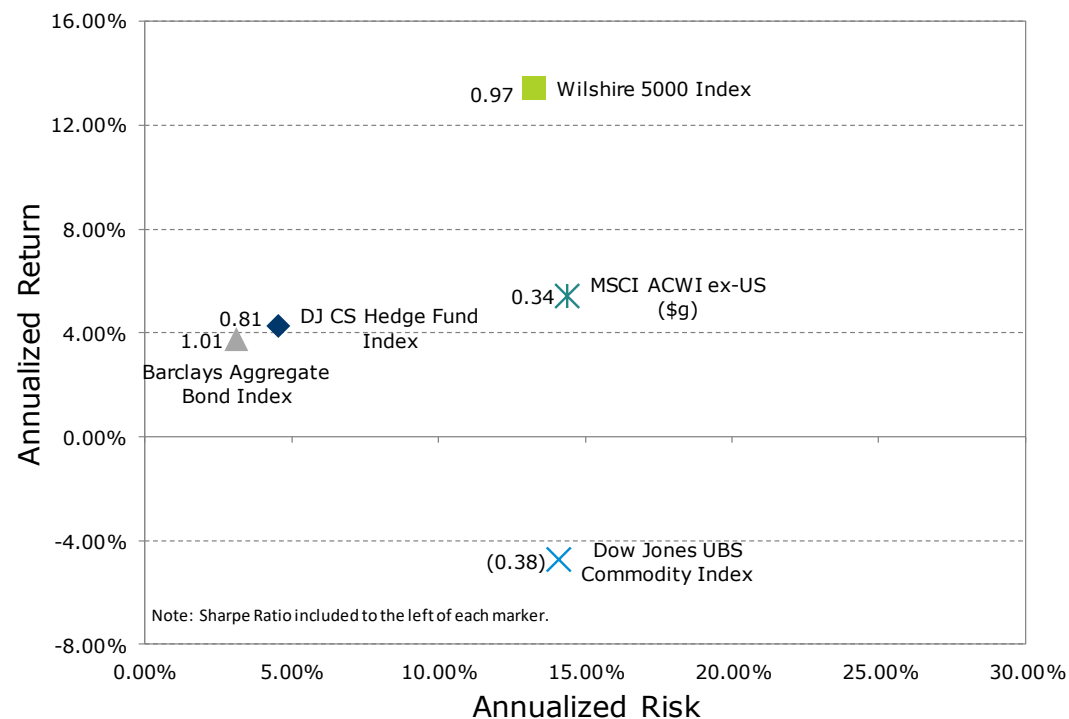
* The Absolute Return Strategies portfolio is a small component whose average monthly market values over the 2019 calendar year represented 0.05% of CalPERS total assets.

Due to its relative size, performance contribution to CalPERS Total Fund is estimated to be -0.006% over the same period.

HEDGE FUND PERFORMANCE

AS OF DECEMBER 31, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DJ CS HEDGE FUND INDEX	2.4	9.3	9.3	4.3	2.6	4.3
EVENT DRIVEN	2.2	8.2	8.2	3.4	1.2	3.5
GLOBAL MACRO	0.8	10.4	10.4	4.0	3.2	4.7
LONG/SHORT EQUITY	5.1	12.2	12.2	6.7	3.9	5.2
MULTI-STRATEGY	1.3	7.2	7.2	4.3	4.2	6.0
WILSHIRE 5000	9.1	31.0	31.0	14.5	11.4	13.4
MSCI ACWI EX-US (\$G)	9.0	22.1	22.1	10.4	6.0	5.4
BLOOMBERG BARCLAYS AGGREGATE	0.2	8.7	8.7	4.0	3.1	3.7
DOW JONES UBS COMMODITY	4.4	7.7	7.7	-0.9	-3.9	-4.7

HEDGE FUND 10-YEAR RISK/RETURN



Data sources: Wilshire Compass

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