

# QUARTERLY PERFORMANCE REPORT

## SAN BERNARDINO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

March 31, 2020

Allan Martin, Partner

Sam Austin, Partner

Michael Malchenko, Senior Analyst



San Bernardino County Employees'  
Retirement Association



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

# MARKET ENVIRONMENT UPDATE AND OUTLOOK

NEPC, LLC

---

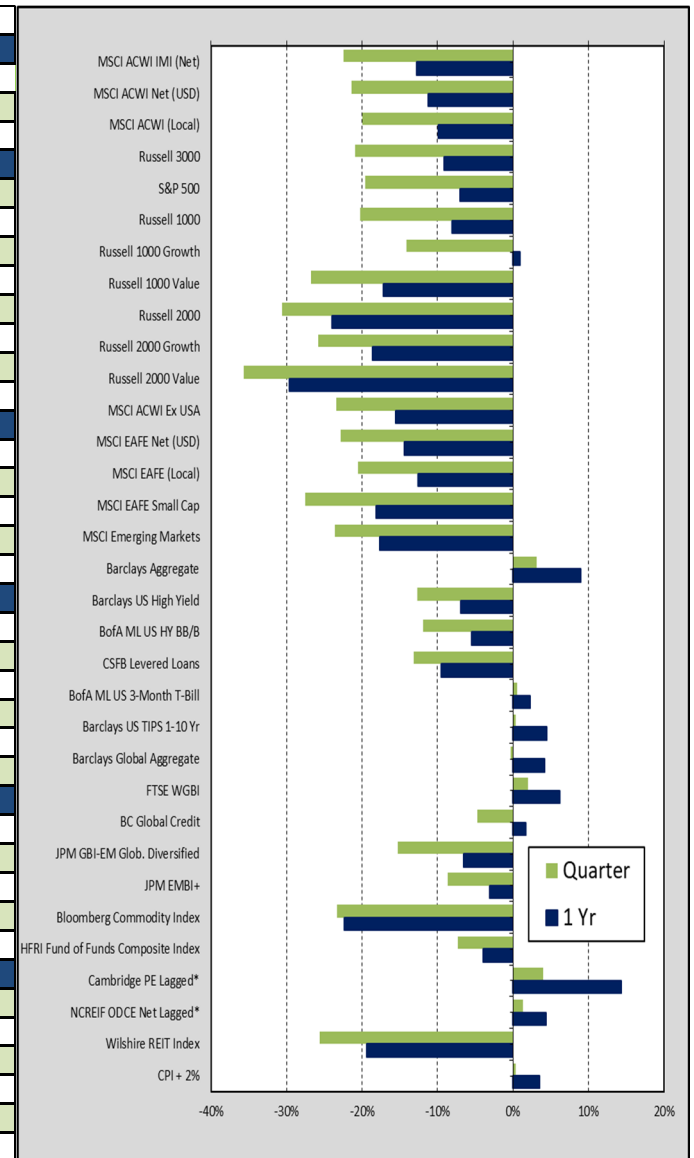
# ECONOMIC ENVIRONMENT

- **Q1 Real GDP (advance estimate) decreased at an annual rate of 4.8%.**
  - Retail sales ended January at +4.5% on a YoY basis. In the same period last year the YoY growth rate was 1.9%.
  - Corporate profits (ended September) as a percent of GDP increased to 8.8% from 8.5% (in June) and remain elevated relative to historical levels.
  - The inventory-to-sales ratio ended January flat at 1.4 from December levels and has remained relatively constant since early 2010.
  - The U.S. trade deficit fell ended January (-6.7%) as imports fell and exports fell due to the coronavirus.
- **The unemployment rate ticked up to 4.4% ended March, up from 3.6% in Q4; U-6, a broader measure of unemployment, increased to 8.7% in Q1 from 6.7% in Q4.**
- **The Case-Shiller Home Price Index (ended February) increased to 213.2 from 212.4 (in December) and remains at levels higher than that of pre-financial crisis levels of 150.9.**
- **Rolling 12-month seasonally-adjusted CPI saw a down-tick to 1.52% in Q1 from 2.29% ended Q4; Capacity Utilization decreased to 72.7% from 77.1% in Q1.**
- **Fed Funds rate was cut 1.50% to a targeted range of 0.00%-to-0.25%. The 10-year Treasury Yield (constant maturity) finished Q1 at 0.9% from 1.9%, a historic low.**
- **The Fed announced an unlimited expansion of the balance sheet to support the US economy. This move expanded on previous announcements for smaller QE denominations**
- **S&P valuations decreased in Q1 to 24.9x, and is now lower than the 10-year average of 25.8x.**
  - Cyclically adjusted Shiller PE ratio remains above the long-term average of 16.7x



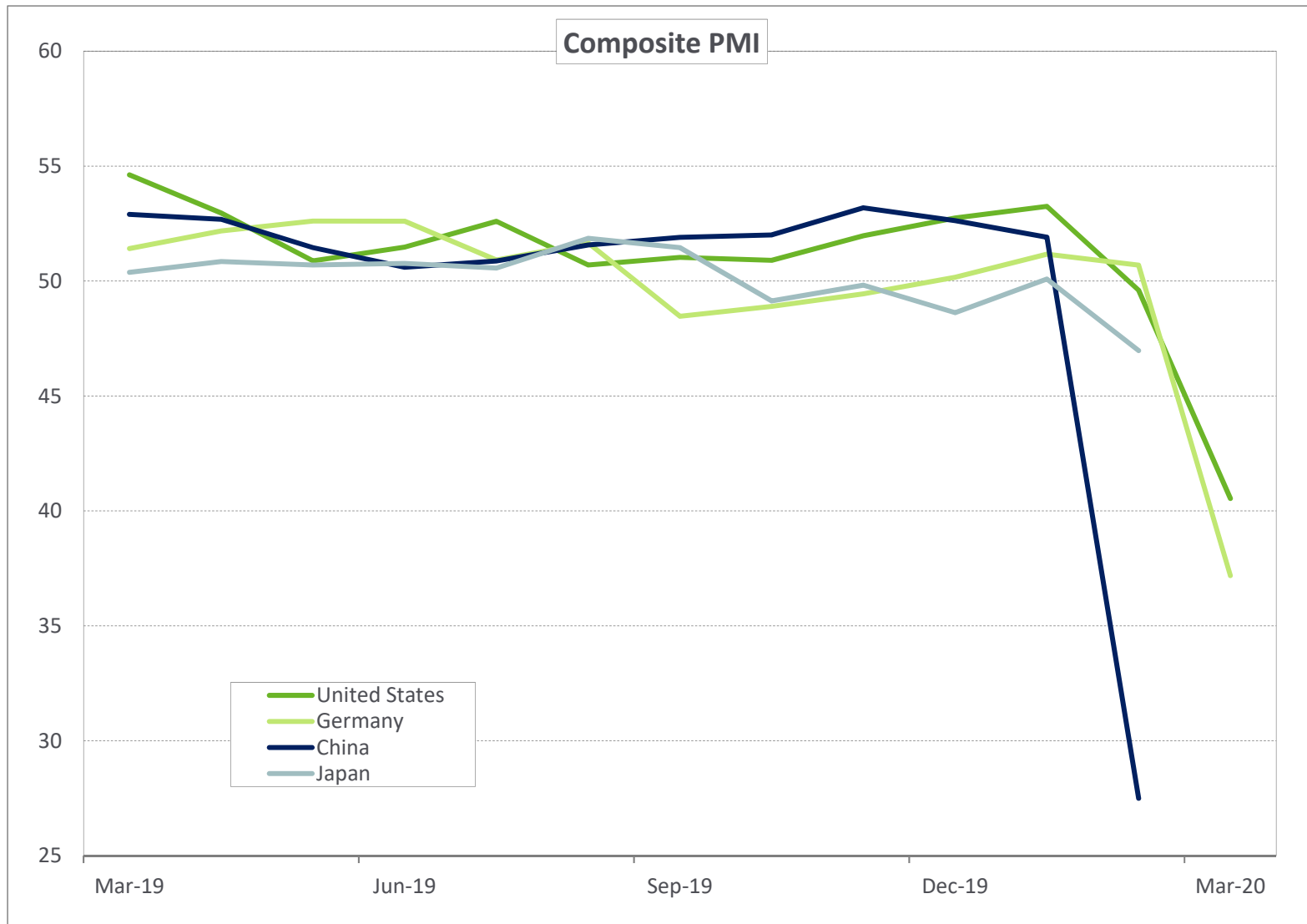
# MARKET ENVIRONMENT – Q1 2020 OVERVIEW

		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
<b>World Equity Benchmarks</b>						
MSCI ACWI IMI (Net)	World with Small Cap	-22.44%	-12.73%	0.76%	2.45%	5.80%
MSCI ACWI Net (USD)	World W/O Small Cap	-21.37%	-11.26%	1.50%	2.85%	5.88%
MSCI ACWI (Local)	World (Local Currency)	-19.97%	-9.87%	1.69%	3.14%	6.80%
<b>Domestic Equity Benchmarks</b>						
Russell 3000	Domestic All Cap	-20.90%	-9.13%	4.00%	5.77%	10.15%
S&P 500	Large Core	-19.60%	-6.98%	5.10%	6.73%	10.53%
Russell 1000	Large Core	-20.22%	-8.03%	4.64%	6.22%	10.39%
Russell 1000 Growth	Large Growth	-14.10%	0.91%	11.32%	10.36%	12.97%
Russell 1000 Value	Large Value	-26.73%	-17.17%	-2.18%	1.90%	7.67%
Russell 2000	Small Core	-30.61%	-23.99%	-4.64%	-0.25%	6.90%
Russell 2000 Growth	Small Growth	-25.77%	-18.58%	0.10%	1.70%	8.89%
Russell 2000 Value	Small Value	-35.66%	-29.64%	-9.51%	-2.42%	4.79%
<b>International Equity Benchmarks</b>						
MSCI ACWI Ex USA	World ex-US	-23.36%	-15.57%	-1.96%	-0.64%	2.05%
MSCI EAFE Net (USD)	Int'l Developed	-22.83%	-14.38%	-1.82%	-0.62%	2.72%
MSCI EAFE (Local)	Int'l Developed (Local Currency)	-20.55%	-12.58%	-1.80%	-0.15%	4.36%
MSCI EAFE Small Cap	Small Cap Int'l	-27.52%	-18.15%	-2.88%	0.97%	4.81%
MSCI Emerging Markets	Emerging Equity	-23.60%	-17.69%	-1.62%	-0.37%	0.68%
<b>Domestic Fixed Income Benchmarks</b>						
Barclays Aggregate	Core Bonds	3.15%	8.93%	4.82%	3.36%	3.88%
Barclays US High Yield	High Yield	-12.69%	-6.94%	0.76%	2.78%	5.64%
BofA ML US HY BB/B	High Yield	-11.88%	-5.46%	1.31%	2.92%	5.63%
CSFB Levered Loans	Bank Loans	-13.19%	-9.51%	-0.73%	1.21%	3.26%
BofA ML US 3-Month T-Bill	Cash	0.57%	2.26%	1.83%	1.19%	0.64%
Barclays US TIPS 1-10 Yr	Inflation	0.31%	4.50%	2.54%	2.18%	2.52%
<b>Global Fixed Income Benchmarks</b>						
Barclays Global Aggregate	Global Core Bonds	-0.33%	4.20%	3.55%	2.64%	2.47%
FTSE WGBI	World Gov. Bonds	2.00%	6.17%	4.27%	2.96%	2.19%
BC Global Credit	Global Bonds	-4.68%	1.67%	3.09%	2.42%	3.39%
JPM GBI-EM Glob. Diversified	Em. Mkt. Bonds (Local Currency)	-15.21%	-6.52%	-0.80%	0.25%	0.49%
JPM EMBI+	Em. Mkt. Bonds	-8.67%	-3.13%	0.53%	2.93%	4.77%
<b>Alternative Benchmarks</b>						
Bloomberg Commodity Index	Commodities	-23.29%	-22.31%	-8.61%	-7.76%	-6.74%
HFRI Fund of Funds Composite Index	Fund of Hedge Funds	-7.30%	-3.94%	0.50%	0.33%	1.91%
Cambridge PE Lagged*	Private Equity	4.03%	14.33%	14.07%	12.14%	13.81%
NCREIF ODCE Net Lagged*	Real Estate	1.27%	4.39%	6.13%	7.99%	10.39%
Wilshire REIT Index	REIT	-25.63%	-19.39%	-2.50%	-0.19%	7.66%
CPI + 2%	Inflation/Real Assets	0.31%	3.55%	3.96%	3.84%	3.76%



\* As of 12/31/2019

# GLOBAL ECONOMY EXPECTED TO CONTRACT



Source: Markit, FactSet



# MONETARY AND FISCAL RESPONSES

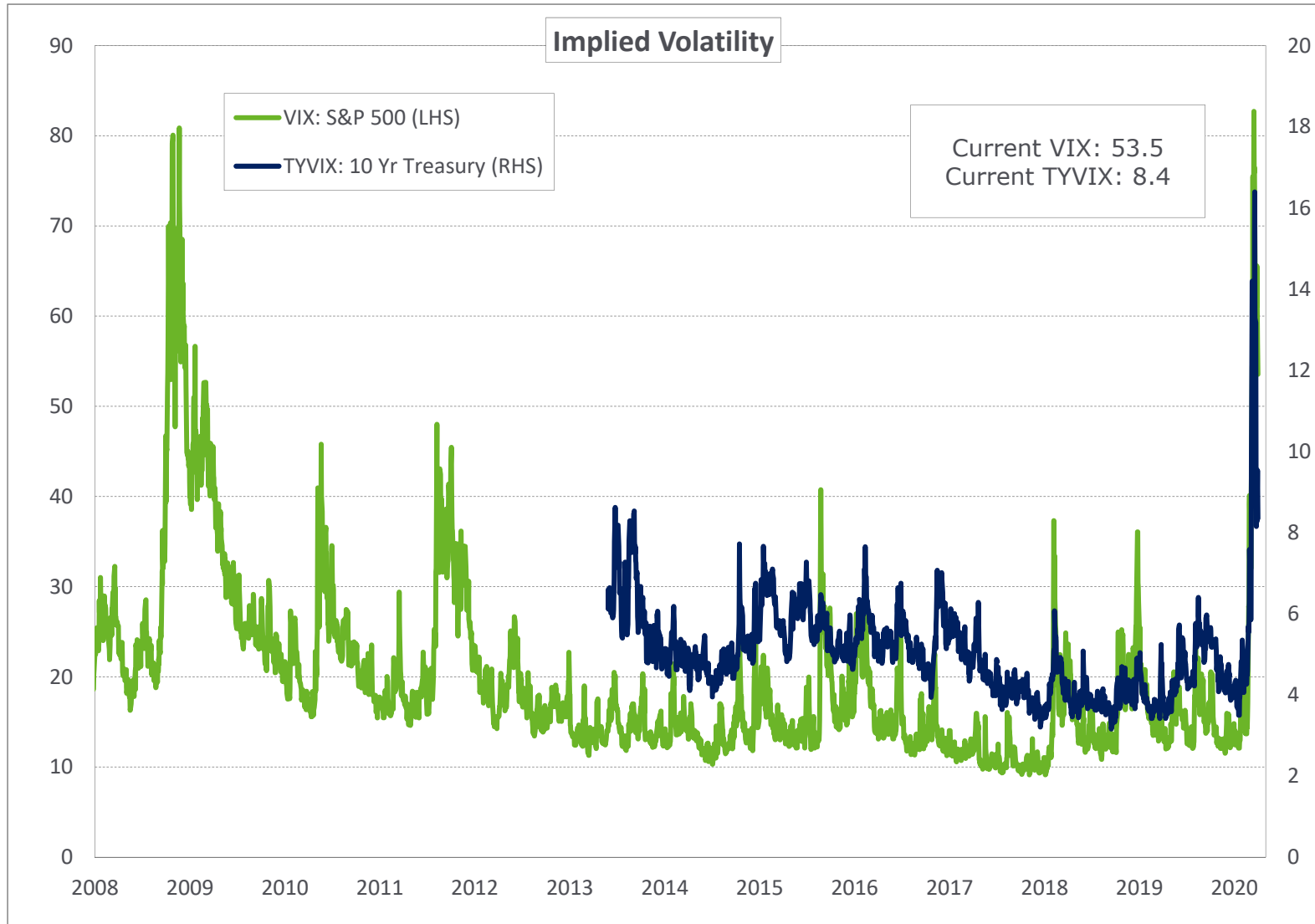
Fed Action	Description
Fed Rate Cuts	The Fed cut rates in two emergency sessions by a total of 1.50% to a range of 0.00% - 0.25%.
Balance Sheet Expansion	The Fed announced an unlimited expansion of the balance sheet to support the US economy. This move expanded on previous announcements for smaller QE denominations
Liquidity Support Facilities	The Fed announced additional measures to ensure market liquidity, including facilities to support money market funds, commercial paper, and broad credit support systems
Credit Support Facilities	The Fed established programs aimed at supporting consumers and businesses, such as the Term Asset-Backed Securities Loan Facility (TALF) and a Main Street Business Lending Program. These programs provide preferential borrower agreements, such as deferred interest and principal payments, for consumers and small businesses.

US Government Action	Description
Families First Coronavirus Response Act	The bill was passed to provide sick leave, expand food assistance and unemployment benefits, and provide additional protection for health care employees
Fiscal Stimulus Package	Congress is finalizing a \$2 trillion economic stimulus package aimed at providing direct financial assistance, expanded benefits programs, and loans to individuals, small businesses, and industries impacted by COVID-19



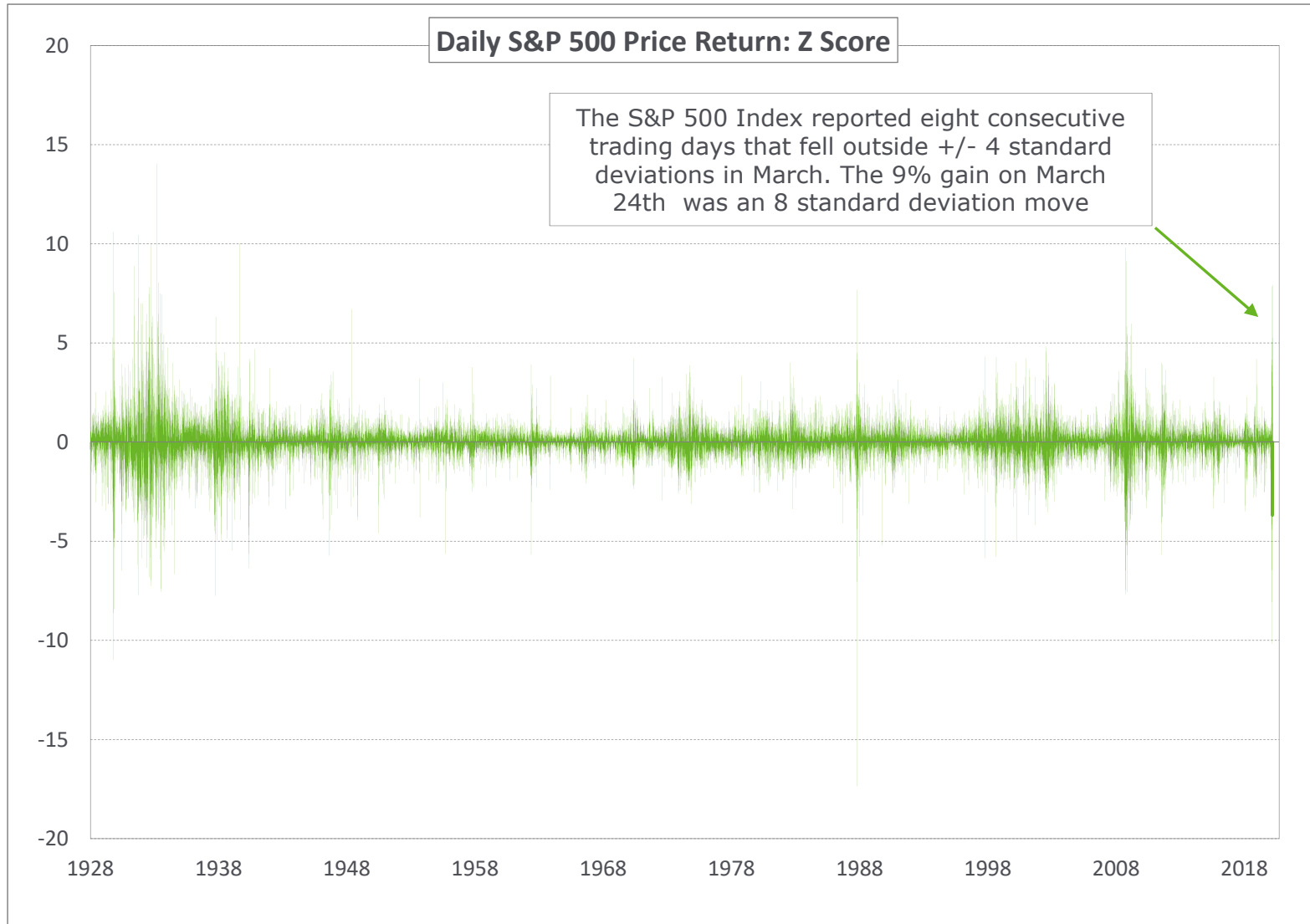
# CORRELATIONS AND VOLATILITY ARE ELEVATED



Source: CBOE, FactSet  
Data as of 3/31/2020



# ABNORMALLY LARGE PRICE MOVEMENTS

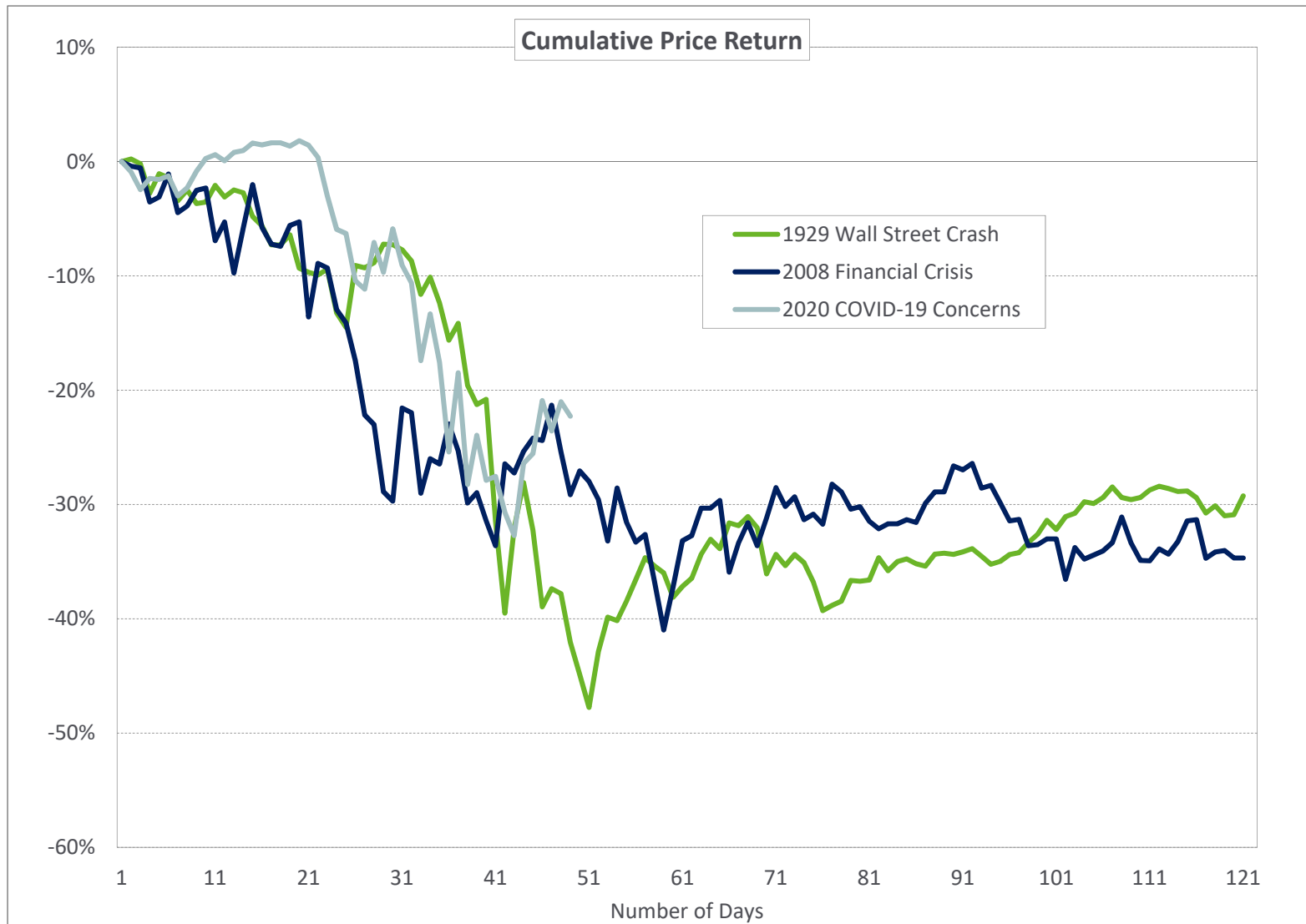


Source: S&P, FactSet  
Calculated of as 1/04/28 - 3/31/2020





# US EQUITY DURING MARKET DELEVERAGING

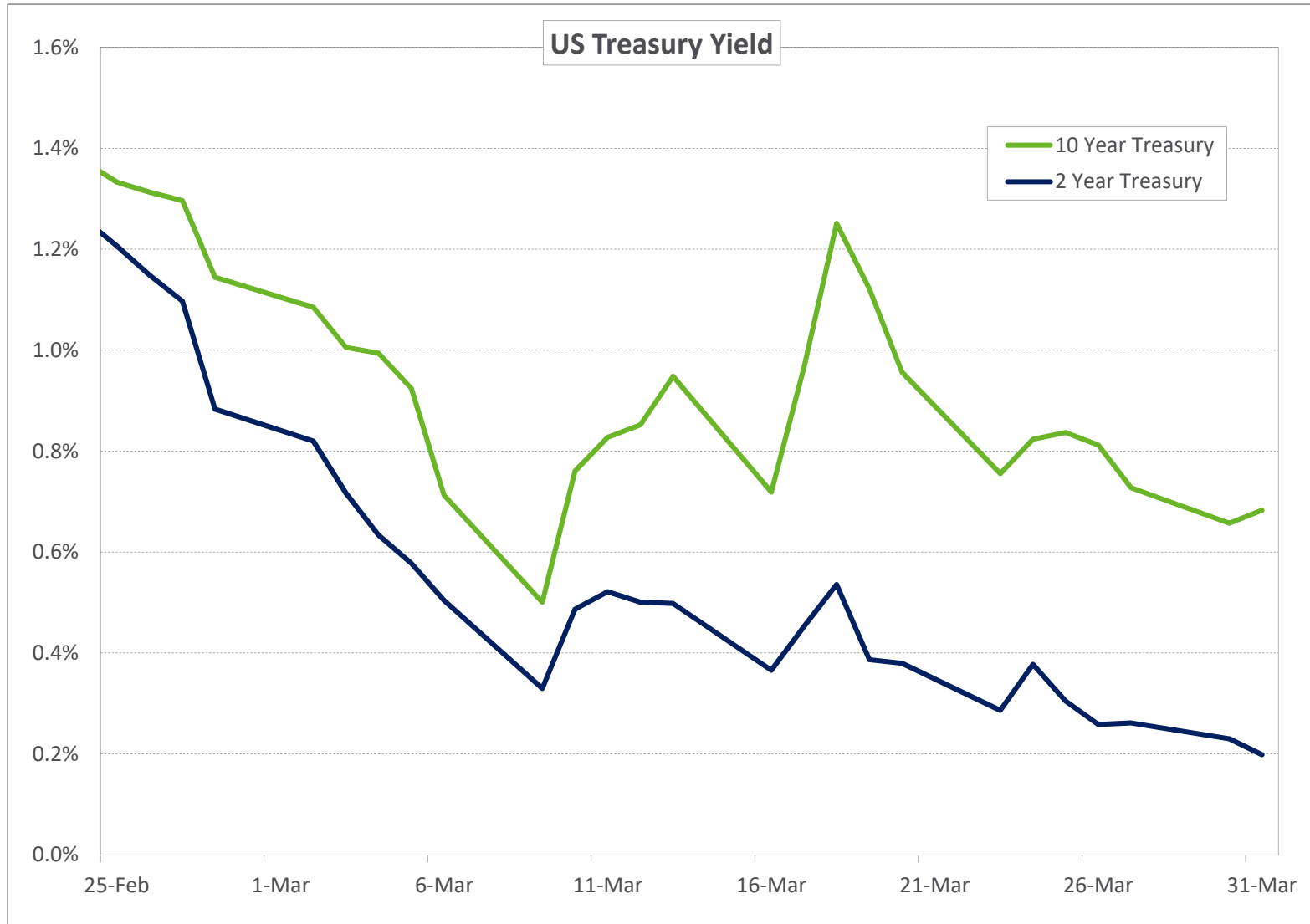


Source: S&P, Dow Jones, FactSet

Financial Crisis represents S&P returns from 9/1/2008 – 3/9/2009; Wall Street Crash represents Dow Jones returns from 8/30/1929 – 2/26/1930; COVID-19 represents S&P returns from 1/23/2020 (representing the start of the Wuhan, China lockdown) – 3/31/2020



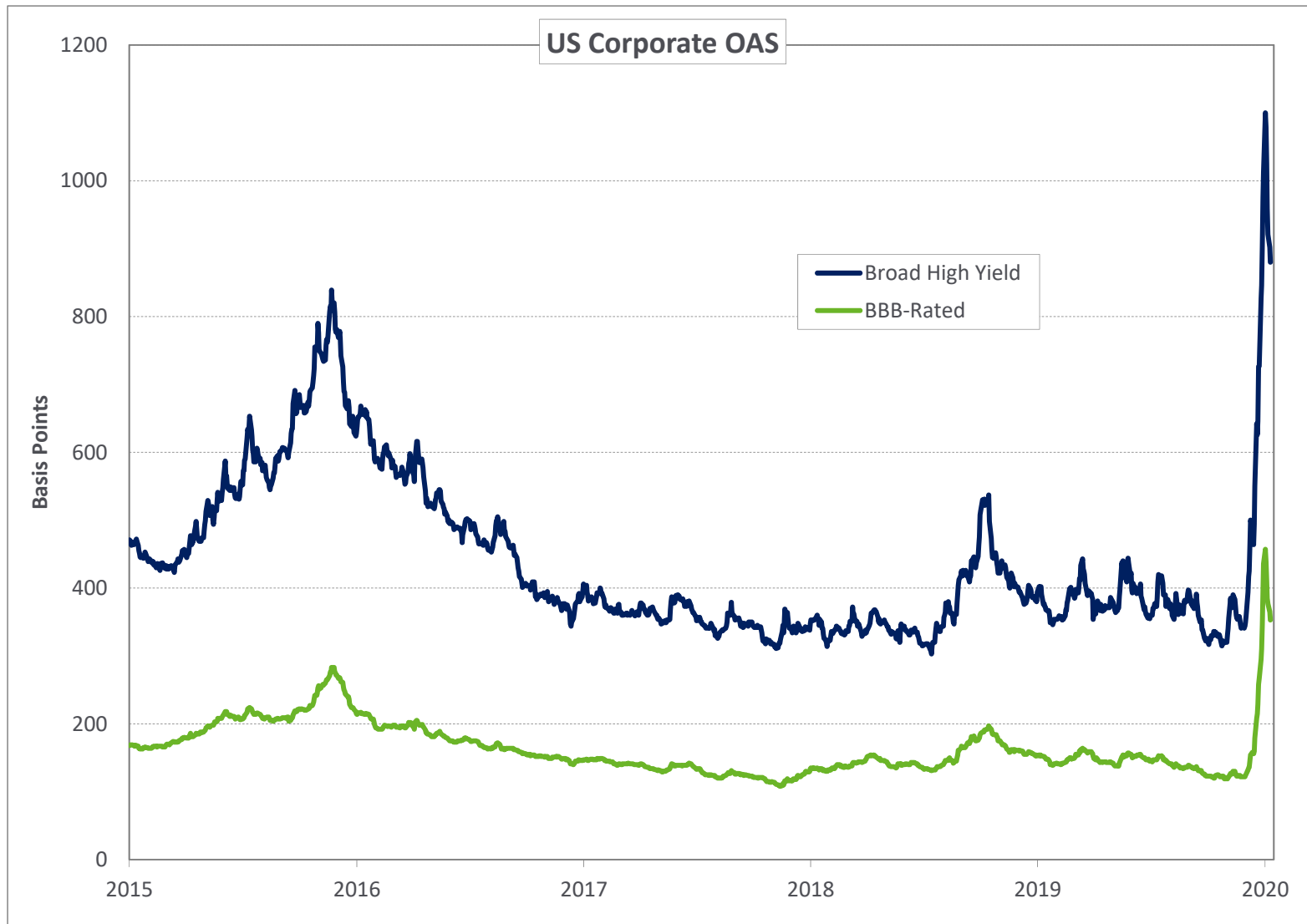
# U.S. TREASURY YIELDS ARE STRESSED



Source: FactSet  
Data as of 3/31/2020



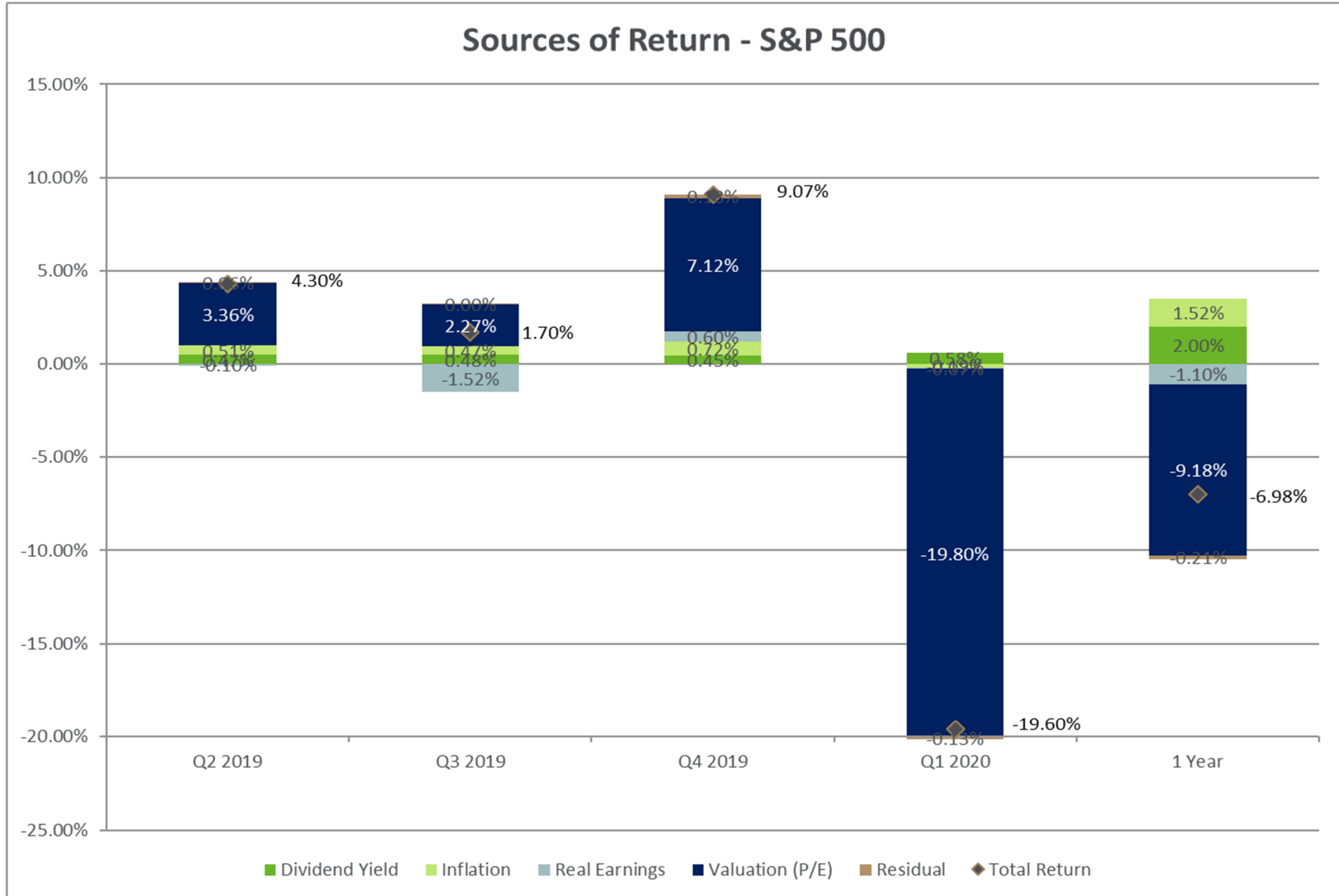
# CREDIT SPREADS HAVE WIDENED



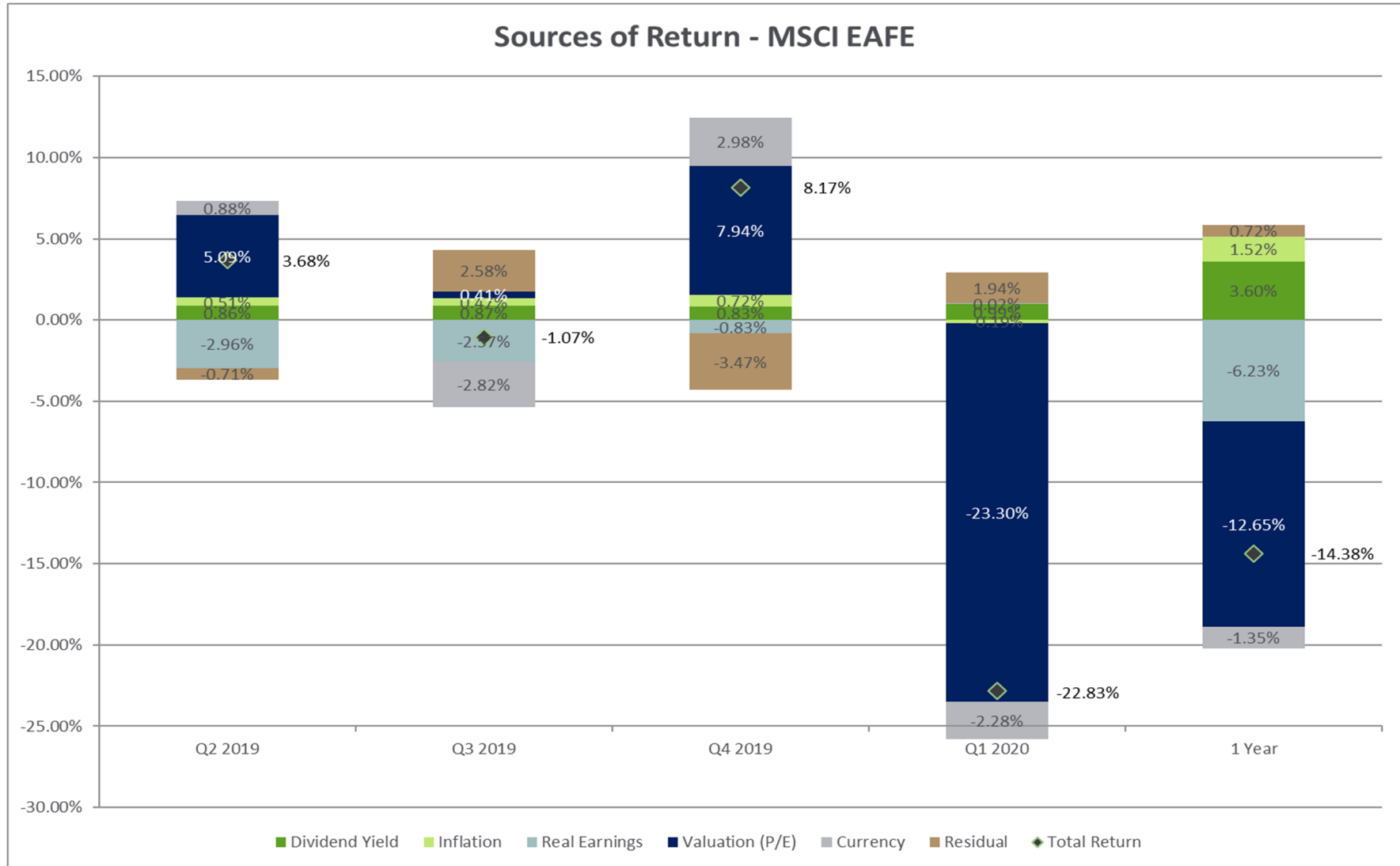
Source: Bloomberg, FactSet  
Data as of 3/31/2020



# 1 YEAR ATTRIBUTION OF S&P 500 RETURNS



# 1 YEAR ATTRIBUTION OF MSCI EAFE RETURNS



**Spot Rates**

1 USD = 0.880 Euro

1 USD = 0.917 Euro

1 USD = 0.891 Euro

1 USD = 0.901 Euro



# TOTAL FUND PERFORMANCE

NEPC, LLC

---

# TOTAL FUND PERFORMANCE SUMMARY (NET OF FEES)

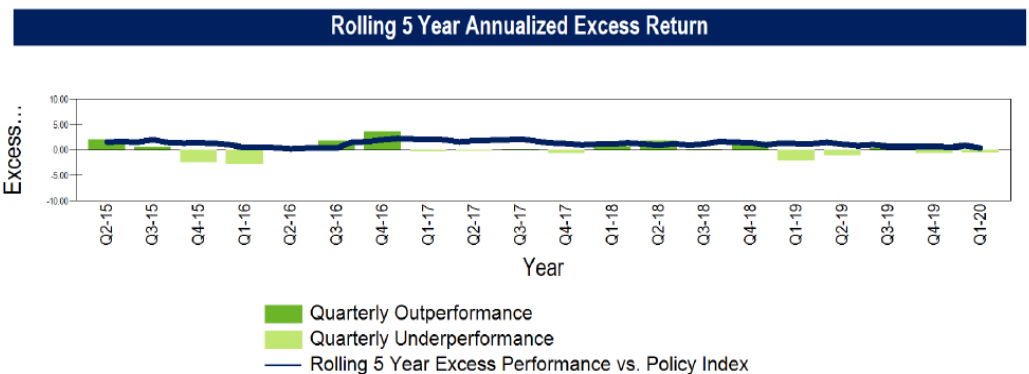
	Market Value	3 Mo	Rank	Fiscal YTD	Rank	1 Yr	Rank	3 Yrs	Rank	5 Yrs	Rank	10 Yrs	Rank
<b>Total Fund</b>	<b>\$9,777,090,056</b>	<b>-11.0%</b>	<b>11</b>	<b>-6.9%</b>	<b>20</b>	<b>-4.9%</b>	<b>40</b>	<b>2.8%</b>	<b>28</b>	<b>4.0%</b>	<b>14</b>	<b>6.8%</b>	<b>14</b>
<i>Policy Index</i>		-10.4%	3	-6.0%	11	-2.9%	1	3.2%	24	3.6%	36	5.8%	66
S&P 500		-19.6%	99	-10.8%	87	-7.0%	67	5.1%	1	6.7%	1	10.5%	1
BBgBarc US Aggregate TR		3.1%	1	5.7%	1	8.9%	1	4.8%	1	3.4%	40	3.9%	99
60% MSCI ACWI (Net) / 40% FTSE WGBI		-12.4%	34	-7.6%	31	-4.1%	23	2.9%	27	3.2%	44	4.6%	99
InvMetrics Public DB > \$1B Net Median		-12.9%		-8.4%		-5.8%		2.3%		3.0%		6.2%	

In the year ended March 31, 2020 the Fund return of -4.9% ranked in the 40<sup>th</sup> percentile of Public Funds > \$1 Billion. The Fund's assets totaled \$9.78 billion, down from \$10.32 billion in the past year.

The Fund experienced a net investment loss of \$463.21 million in the past year including with an investment loss of \$1.19 billion in the first calendar quarter.

In the three-year period ended March 31, 2020 the Fund return of 2.8% ranked in the 28<sup>th</sup> percentile among its peers. The Sharpe Ratio over this period of 0.2 ranks in the 21<sup>st</sup> percentile, indicating that the Fund earned a higher rate of return per unit of risk than 79% of its peers.

In the five-year period ended March 31, 2020 the Fund return of 4.0% ranked in the 14<sup>th</sup> percentile among its peers. On a risk adjusted basis the Fund's Sharpe and Sortino Ratios rank in the 1<sup>st</sup> and 9<sup>th</sup> percentile, indicating very strong returns per unit of risk taken and returns per unit of downside risk experienced when compared to public fund peers with assets greater than \$1B.



3 Years Ending March 31, 2020						
	Sharpe Ratio	Sharpe Ratio Rank	Sortino Ratio	Sortino Ratio Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank
Total Fund	0.2	21	0.3	23	6.3%	1
InvMetrics Public DB > \$1B Net Median	0.1	--	0.2	--	8.9%	--

Total Fund	0.2	21	0.3	23	6.3%	1
InvMetrics Public DB > \$1B Net Median	0.1	--	0.2	--	8.9%	--

5 Years Ending March 31, 2020						
	Sharpe Ratio	Sharpe Ratio Rank	Sortino Ratio	Sortino Ratio Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank
Total Fund	0.5	1	0.6	9	5.6%	1
InvMetrics Public DB > \$1B Net Median	0.3	--	0.4	--	7.8%	--

Total Fund	0.5	1	0.6	9	5.6%	1
InvMetrics Public DB > \$1B Net Median	0.3	--	0.4	--	7.8%	--

Note: InvestMetrics Public Funds >\$1B Net of Fee universe contains 22 portfolios.



San Bernardino County Employees' Retirement Association

# TOTAL FUND PERFORMANCE SUMMARY

Statistics Summary								
1 Year Ending March 31, 2020								
	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank	Sortino Ratio	Sortino Ratio Rank
Total Fund	-4.9%	40	9.6%	3	-0.7	75	-0.4	39
InvMetrics Public DB > \$1B Net Median	-5.8%	--	11.5%	--	-0.6	--	-0.4	--

Statistics Summary								
3 Years Ending March 31, 2020								
	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank	Sortino Ratio	Sortino Ratio Rank
Total Fund	2.8%	28	6.3%	1	0.2	21	0.3	23
InvMetrics Public DB > \$1B Net Median	2.3%	--	8.9%	--	0.1	--	0.2	--

Statistics Summary								
5 Years Ending March 31, 2020								
	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank	Sortino Ratio	Sortino Ratio Rank
Total Fund	4.0%	14	5.6%	1	0.5	1	0.6	9
InvMetrics Public DB > \$1B Net Median	3.0%	--	7.8%	--	0.3	--	0.4	--

Sortino Ratio requires at least two negative points during the time period in order to calculate

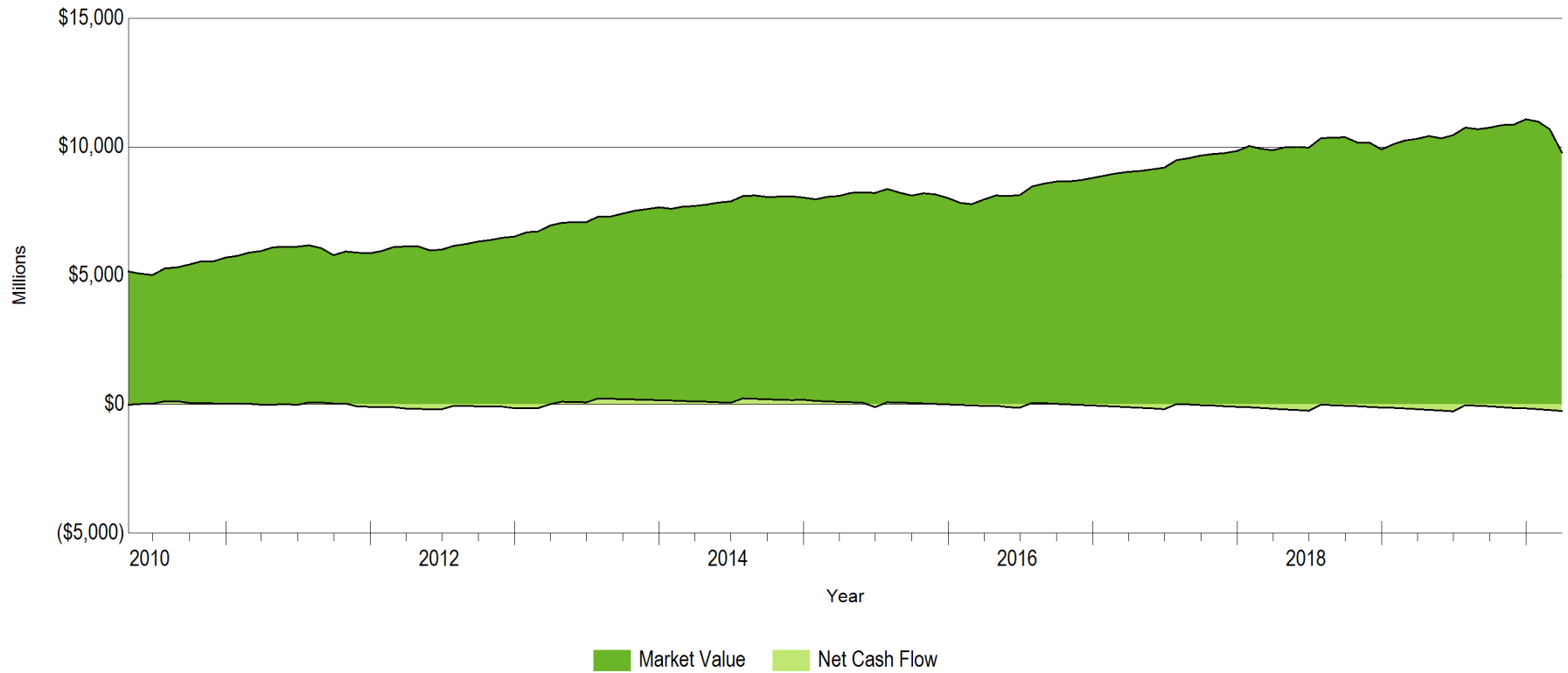




San Bernardino County Employees' Retirement Association

# TOTAL FUND ASSET GROWTH SUMMARY

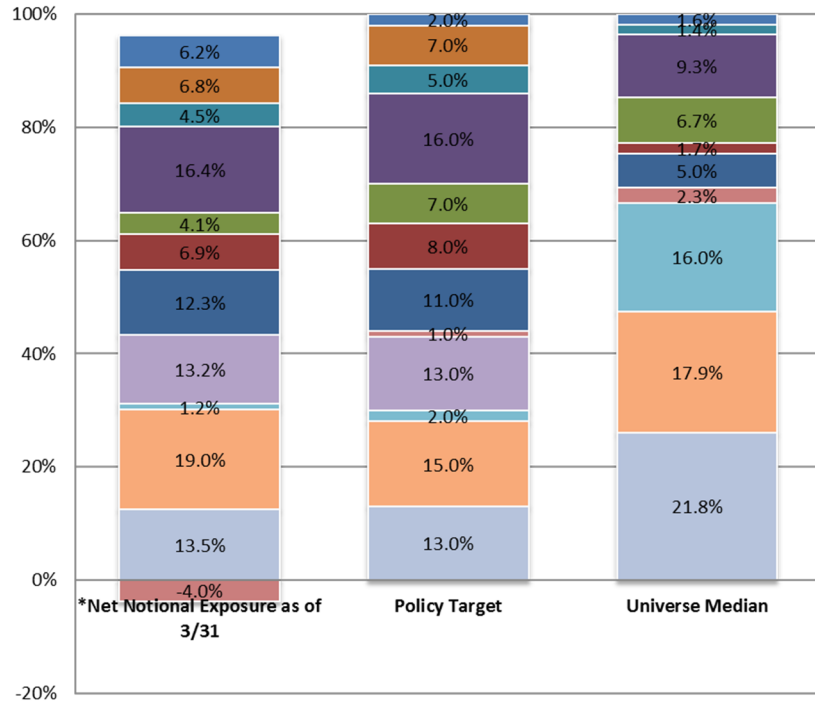
10 Years Ending March 31, 2020



	Last Three Months	Year-To-Date	One Year	Five Years	Ten Years
Beginning Market Value	\$11,074,080,814	\$11,074,080,814	\$10,315,832,387	\$8,096,374,359	\$5,092,948,389
Net Cash Flow	-\$103,574,851	-\$103,574,851	-\$75,532,003	-\$356,982,560	-\$246,119,035
Net Investment Change	-\$1,193,415,907	-\$1,193,415,907	-\$463,210,329	\$2,037,698,256	\$4,930,260,702
Ending Market Value	\$9,777,090,056	\$9,777,090,056	\$9,777,090,056	\$9,777,090,056	\$9,777,090,056



# TOTAL FUND PERFORMANCE SUMMARY



	*Net Notional Exposure	*Net Notional Exposure as of 3/31	Policy Target	*Difference	Policy Ranges	Within Range
<b>US Equities</b>	1,302,453	<b>13.5%</b>	<b>13.0%</b>	<b>0.5%</b>	<b>8%-18%</b>	<b>Yes</b>
<b>Int'l Equities</b>	1,734,093	<b>19.0%</b>	<b>15.0%</b>	<b>4.0%</b>	<b>10%-20%</b>	<b>Yes</b>
<b>U.S. Core Fixed Income</b>	93,800	<b>1.2%</b>	<b>2.0%</b>	<b>-0.8%</b>	<b>-3%-7%</b>	<b>Yes</b>
<b>US Credit</b>	1,352,869	<b>13.2%</b>	<b>13.0%</b>	<b>0.2%</b>	<b>8%-18%</b>	<b>Yes</b>
<b>Non-US Core Fixed Income</b>	(391,084)	<b>-4.0%</b>	<b>1.0%</b>	<b>-5.0%</b>	<b>-4%-6%</b>	<b>Yes</b>
<b>Non-US Credit</b>	1,188,481	<b>12.3%</b>	<b>11.0%</b>	<b>1.3%</b>	<b>6%-16%</b>	<b>Yes</b>
<b>Emerging Market Debt</b>	602,565	<b>6.9%</b>	<b>8.0%</b>	<b>-1.1%</b>	<b>3%-13%</b>	<b>Yes</b>
<b>Real Estate</b>	465,042	<b>4.1%</b>	<b>7.0%</b>	<b>-2.9%</b>	<b>0%-14%</b>	<b>Yes</b>
<b>Private Equity</b>	1,883,008	<b>16.4%</b>	<b>16.0%</b>	<b>0.4%</b>	<b>6%-21%</b>	<b>Yes</b>
<b>Real Assets</b>	403,544	<b>4.5%</b>	<b>5.0%</b>	<b>-0.5%</b>	<b>0%-10%</b>	<b>Yes</b>
<b>Absolute Return</b>	747,047	<b>6.8%</b>	<b>7.0%</b>	<b>-0.2%</b>	<b>0%-12%</b>	<b>Yes</b>
<b>Cash</b>	395,272	<b>6.2%</b>	<b>2.0%</b>	<b>4.2%</b>	<b>0%-10%</b>	<b>Yes</b>
	<b>9,777,090</b>	<b>100.0%</b>	<b>100.0%</b>			

- US Equities
- Int'l Equities
- U.S. Core
- US Credit
- Non-US Core Fixed Income
- Non-US Credit
- Emerging Market Debt
- Real Estate
- Private Equity
- Real Assets
- Absolute Return
- Cash



# TOTAL FUND PERFORMANCE SUMMARY

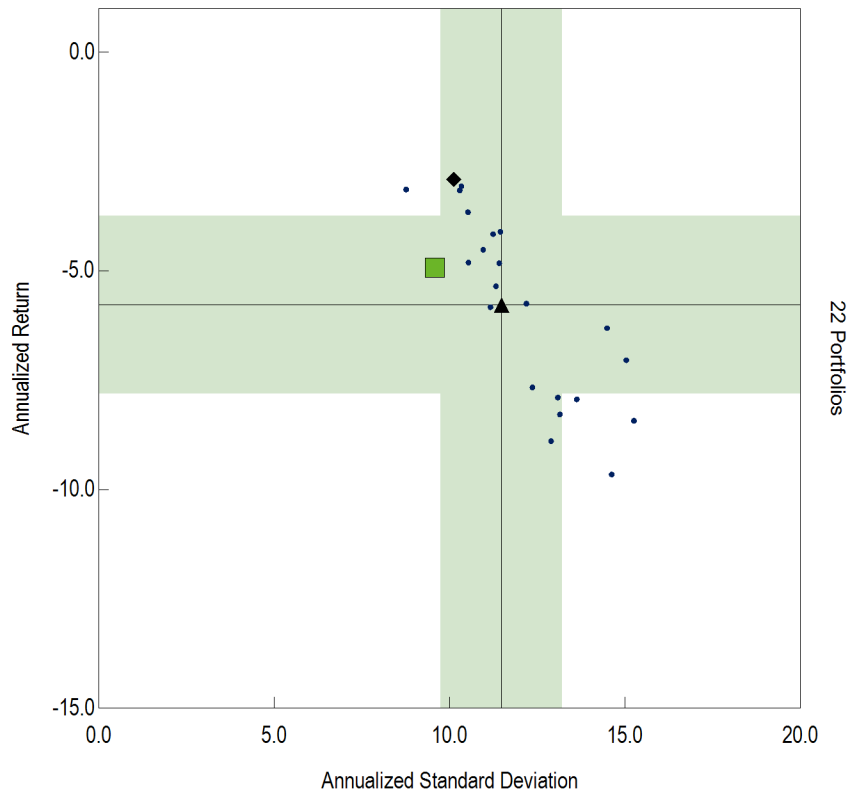
<u>Asset Class</u>	<u>Physical Exposure</u>		<u>Delta Adjusted</u>		<u>Net Position</u>		<u>Overlay Target</u>		<u>Policy Target</u>	
			<u>Synthetic Exposure</u>							
<b>Total Market Value</b>	9,958.6	100.0%	0.0	0.0%	9,958.6	100.0%	9,958.6	100.0%	9,958.6	100.00%
Cash	1,709.6	17.17%	-1,154.3	-11.59%	555.3	5.58%	0.0	0.0%	0.0	0.00%
Cash	1,709.6	17.17%	-1,154.3	-11.59%	555.3	5.58%	0.0	0.0%	0.0	0.00%
<b>Equity</b>	<b>1,349.2</b>	<b>13.55%</b>	<b>1,808.8</b>	<b>18.16%</b>	<b>3,158.0</b>	<b>31.71%</b>	<b>3,687.0</b>	<b>37.02%</b>	<b>3,684.7</b>	<b>37.00%</b>
Emerging Markets	418.7	4.2%	357.6	3.59%	776.3	7.79%	797.2	8.01%	796.7	8.00%
Equity Delta Hedge	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.00%
International Developed	49.4	0.5%	986.4	9.9%	1,035.8	10.4%	1,096.1	11.01%	1,095.4	11.00%
US Large Cap	880.8	8.85%	172.5	1.73%	1,053.4	10.58%	1,444.9	14.51%	1,444.0	14.50%
US Small Cap	0.2	0.0%	292.4	2.94%	292.6	2.94%	348.8	3.5%	348.6	3.50%
<b>Fixed</b>	<b>3,592.8</b>	<b>36.08%</b>	<b>-654.5</b>	<b>-6.57%</b>	<b>2,938.2</b>	<b>29.5%</b>	<b>2,964.6</b>	<b>29.77%</b>	<b>2,962.7</b>	<b>29.75%</b>
EM High Yield CDX	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.00%
Global ex US Fixed Income	2,199.4	22.09%	-748.3	-7.51%	1,451.1	14.57%	1,494.7	15.01%	1,493.8	15.00%
High Yield	1,035.4	10.4%	0.0	0.0%	1,035.4	10.4%	946.7	9.51%	946.1	9.50%
US Fixed Income	358.0	3.59%	93.8	0.94%	451.7	4.54%	523.2	5.25%	522.8	5.25%
<b>Other</b>	<b>3,307.0</b>	<b>33.21%</b>	<b>0.0</b>	<b>0.0%</b>	<b>3,307.0</b>	<b>33.21%</b>	<b>3,307.0</b>	<b>33.21%</b>	<b>3,311.2</b>	<b>33.25%</b>
Alternatives	50.6	0.51%	0.0	0.0%	50.6	0.51%	50.6	0.51%	49.8	0.50%
Commodities	253.6	2.55%	0.0	0.0%	253.6	2.55%	253.6	2.55%	268.9	2.70%
Infrastructure	105.7	1.06%	0.0	0.0%	105.7	1.06%	105.7	1.06%	79.7	0.80%
Private Equity	1,836.3	18.44%	0.0	0.0%	1,836.3	18.44%	1,836.3	18.44%	1,842.3	18.50%
Real Estate	468.3	4.7%	0.0	0.0%	468.3	4.7%	468.3	4.7%	478.0	4.80%
Tactical Cash	592.5	5.95%	0.0	0.0%	592.5	5.95%	592.5	5.95%	592.5	5.95%



San Bernardino County Employees' Retirement Association

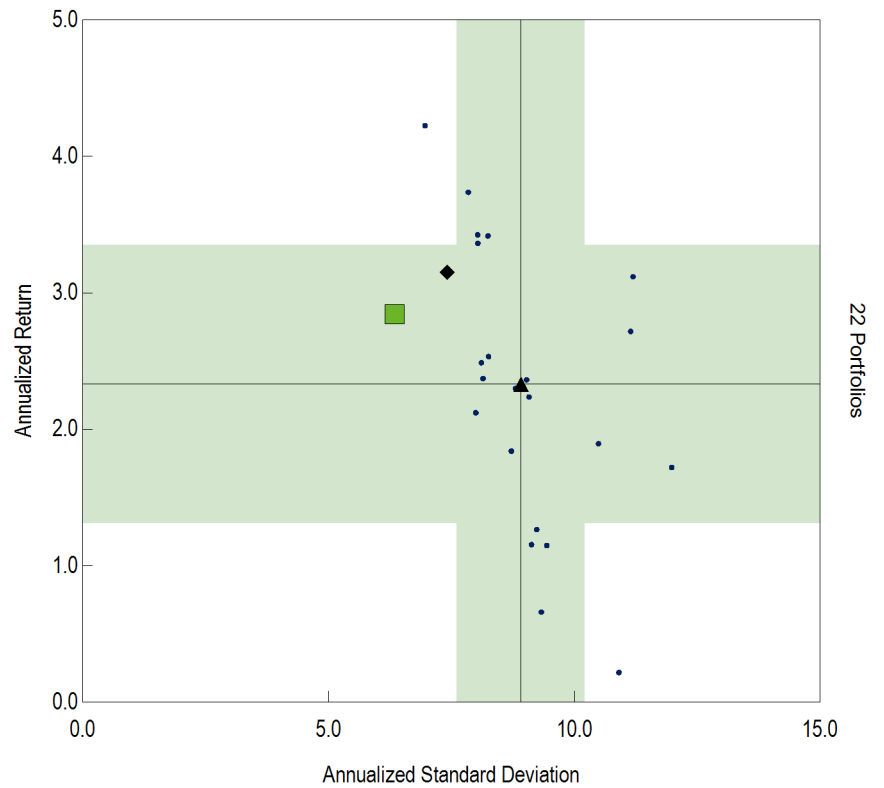
# TOTAL FUND RISK/RETURN

1 Year Ending March 31, 2020



- Total Fund
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB > \$1B Net

3 Years Ending March 31, 2020



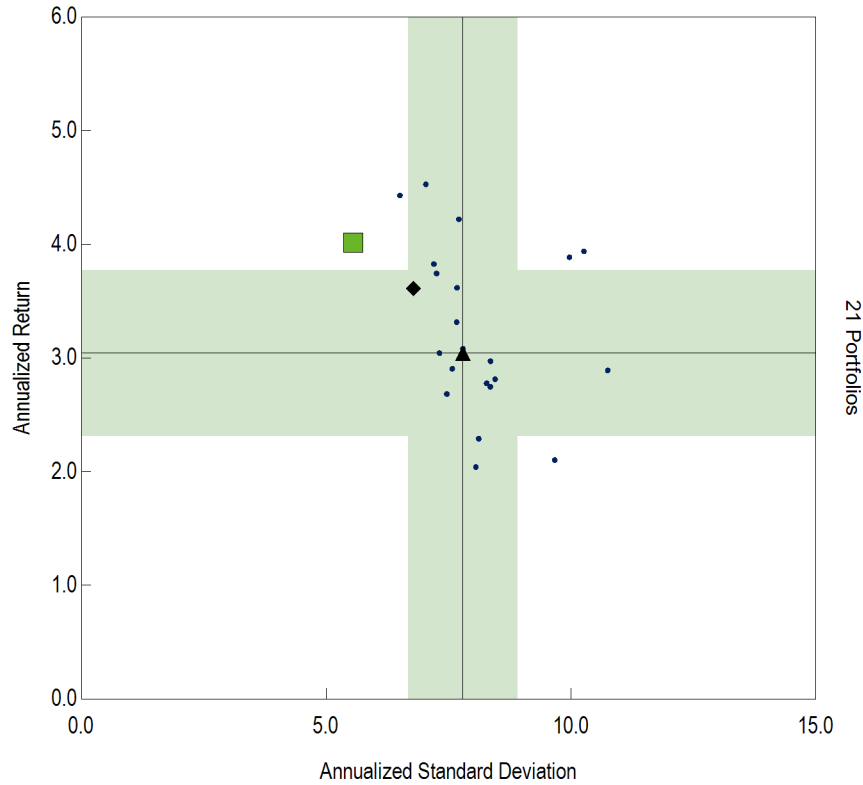
- Total Fund
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB > \$1B Net



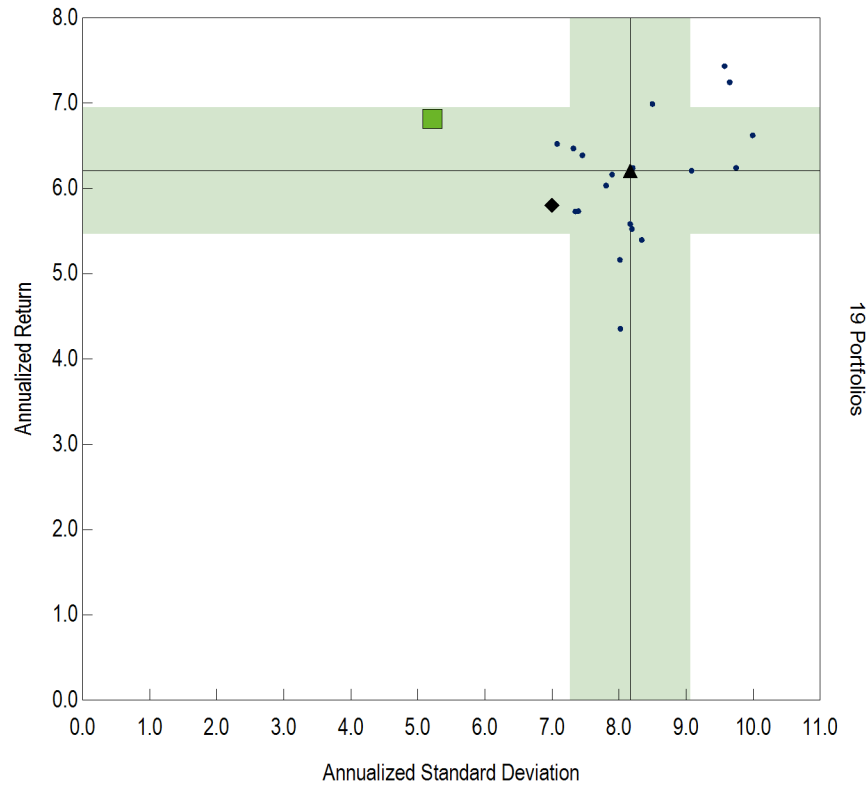
San Bernardino County Employees' Retirement Association

# TOTAL FUND RISK/RETURN

5 Years Ending March 31, 2020



10 Years Ending March 31, 2020



- Total Fund
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB > \$1B Net

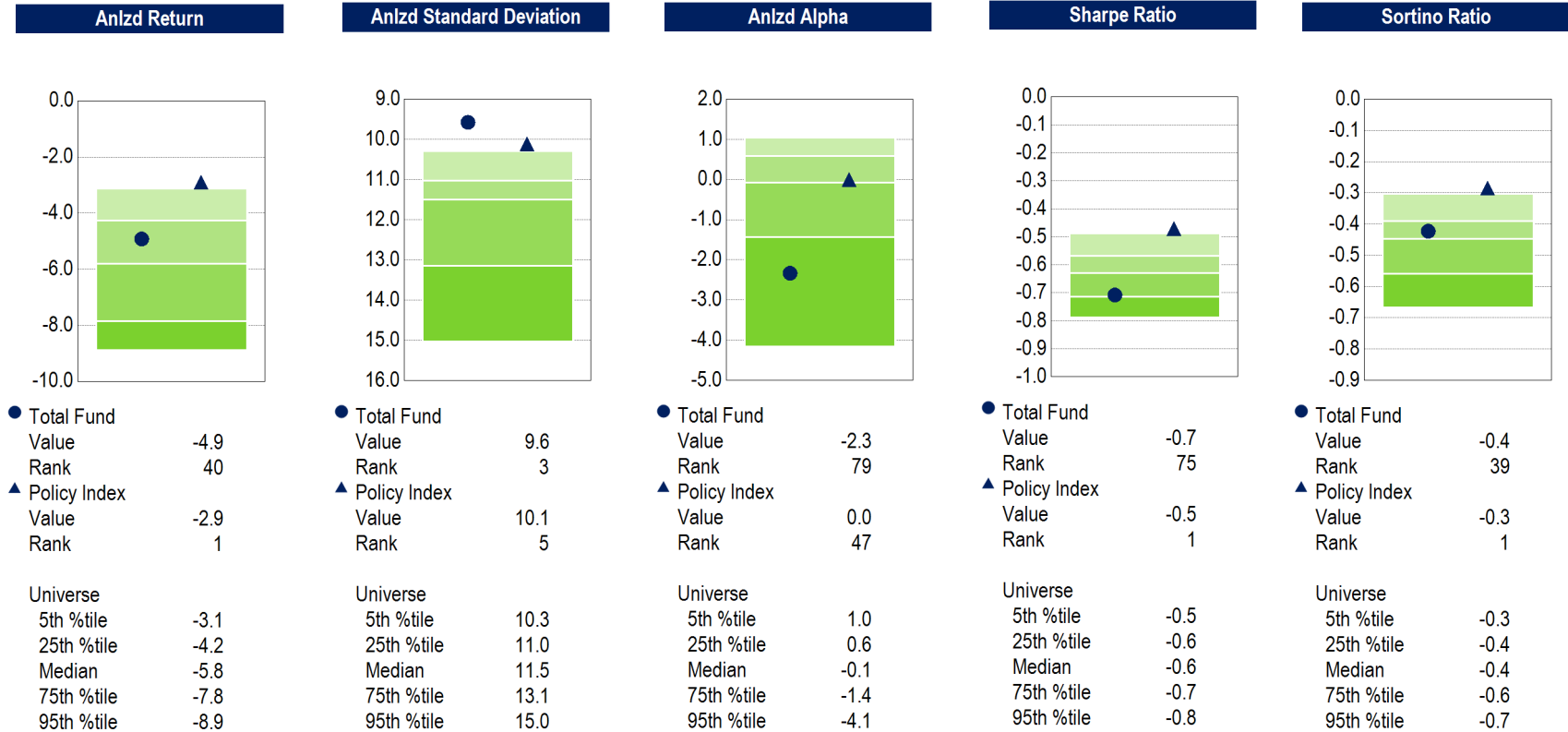
- Total Fund
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB > \$1B Net



San Bernardino County Employees' Retirement Association

# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

**Total Fund vs. InvMetrics Public DB > \$1B Net (USD)  
1 Year**



Sortino Ratio requires at least two negative points during the time period in order to calculate.  
Sample size is 22 Portfolios

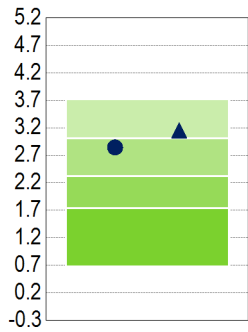


San Bernardino County Employees' Retirement Association

# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

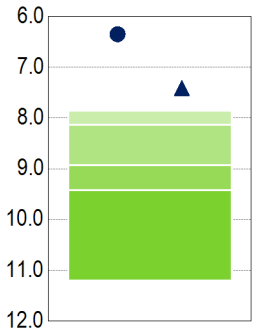
**Total Fund vs. InvMetrics Public DB > \$1B Net (USD)**  
3 Years

**Anlzd Return**



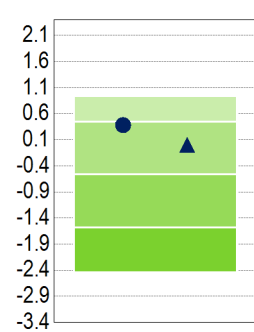
● Total Fund	
Value	2.8
Rank	28
▲ Policy Index	
Value	3.2
Rank	24
Universe	
5th %tile	3.7
25th %tile	3.0
Median	2.3
75th %tile	1.8
95th %tile	0.7

**Anlzd Standard Deviation**



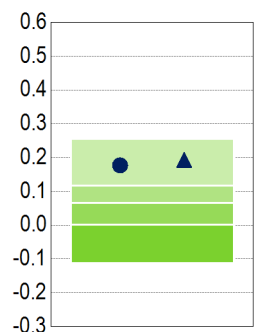
● Total Fund	
Value	6.3
Rank	1
▲ Policy Index	
Value	7.4
Rank	3
Universe	
5th %tile	7.9
25th %tile	8.1
Median	8.9
75th %tile	9.4
95th %tile	11.2

**Anlzd Alpha**



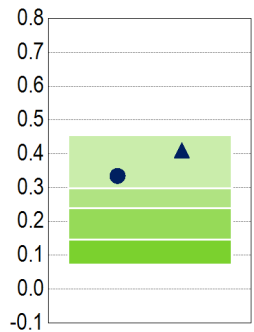
● Total Fund	
Value	0.4
Rank	26
▲ Policy Index	
Value	0.0
Rank	39
Universe	
5th %tile	0.9
25th %tile	0.5
Median	-0.6
75th %tile	-1.6
95th %tile	-2.4

**Sharpe Ratio**



● Total Fund	
Value	0.2
Rank	21
▲ Policy Index	
Value	0.2
Rank	20
Universe	
5th %tile	0.3
25th %tile	0.1
Median	0.1
75th %tile	0.0
95th %tile	-0.1

**Sortino Ratio**



● Total Fund	
Value	0.3
Rank	23
▲ Policy Index	
Value	0.4
Rank	13
Universe	
5th %tile	0.5
25th %tile	0.3
Median	0.2
75th %tile	0.1
95th %tile	0.1

Sortino Ratio requires at least two negative points during the time period in order to calculate.  
Sample size is 22 Portfolios

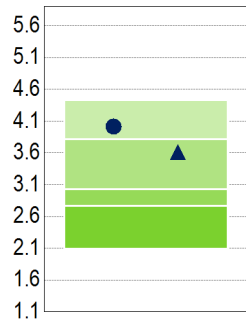


San Bernardino County Employees' Retirement Association

# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

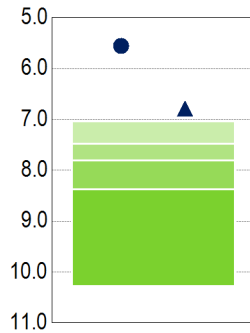
**Total Fund vs. InvMetrics Public DB > \$1B Net (USD)  
5 Years**

**Anlzd Return**



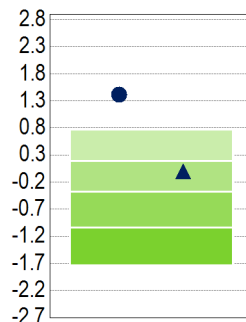
● Total Fund	
Value	4.0
Rank	14
▲ Policy Index	
Value	3.6
Rank	36
Universe	
5th %tile	4.4
25th %tile	3.8
Median	3.0
75th %tile	2.8
95th %tile	2.1

**Anlzd Standard Deviation**



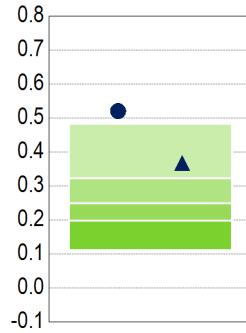
● Total Fund	
Value	5.6
Rank	1
▲ Policy Index	
Value	6.8
Rank	3
Universe	
5th %tile	7.0
25th %tile	7.5
Median	7.8
75th %tile	8.4
95th %tile	10.3

**Anlzd Alpha**



● Total Fund	
Value	1.4
Rank	1
▲ Policy Index	
Value	0.0
Rank	33
Universe	
5th %tile	0.8
25th %tile	0.2
Median	-0.4
75th %tile	-1.0
95th %tile	-1.7

**Sharpe Ratio**



● Total Fund	
Value	0.5
Rank	1
▲ Policy Index	
Value	0.4
Rank	18
Universe	
5th %tile	0.5
25th %tile	0.3
Median	0.3
75th %tile	0.2
95th %tile	0.1

**Sortino Ratio**



● Total Fund	
Value	0.6
Rank	9
▲ Policy Index	
Value	0.6
Rank	9
Universe	
5th %tile	0.6
25th %tile	0.5
Median	0.4
75th %tile	0.3
95th %tile	0.2

Sortino Ratio requires at least two negative points during the time period in order to calculate.  
Sample size is 22 Portfolios



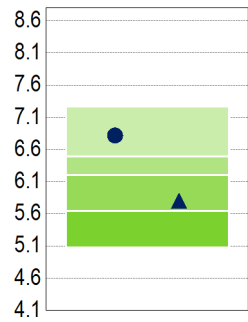


San Bernardino County Employees' Retirement Association

# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

**Total Fund vs. InvMetrics Public DB > \$1B Net (USD)  
10 Years**

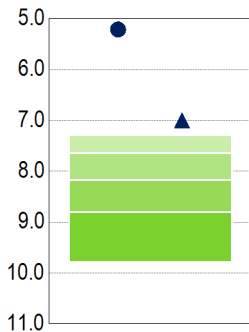
**Anlzd Return**



● Total Fund  
Value 6.8  
Rank 14  
▲ Policy Index  
Value 5.8  
Rank 66

Universe  
5th %tile 7.3  
25th %tile 6.5  
Median 6.2  
75th %tile 5.7  
95th %tile 5.1

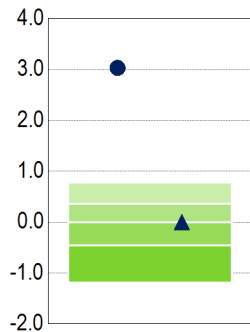
**Anlzd Standard Deviation**



● Total Fund  
Value 5.2  
Rank 1  
▲ Policy Index  
Value 7.0  
Rank 1

Universe  
5th %tile 7.3  
25th %tile 7.6  
Median 8.2  
75th %tile 8.8  
95th %tile 9.8

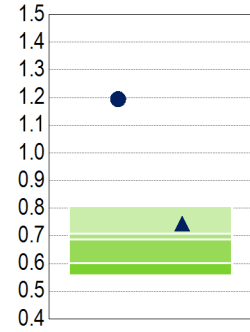
**Anlzd Alpha**



● Total Fund  
Value 3.0  
Rank 1  
▲ Policy Index  
Value 0.0  
Rank 51

Universe  
5th %tile 0.8  
25th %tile 0.4  
Median 0.0  
75th %tile -0.4  
95th %tile -1.2

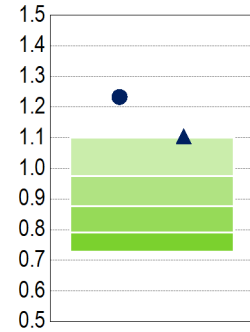
**Sharpe Ratio**



● Total Fund  
Value 1.2  
Rank 1  
▲ Policy Index  
Value 0.7  
Rank 18

Universe  
5th %tile 0.8  
25th %tile 0.7  
Median 0.7  
75th %tile 0.6  
95th %tile 0.6

**Sortino Ratio**



● Total Fund  
Value 1.2  
Rank 1  
▲ Policy Index  
Value 1.1  
Rank 5

Universe  
5th %tile 1.1  
25th %tile 1.0  
Median 0.9  
75th %tile 0.8  
95th %tile 0.7

Sortino Ratio requires at least two negative points during the time period in order to calculate.  
Sample size is 22 Portfolios



San Bernardino County Employees' Retirement Association

**TOTAL FUND RISK STATISTICS**

1 Years Ending March 31, 2020								
	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Tracking Error	Info Ratio	Rank
Domestic Equity With Beta Overlay	13.5%	-13.1%	66	22.1%	86	3.1%	-1.3	--
Russell 3000	--	-9.1%	5	20.8%	55	0.0%	--	--
International Equity With Beta Overlay	18.6%	-16.9%	64	19.6%	18	1.8%	-1.0	--
MSCI ACWI ex USA Gross	--	-15.1%	26	20.4%	40	0.0%	--	--
Global Fixed Income With Beta Overlay	29.0%	-5.1%	--	8.7%	--	6.7%	-1.4	--
BBgBarc Global Aggregate TR	--	4.2%	--	4.6%	--	0.0%	--	--
U.S. Credit Strategies	13.9%	-2.9%	82	10.4%	79	3.0%	1.5	--
50% CS Leveraged Loan / 50% ICE BofA ML US HY BB-B Rated Constrained Index	--	-7.5%	94	12.4%	85	0.0%	--	--
Non-U.S. Credit Composite	12.0%	-9.8%	99	12.6%	99	8.4%	0.2	--
ICE BofAML Euro High Yield Constrained TR	--	-11.8%	99	15.5%	99	0.0%	--	--
Emerging Markets Debt Composite	9.8%	-5.9%	24	6.6%	1	8.8%	0.1	--
50% JPM EMBI Global Diversified/50% JPM GBI - EM Global Diversified	--	-6.6%	27	14.5%	28	0.0%	--	--
Alpha Pool Composite	14.6%	-1.7%	36	6.1%	49	6.0%	-1.1	--
91 Day T-Bill + 3%	--	4.9%	16	0.1%	1	0.0%	--	--

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Private Equity Composite	19.3%	14.2%	36	3.6%	14
Cambridge Associates Global All PE (Qtr Lag)	--	14.6%	32	7.0%	70
Real Estate Composite	4.8%	7.8%	4	1.9%	50
NCREIF Property Index 1 Qtr. Lag	--	6.4%	6	2.7%	62
Real Assets Composite	4.1%	-14.7%	69	15.0%	72
Real Assets Custom Blend	--	-13.9%	68	11.3%	57

US Credit and Non-US Credit composites are based on physical assets.



San Bernardino County Employees' Retirement Association

**TOTAL FUND RISK STATISTICS**

3 Years Ending March 31, 2020								
	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Tracking Error	Info Ratio	Rank
Domestic Equity With Beta Overlay	13.5%	-0.1%	93	15.4%	8	2.9%	-1.4	--
Russell 3000	--	4.0%	8	15.8%	35	0.0%	--	--
International Equity With Beta Overlay	18.6%	-3.2%	65	14.2%	8	2.4%	-0.7	--
MSCI ACWI ex USA Gross	--	-1.5%	22	15.1%	21	0.0%	--	--
Global Fixed Income With Beta Overlay	29.0%	-0.8%	--	5.6%	--	5.8%	-0.7	--
BBgBarc Global Aggregate TR	--	3.5%	--	3.9%	--	0.0%	--	--
U.S. Credit Strategies	13.9%	2.8%	78	6.6%	79	3.9%	0.6	54
50% CS Leveraged Loan / 50% ICE BofA ML US HY BB-B Rated Constrained Index	--	0.3%	92	7.6%	83	0.0%	--	--
Non-U.S. Credit Composite	12.0%	1.8%	87	8.0%	99	8.7%	0.3	5
ICE BofAML Euro High Yield Constrained TR	--	-0.5%	99	11.2%	99	0.0%	--	--
Emerging Markets Debt Composite	9.8%	-0.6%	36	5.2%	1	7.3%	-0.1	--
50% JPM EMBI Global Diversified/50% JPM GBI - EM Global Diversified	--	-0.1%	32	10.0%	32	0.0%	--	--
Alpha Pool Composite	14.6%	2.8%	30	4.0%	20	4.0%	-0.5	--
91 Day T-Bill + 3%	--	4.8%	22	0.1%	1	0.0%	--	--

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Private Equity Composite	19.3%	15.0%	26	3.7%	1
Cambridge Associates Global All PE (Qtr Lag)	--	14.2%	40	6.7%	59
Real Estate Composite	4.8%	6.2%	55	2.7%	52
NCREIF Property Index 1 Qtr. Lag	--	6.7%	40	2.7%	56
Real Assets Composite	4.1%	-2.9%	62	10.1%	63
Real Assets Custom Blend	--	-4.0%	66	7.5%	30

US Credit and Non-US Credit composites are based on physical assets.



San Bernardino County Employees' Retirement Association

# TOTAL FUND RISK STATISTICS

	5 Years Ending March 31, 2020							
	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Tracking Error	Info Ratio	Rank
Domestic Equity	8.5%	0.6%	--	11.1%	--	9.1%	-0.6	--
Russell 3000	--	5.8%	--	14.2%	--	0.0%	--	--
International Developed	0.4%	-2.2%	67	19.7%	99	14.4%	-0.1	--
MSCI EAFE	--	-0.6%	59	14.1%	31	0.0%	--	--
International Emerging	3.5%	-3.1%	91	15.4%	36	4.8%	-0.6	--
MSCI Emerging Markets	--	-0.4%	35	17.6%	85	0.0%	--	--
U.S. Credit Strategies	13.9%	4.0%	5	5.6%	66	3.9%	0.5	3
50% CS Leveraged Loan / 50% ICE BofA ML US HY BB-B Rated Constrained Index	--	2.1%	87	6.5%	83	0.0%	--	--
Non-U.S. Credit Composite	12.0%	4.4%	1	6.5%	99	9.6%	0.3	5
ICE BofAML Euro High Yield Constrained TR	--	1.3%	96	10.6%	99	0.0%	--	--
Emerging Markets Debt Composite	9.8%	2.4%	23	5.8%	4	6.8%	0.1	33
50% JPM EMBI Global Diversified/50% JPM GBI - EM Global Diversified	--	1.6%	52	9.6%	42	0.0%	--	--
Alpha Pool Composite	14.6%	3.3%	14	4.3%	38	4.3%	-0.2	--
91 Day T-Bill + 3%	--	4.2%	10	0.2%	1	0.0%	--	--

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Private Equity Composite	19.3%	13.1%	46	3.8%	7
Cambridge Associates Global All PE (Qtr Lag)	--	11.7%	67	6.1%	41
Real Estate Composite	4.8%	8.1%	34	2.7%	33
NCREIF Property Index 1 Qtr. Lag	--	8.2%	29	3.5%	44
Real Assets Composite	4.1%	-2.8%	56	8.7%	32
Real Assets Custom Blend	--	-2.9%	57	7.4%	20

Percent of Total equals 90.9% because Beta Overlay is not included as these statistics are not relevant for alternative asset classes.



# PUBLIC EQUITY PORTFOLIO

<b>Public Equity Portfolio</b> (28% Target)	<b>US Equities</b> (13% Target)	<b>Large Cap (8%)</b>	Russell Investments (Russell1000 Index) StateStreet Global Advisors S&P500 Buy/Write Call Option Strategy TOBAM Anti-Benchmark US Equity Fund
		<b>Small Cap (2%)</b>	Russell Investments (Russell2000 Index)
		<b>Volatility (3%)</b>	Russell Investments (Russell1000 Index)
	<b>International Equities</b> (15% Target)	<b>Developed Markets (6%)</b>	Russell Investments (MSCI EAFE Index) TOBAM Anti-Benchmark World ex-US Fund
		<b>Emerging Markets (6%)</b>	Mondrian Emerging Markets Equity Fund LP Russell Investments (MSCI EM Index) TOBAM Anti-Benchmark EM Equity Fund
		<b>Volatility (3%)</b>	Russell Investments (MSCI EAFE Index)



San Bernardino County Employees' Retirement Association

**GLOBAL EQUITY STRATEGIES - NET**

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Total Equity</b>	<b>1,225,182,354</b>	<b>12.5</b>	<b>-21.9</b>	<b>27</b>	<b>-15.4</b>	<b>43</b>	<b>-12.9</b>	<b>67</b>	<b>-0.7</b>	<b>93</b>	<b>0.4</b>	<b>99</b>	<b>2.7</b>	<b>99</b>
MSCI ACWI			-21.4	11	-14.3	13	-11.3	18	1.5	54	2.8	61	5.9	99
Excess Return			-0.5		-1.1		-1.6		-2.2		-2.4		-3.2	
InvMetrics Public DB Total Eq Net Median			-22.4		-15.6		-12.3		1.5		3.3		6.6	
<b>Domestic Equity With Beta Overlay</b>	<b>1,302,452,703</b>	<b>13.5</b>	<b>-23.7</b>	<b>66</b>	<b>-16.3</b>	<b>62</b>	<b>-13.1</b>	<b>66</b>	<b>-0.1</b>	<b>93</b>	<b>1.4</b>	<b>99</b>	<b>--</b>	<b>--</b>
Russell 3000			-20.9	9	-12.7	4	-9.1	5	4.0	8	5.8	6	10.1	6
Excess Return			-2.8		-3.6		-4.0		-4.1		-4.4			
InvMetrics Public DB US Eq Net Median			-22.6		-15.4		-11.9		2.2		4.3		9.0	
<b>Domestic Equity</b>	<b>835,633,304</b>	<b>8.5</b>	<b>-20.5</b>	<b>--</b>	<b>-12.5</b>	<b>--</b>	<b>-8.8</b>	<b>--</b>	<b>0.1</b>	<b>--</b>	<b>0.6</b>	<b>--</b>	<b>2.3</b>	<b>--</b>
Russell 3000			-20.9	--	-12.7	--	-9.1	--	4.0	--	5.8	--	10.1	--
Excess Return			0.4		0.2		0.3		-3.9		-5.2		-7.8	
Tobam AB US Equity	272,837,400	2.8	-18.7	23	-11.8	25	-8.1	27	--	--	--	--	--	--
Russell 3000			-20.9	35	-12.7	29	-9.1	30	4.0	32	5.8	25	10.1	28
Excess Return			2.2		0.9		1.0							
eV All US Equity Net Median			-24.6		-18.7		-15.4		0.3		2.6		8.3	
<b>Large Cap Equity</b>	<b>562,547,822</b>	<b>5.8</b>	<b>-21.2</b>	<b>36</b>	<b>-12.8</b>	<b>29</b>	<b>-9.0</b>	<b>30</b>	<b>0.7</b>	<b>48</b>	<b>1.9</b>	<b>56</b>	<b>3.3</b>	<b>97</b>
S&P 500			-19.6	27	-10.8	21	-7.0	22	5.1	26	6.7	18	10.5	22
Excess Return			-1.6		-2.0		-2.0		-4.4		-4.8		-7.2	
eV All US Equity Net Median			-24.6		-18.7		-15.4		0.3		2.6		8.3	
SsgA S&P500	552,771,862	5.7	-21.4	38	-12.9	29	-9.1	30	1.5	45	3.5	44	5.7	84
S&P 500			-19.6	27	-10.8	21	-7.0	22	5.1	26	6.7	18	10.5	22
Excess Return			-1.8		-2.1		-2.1		-3.6		-3.2		-4.8	
eV All US Equity Net Median			-24.6		-18.7		-15.4		0.3		2.6		8.3	
Russell US Large Cap Volatility	9,775,960	0.1												
<b>Small Cap Equity</b>	<b>248,082</b>	<b>0.0</b>												
Russell US Small Cap Volatility	248,082	0.0												



San Bernardino County Employees' Retirement Association

**GLOBAL EQUITY STRATEGIES - NET**

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>International Equity With Beta Overlay</b>	<b>1,815,605,049</b>	<b>18.6</b>	<b>-23.4</b>	<b>21</b>	<b>-18.4</b>	<b>39</b>	<b>-16.9</b>	<b>64</b>	<b>-3.2</b>	<b>65</b>	<b>-1.2</b>	<b>71</b>	<b>--</b>	<b>--</b>
MSCI ACWI ex USA Gross			-23.3	21	-17.8	24	-15.1	26	-1.5	22	-0.2	34	2.5	63
Excess Return			-0.1		-0.6		-1.8		-1.7		-1.0			
InvMetrics Public DB ex-US Eq Net Median			-24.6		-18.8		-16.5		-2.5		-0.5		2.7	
<b>International Equity</b>	<b>389,549,050</b>	<b>4.0</b>	<b>-25.3</b>	<b>--</b>	<b>-22.2</b>	<b>--</b>	<b>-22.3</b>	<b>--</b>	<b>-4.3</b>	<b>--</b>	<b>-2.3</b>	<b>--</b>	<b>2.2</b>	<b>--</b>
MSCI ACWI			-21.4	--	-14.3	--	-11.3	--	1.5	--	2.8	--	5.9	--
Excess Return			-3.9		-7.9		-11.0		-5.8		-5.1		-3.7	
<b>International Developed</b>	<b>42,825,306</b>	<b>0.4</b>	<b>-20.7</b>	<b>21</b>	<b>-17.6</b>	<b>43</b>	<b>-17.8</b>	<b>57</b>	<b>-6.2</b>	<b>99</b>	<b>-2.2</b>	<b>67</b>	<b>5.9</b>	<b>16</b>
MSCI EAFE			-22.8	38	-17.4	42	-14.4	42	-1.8	42	-0.6	59	2.7	89
Excess Return			2.1		-0.2		-3.4		-4.4		-1.6		3.2	
InvMetrics Public DB Dev Mkt ex-US Eq Net Median			-24.6		-19.2		-16.7		-2.7		-0.2		3.3	
Russell International Volatility	4,515,256	0.0												
Tobam AB World Ex-US Equity	38,310,050	0.4	-22.6	48	-19.4	65	-19.7	79	--	--	--	--	--	--
MSCI ACWI ex USA			-23.4	53	-18.0	59	-15.6	60	-2.0	61	-0.6	65	2.1	81
Excess Return			0.8		-1.4		-4.1							
eV All ACWI ex-US Equity Net Median			-23.0		-16.7		-13.6		-0.9		0.3		3.7	
<b>International Emerging</b>	<b>346,723,744</b>	<b>3.5</b>	<b>-25.8</b>	<b>59</b>	<b>-22.8</b>	<b>79</b>	<b>-22.8</b>	<b>99</b>	<b>-3.8</b>	<b>61</b>	<b>-3.1</b>	<b>91</b>	<b>-0.7</b>	<b>69</b>
MSCI Emerging Markets			-23.6	27	-18.2	27	-17.7	28	-1.6	26	-0.4	35	0.7	60
Excess Return			-2.2		-4.6		-5.1		-2.2		-2.7		-1.4	
Mondrian	115,153,369	1.2	-26.1	61	-20.4	53	-20.3	62	-4.7	70	-3.0	83	0.4	73
MSCI Emerging Markets			-23.6	35	-18.2	37	-17.7	41	-1.6	32	-0.4	41	0.7	64
Excess Return			-2.5		-2.2		-2.6		-3.1		-2.6		-0.3	
eV Emg Mkts Equity Net Median			-25.0		-20.0		-19.0		-2.7		-0.9		1.3	
Tobam	231,570,375	2.4	-25.7	57	-23.8	75	-24.0	80	-3.6	58	--	--	--	--
MSCI Emerging Markets			-23.6	35	-18.2	37	-17.7	41	-1.6	32	-0.4	41	0.7	64
Excess Return			-2.1		-5.6		-6.3		-2.0					
eV Emg Mkts Equity Net Median			-25.0		-20.0		-19.0		-2.7		-0.9		1.3	



# GLOBAL DEBT STRATEGIES

<b>Global Debt Strategies (35% Target)</b>	<b>US Fixed Income (15% Target)</b>	<b>Core Fixed Income (2%)</b>	Russell Investments (Bloomberg Barclays US Agg. Bond TR Index) Apollo Credit Strategies Fund LP (MCA) Beach Point Select Fund LP GoldenTree Credit Opportunities - Gold Coast X GoldenTree Distressed Debt Fund 2010 GoldenTree Asset Management SMA - Gold Coast X Halcyon Direct Portfolio (MCA) Halcyon Solutions Fund LP (MCA) MacKay Shields High Yield Bond Strategy - Gold Coast III Manulife Asset Management - Gold Coast IV Waterfall - Sutherland REIT Holdings LP (MCA) Waterfall Asset Management SMA (MCA) Waterfall Victoria Fund LP (MCA)
		<b>Credit Strategies/ High Yield Strategies (13%)</b>	Russell Investments (Barclays Global Aggregate ex US Unhedged) Alcentra Clareant European Direct Lending Fund - Kneiff Tower Alcentra Clareant Strategic Credit Fund - Kneiff Tower Alcentra Limited SMA - Kneiff Tower Alcentra Mezzanine III/Alcentra Capital Corp. - Kneiff Tower Alcentra Structured Credit Opportunity Fund III - Kneiff Tower Cairn Capital Limited SMA - Kneiff Tower Cairn European CLO Strategy - Kneiff Tower Cairn Loan Investments - Kneiff Tower Cairn Special Opportunities Credit Fund - Kneiff Tower Cairn Strata Credit Fund - Kneiff Tower Cairn Subordinated Financials Fund II - Kneiff Tower Halcyon European Credit Opportunities Fund Ltd. (MCA) Marathon Asset Management SMA - Gold Coast I Marathon CLO Equity Fund - Gold Coast I Marathon Distressed Debt Fund - Gold Coast I Marathon European Credit Opportunities Fund - Gold Coast I Marathon European Credit Opportunity Fund II - Gold Coast I Marathon European Credit Opportunity Fund III - Gold Coast I Marathon Loan Opportunities Fund - Gold Coast I Marathon Structured Product Strategies Fund - Gold Coast I York Global Credit Income Fund
	<b>Global Fixed Income (20% Target)</b>	<b>International Core (1%)</b>	Ashmore Emerging Markets MCA Gramercy Capital Solutions Fund (MCA) Gramercy Distressed Argentina Fund III Private (MCA) Gramercy Distressed Opportunity Fund II (MCA) Gramercy Distressed Opportunity Fund III (MCA) Gramercy Emerging Markets Debt Allocation Fund (MCA) Gramercy Separate Account (MCA) Gramercy Venezuela Opportunity Fund (MCA) Marathon Global Emerging Markets Fund - Gold Coast I PGIM Emerging Market Debt Opportunities Fund
		<b>International Credit (11%)</b>	
		<b>Emerging Market Debt (8%)</b>	





San Bernardino County Employees' Retirement Association

**GLOBAL DEBT STRATEGIES - NET**

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Global Fixed Income With Beta Overlay</b>	<b>2,834,247,532</b>	<b>29.0</b>	<b>-7.9</b>	<b>--</b>	<b>-5.6</b>	<b>--</b>	<b>-5.1</b>	<b>--</b>	<b>-0.8</b>	<b>--</b>	<b>1.6</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>BBgBarc Global Aggregate TR</i>			<i>-0.3</i>	<i>--</i>	<i>0.9</i>	<i>--</i>	<i>4.2</i>	<i>--</i>	<i>3.5</i>	<i>--</i>	<i>2.6</i>	<i>--</i>	<i>2.5</i>	<i>--</i>
Excess Return			<b>-7.6</b>		<b>-6.5</b>		<b>-9.3</b>		<b>-4.3</b>		<b>-1.0</b>			
<b>Total Fixed</b>	<b>3,488,760,786</b>	<b>35.7</b>	<b>-9.3</b>	<b>99</b>	<b>-7.3</b>	<b>98</b>	<b>-6.2</b>	<b>99</b>	<b>1.6</b>	<b>90</b>	<b>3.8</b>	<b>6</b>	<b>5.6</b>	<b>1</b>
<i>InvMetrics Public DB Total Fix Inc Net Median</i>			<i>1.3</i>		<i>3.3</i>		<i>5.8</i>		<i>3.4</i>		<i>2.6</i>		<i>3.5</i>	
<b>U.S. Credit Strategies</b>	<b>1,356,706,106</b>	<b>13.9</b>	<b>-8.0</b>	<b>78</b>	<b>-4.3</b>	<b>80</b>	<b>-2.9</b>	<b>82</b>	<b>2.8</b>	<b>78</b>	<b>4.0</b>	<b>5</b>	<b>6.5</b>	<b>1</b>
<i>50% CS Leveraged Loan / 50% ICE BofA ML US HY BB-B Rated Constrained Index</i>			<i>-12.6</i>	<i>89</i>	<i>-9.5</i>	<i>92</i>	<i>-7.5</i>	<i>94</i>	<i>0.3</i>	<i>92</i>	<i>2.1</i>	<i>87</i>	<i>4.4</i>	<i>36</i>
Excess Return			<b>4.6</b>		<b>5.2</b>		<b>4.6</b>		<b>2.5</b>		<b>1.9</b>		<b>2.1</b>	
<i>ICE BofAML US High Yield TR</i>			<i>-13.1</i>	<i>90</i>	<i>-9.7</i>	<i>92</i>	<i>-7.4</i>	<i>94</i>	<i>0.6</i>	<i>92</i>	<i>2.7</i>	<i>41</i>	<i>5.5</i>	<i>1</i>
<i>eV Global Credit Fixed Inc Net Median</i>			<i>-5.9</i>		<i>-2.4</i>		<i>1.5</i>		<i>3.1</i>		<i>2.6</i>		<i>3.7</i>	
Golden Tree Asset Management	386,259,061	4.0	-18.3	99	-14.4	97	-12.5	99	0.5	92	3.4	17	--	--
Beach Point Capital (Formerly Post)	168,426,213	1.7	1.0	2	5.1	2	7.4	3	6.0	3	7.5	1	8.4	1
Golden Tree Distressed Debt	17,877,565	0.2	4.8	1	0.5	5	3.8	5	3.7	14	3.4	17	--	--
Mackay / Gold Coast	105,943,906	1.1	-10.6	85	-4.9	81	-3.6	83	1.0	83	2.3	84	5.2	6
MD SASS Waterfall Victoria	25,259,730	0.3	-0.7	--	14.3	--	-0.2	--	6.1	--	--	--	--	--
Russell Interest Rate Hedging	3,837,061	0.0	-51.6	99	-64.1	99	-74.9	99	-48.8	99	-36.6	99	-30.6	99
Stone Tower Credit (Apollo)	104,352,298	1.1	4.8	1	10.3	1	13.2	1	9.0	1	7.9	1	--	--
Gold Coast Capital IV	97,262,230	1.0	-10.6	--	-7.9	--	-6.1	--	1.5	--	--	--	--	--
Waterfall Asset Management	39,086,268	0.4	-30.1	--	-26.6	--	-23.0	--	-0.4	--	--	--	--	--
Waterfall Victoria	55,069,722	0.6	2.0	--	8.4	--	10.0	--	9.6	--	9.5	--	--	--
Stone Tower Offshore Credit (Apollo)	353,300,665	3.6	1.1	--	3.3	--	5.1	--	4.0	--	4.8	--	7.6	--
AG Capital	4,650	0.0	0.0	3	-1.4	28	-4.2	83	-3.0	97	-3.0	99	2.8	73



San Bernardino County Employees' Retirement Association

**GLOBAL DEBT STRATEGIES - NET**

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Non-U.S. Fixed Income Composite</b>	<b>2,132,054,680</b>	<b>21.8</b>	<b>-10.2</b>	<b>99</b>	<b>-9.1</b>	<b>99</b>	<b>-8.2</b>	<b>99</b>	<b>1.0</b>	<b>95</b>	<b>3.8</b>	<b>7</b>	<b>4.7</b>	<b>8</b>
<i>BBgBarc Global Aggregate TR</i>			<u>-0.3</u>	67	<u>0.9</u>	70	<u>4.2</u>	67	<u>3.5</u>	46	<u>2.6</u>	49	<u>2.5</u>	99
Excess Return			<b>-9.9</b>		<b>-10.0</b>		<b>-12.4</b>		<b>-2.5</b>		1.2		2.2	
<i>InvMetrics Public DB Total Fix Inc Net Median</i>			1.3		3.3		5.8		3.4		2.6		3.5	
<b>Non-U.S. Credit Composite</b>	<b>1,172,273,730</b>	<b>12.0</b>	<b>-12.5</b>	<b>99</b>	<b>-10.3</b>	<b>99</b>	<b>-9.8</b>	<b>99</b>	<b>1.8</b>	<b>87</b>	<b>4.4</b>	<b>1</b>	<b>5.3</b>	<b>1</b>
<i>ICE BofAML Euro High Yield Constrained TR</i>			<u>-16.6</u>	99	<u>-15.0</u>	99	<u>-11.8</u>	99	<u>-0.5</u>	99	<u>1.3</u>	96	<u>2.8</u>	99
Excess Return			4.1		4.7		2.0		2.3		3.1		2.5	
Marathon/Gold Coast	237,917,966	2.4	1.4	2	7.8	1	9.0	3	11.0	1	8.6	1	6.5	1
Halcyon Asset Management	187,183,387	1.9	-2.8	4	-0.8	12	3.1	13	0.5	92	--	--	--	--
<i>ICE BofAML Euro High Yield Constrained TR</i>			<u>-16.6</u>	98	<u>-15.0</u>	98	<u>-11.8</u>	98	<u>-0.5</u>	93	<u>1.3</u>	88	<u>2.8</u>	72
Excess Return			13.8		14.2		14.9		1.0					
<i>eV Global Credit Fixed Inc Net Median</i>			-5.9		-2.4		1.5		3.1		2.6		3.7	
Cairn Composite	317,676,524	3.2	-10.1	84	-5.9	82	-8.5	95	3.8	9	4.4	4	4.1	41
<i>ICE BofAML Euro High Yield Constrained TR</i>			<u>-16.6</u>	98	<u>-15.0</u>	98	<u>-11.8</u>	98	<u>-0.5</u>	93	<u>1.3</u>	88	<u>2.8</u>	72
Excess Return			6.5		9.1		3.3		4.3		3.1		1.3	
<i>eV Global Credit Fixed Inc Net Median</i>			-5.9		-2.4		1.5		3.1		2.6		3.7	
Alcentra - KT1	303,063,403	3.1	-30.0	--	-28.5	--	-27.7	--	-4.5	--	--	--	--	--
<i>ICE BofAML Euro High Yield Constrained TR</i>			<u>-16.6</u>	--	<u>-15.0</u>	--	<u>-11.8</u>	--	<u>-0.5</u>	--	<u>1.3</u>	--	<u>2.8</u>	--
Excess Return			<b>-13.4</b>		<b>-13.5</b>		<b>-15.9</b>		<b>-4.0</b>					
Alcentra SP1 - KT1	5,938,300	0.1	1.1	--	-67.1	--	-64.6	--	--	--	--	--	--	--
<i>ICE BofAML Euro High Yield Constrained TR</i>			<u>-16.6</u>	--	<u>-15.0</u>	--	<u>-11.8</u>	--	<u>-0.5</u>	--	<u>1.3</u>	--	<u>2.8</u>	--
Excess Return			17.7		<b>-52.1</b>		<b>-52.8</b>							
Alcentra SP2 - KT1	20,762,785	0.2	-7.3	--	-26.1	--	-27.9	--	--	--	--	--	--	--
<i>ICE BofAML Euro High Yield Constrained TR</i>			<u>-16.6</u>	--	<u>-15.0</u>	--	<u>-11.8</u>	--	<u>-0.5</u>	--	<u>1.3</u>	--	<u>2.8</u>	--
Excess Return			9.3		<b>-11.1</b>		<b>-16.1</b>							
Alcentra SP3 - KT1	44,587,254	0.5	0.5	--	21.5	--	20.1	--	8.0	--	--	--	--	--
<i>ICE BofAML Euro High Yield Constrained TR</i>			<u>-16.6</u>	--	<u>-15.0</u>	--	<u>-11.8</u>	--	<u>-0.5</u>	--	<u>1.3</u>	--	<u>2.8</u>	--
Excess Return			17.1		36.5		31.9		8.5					
Alcentra SP4 - KT1	55,144,110	0.6	2.7	--	5.5	--	5.7	--	--	--	--	--	--	--
<i>ICE BofAML Euro High Yield Constrained TR</i>			<u>-16.6</u>	--	<u>-15.0</u>	--	<u>-11.8</u>	--	<u>-0.5</u>	--	<u>1.3</u>	--	<u>2.8</u>	--
Excess Return			19.3		20.5		17.5							



San Bernardino County Employees' Retirement Association

**GLOBAL DEBT STRATEGIES - NET**

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Emerging Markets Debt Composite</b>	<b>959,780,949</b>	<b>9.8</b>	<b>-7.2</b>	<b>2</b>	<b>-7.6</b>	<b>11</b>	<b>-5.9</b>	<b>24</b>	<b>-0.6</b>	<b>36</b>	<b>2.4</b>	<b>23</b>	<b>3.1</b>	<b>63</b>
50% JPM EMBI Global Diversified/50% JPM GBI - EM Global Diversified			-14.3	35	-10.9	31	-6.6	27	-0.1	32	1.6	52	2.8	65
Excess Return			7.1		3.3		0.7		-0.5		0.8		0.3	
eV All Emg Mkts Fixed Inc Net Median			-15.6		-12.6		-8.5		-1.2		1.7		3.6	
<b>Ashmore Emerging Markets Liquid Investments</b>	<b>131,908,211</b>	<b>1.3</b>	<b>-14.3</b>	<b>35</b>	<b>-10.9</b>	<b>31</b>	<b>-6.6</b>	<b>27</b>	<b>-0.1</b>	<b>32</b>	<b>1.6</b>	<b>52</b>	<b>2.8</b>	<b>65</b>
JP Morgan GBI - EM Global Diversified Index			-15.2	44	-11.5	37	-6.5	27	-0.8	42	0.3	70	0.5	76
Excess Return			0.9		0.6		-0.1		0.7		1.3		2.3	
eV All Emg Mkts Fixed Inc Net Median			-15.6		-12.6		-8.5		-1.2		1.7		3.6	
<b>Ashmore Local Currency</b>	<b>81,883,209</b>	<b>0.8</b>	<b>-26.4</b>	<b>99</b>	<b>-26.9</b>	<b>99</b>	<b>-23.9</b>	<b>99</b>	<b>-6.5</b>	<b>99</b>	<b>-2.8</b>	<b>99</b>	<b>--</b>	<b>--</b>
JP Morgan ELM+ TR USD			-8.5	56	-7.0	61	-5.1	63	-0.4	81	0.3	85	-0.4	99
Excess Return			-17.9		-19.9		-18.8		-6.1		-3.1			
JP Morgan EMBI Global Index			-11.8	70	-8.7	68	-5.3	63	0.4	70	2.8	23	4.8	19
eV All Global Fixed Inc Net Median			-7.0		-4.5		-2.0		1.6		2.0		3.3	
Gramercy Funds Management LLC	638,518,489	6.5	-1.4	1	-3.1	1	-2.4	6	-0.8	42	3.0	11	--	--
JP Morgan ELM+ TR USD			-8.5	6	-7.0	10	-5.1	17	-0.4	35	0.3	68	-0.4	90
Excess Return			7.1		3.9		2.7		-0.4		2.7			
JP Morgan EMBI Global Index			-11.8	17	-8.7	17	-5.3	17	0.4	26	2.8	13	4.8	9
eV All Emg Mkts Fixed Inc Net Median			-15.6		-12.6		-8.5		-1.2		1.7		3.6	
PGIM Fixed Income	107,471,040	1.1	0.4	1	6.8	1	7.2	1	6.0	1	6.0	1	--	--
JP Morgan ELM+ TR USD			-8.5	6	-7.0	10	-5.1	17	-0.4	35	0.3	68	-0.4	90
Excess Return			8.9		13.8		12.3		6.4		5.7			
JP Morgan EMBI Global Index			-11.8	17	-8.7	17	-5.3	17	0.4	26	2.8	13	4.8	9
eV All Emg Mkts Fixed Inc Net Median			-15.6		-12.6		-8.5		-1.2		1.7		3.6	



# ABSOLUTE RETURN (ALPHA POOL)

<p>Absolute Return (Alpha Pool) (7% Target)</p>	<p><b>Core &amp; Credit Strategies (7%)</b></p> <ul style="list-style-type: none"><li>Apollo Accord Fund (MCA)</li><li>Apollo Global SMA (MCA)</li><li>Apollo MicCap Financial Holdings Trust (MCA)</li><li>Apollo Offshore Credit Fund LTD (MCA)</li><li>Ares Enhanced Credit Opportunites Master Fund II, LTD (MCA)</li><li>Birch Grove Credit Strategies Fund</li><li>Corrum Capital Global Credit Opportunities Fund</li><li>Corrum Capital GCO Co-Invest Fund</li><li>StateStreet Global Advisors Short Term Treasury Strategy SMA</li><li>Zais Group SMA</li><li>Zais Opportunity Fund, LTD</li><li>Zais Zephyr A-6, LP</li></ul>
---	---



San Bernardino County Employees' Retirement Association

**ALPHA POOL STRATEGIES - NET**

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Alpha Pool Composite</b>	<b>1,429,278,138</b>	<b>14.6</b>	<b>-4.8</b>	<b>48</b>	<b>-4.2</b>	<b>50</b>	<b>-1.7</b>	<b>36</b>	<b>2.8</b>	<b>30</b>	<b>3.3</b>	<b>14</b>	<b>6.0</b>	<b>1</b>
91 Day T-Bill + 3%			1.1	18	3.5	18	4.9	16	4.8	22	4.2	10	3.6	57
Excess Return			-5.9		-7.7		-6.6		-2.0		-0.9		2.4	
Alpha Liquidity (Ssga)	6,202,100	0.1	1.1	7	2.3	8	3.0	20	2.1	44	1.4	72	0.9	98
Apollo Global Management	38,536,810	0.4	-0.1	12	12.0	1	17.4	1	14.8	1	--	--	--	--
Ares Eco Master Fund II	496,895,526	5.1	2.4	2	3.5	4	5.5	10	2.8	33	--	--	--	--
Birch Grove Credit Strategies	143,073,356	1.5	3.0	2	5.9	1	9.7	1	7.4	1	5.7	1	--	--
Sterling Stamos	279,858,543	2.9	-5.7	41	-6.3	58	-2.9	54	3.5	16	4.7	1	4.2	34
Zais	132,410,303	1.4	1.5	5	-4.1	49	-2.4	52	1.2	57	2.7	24	15.1	1
Zais Group Invest Advisors	223,336,386	2.3	-25.9	99	-26.8	99	-24.6	99	-4.9	99	0.7	81	--	--
Zais Zephyr A 6 LP	27,631,131	0.3	0.1	--	14.6	--	18.9	--	15.2	--	--	--	--	--
Zais Zephyr 8	36,333,983	0.4	2.3	--	3.6	--	--	--	--	--	--	--	--	--
Zais Zephyr 7	20,000,000	0.2												



# PRIVATE ASSETS

<b>Private Assets (16% Target)</b>	<b>Private Equity</b>	<b>Diversified</b>	Partners Group SMA (MCA) Pathway Capital SMA (MCA) Pathway PE Fund VII LLC SL Capital European Strategic Partners 2004 SL Capital European Strategic Partners 2008
		<b>Buyout Funds</b>	Aurora Equity Partners IV Kayne Partners Fund IV LP (MCA) Partners Group Direct Equity 2016 (MCA) Partners Group Direct Investments 2012 LP (MCA) Partners Group European Buyout 2005 (A) LP (MCA) Waterfall Sentinel Fund (MCA)
		<b>Venture Funds</b>	Industry Ventures Direct LP (MCA) Industry Ventures Fund V LP (MCA) Industry Ventures Fund VI LP (MCA) Industry Ventures MCA Industry Ventures Partnership Holdings II LP (MCA) Industry Ventures Partnership Holdings III LP (MCA) Industry Ventures Partnership Holdings III-A LP (MCA) Industry Ventures Partnership Holdings IV LP (MCA) Industry Ventures Special Opportunities Fund II-A LP (MCA)
		<b>Secondary Funds</b>	Aberdeen Standard Secondary Opportunities Fund IV Industry Ventures Secondary VII LP (MCA) Industry Ventures Secondary VIII LP (MCA) Lexington Capital Partners VI Lexington Capital Partners VII Lexington Middle Market Investors I Lexington Middle Market Investors II Partners Group Secondary 2004 LP (MCA) Partners Group Secondary 2008 LP (MCA) SL Capital Secondary Opportunities Fund I SL Capital Secondary Opportunities Fund II SL Capital Secondary Opportunities Fund III
		<b>Sector Specific Funds</b>	Kayne Anderson Energy Fund VII LP (MCA) Tennenbaum Energy Opportunities Fund LP (MCA)
		<b>Direct Lending</b>	Ares Private Credit Solutions Fund (MCA) Tennenbaum Lending Fund VIII LLC (MCA) Tennenbaum Waterman Fund LP (MCA)
	<b>Private Debt</b>	<b>Mezzanine Funds</b>	Crescent Mezzanine Partners V
		<b>Credit/Distressed/ Opportunistic/ Special Situations</b>	Apollo Private Equity Fund VII Ares European Loan Funding LP (MCA) Ares ICOF II (MCA) Ares ICOF III (MCA) Ares SMA (MCA) Ares Special Situations Fund IV (MCA) Catalyst Fund LP II Crestline Portfolio Financing Fund Kayne Anderson Solutions Fund (MCA) Sigular Guff Distressed Opportunity Fund III LP Tennenbaum Co-Invest (MCA) Tennenbaum Opportunities Fund V LLC (MCA) Tennenbaum Opportunities Fund VI LLC (MCA) Tennenbaum Special Situations Fund IX LLC (MCA)



# REAL ESTATE

<b>Real Estate Portfolio (7% Target)</b>	<b>Core Real Estate (3.5%)</b>	<b>Core Real Estate</b>	PRISA II 348 West Hospitality Invesco Real Estate Asia Fund Kayne Anderson Real Estate Debt III (MCA) Marathon Real Estate Debt Fund Pramerica Real Estate Capital VI LP
	<b>Non-Core Real Estate (3.5%)</b>	<b>Enhanced Real Estate/ High Return</b>	Apollo Real Estate Fund II LP (MCA) Bryanston Retail Opportunity Fortress Japan Opportunity Fund II Kayne Anderson Real Estate Partners V LP (MCA) Morgan Stanley RE Fund V International Oaktree RE Opportunities Fund V PRISA III Starwood Global Opportunity Fund VII-A Starwood Opportunity Fund VII Walton Street Real Estate Fund V
		<b>Real Estate Secondaries</b>	Partners Group Real Estate Secondary 2013 A LP (MCA) Partners Group Real Estate Secondary 2017 A LP (MCA)



# REAL ASSETS

Real Asset Portfolio (5% Target)	<b>Commodities (2% Target)</b>	Energy Spectrum Partners VI LP Pinnacle Natural Resources LP Pinnacle Physicals & Financing LTD Starwood Energy Infrastructure Fund
	<b>Infrastructure (1% Target)</b>	Fortress Worldwide Transportation & Infrastructure LP Highstar Capital III Kayne Anderson MLP Strategy (MCA)
	<b>Timber (2% Target)</b>	Hancock Timberland VII & VIII LP Timbervest Crossover Partners II LP Timbervest Partners II LP





San Bernardino County Employees' Retirement Association

# ALTERNATIVES - NET

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
<b>Private Equity Composite</b>	<b>1,883,007,938</b>	<b>19.3</b>	<b>2.5</b>	<b>19</b>	<b>8.7</b>	<b>40</b>	<b>14.2</b>	<b>36</b>	<b>15.0</b>	<b>26</b>	<b>13.1</b>	<b>46</b>	<b>13.5</b>	<b>13</b>
Cambridge Associates Global All PE (Qtr Lag)			<u>5.1</u>	1	<u>9.5</u>	37	<u>14.6</u>	32	<u>14.2</u>	40	<u>11.7</u>	67	<u>12.8</u>	26
Excess Return			-2.6		-0.8		-0.4		0.8		1.4		0.7	
Russell 3000			-20.9	99	-12.7	99	-9.1	99	4.0	99	5.8	97	10.1	58
Cambridge Associates US All PE (1 Qtr Lag)			4.0	6	9.0	39	14.3	35	14.1	40	12.1	62	13.8	9
<b>Real Estate Composite</b>	<b>465,041,842</b>	<b>4.8</b>	<b>2.9</b>	<b>1</b>	<b>5.6</b>	<b>1</b>	<b>7.8</b>	<b>4</b>	<b>6.2</b>	<b>55</b>	<b>8.1</b>	<b>34</b>	<b>9.5</b>	<b>74</b>
NCREIF Property Index 1 Qtr. Lag			<u>1.6</u>	3	<u>4.5</u>	5	<u>6.4</u>	6	<u>6.7</u>	40	<u>8.2</u>	29	<u>10.2</u>	62
Excess Return			1.3		1.1		1.4		-0.5		-0.1		-0.7	
InvMetrics Public DB Real Estate Pub+Priv Net Median			0.4		2.8		4.3		6.4		7.4		10.9	
<b>Real Assets Composite</b>	<b>403,544,140</b>	<b>4.1</b>	<b>-16.7</b>	<b>66</b>	<b>-13.4</b>	<b>65</b>	<b>-14.7</b>	<b>69</b>	<b>-2.9</b>	<b>62</b>	<b>-2.8</b>	<b>56</b>	<b>1.2</b>	<b>--</b>
Real Assets Custom Blend			<u>-15.5</u>	64	<u>-13.5</u>	65	<u>-13.9</u>	68	<u>-4.0</u>	66	<u>-2.9</u>	57	<u>-1.3</u>	--
Excess Return			-1.2		0.1		-0.8		1.1		0.1		2.5	
67% Bloomberg Commodity/ 33% Barclays US TIPS			-15.5	64	-13.5	65	-13.3	68	-4.6	67	-4.2	62	-3.3	--
Timber	50,550,142	0.5	-0.6	--	-0.7	--	-3.4	--	-3.3	--	-1.8	--	1.3	--
NCREIF Timberland 1 Qtr. Lag			<u>0.0</u>	--	<u>1.2</u>	--	<u>1.3</u>	--	<u>2.7</u>	--	<u>3.2</u>	--	<u>4.5</u>	--
Excess Return			-0.6		-1.9		-4.7		-6.0		-5.0		-3.2	
<b>Infrastructure</b>	<b>94,340,455</b>	<b>1.0</b>	<b>-47.0</b>	<b>--</b>	<b>-45.8</b>	<b>--</b>	<b>-47.5</b>	<b>--</b>	<b>-15.3</b>	<b>--</b>	<b>-10.1</b>	<b>--</b>	<b>-0.6</b>	<b>--</b>
Russell 3000			<u>-20.9</u>	--	<u>-12.7</u>	--	<u>-9.1</u>	--	<u>4.0</u>	--	<u>5.8</u>	--	<u>10.1</u>	--
Excess Return			-26.1		-33.1		-38.4		-19.3		-15.9		-10.7	
<b>Commodities</b>	<b>258,653,544</b>	<b>2.6</b>	<b>1.7</b>	<b>--</b>	<b>9.2</b>	<b>--</b>	<b>9.8</b>	<b>--</b>	<b>8.9</b>	<b>--</b>	<b>3.0</b>	<b>--</b>	<b>4.0</b>	<b>--</b>
Bloomberg Commodity Index			<u>-23.3</u>	--	<u>-21.4</u>	--	<u>-22.3</u>	--	<u>-8.6</u>	--	<u>-7.8</u>	--	<u>-6.7</u>	--
Excess Return			25.0		30.6		32.1		17.5		10.8		10.7	



**APPENDIX: PRIVATE EQUITY, REAL ESTATE AND  
REAL ASSETS PERFORMANCE**

NEPC, LLC

---

# REAL ESTATE PERFORMANCE ENDED SEPTEMBER 30, 2019

Investment Name	Vintage Year	Commitment Amount	Paid In Capital	Distributions	Valuation	Investment Multiple	ITD IRR
348 Hospitality	2001	5,722,173.54	6,059,537.66	3,510,500.00	6,083,505.00	1.58	3.61
810 First No Washington DC	2001	35,382,468.00	40,658,445.34	103,170,935.45	37,285.00	2.54	12.08
Tuckerman Multi-Family Development Fund III	2002	10,000,000.00	10,219,311.00	16,939,699.00	0.00	1.66	26.98
CBRE Strategic Partners III	2003	10,000,000.00	10,000,000.00	13,104,012.33	0.00	1.31	8.70
PRISA III	2003	89,315,030.00	70,903,635.83	42,316,697.95	52,609,898.23	1.34	8.20
Walton Street Real Estate Fund IV, L.P.	2003	10,000,000.00	10,316,425.24	16,502,793.94	74,355.00	1.61	10.72
Bryanston Retail Opportunity Fund, L.P.	2004	20,000,000.00	18,083,952.00	28,924,192.40	8,481,318.00	2.07	53.12
PRISA II	2004	140,000,000.00	140,000,586.09	45,880,206.31	170,340,166.72	1.54	8.67
RREEF America REIT III	2004	20,000,000.00	20,539,308.00	23,658,674.71	0.00	1.15	3.00
Blackrock Diamond Property Fund	2005	25,000,000.00	25,010,402.04	18,617,244.55	0.00	0.74	(5.15)
CBRE Strategic Partners US Fund IV	2005	40,000,000.00	40,000,000.00	1,709,002.38	0.00	0.04	(33.41)
Invesco Real Estate Fund I	2005	10,000,000.00	9,248,389.00	10,015,656.99	0.00	1.08	1.54
LaSalle Income & Growth Fund IV	2005	20,000,000.00	19,469,417.05	13,493,924.93	0.00	0.69	(5.48)
North Haven Real Estate Fund V International	2005	25,000,000.00	31,313,757.00	34,450,308.00	1,158,816.00	1.14	5.03
Prologis Japan Fund	2005	25,290,819.00	25,886,808.30	32,436,860.33	0.00	1.25	4.02
TRI Continental Capital VII	2005	23,000,000.00	26,906,767.00	6,615,985.00	810,706.00	0.28	(16.75)
Beacon Capital Strategic Partners IV	2006	38,000,000.00	38,000,000.00	31,424,700.00	0.00	0.83	(3.26)
Fillmore East Fund	2006	20,000,000.00	31,403,817.64	20,489,689.29	0.00	0.65	(10.00)
Starwood Capital Hospitality Fund I-2	2006	30,000,000.00	30,000,000.00	27,879,087.05	2,483,938.00	1.01	0.16
Starwood Opportunity Fund VII-A	2006	25,000,000.00	25,000,000.00	19,507,016.80	731,738.00	0.81	(2.30)
Walton Street Real Estate Fund V	2006	40,000,000.30	40,000,000.30	26,253,672.68	3,899,428.00	0.75	(3.11)
Beacon Capital Strategic Partners V, LP	2007	18,000,000.00	18,000,000.00	11,174,694.15	0.00	0.62	(7.87)
INVESCO Asian RE Partners II, L.P.	2007	9,981,889.00	9,709,855.84	12,633,308.46	142,070.00	1.32	7.52
Invesco High Yield Debt Fund I	2007	20,000,000.00	20,553,003.52	9,104,142.09	0.00	0.44	(34.64)
RREEF North American Infrastructure Fund	2007	50,846,289.00	50,846,289.00	55,238,754.00	0.00	1.09	12.09
Square Mile Partners II, L.P.	2007	20,000,000.00	19,831,232.00	5,312,231.00	0.00	0.27	(19.10)
Fillmore West Fund	2008	20,000,000.00	19,561,557.10	21,175,797.71	0.00	1.08	1.14
Guggenheim Structured Real Estate III	2008	20,000,000.00	20,000,000.00	16,320,664.00	0.00	0.82	(4.99)
Square Mile Partners III TE, L.P.	2008	20,000,000.00	23,497,664.00	31,477,569.00	93,127.00	1.34	10.08
Starwood Debt Fund II	2008	20,000,000.00	17,622,082.00	21,912,511.86	0.00	1.24	6.43
Bryanston Real Estate Opp. Fund II L.P.	2009	13,930,744.00	8,338,309.01	11,597,050.42	0.00	1.39	10.18
Fortress Japan Opportunity Fund II	2012	21,739,130.00	22,564,843.00	39,945,639.00	6,484,993.00	2.06	25.25
Oaktree Real Estate Opportunities Fd V	2012	25,000,000.00	29,660,605.00	38,122,110.63	2,336,740.00	1.36	9.75
Invesco Real Estate Asia Fund	2014	51,732,500.00	56,502,605.99	13,076,273.93	62,279,343.56	1.33	6.43
Partners Group RE Secondary 2013 (USD) A	2014	65,000,000.00	49,312,509.98	21,574,196.55	52,088,489.00	1.49	15.42
Apollo U.S. Real Estate Fund II L.P.	2015	20,000,000.00	17,348,965.93	8,558,845.63	13,481,958.20	1.27	13.90
Pramerica RE Capital VI (Scots Feeder)	2016	25,242,170.26	17,821,615.43	10,419,270.09	10,132,892.25	1.15	12.81
Kayne Anderson Real Estate Fund V, L.P.	2017	20,000,000.00	10,140,062.79	0.00	10,602,493.00	1.05	4.08
Partners Group RE Secondary 2017 (USD) A	2017	75,000,000.00	27,848,593.53	133,349.75	30,808,677.00	1.11	11.53
Kayne Anderson Real Estate Debt III, L.P.	2018	20,000,000.00	12,634,158.00	5,959,191.00	7,219,835.00	1.04	6.90

Note: All metrics are calculated since inception

\* Denotes cash adjusted



## REAL ASSETS PERFORMANCE ENDED SEPTEMBER 30, 2019

Investment Name	Vintage Year	Commitment Amount	Paid In Capital	Distributions	Valuation	Investment Multiple	ITD IRR
Hancock Timberland VII Inc.	2005	90,000,000.00	90,000,000.00	77,327,100.00	27,402,979.00	1.16	1.32
Hancock Timberland VIII Inc.	2006	40,000,000.00	40,000,225.00	7,511,950.00	29,432,029.00	0.92	(0.75)
Domain Timber Investments II, LP	2007	50,000,000.00	50,000,000.00	42,525,000.00	10,264,447.00	1.06	0.57
Highstar Capital III, L.P.	2007	60,000,000.00	65,467,944.00	58,551,559.00	10,368,742.00	1.05	0.72
Domain Environmental Investments II, LP	2008	30,000,000.00	30,000,198.00	15,495,000.00	12,654,872.00	0.94	(0.94)
Fortress Worldwide Transport Infra L.P.	2014	50,000,000.00	52,891,351.74	53,897,581.79	0.00	1.02	2.32
Fortress Transportation Infrastructure LLC	2015	45,403,353.99	45,403,353.99	14,101,750.05	40,462,407.90	1.20	5.63

*Note: All metrics are calculated since inception*

*\* Denotes cash adjusted*



# PRIVATE EQUITY PERFORMANCE ENDED SEPTEMBER 30, 2019

Investment Name	Vintage Year	Commitment Amount	Paid In Capital	Distributions	Valuation	Investment Multiple	ITD IRR
Franklin Cool Springs Corporation	2000	29,853,550.00	33,225,210.58	115,452,622.00	6,634.00	3.48	12.62
European Strategic Partners 2004	2004	240,071,702.78	220,809,634.20	267,004,412.56	15,061,622.25	1.28	4.10
Partners Group European Mandate LP	2004	229,625,840.89	171,225,315.83	229,106,082.49	3,850,245.94	1.36	4.56
Pathway Private Equity Fund VII, L.P.	2004	904,500,000.00	846,990,469.97	1,148,883,511.77	365,865,472.00	1.79	11.31
Aurora Equity Partners III, L.P.	2005	25,000,000.00	23,623,185.00	41,553,369.00	184,862.00	1.77	16.01
Lexington Middle Markets Investors, L.P.	2005	25,000,000.00	24,771,942.00	37,780,661.17	2,967,786.00	1.64	11.62
NB Secondary Opp. Fund	2005	20,000,000.00	18,500,842.72	24,330,105.06	0.00	1.32	6.58
Partners Group European Mezzanine 2005	2005	101,024,580.47	101,024,580.47	122,030,664.72	1,015,214.86	1.22	3.20
Safari Industrial Corporation	2005	47,641,776.50	50,483,437.21	70,819,645.65	0.00	1.40	4.20
FPA SB Hunters Run	2006	11,114,254.71	13,607,551.54	32,448,089.99	0.00	2.38	11.21
Lexington Capital Partners VI-B, L.P.	2006	25,000,000.00	26,403,380.00	34,873,791.50	2,093,461.00	1.40	7.02
Partners Group Secondary 2006 LP	2006	52,533,142.57	44,202,178.25	52,164,758.02	694,917.40	1.20	3.23
Siguler Guff Distress Opp Fund II, L.P.	2006	30,000,000.00	30,000,000.00	42,347,626.53	0.00	1.41	8.49
TCW/Crescent Mezzanine Partners IV, L.P.	2006	40,000,000.00	34,938,814.00	39,432,724.00	92,345.71	1.13	2.54
Blue Tip Energy Partners Fund I, L.P.	2007	11,417,093.00	11,417,092.00	46,364.00	0.00	0.00	
Catalyst Fund Limited Partnership II	2007	10,000,000.00	13,784,236.42	8,048,485.65	16,860,853.00	1.81	9.22
Energy Spectrum Partners V, L.P.	2007	15,000,000.00	13,837,678.21	25,799,483.45	14,544.00	1.87	31.71
Tennenbaum Opportunity Fund V, L.P.	2007	10,000,000.00	10,000,000.00	11,880,153.16	2,315,618.00	1.42	5.21
Apollo Investment Fund VII, L.P.	2008	10,000,000.00	12,941,012.56	20,301,397.89	1,378,018.00	1.68	24.70
Aurora Resurgence Fund, L.P.	2008	15,000,000.00	11,398,307.00	15,887,094.00	0.00	1.39	16.91
Industry Ventures Fund V	2008	10,000,000.00	9,500,000.00	22,324,904.73	5,651,349.00	2.94	29.66
Lexington Middle Market Investors II, L.P.	2008	10,000,000.00	9,796,342.00	13,031,319.93	3,361,730.00	1.67	14.15
NB Secondary Offshore Opp. Fund II	2008	20,000,000.00	21,628,010.17	31,260,030.23	0.00	1.45	14.21
Siguler Guff Distress Opp Fund III, L.P.	2008	10,000,000.00	9,700,000.00	13,999,328.25	1,664,619.00	1.61	10.57
TCW/Crescent Mezzanine Partners V, L.P.	2008	20,000,000.00	18,840,857.00	24,274,025.00	634,427.17	1.32	8.54
Apollo European Principal Finance Fund, L.P.	2009	52,531,911.13	76,322,519.46	104,823,588.52	278,766.81	1.38	14.95
Drug Royalty II	2009	20,000,000.00	12,568,461.00	19,130,909.98	0.00	1.52	19.99
Partners Group Secondary 2008, L.P.	2009	26,290,066.76	22,810,235.43	30,988,663.73	2,974,776.14	1.49	8.70
Starwood Energy Infrastructure Fund, LP	2009	15,000,000.00	14,843,463.34	20,236,770.78	128,435.00	1.37	8.02
Apollo PCPL Webb V	2010	4,844,397.94	4,844,397.94	4,207,461.86	33,125.92	0.88	(9.44)
Apollo PCPL Webb VIII	2010	4,734,303.02	4,734,303.02	13,077,622.92	2,277.29	2.76	48.29
Energy Spectrum Partners VI, L.P.	2010	20,000,000.00	17,124,618.20	16,767,383.01	5,286,972.00	1.29	7.84
European Strategic Partners 2008	2010	31,054,969.05	28,223,607.93	29,536,876.49	11,750,694.67	1.46	9.08
Industry Ventures Fund VI	2011	20,000,000.00	18,400,000.00	18,658,109.73	6,009,927.00	1.34	8.10
Lexington Capital Partners VII Offshore	2011	25,000,000.00	21,794,489.00	27,848,269.61	6,162,885.00	1.56	15.20
Tennenbaum Opportunity Fund VI, L.P.	2011	20,000,000.00	20,250,373.66	19,544,046.05	6,543,657.00	1.29	6.39
Aurora Equity Partners IV L.P.	2012	20,000,000.00	19,385,524.00	31,008,537.00	7,715,610.00	2.00	18.80
BNY Mellon-Alcentra Mezzanine III, L.P.	2012	25,000,000.00	31,839,520.00	31,484,319.00	0.00	0.99	(1.09)
Industry Ventures Fund II	2012	25,000,000.00	23,500,000.00	17,059,367.65	52,508,196.00	2.96	23.56
Industry Vent Part Holdings III-A, LP	2013	12,500,000.00	10,793,396.11	3,583,829.78	7,588,332.00	1.04	1.10
Industry Vent Part Holdings III, LP	2013	25,000,000.00	23,244,168.05	4,814,586.85	45,945,366.00	2.18	23.96
Industry Ventures Secondary VII, L.P.	2013	25,000,000.00	22,386,661.00	18,661,423.11	18,455,189.00	1.66	16.11
Partners Group Access 632, L.P.	2013	2,782,600.95	2,805,048.82	4,642,904.30	1.09	1.66	16.12
Partners Group Client Access 8 LP	2013	5,535,259.60	5,558,630.98	30,719,587.85	0.00	5.53	69.62
Partners Group Direct Investments 2012 (EUR)	2013	18,124,686.93	16,625,355.18	13,920,096.26	17,404,545.38	1.88	18.60
Partners Group Princess Learning IC LTD	2013	11,853,576.33	7,605,834.56	0.00	21,134,017.85	2.78	36.55
Partners Group Starfrost Limited	2013	3,648,220.85	3,648,220.85	1,922,337.89	3,801,596.83	1.57	9.79
SL Capital SOF I LP	2013	25,000,000.00	23,566,657.29	20,584,203.46	10,689,246.89	1.33	11.59
Tennenbaum Waterman Fund, LP	2013	70,000,000.00	75,778,956.00	52,411,486.68	68,328,586.00	1.59	11.10
Alcentra Capital Corporation	2014	9,002,406.00	9,002,406.00	4,150,836.01	6,606,030.45	1.19	4.94
Baring Asia Private Equity IV, L.P.	2014	3,308,931.00	3,131,350.58	3,558,801.07	295,399.00	1.23	9.98
Charlesbank Equity Fund VIII, LP	2014	7,500,000.00	8,161,034.00	5,343,934.00	6,588,332.00	1.46	18.45
Glendon Opportunities Fund	2014	7,000,000.00	5,950,000.00	17,872.00	7,338,233.58	1.24	5.61
Insight Venture Partners III Co-Invest	2014	4,000,000.00	4,000,000.00	9,299,211.42	1,458,946.63	2.69	26.97
Partners Group Access 648, L.P.	2014	4,852,230.27	4,852,230.27	19,447.25	4,698,715.01	0.97	(0.61)
Pathway MCA	2014	0.00	183,191,447.00	189,152.00	4,670,321.89	0.03	
Quantum Energy Partners IV, L.P.	2014	2,907,301.00	2,868,364.62	1,366,891.18	293,220.00	0.58	(20.04)
Spectrum Equity VII, L.P.	2014	8,000,000.00	7,241,668.00	9,330,953.52	11,271,808.00	2.85	43.09
The Resolute Fund III	2014	8,000,000.00	8,535,652.00	4,375,444.00	8,381,628.00	1.49	19.43

Note: All metrics are calculated since inception

\* Denotes Cash adjusted value



# PRIVATE EQUITY PERFORMANCE ENDED SEPTEMBER 30, 2019

Investment Name	Vintage Year	Commitment Amount	Paid In Capital	Distributions	Valuation	Investment Multiple	ITD IRR
Thoma Bravo Fund XI	2014	8,000,000.00	8,253,839.00	7,558,074.00	12,707,956.94	2.46	27.07
Advantech Capital LP	2015	2,100,000.00	1,993,941.00	2,241,773.00	4,436,570.00	3.35	72.57
American Industrial Capital Fund VI, L.P.	2015	2,400,000.00	2,515,458.43	333,044.45	2,662,229.00	1.19	10.61
Catalyst Investors QP IV, LP	2015	8,000,000.00	6,809,143.00	989,142.00	10,533,668.00	1.69	21.16
Clearlake Capital Partners IV, L.P.	2015	8,000,000.00	10,253,167.98	6,636,459.98	9,809,975.00	1.60	31.66
Clearlake Opportunities Partners, L.P.	2015	8,000,000.00	7,662,408.02	2,952,285.21	6,200,994.00	1.19	11.90
Genstar Capital Partners VII, L.P.	2015	4,500,000.00	5,625,008.61	3,890,087.07	5,759,421.00	1.72	34.65
Industry Vent Part Holdings IV, L.P.	2015	25,000,000.00	16,900,000.00	1,224,603.03	19,300,362.00	1.21	14.00
Nautic Partners VIII, L.P.	2015	2,500,000.00	1,733,235.44	1,402,154.02	904,138.00	1.33	56.43
NorthEdge Capital Fund II LP	2015	1,540,902.35	994,292.15	195,708.24	981,590.66	1.18	9.64
Partners Group Access 680 L.P.	2015	7,035,459.07	7,035,459.68	3,507,229.08	14,115,589.98	2.50	28.53
Partners Group Brilliant Holdings Sarl	2015	3,352,906.78	3,352,906.55	136,225.72	5,078,251.44	1.56	11.79
Partners Group Seabras Holdings, LLC	2015	4,660,000.00	3,355,016.00	0.00	2,006,952.00	0.60	(13.43)
Partners Group Zeuss Childcare, L.P.	2015	6,484,947.28	6,383,460.10	0.00	7,496,003.31	1.17	5.08
Quantum Energy Partners VI, L.P.	2015	8,000,000.00	6,941,139.24	4,113,534.73	8,089,327.00	1.76	34.79
Quantum Parallel Partners VI-C, LP	2015	3,290,000.00	2,209,821.74	287,468.78	3,118,415.00	1.54	24.54
Redview Capital LP	2015	2,100,000.00	1,954,126.00	302,413.00	1,881,064.00	1.12	5.59
Ridgmont Equity Partners II, L.P.	2015	7,600,000.00	8,716,269.75	3,080,033.98	8,181,429.00	1.29	17.38
SL Capital SOF II LP	2015	25,000,000.00	22,619,141.03	16,590,449.45	16,053,833.39	1.44	20.94
Southwest Fund VII, L.P.	2015	4,900,000.00	1,874,129.47	222,972.28	1,127,831.00	0.72	(31.87)
Tennenbaum Energy Opportunities Fund, LP	2015	20,000,000.00	16,966,099.37	8,881,074.88	12,768,224.00	1.28	13.50
Tennenbaum Special Situations Fund IX	2015	50,000,000.00	47,283,826.13	12,654,876.31	46,001,026.00	1.24	11.57
The Resolute Fund II, L.P. - Secondary	2015	9,330,964.33	7,933,761.33	1,625,150.00	6,542,368.00	1.03	2.29
Thoma Bravo Discover Fund, L.P.	2015	3,000,000.00	3,405,122.00	1,794,636.00	4,231,089.39	1.77	32.36
2014 Co-Investment	2016	4,500,000.00	4,506,920.00	2.00	5,622,000.50	1.25	4.62
2015 Co-Investment	2016	800,000.00	800,000.00	0.00	347,000.00	0.43	(17.22)
2016 Co-Investment	2016	16,606,517.00	15,245,554.34	14,386,600.06	18,870,443.38	2.18	43.07
Advent International GPE VIII LP	2016	10,000,000.00	8,684,999.00	0.00	10,847,488.00	1.25	14.63
Centerbridge Special Credit Partners III, L.P.	2016	10,000,000.00	2,549,964.00	813,285.00	2,091,658.00	1.14	7.36
Industry Ventures Direct, L.P.	2016	25,000,000.00	18,420,844.67	1,900,631.74	18,840,287.00	1.13	8.19
Industry Ventures Secondary VIII, L.P.	2016	25,000,000.00	11,750,000.00	2,748,194.32	15,406,246.00	1.55	51.87
Industry Ventures Special Opportunities II-A, L.P.	2016	12,500,000.00	1,225,000.00	439,631.81	2,210,173.00	2.16	74.52
Insight Venture Partners VI	2016	539,922.00	274,161.00	372,035.68	63,285.20	1.59	31.10
Institutional Venture Partners XII	2016	1,079,843.00	398,262.00	413,970.99	222,385.00	1.60	23.36
Institutional Venture Partners XIII	2016	1,079,843.00	1,179,321.00	808,172.01	556,501.00	1.16	6.88
Madison Dearborn Capital Partners VII	2016	10,000,000.00	7,441,822.00	926,352.00	7,873,630.00	1.18	10.92
ONCAP IV	2016	600,000.00	336,015.00	90,958.00	247,986.00	1.01	0.72
Partners Group Access 384, L.P.	2016	8,360,000.00	8,360,000.00	0.00	7,144,279.00	0.85	(5.52)
Partners Group Access 772, L.P.	2016	6,433,856.56	5,202,087.19	0.00	4,767,544.98	0.92	(4.08)
Partners Group Access 773, L.P.	2016	9,127,941.00	6,025,723.10	0.00	7,464,069.00	1.24	7.34
Partners Group Access 873, L.P.	2016	5,145,968.99	5,097,147.27	72,195.51	6,201,085.27	1.23	12.59
Partners Group CA Infrastructure, LP Inc	2016	6,246,500.00	2,635,504.54	0.00	3,497,590.00	1.33	13.80
Partners Group Direct Equity 2016 USD A	2016	20,000,000.00	16,443,101.83	84,466.71	21,135,309.00	1.29	13.51
TCP Direct Lending Fund VIII-L, LLC	2016	40,000,000.00	50,542,297.00	21,269,074.82	31,828,678.00	1.05	5.98
TCV IX, L.P.	2016	10,000,000.00	7,559,000.00	549,488.62	7,771,464.00	1.10	7.70
Thoma Bravo Fund XII, L.P.	2016	10,000,000.00	9,724,091.00	567,085.00	12,297,165.07	1.32	15.12
Vista Foundation Fund III, L.P.	2016	10,000,000.00	7,212,266.00	80,076.00	8,246,527.00	1.15	9.47
2017 Co-Investment	2017	9,450,000.00	8,883,370.44	665,656.36	9,706,993.00	1.17	7.28
Apollo Accord Fund LP	2017	30,000,000.00	7,492,420.49	5,511,478.18	2,653,825.09	1.09	6.29
Ares ICOF II Fund (Cayman), LTD.	2017	101,743,265.00	101,758,455.21	48,361,288.41	78,388,445.00	1.25	11.77
Ares Private Credit Solutions	2017	50,000,000.00	29,427,926.07	6,509,929.96	25,707,197.00	1.09	9.29
Kayne Anderson Energy Fund VII, L.P.	2017	10,000,000.00	8,953,328.00	3,465,199.00	6,960,712.00	1.16	10.72
Kayne Partners Fund IV (QP), L.P.	2017	20,000,000.00	11,382,561.21	0.00	13,462,294.00	1.18	15.88
Marlin Equity V, L.P.	2017	7,000,000.00	2,449,944.00	145,999.00	2,826,890.00	1.21	24.06
Marlin Heritage II, L.P.	2017	700,000.00	356,642.00	0.00	362,555.00	1.02	1.41
Pamlico Capital IV, L.P.	2017	3,750,000.00	2,251,674.86	0.00	2,273,263.00	1.01	1.07
Partners Group Access 188 L.P.	2017	7,720,000.00	7,720,000.00	0.00	9,779,752.00	1.27	11.85
Partners Group Access 216, LP	2017	8,899,981.89	8,899,981.95	0.00	13,475,345.01	1.51	20.14
Partners Group Access 587 LP	2017	2,274,408.65	1,169,958.04	0.00	1,292,124.47	1.10	5.75
Partners Group Access 677, L.P.	2017	7,645,017.13	5,167,930.49	0.00	7,230,522.99	1.40	17.86
Partners Group Access 906, L.P.	2017	15,000,000.00	15,002,297.70	17,269.17	18,498,101.00	1.23	11.36
Partners Group Global Opp Limited	2017	3,931,628.11	3,931,628.11	4,826,844.28	789,974.11	1.43	23.62

Note: All metrics are calculated since inception. \* Denotes Cash adjusted value



# PRIVATE EQUITY PERFORMANCE ENDED SEPTEMBER 30, 2019

Investment Name	Vintage Year	Commitment Amount	Paid In Capital	Distributions	Valuation	Investment Multiple	ITD IRR
Partners Group Series Access II, LLC, Series 50	2017	9,637,442.00	9,583,083.44	0.00	11,261,695.00	1.18	13.88
Quad-C Partners IX, L.P.	2017	8,000,000.00	3,196,776.00	33,224.00	3,570,297.00	1.13	8.47
Quantum Energy Partners VII Co-Invest	2017	1,709,039.00	545,183.16	23,079.22	471,053.00	0.91	(7.15)
Quantum Energy Partners VII, LP	2017	6,700,000.00	3,496,498.84	512,948.03	3,074,920.00	1.03	2.26
SL Capital SOF III LP	2017	25,000,000.00	16,000,440.42	4,867,579.17	15,775,669.53	1.29	37.80
The Huron Fund V L.P.	2017	10,000,000.00	2,585,000.00	0.00	2,973,421.00	1.15	14.71
Theo Topco Limited	2017	6,028,794.74	5,984,335.98	0.00	8,453,285.24	1.41	17.15
Towerbrook III 2ndry	2017	1,520,778.00	387,911.00	327,172.00	152,494.00	1.24	16.66
Towerbrook IV (OS) 2ndry	2017	760,389.00	534,797.00	80,352.00	606,188.00	1.28	16.39
Trident VII, L.P.	2017	8,300,000.00	5,736,221.99	66,190.11	6,907,852.39	1.22	18.02
2018 Co-Investment	2018	16,044,954.00	13,627,047.77	4,838,045.36	11,698,466.99	1.21	19.08
Advantech Capital II, L.P.	2018	3,000,000.00	1,079,547.00	0.00	1,019,219.00	0.94	(7.34)
Blue Point Capital Partners IV, LP	2018	3,550,000.00	1,020,390.70	0.00	1,030,334.00	1.01	1.35
Centerbridge Capital Partners II, LP	2018	2,244,227.84	1,996,504.00	223,275.00	1,029,050.00	0.63	(34.20)
Clearlake Capital Partners V, L.P.	2018	10,000,000.00	6,452,362.94	1,247,286.93	8,326,034.00	1.48	57.43
Crestline Portfolio Financing Fund	2018	50,000,000.00	21,276,315.00	201,644.00	23,440,582.85	1.11	10.98
Flywheel Co-investment LLC	2018	8,000,000.00	6,400,000.00	1,077,991.00	6,396,951.00	1.17	17.38
GTCR Fund XII LP	2018	8,000,000.00	2,060,800.00	144,018.00	1,949,811.00	1.02	1.91
Industry Ventures Partnership Holdings V, LP	2018	25,000,000.00	3,675,000.00	65,246.89	4,206,116.00	1.16	30.27
Industry Ventures Tech Buyout LP	2018	25,000,000.00	3,418,022.94	0.00	2,918,129.00	0.85	(15.21)
Kayne Private Energy Income Fund II, LP	2018	20,000,000.00	3,932,092.00	1,131,380.00	3,377,219.00	1.15	15.31
Kayne Solutions Fund LP	2018	20,000,000.00	6,743,933.00	3,189,294.00	4,503,657.00	1.14	13.91
Partners Group Access 1003, L.P.	2018	3,147,256.00	1,447,386.52	0.00	1,631,483.00	1.13	15.07
Partners Group Access 1036, L.P.	2018	9,888,511.59	0.00	0.00	0.00	0.00	
Partners Group Access 780 LP	2018	4,242,000.00	1,113,863.00	0.00	2,609,128.00	2.34	98.08
Partners Group Access 932, L.P.	2018	8,282,963.42	6,587,441.46	0.00	7,602,653.39	1.15	19.25
Partners Group Access 952 LP	2018	6,168,891.55	6,094,005.08	206,714.06	5,215,676.58	0.89	(8.43)
Partners Group Access 967 L.P.	2018	14,728,080.81	14,728,080.81	0.00	15,662,072.33	1.06	5.48
Partners Group Access 990 LP	2018	14,438,450.00	13,980,450.00	0.00	14,018,775.00	1.00	0.22
Partners Group Borssele Access 2, L.P.	2018	13,511,868.58	1,201,396.75	0.00	1,407,070.86	1.17	18.67
Partners Group Client Access 28 LP	2018	7,364,184.46	7,370,023.31	1,571.71	7,833,902.85	1.06	5.46
Partners Group Hawthorne Holdings LLC	2018	8,685,000.00	2,498,983.78	0.00	2,262,945.00	0.91	(12.04)
Partners Group Lock Access, L.P.	2018	5,881,944.11	2,872,142.22	0.00	3,465,313.77	1.21	17.31
Redview Capital II L.P.	2018	3,000,000.00	193,751.00	0.00	88,801.00	0.46	(74.00)
Ridgmont Equity Partners III, LP	2018	8,000,000.00	0.00	0.00	(117,839.00)	0.00	
Riverside Micro-Cap Fund V, L.P.	2018	4,700,000.00	949,711.00	0.00	836,862.00	0.88	(22.25)
Spectrum Equity VIII-A, L.P.	2018	8,000,000.00	3,640,000.00	0.00	3,332,491.00	0.92	(18.07)
The Resolute Fund IV, L.P.	2018	8,000,000.00	2,310,117.00	788,718.00	2,232,211.00	1.31	71.66
Thoma Bravo Discover Fund II, L.P.	2018	4,000,000.00	1,352,393.00	0.00	1,276,713.60	0.94	(8.12)
Thoma Bravo Fund XIII, L.P.	2018	8,000,000.00	2,888,293.00	32.00	2,849,449.34	0.99	(1.75)
2019 Co-Investment	2019	10,861,307.00	9,804,504.74	0.00	9,782,693.99	1.00	(0.68)
Arlington Capital Partners V, L.P.	2019	7,200,000.00	54,120.00	0.00	(27,671.00)	(0.51)	
Clearlake Opportunity Partners II LP	2019	8,000,000.00	650,814.30	428.47	619,118.34	0.95	(4.81)
EnCap Flatrock Midstream Fund II, L.P.	2019	3,261,428.51	1,732,935.01	0.00	1,768,427.72	1.02	2.15
Encap Flatrock Midstream Fund III	2019	4,462,375.89	3,870,250.71	179,952.31	4,044,731.91	1.09	9.89
HIG Middle Market LBO Fund III, L.P.	2019	3,900,000.00	0.00	0.00	(16,187.00)	0.00	
Insight Partners Continuation Fund, LP	2019	8,000,000.00	7,100,000.00	0.00	7,665,528.91	1.08	7.97
Nautic Partners IX, L.P.	2019	4,700,000.00	0.00	0.00	0.00	0.00	
Partners Group Access 1065 LP	2019	6,900,000.00	6,837,276.87	6,142.45	6,831,134.00	1.00	(0.00)
Partners Group Access 1083 LP	2019	8,040,000.00	4,027,690.67	0.00	4,027,691.00	1.00	0.00
Partners Group Access 1098 LP	2019	9,740,000.00	4,913,000.00	0.00	4,913,000.00	1.00	0.00
Partners Group Access 1114 L.P	2019	4,830,634.31	3,969,506.41	0.00	3,935,751.38	0.99	(0.85)
Partners Group Access 1124, L.P.	2019	9,036,000.00	6,183,778.70	0.00	6,183,779.00	1.00	0.00
Partners Group Access 1133 LP	2019	6,800,000.00	5,916,000.00	0.00	5,916,000.00	1.00	0.00
Partners Group Access 1135 LP	2019	15,000,000.00	10,203,938.22	0.00	10,203,938.22	1.00	
Partners Group Azure Holdings, LLC	2019	8,000,000.00	4,344,000.00	0.00	4,344,000.00	1.00	(0.00)
Partners Group Greenlink Access 2, L.P.	2019	10,059,049.47	790,597.75	0.00	758,817.29	0.96	(4.03)
TCV X, L.P.	2019	8,000,000.00	2,638,400.00	0.00	2,478,451.00	0.94	(17.35)
Waterfall Sentinel Co-Investments	2019	30,000,000.00	15,000,000.00	0.00	14,935,432.00	1.00	(0.43)
Waterfall Sentinel Fund	2019	30,000,000.00	12,359,550.56	0.00	12,197,278.00	0.99	(1.31)
TCV X, L.P.	2019	8,000,000.00	2,638,400.00	0.00	2,478,451.00	0.94	(17.35)
Waterfall Sentinel Co-Investments	2019	30,000,000.00	15,000,000.00	0.00	14,935,432.00	1.00	(0.43)
Waterfall Sentinel Fund	2019	30,000,000.00	12,359,550.56	0.00	12,197,278.00	0.99	(1.31)



# APPENDIX MARKET OUTLOOK

NEPC, LLC

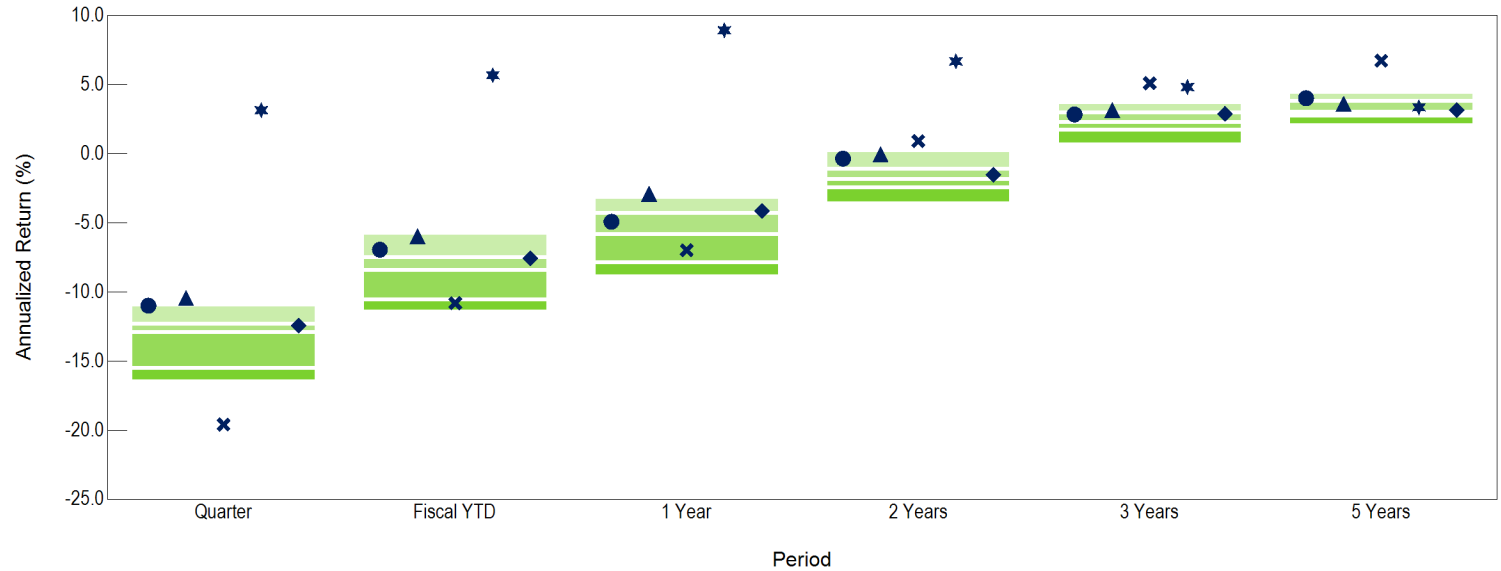
---



San Bernardino County Employees' Retirement Association

# TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE

Total Fund vs. InvMetrics Public DB > \$1B Net



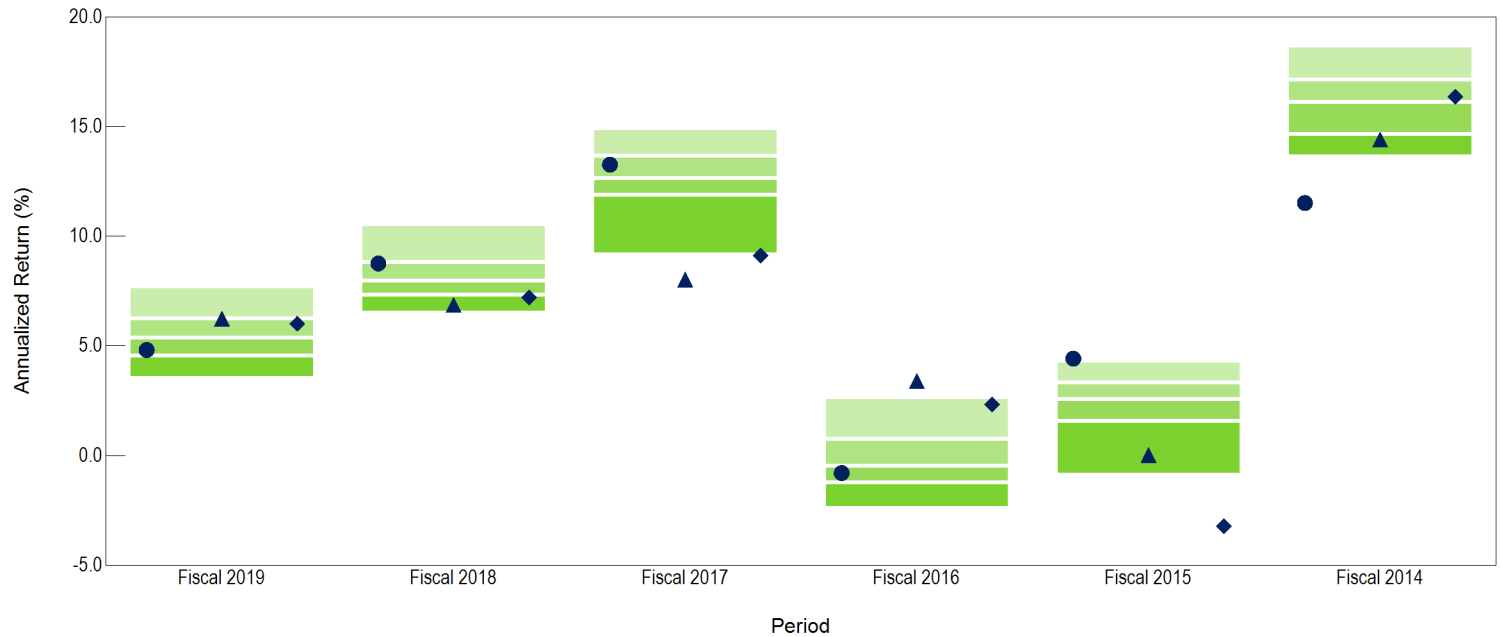
	Return (Rank)											
5th Percentile	-10.9		-5.8		-3.1		0.2		3.7		4.4	
25th Percentile	-12.3		-7.5		-4.2		-1.1		3.0		3.8	
Median	-12.9		-8.4		-5.8		-1.8		2.3		3.0	
75th Percentile	-15.5		-10.5		-7.8		-2.4		1.8		2.8	
95th Percentile	-16.5		-11.4		-8.9		-3.6		0.7		2.1	
# of Portfolios	22		22		22		22		22		21	
● Total Fund	-11.0	(11)	-6.9	(20)	-4.9	(40)	-0.4	(19)	2.8	(28)	4.0	(14)
▲ Policy Index	-10.4	(3)	-6.0	(11)	-2.9	(1)	0.0	(12)	3.2	(24)	3.6	(36)
× S&P 500	-19.6	(99)	-10.8	(87)	-7.0	(67)	0.9	(1)	5.1	(1)	6.7	(1)
* BBgBarc US Aggregate TR	3.1	(1)	5.7	(1)	8.9	(1)	6.7	(1)	4.8	(1)	3.4	(40)
◆ 60% MSCI ACWI (Net) / 40% FTSE WGBI	-12.4	(34)	-7.6	(31)	-4.1	(23)	-1.5	(40)	2.9	(27)	3.2	(44)



San Bernardino County Employees' Retirement Association

# TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE

Total Fund vs. InvMetrics Public DB > \$1B Net



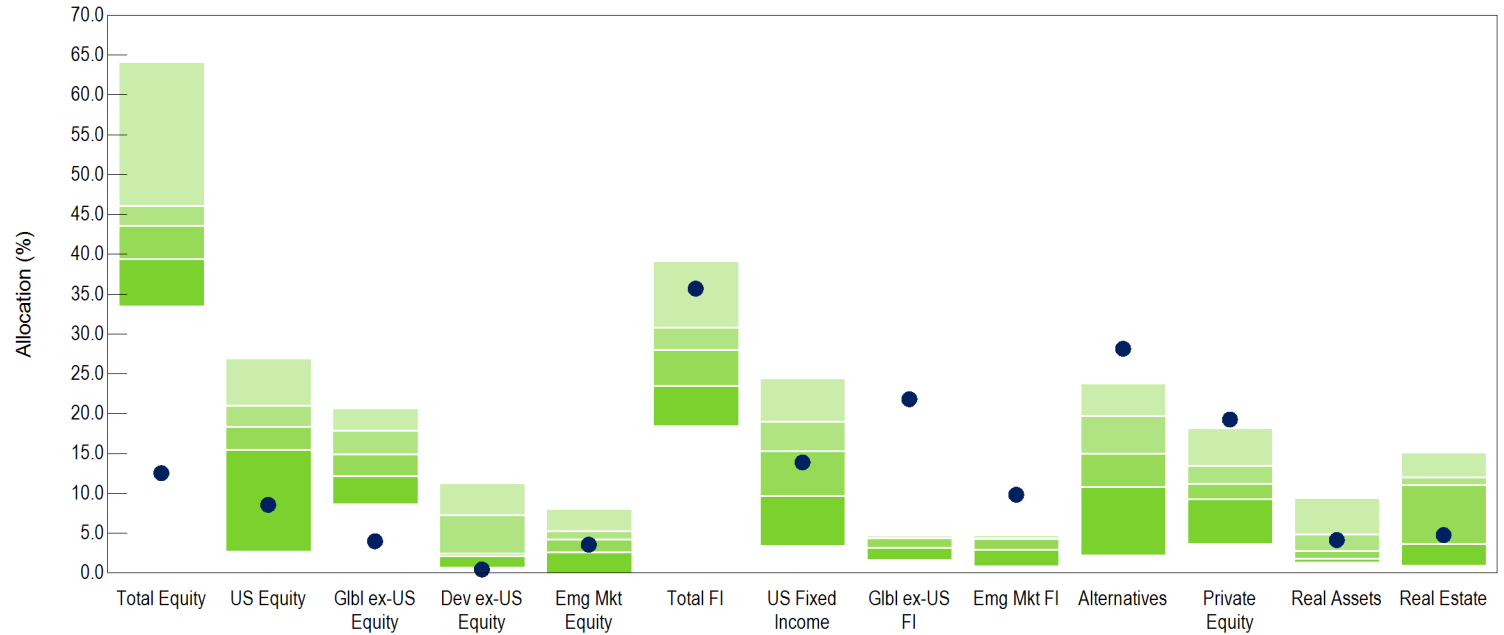
	Return (Rank)					
	Fiscal 2019	Fiscal 2018	Fiscal 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014
5th Percentile	7.7	10.5	14.9	2.7	4.3	18.7
25th Percentile	6.3	8.8	13.7	0.8	3.3	17.2
Median	5.4	8.0	12.7	-0.5	2.6	16.1
75th Percentile	4.6	7.3	11.9	-1.2	1.6	14.7
95th Percentile	3.5	6.5	9.2	-2.4	-0.9	13.6
# of Portfolios	77	51	65	55	53	43
● Total Fund	4.8 (69)	8.8 (29)	13.3 (33)	-0.8 (66)	4.4 (2)	11.5 (99)
▲ Policy Index	6.2 (27)	6.9 (91)	8.0 (96)	3.4 (1)	0.0 (93)	14.4 (80)
◆ 60% MSCI ACWI (Net) / 40% FTSE WGBI	6.0 (31)	7.2 (79)	9.1 (96)	2.3 (8)	-3.2 (99)	16.4 (41)



San Bernardino County Employees' Retirement Association

# TOTAL FUND ALLOCATIONS VS. PEER UNIVERSE

Total Plan Allocation vs. InvMetrics Public DB > \$1B Net



	Total Equity	US Equity	Gbl ex-US Equity	Dev ex-US Equity	Emg Mkt Equity	Total FI	US Fixed Income	Gbl ex-US FI	Emg Mkt FI	Alternatives	Private Equity	Real Assets	Real Estate	
<b>Allocation (Rank)</b>														
5th Percentile	64.2	26.9	20.7	11.2	8.0	39.1	24.4	4.8	4.8	23.8	18.2	9.4	15.1	--
25th Percentile	46.2	21.1	17.9	7.3	5.3	30.8	19.1	4.5	4.5	19.8	13.5	4.9	12.1	--
Median	43.7	18.5	15.0	2.5	4.2	28.1	15.4	4.4	4.4	15.0	11.3	2.8	11.1	--
75th Percentile	39.5	15.5	12.2	2.2	2.7	23.6	9.7	3.2	3.0	10.9	9.3	1.9	3.7	--
95th Percentile	33.5	2.7	8.7	0.7	0.0	18.5	3.5	1.7	0.9	2.3	3.8	1.4	1.0	--
# of Portfolios	20	17	20	10	16	20	17	11	10	20	19	7	19	--
● Total Fund	12.5 (99)	8.5 (82)	4.0 (99)	0.4 (99)	3.5 (62)	35.7 (9)	13.9 (54)	21.8 (1)	9.8 (1)	28.1 (1)	19.3 (2)	4.1 (31)	4.8 (70)	--



## TOP 10 MANAGERS BY AUM: AS OF MAR. 31, 2020

Manager	Market Value
Total Pathway	653,150,068
Gramercy Funds Management	638,518,489
SSGA S&P500 Flagship Fund	552,771,862
Total Tobam	542,717,825
Total Apollo	537,512,771
Total Ares	528,754,070
Total Russell	507,065,665
Total Zais	439,711,803
Total Partner Group	438,944,267
Total Alcentra	429,495,853

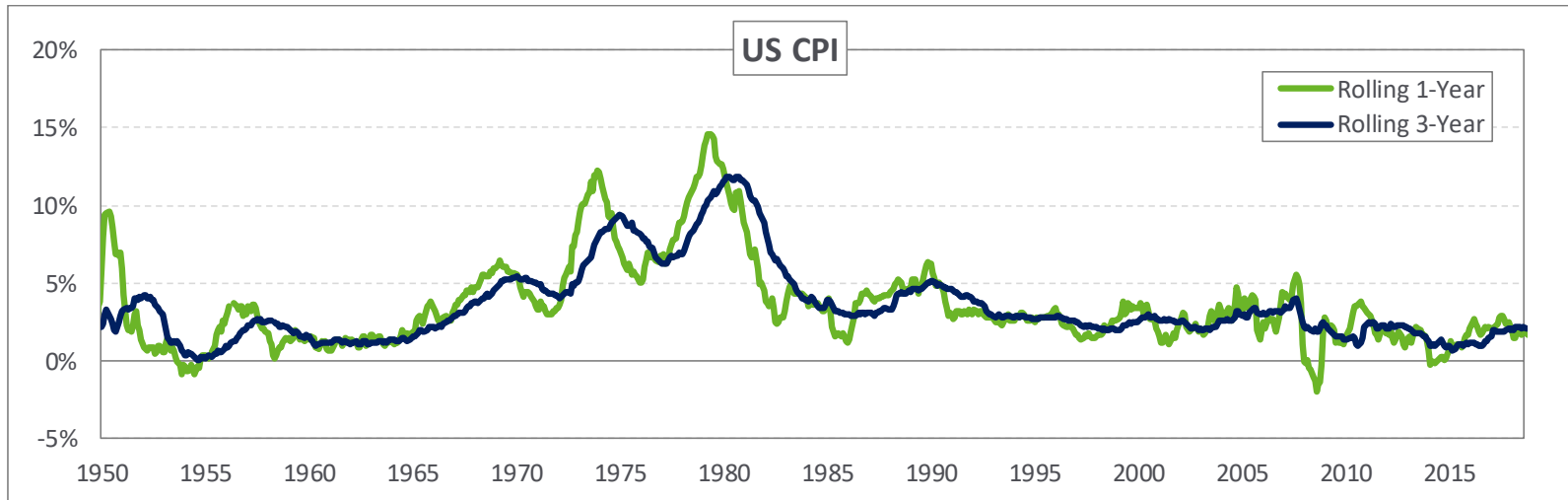


# MACRO

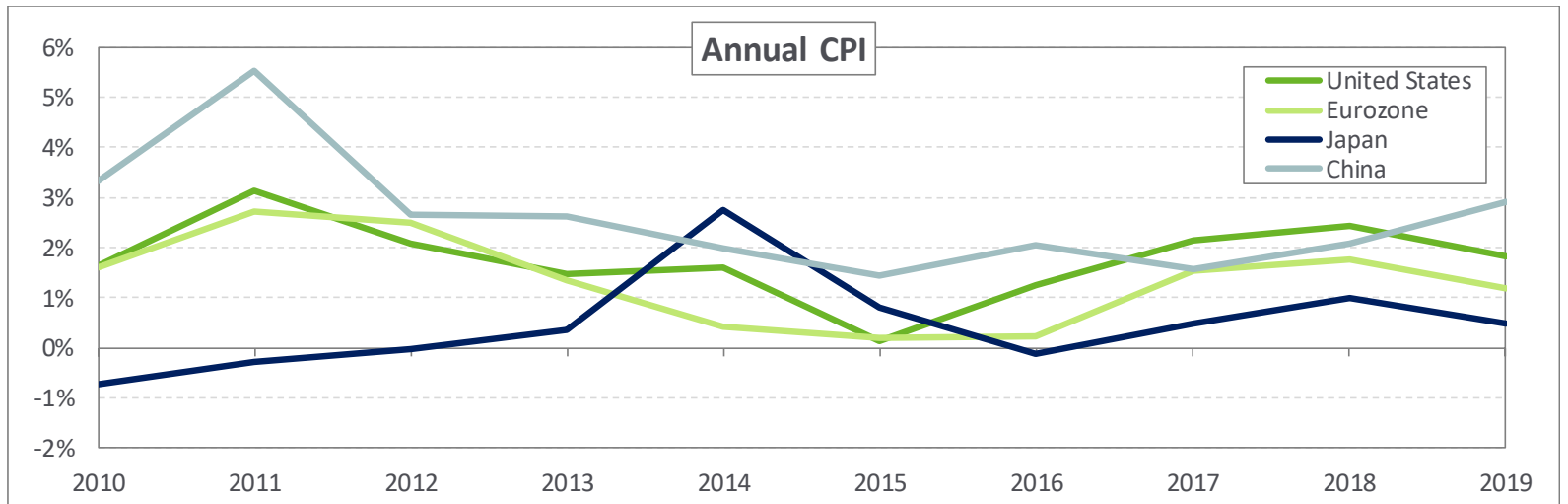
NEPC, LLC

---

# INFLATION



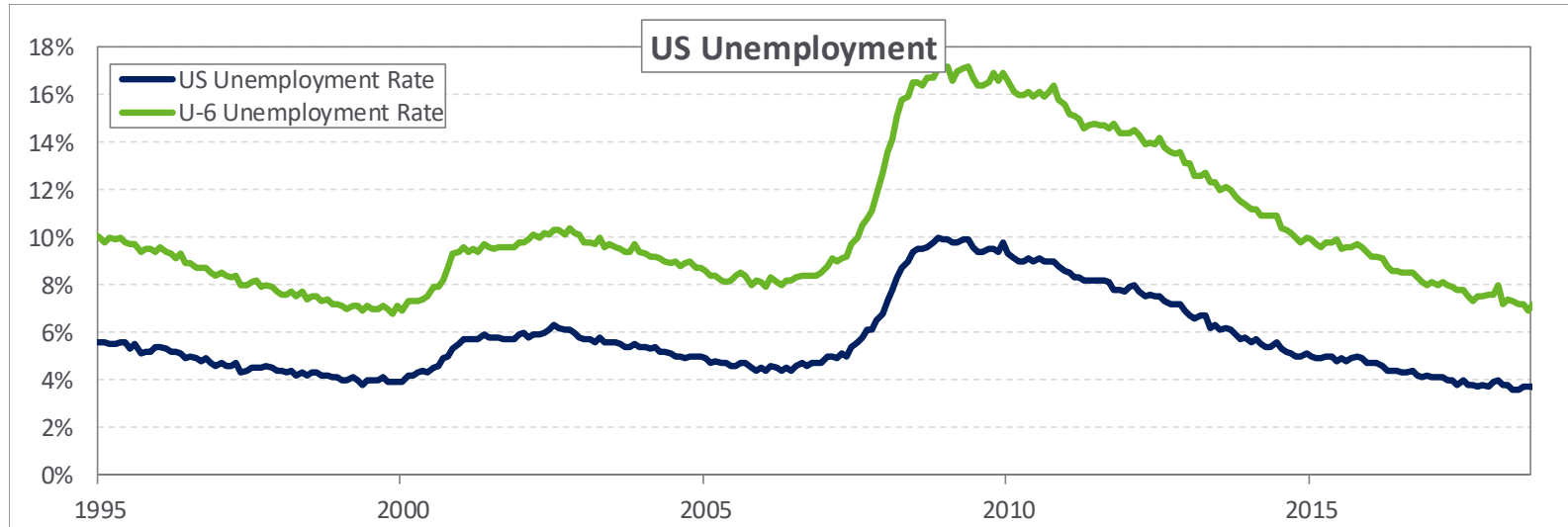
Source: Bureau of Labor Statistics, FactSet



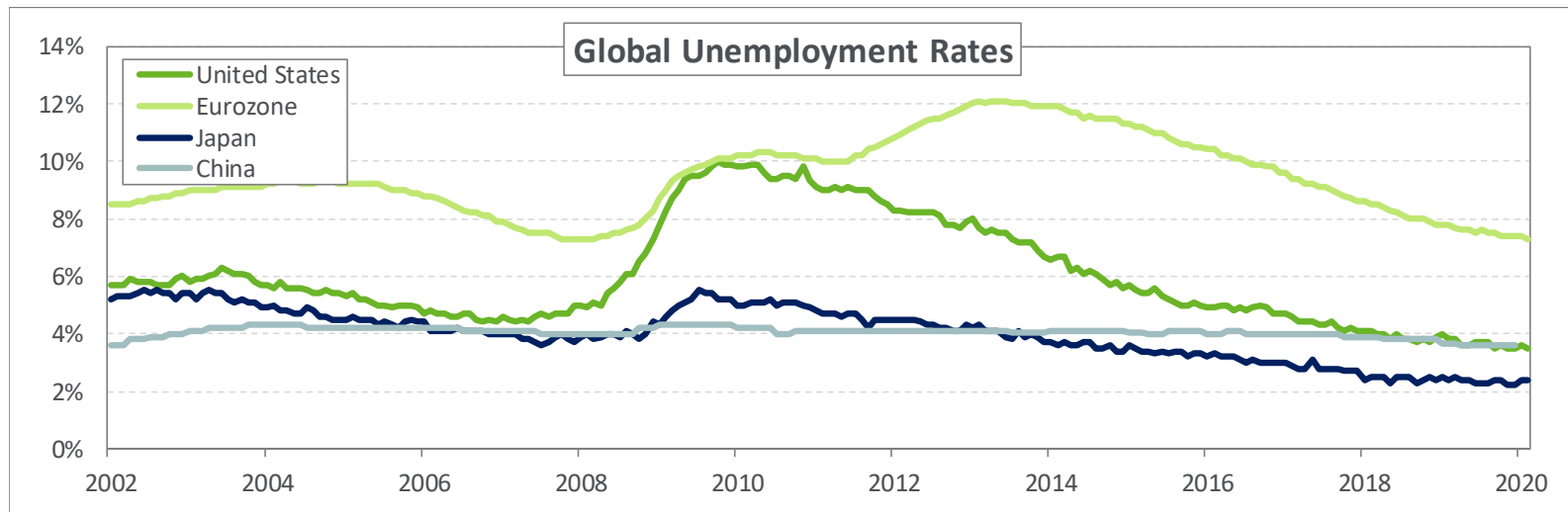
Source: FactSet



# UNEMPLOYMENT



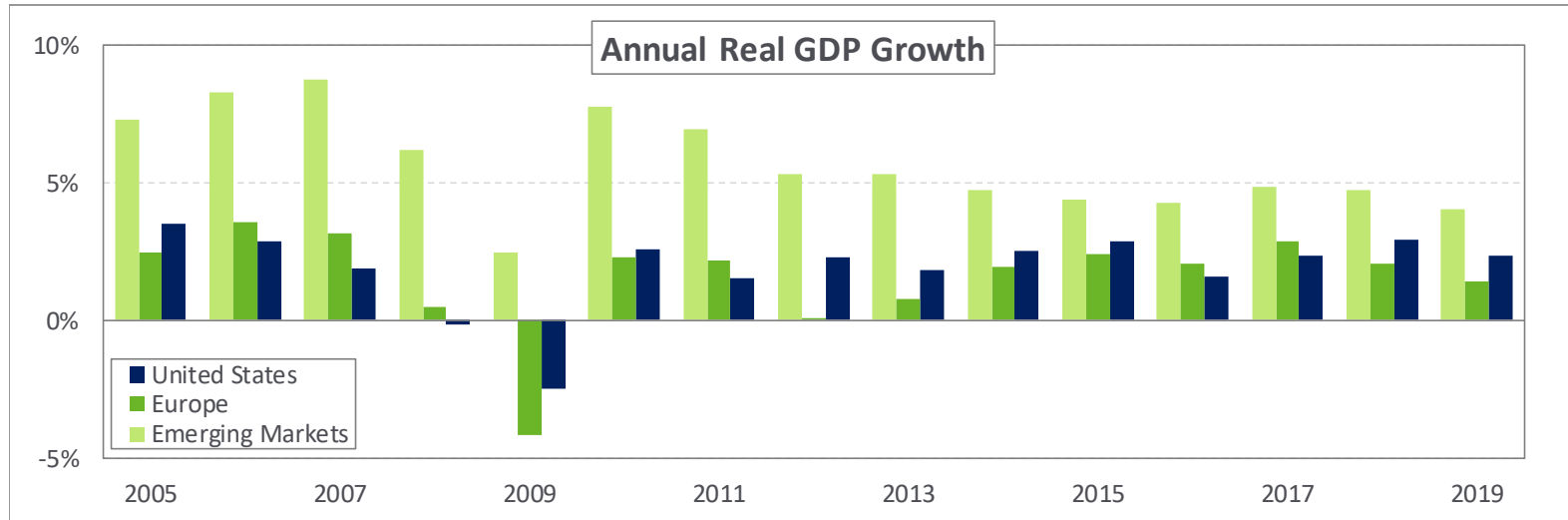
Source: FactSet



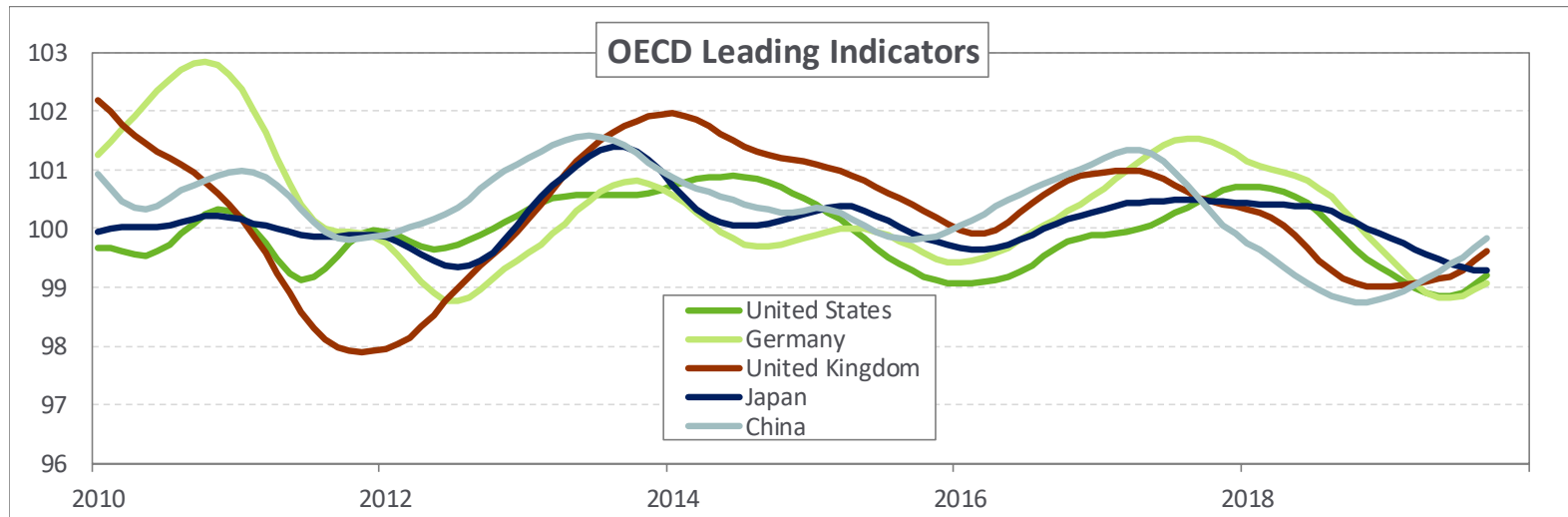
Source: FactSet



# ECONOMIC INDICATORS



Source: Bureau of Economic Analysis, Oxford Economics, FactSet

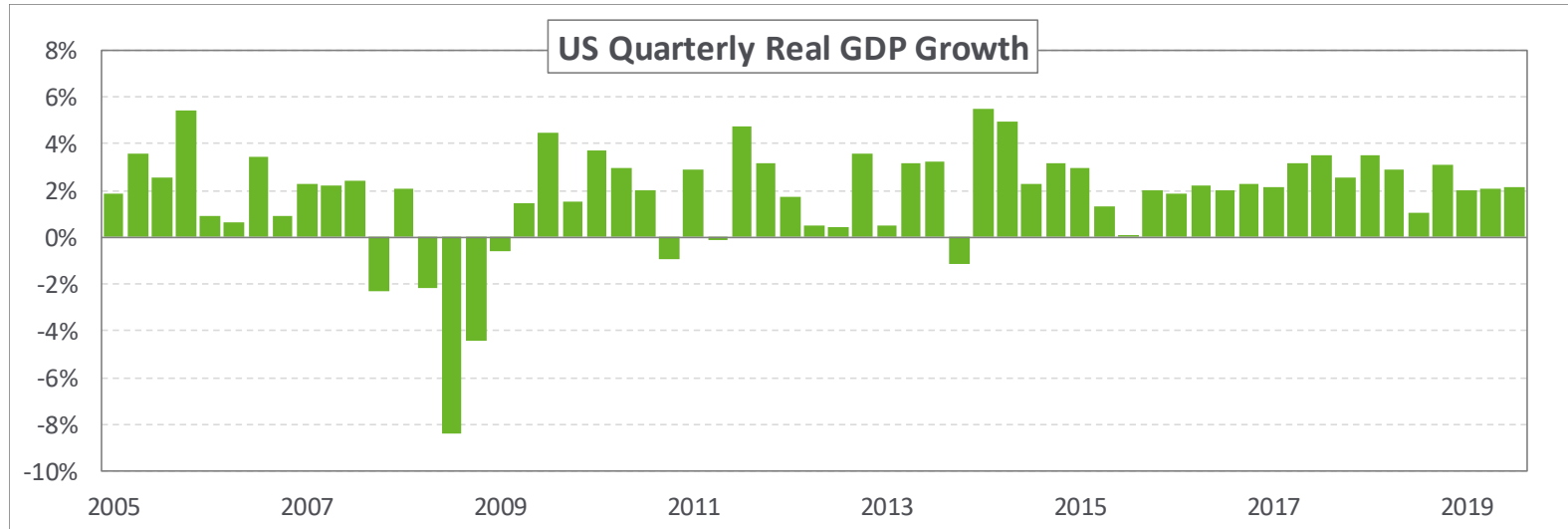


Source: OECD, FactSet

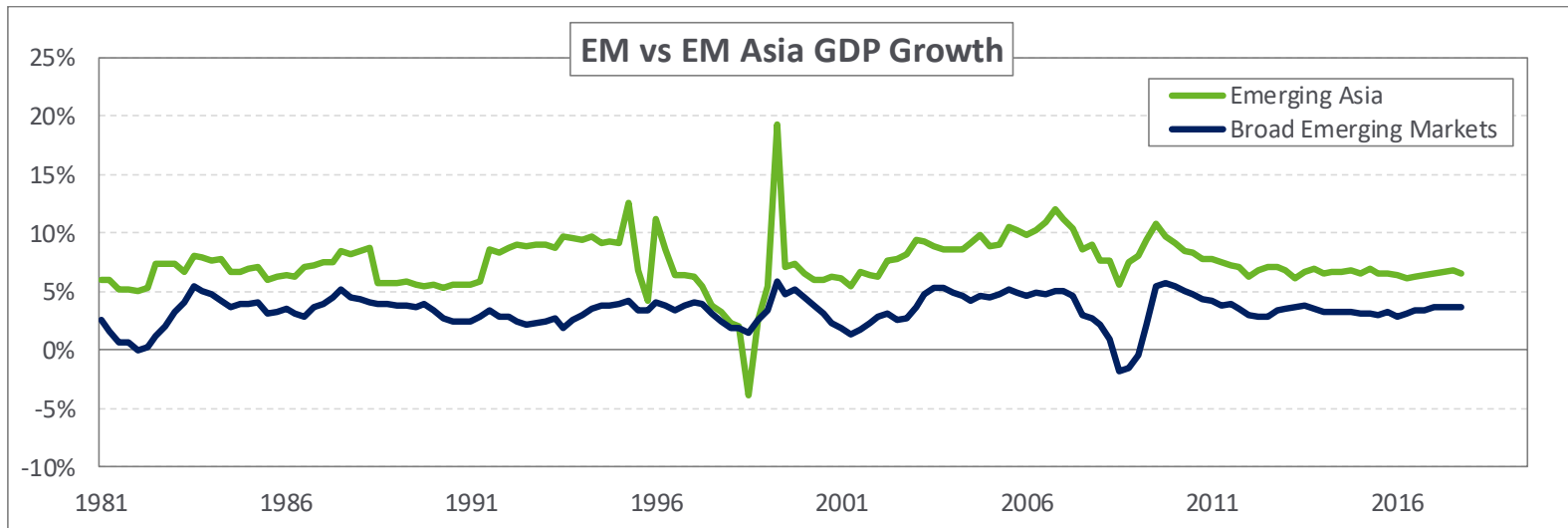




# GROSS DOMESTIC PRODUCT



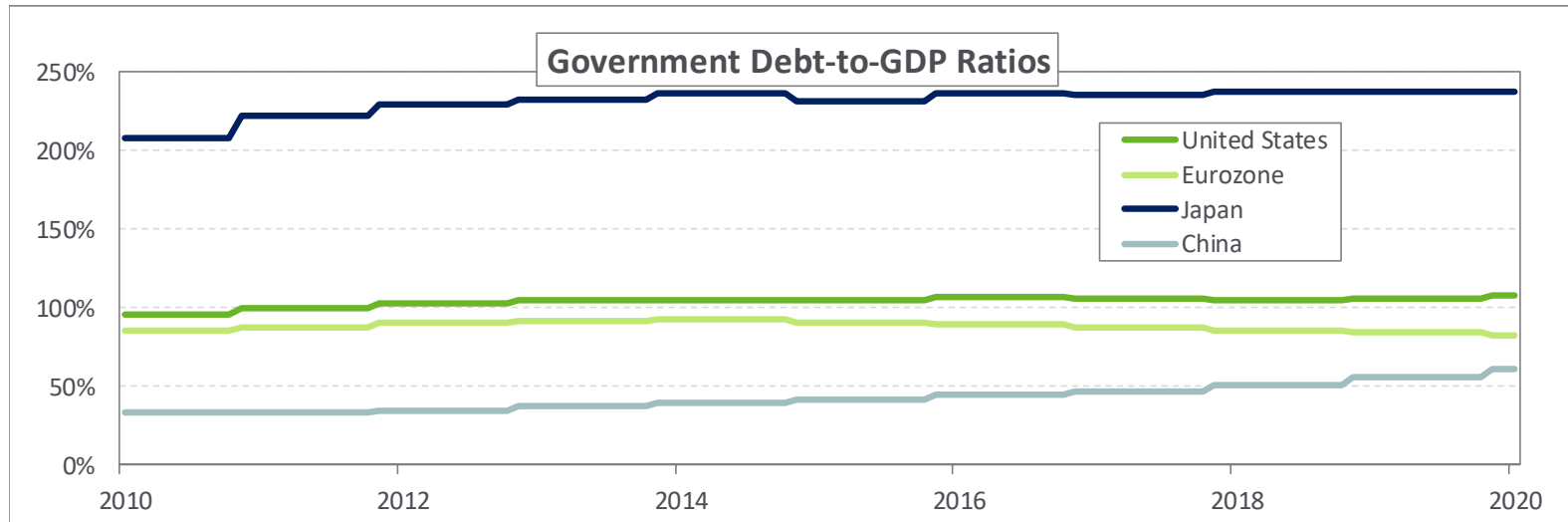
Source: Bureau of Economic Analysis, FactSet



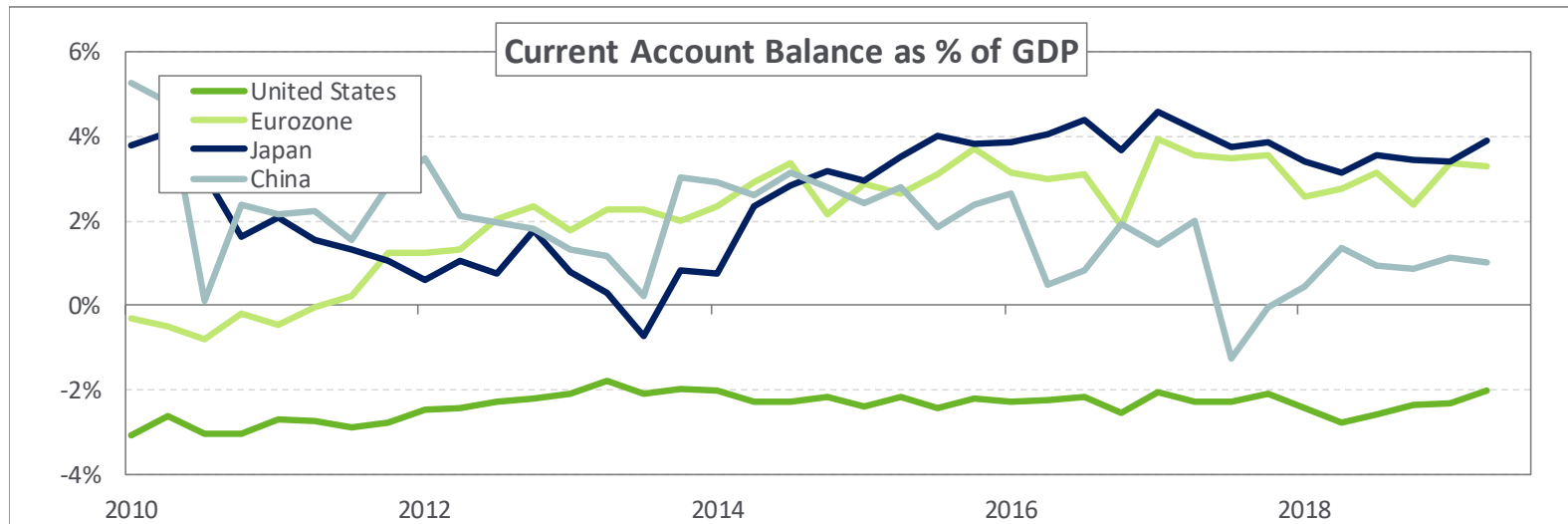
Source: IMF, FactSet



# GROSS DOMESTIC PRODUCT METRICS



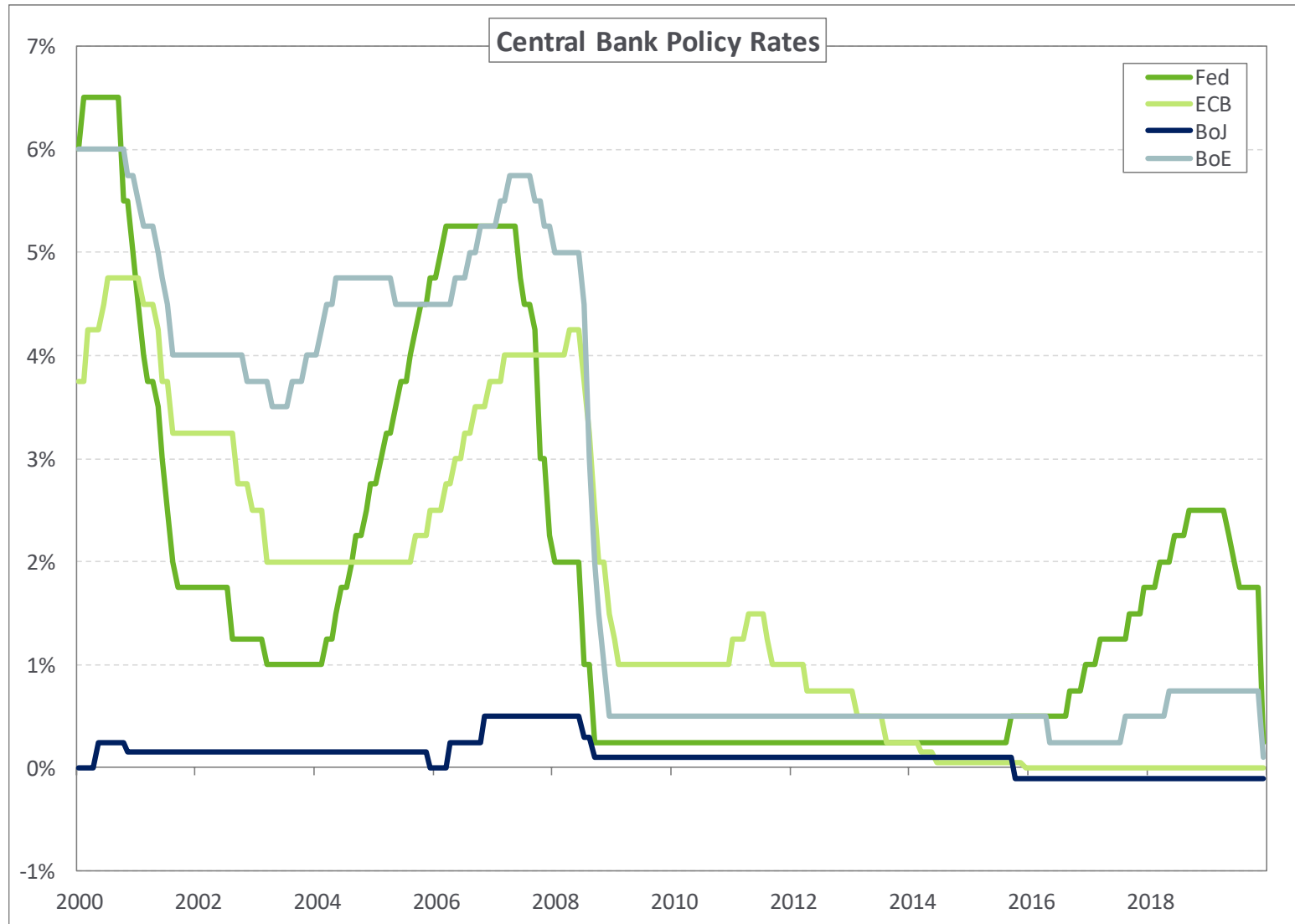
Source: IMF, FactSet



Source: FactSet



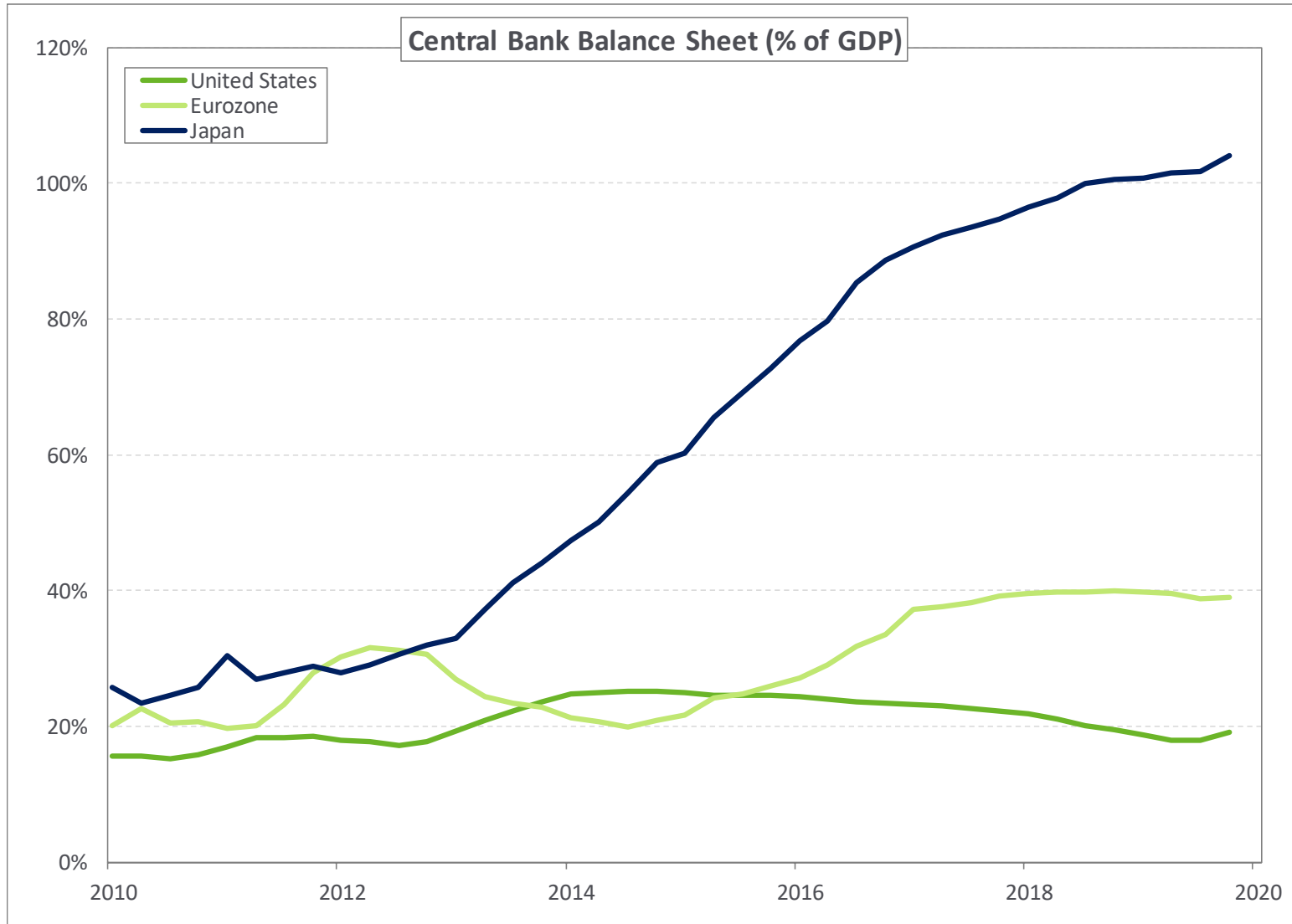
# CENTRAL BANK RATES



Source: Federal Reserve, ECB, Bank of Japan, Bank of England, FactSet



# CENTRAL BANK BALANCE SHEETS



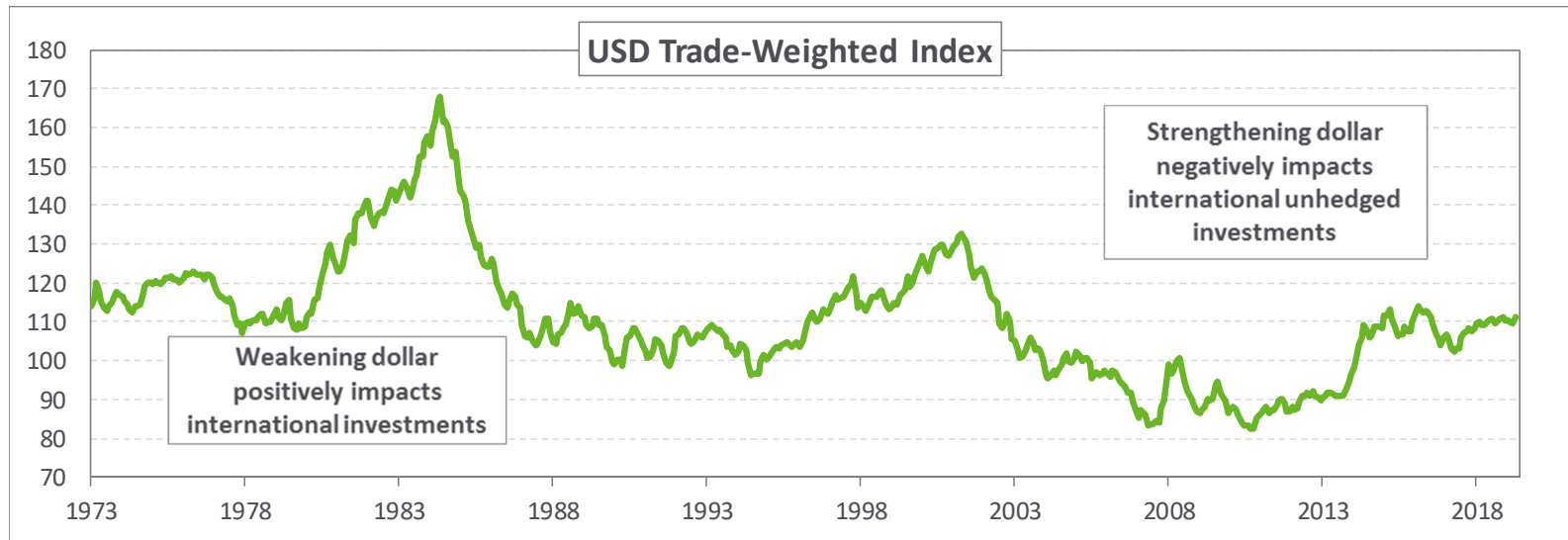
Source: FactSet



# CURRENCIES

% Change Relative to USD				
Currencies	Spot	1 Month	YTD	1 Year
<b>Euro</b>	<b>1.10</b>	-0.11%	-2.25%	-2.28%
<b>British Pound</b>	<b>1.24</b>	-2.92%	-6.40%	-4.84%
<b>Japanese Yen</b>	<b>107.96</b>	0.08%	-0.66%	-2.47%
<b>Swiss Franc</b>	<b>0.97</b>	-0.04%	-0.08%	-2.85%
<b>Australian Dollar</b>	<b>0.61</b>	-5.07%	-12.93%	-13.84%
<b>Chinese Yuan</b>	<b>7.09</b>	1.47%	1.83%	5.55%
<b>Brazilian Real</b>	<b>5.19</b>	14.96%	28.93%	33.27%
<b>Russian Ruble</b>	<b>78.13</b>	16.27%	25.80%	18.93%
<b>Indian Rupee</b>	<b>75.65</b>	4.83%	5.99%	9.20%
<b>Mexican Peso</b>	<b>23.46</b>	18.50%	24.23%	20.94%
<b>South African Rand</b>	<b>17.86</b>	13.53%	27.72%	23.85%

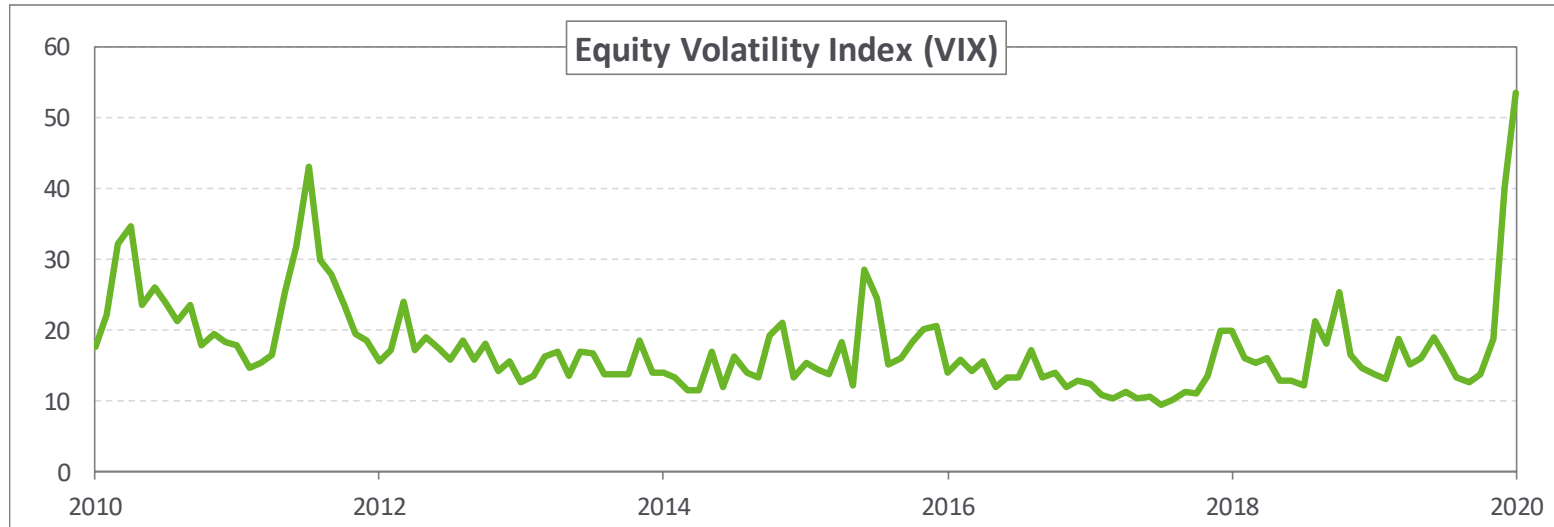
Source: FactSet



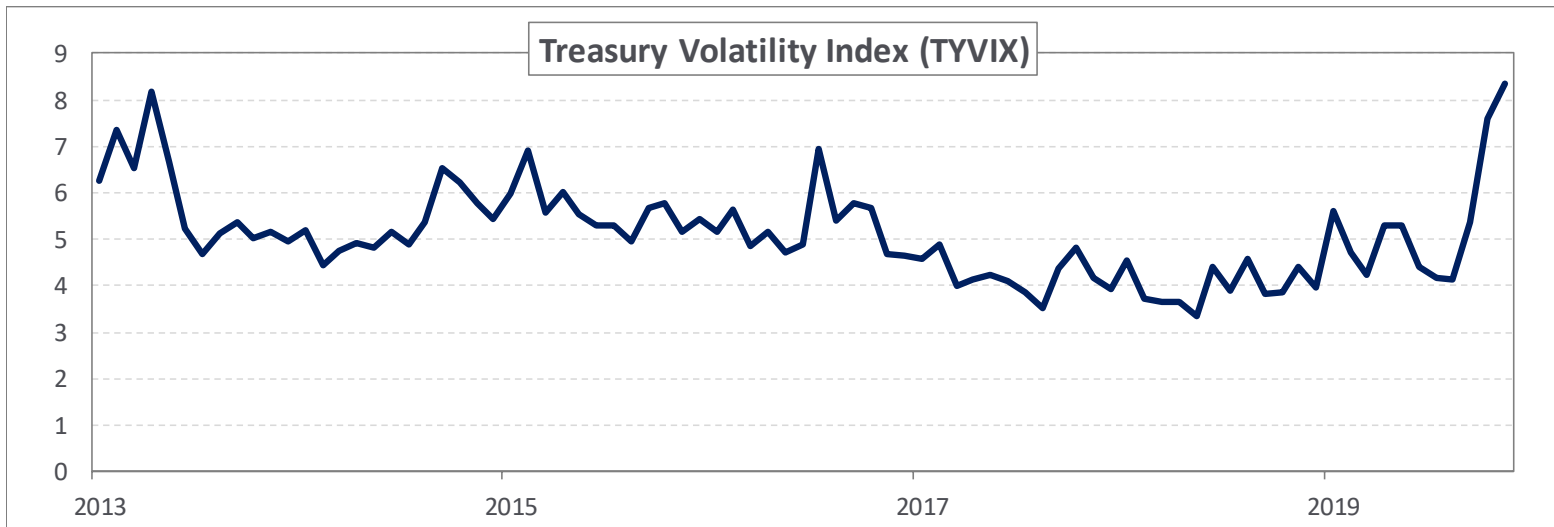
Source: FactSet



# VOLATILITY



Source: CBOE, FactSet



Source: CBOE, FactSet

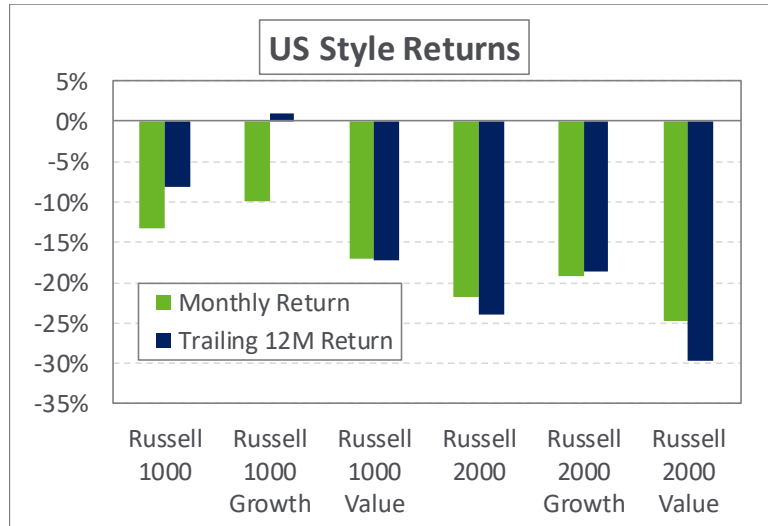


# EQUITY

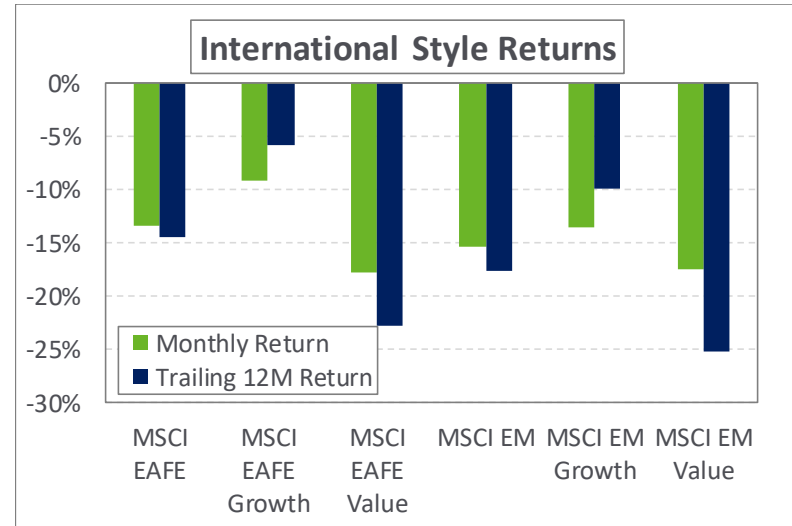
NEPC, LLC

---

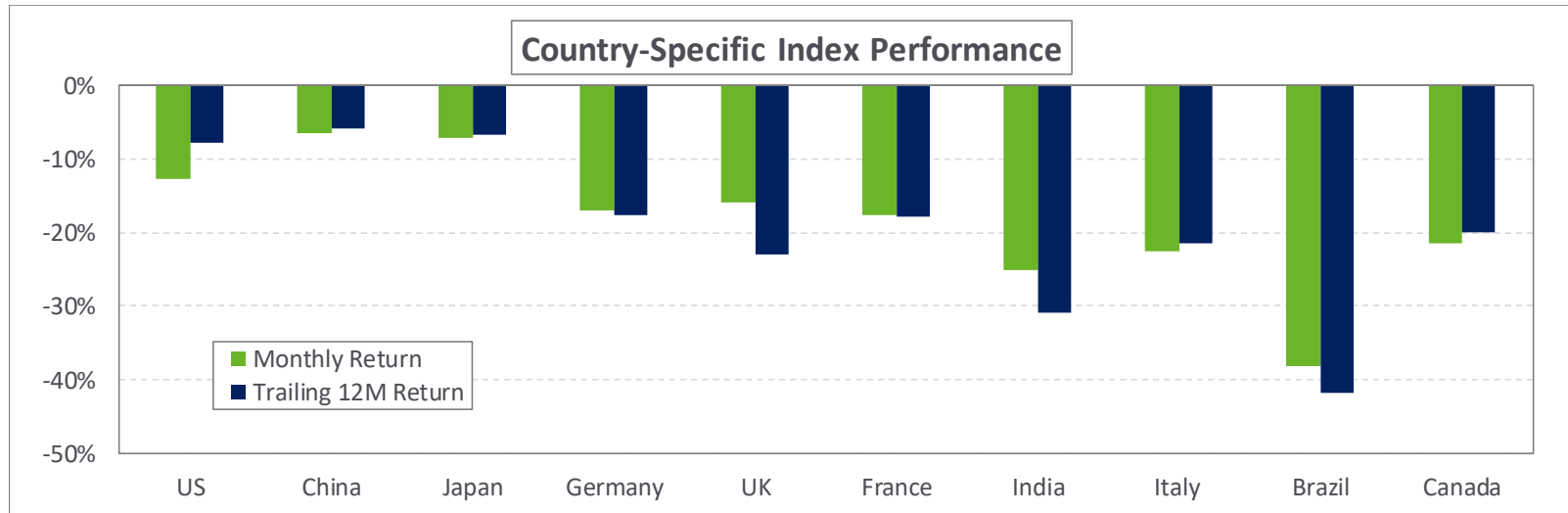
# EQUITY INDEX PERFORMANCE



Source: Russell, FactSet



Source: MSCI, FactSet



Source: MSCI, FactSet  
Represents returns in USD





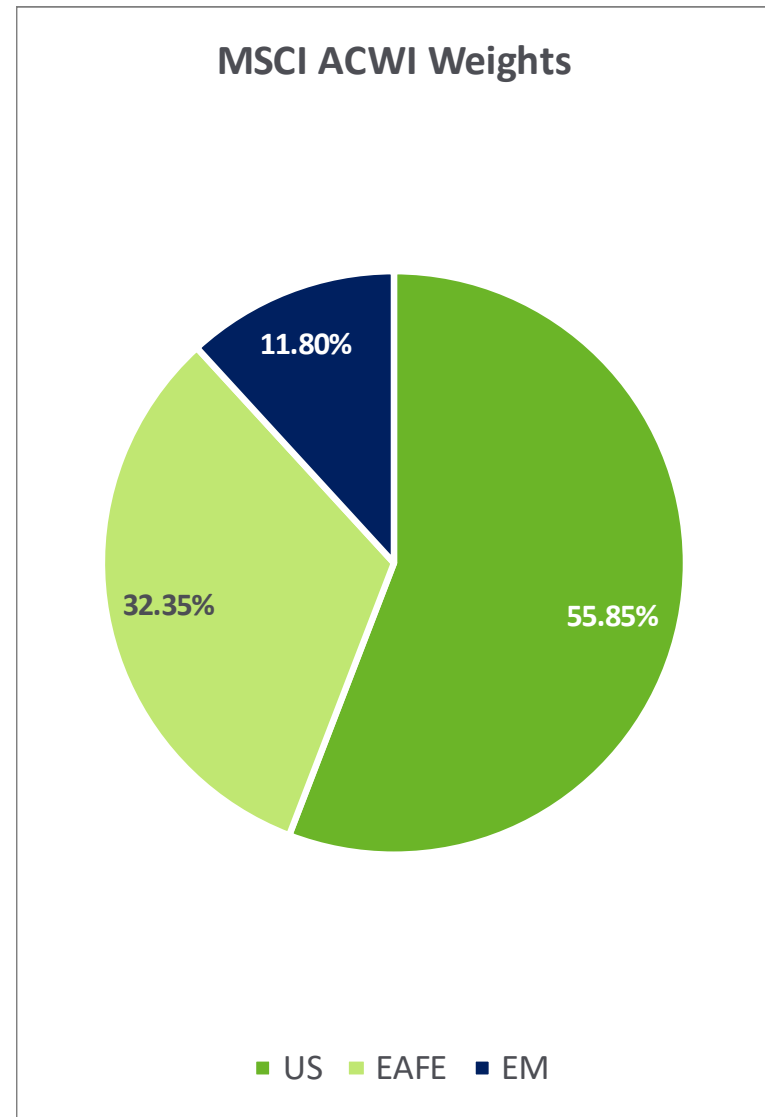
# INDEX COMPOSITION

	MTD	QTD	YTD	Index Weight
<b>S&amp;P 500</b>	<b>-12.4%</b>	<b>-19.6%</b>	<b>-19.6%</b>	<b>100.0%</b>
Communication Services	-1.3%	-1.8%	-1.8%	10.7%
Consumer Discretionary	-1.2%	-1.8%	-1.8%	9.8%
Consumer Staples	-0.6%	-1.1%	-1.1%	7.8%
Energy	-1.2%	-2.0%	-2.0%	2.6%
Financials	-2.5%	-4.0%	-4.0%	10.9%
Health Care	-0.8%	-1.9%	-1.9%	15.4%
Industrials	-1.7%	-2.4%	-2.4%	8.2%
Information Technology	-1.9%	-2.7%	-2.7%	25.5%
Materials	-0.3%	-0.7%	-0.7%	2.4%
Real Estate	-0.6%	-0.7%	-0.7%	3.0%
Utilities	-0.4%	-0.6%	-0.6%	3.6%

Source: S&P, FactSet

	MTD	QTD	YTD	Index Weight
<b>MSCI ACWI</b>	<b>-13.5%</b>	<b>-21.4%</b>	<b>-21.4%</b>	<b>100.0%</b>
Communication Services	-1.0%	-1.4%	-1.4%	9.3%
Consumer Discretionary	-1.4%	-2.2%	-2.2%	10.8%
Consumer Staples	-0.6%	-1.2%	-1.2%	8.8%
Energy	-1.2%	-2.1%	-2.1%	3.7%
Financials	-3.6%	-5.3%	-5.3%	14.4%
Health Care	-0.5%	-1.4%	-1.4%	13.3%
Industrials	-1.8%	-2.7%	-2.7%	9.6%
Information Technology	-1.6%	-2.3%	-2.3%	18.8%
Materials	-0.6%	-1.2%	-1.2%	4.4%
Real Estate	-0.7%	-0.9%	-0.9%	3.1%
Utilities	-0.5%	-0.6%	-0.6%	3.6%

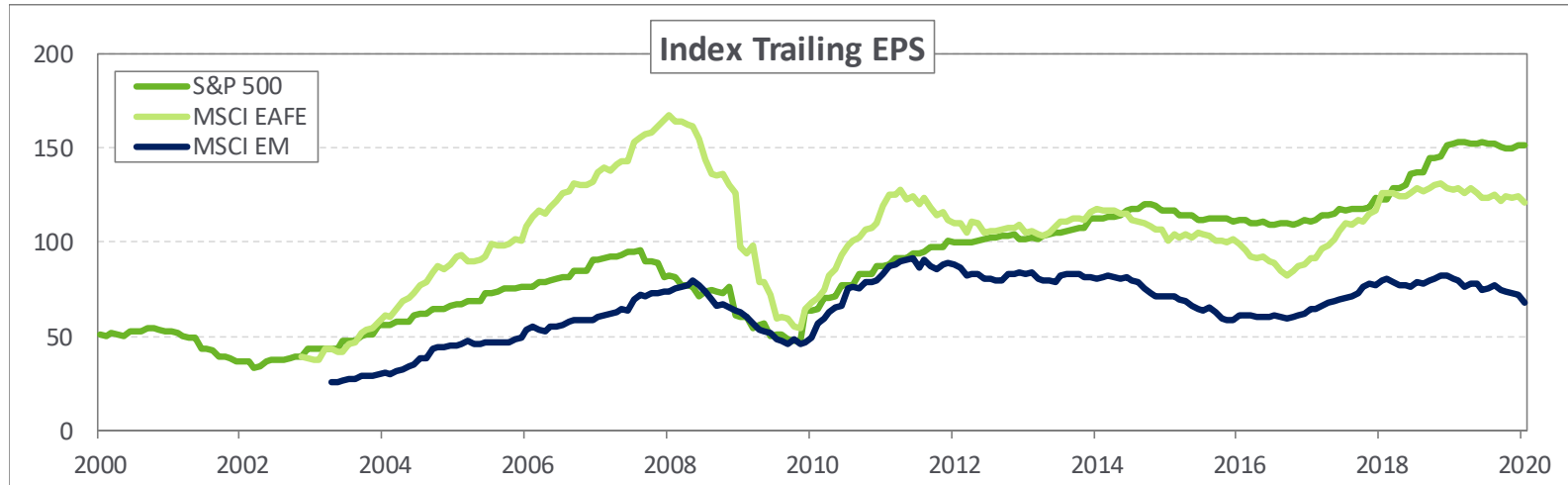
Source: MSCI, FactSet



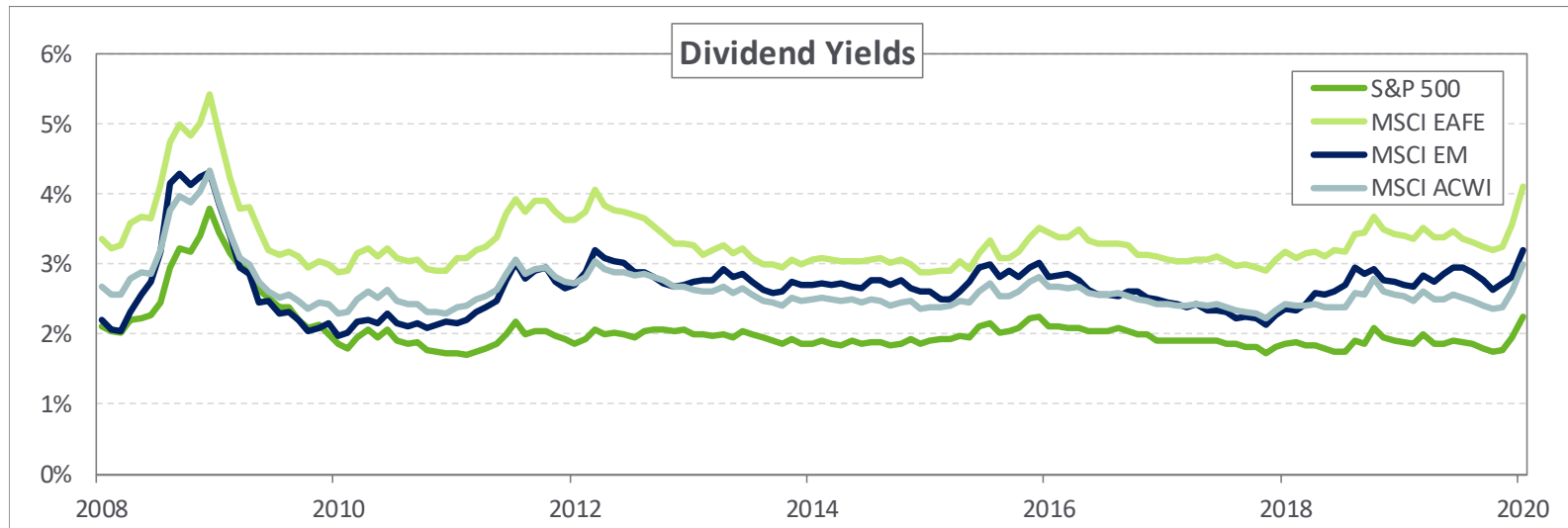
Source: MSCI, FactSet



# EARNINGS & YIELDS



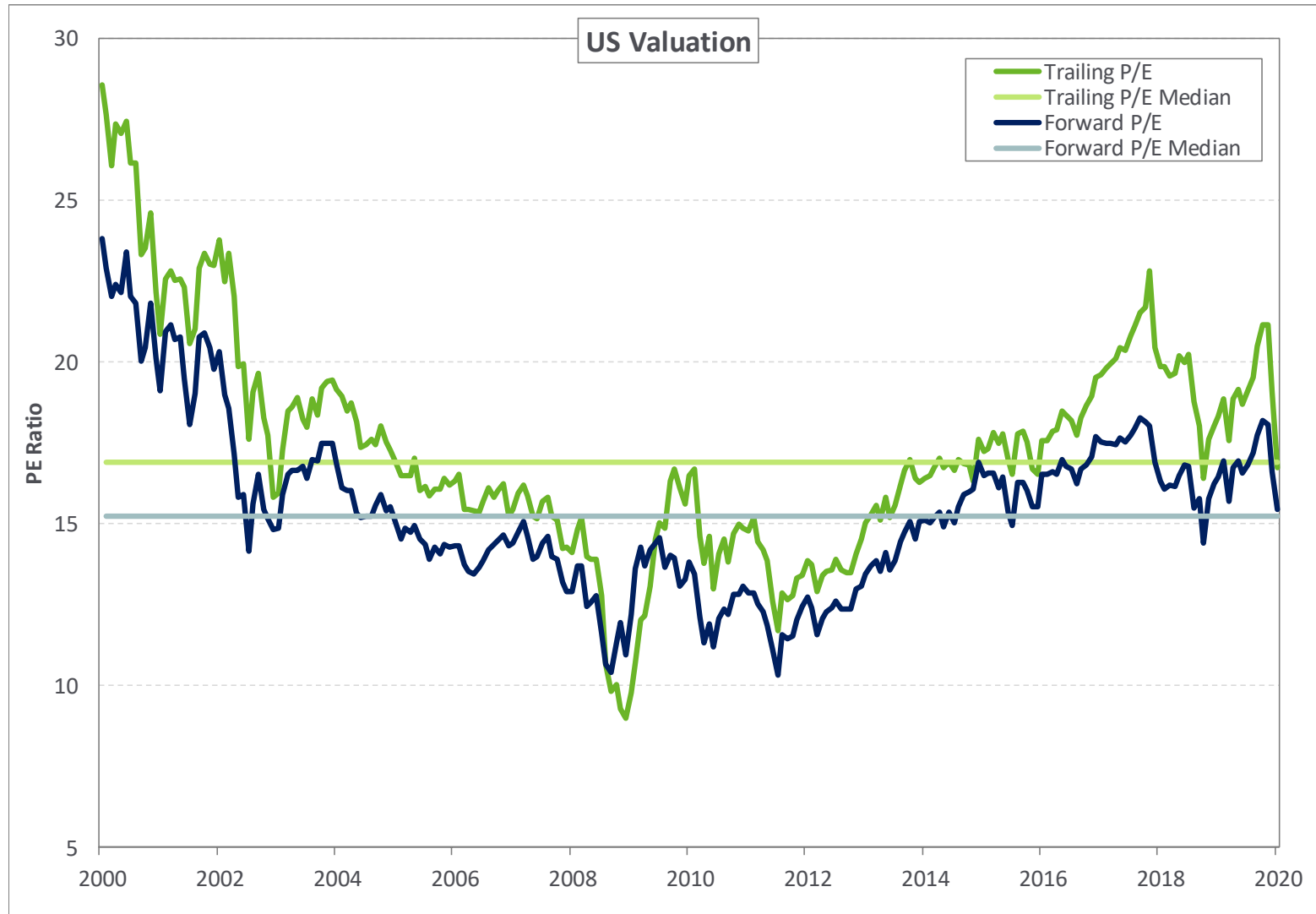
Source: FactSet



Source: FactSet



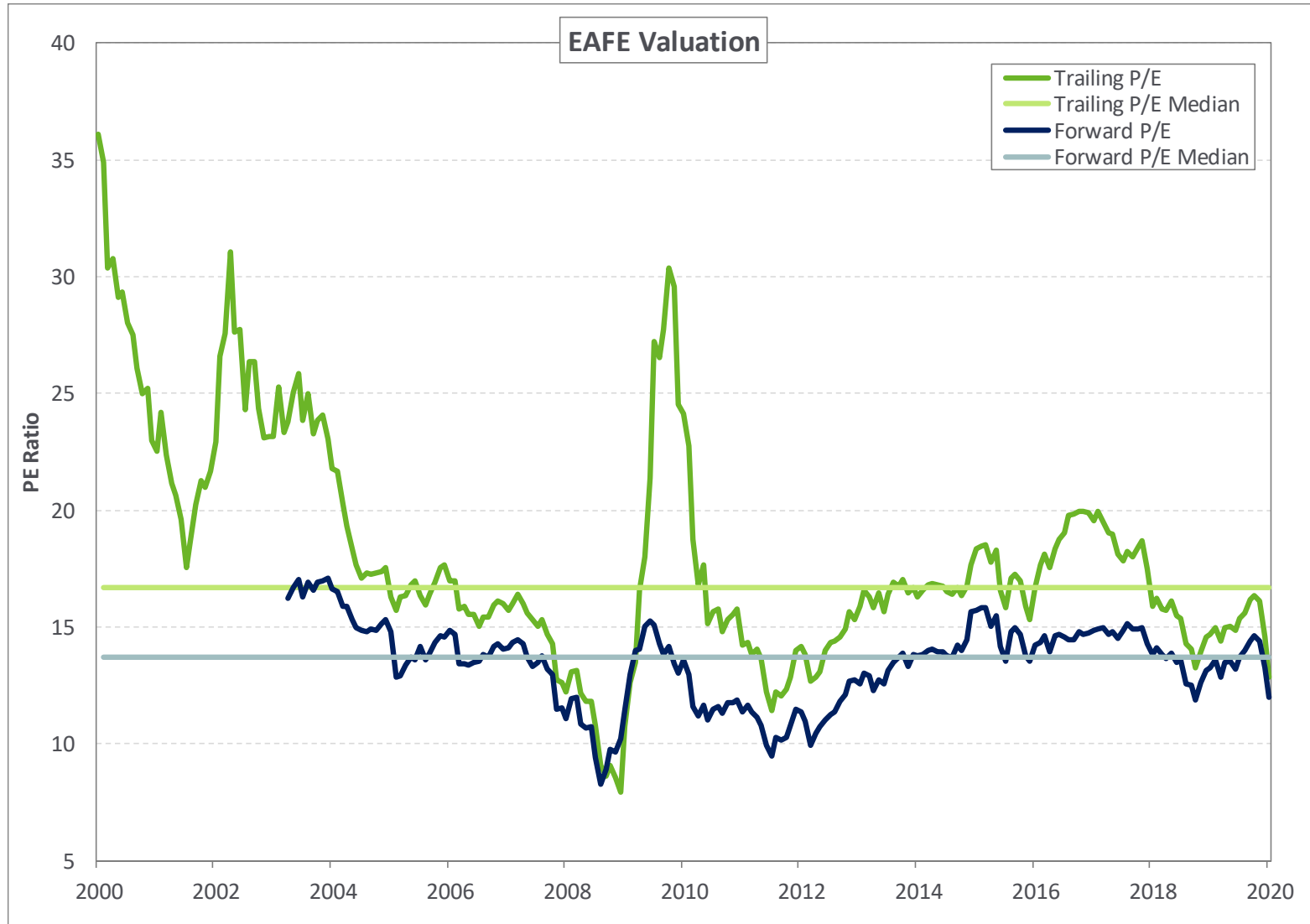
# US EQUITY VALUATIONS



Source: S&P, FactSet



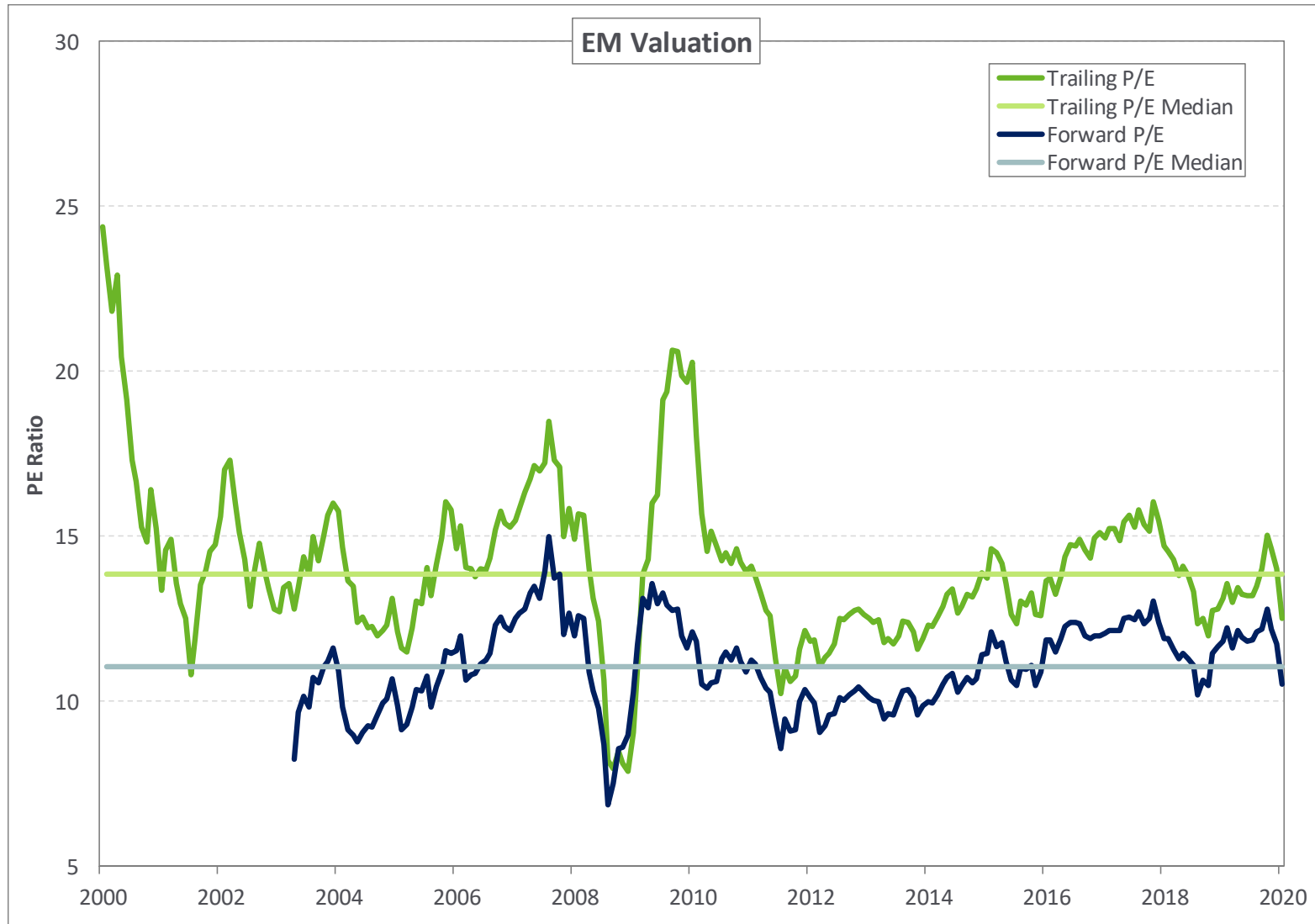
# EAFE EQUITY VALUATIONS



Source: MSCI, FactSet



# EM EQUITY VALUATIONS



Source: MSCI, FactSet



# CREDIT

NEPC, LLC

---

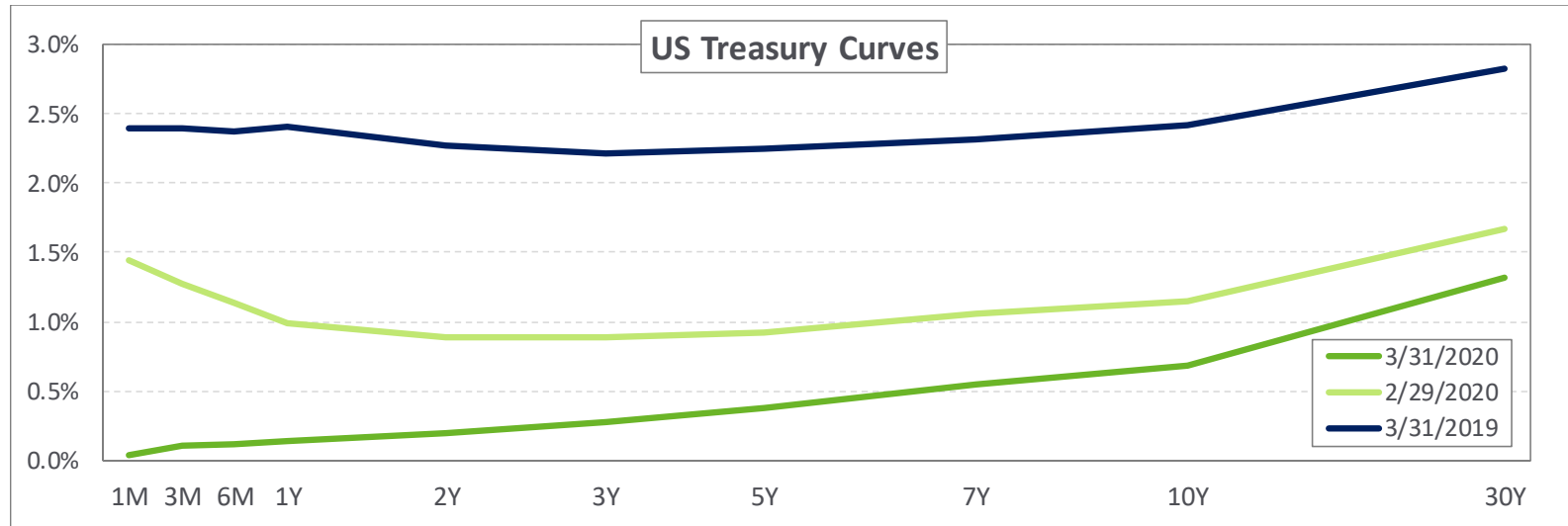
# FIXED INCOME CHARACTERISTICS

	Averages			Total Returns (%)		
	Yield to Worst	Spread (bps)	Duration (Years)	1-Month	YTD	1-Year
<b>Barclays Aggregate</b>	1.59%	95	5.7	-0.6%	3.1%	8.9%
<b>Barclays Treasury</b>	0.58%	-	7.0	2.9%	8.2%	13.1%
<b>Barclays Agency</b>	0.94%	49	3.9	1.0%	4.1%	8.2%
<b>Barclays MBS</b>	1.34%	60	1.7	1.1%	2.8%	7.0%
<b>Barclays ABS</b>	2.40%	213	2.1	-2.1%	-0.2%	2.8%
<b>Barclays CMBS</b>	1.80%	130	5.6	-1.3%	3.6%	8.2%
<b>Barclays Corp IG</b>	3.43%	272	8.0	-7.1%	-3.6%	4.9%
<b>Barclays Muni</b>	2.01%	-	5.4	-3.6%	-0.6%	3.8%
<b>Barclays HY Muni</b>	5.24%	-	10.0	-11.0%	-6.9%	-0.7%
<b>Barclays TIPS</b>	0.93%	-	6.7	-1.8%	1.7%	6.8%
<b>Barclays HY</b>	9.44%	880	4.1	-11.5%	-12.7%	-6.9%
<b>Barclays Global Agg</b>	1.22%	82	7.0	-2.2%	-0.3%	4.2%
<b>JPM EMBI Glob Div</b>	-	627	7.1	-13.8%	-13.4%	-6.8%
<b>JPM GBI - EM</b>	4.61%	-	5.3	-11.1%	-15.2%	-6.5%

Source: Barclays, JP Morgan, FactSet



# TREASURIES



Source: FactSet

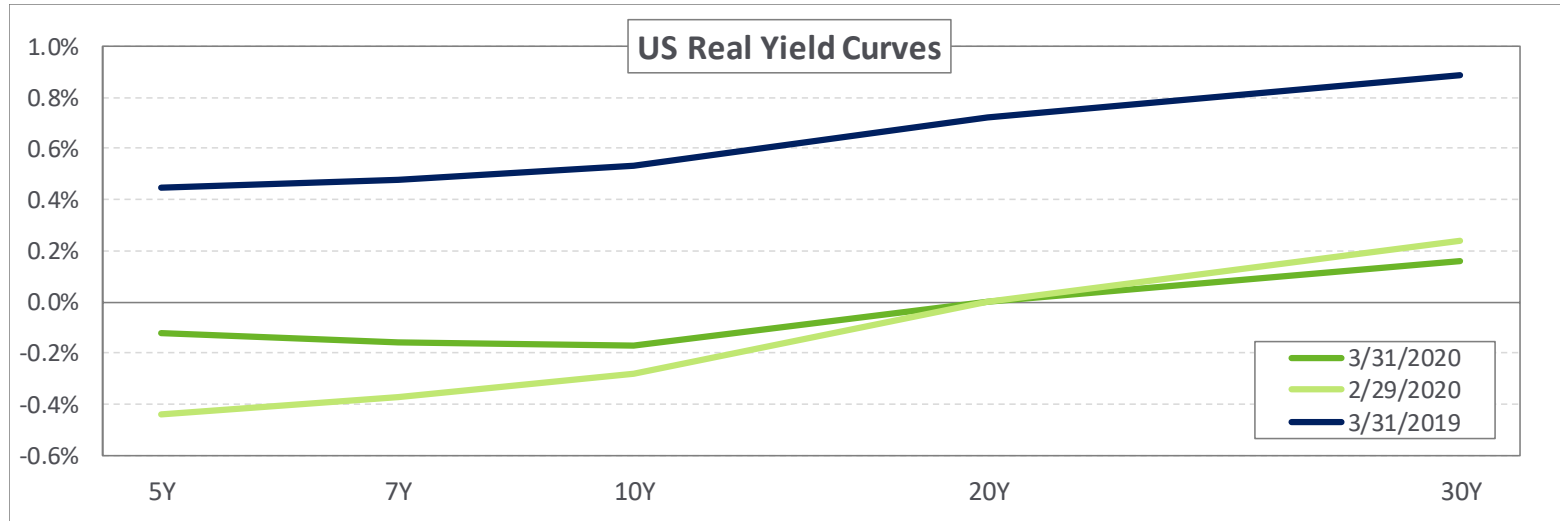
	Yield (%)			Total Return (%)	
	Current	1 Month Ago	12 Months Ago	1 Month	12 Months
<b>3M Treasury</b>	0.10%	1.27%	2.39%	0.29%	2.25%
<b>6M Treasury</b>	0.11%	1.14%	2.37%	0.52%	2.85%
<b>2Y Treasury</b>	0.20%	0.88%	2.27%	1.32%	5.38%
<b>5Y Treasury</b>	0.37%	0.92%	2.24%	2.62%	10.88%
<b>10Y Treasury</b>	0.68%	1.14%	2.42%	4.16%	18.25%
<b>30Y Treasury</b>	1.32%	1.67%	2.82%	7.57%	39.50%

Source: FactSet





# REAL YIELDS



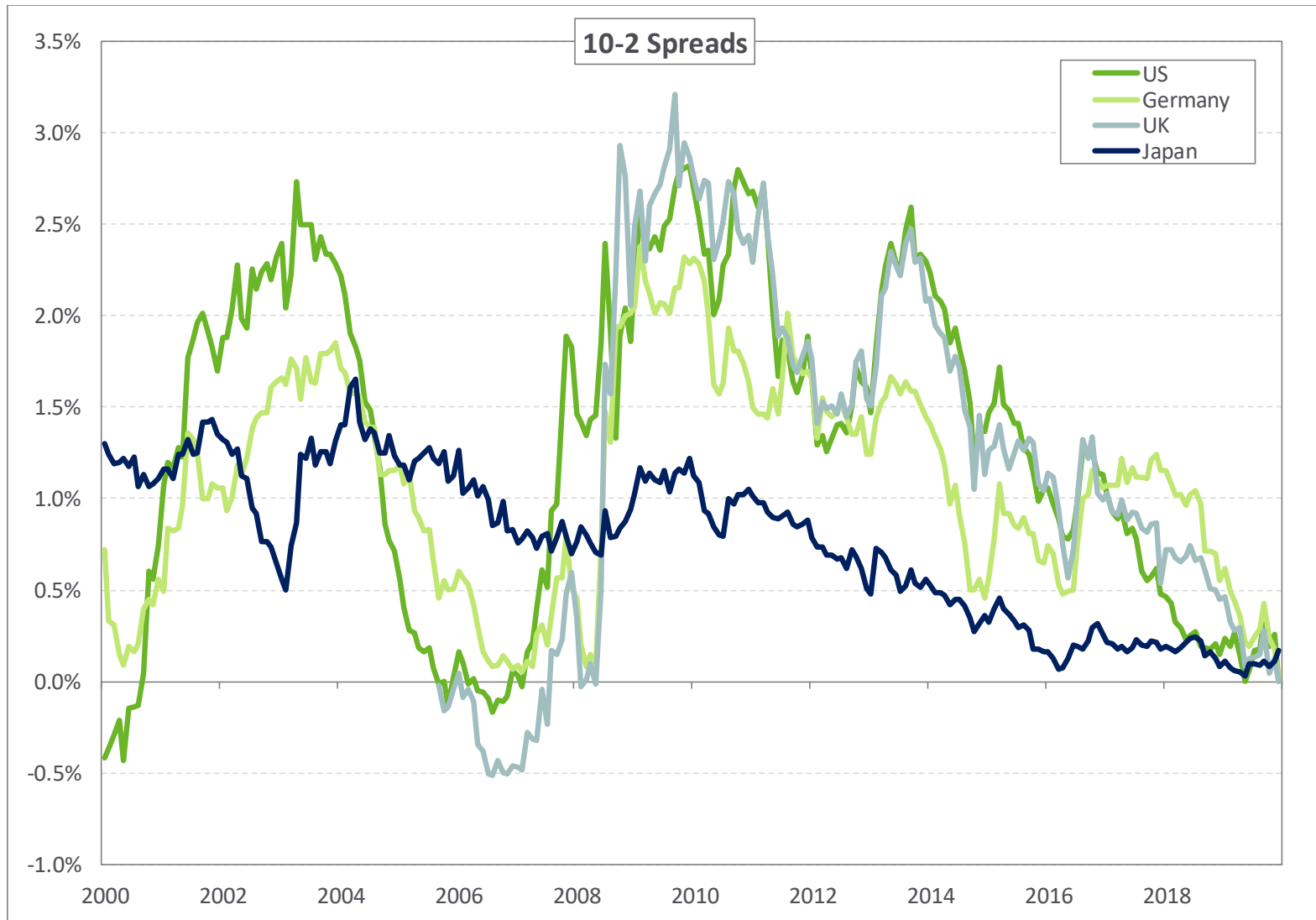
Source: FactSet

	Real Rates			Breakeven Rates	
	Current	1 Month Ago	12 Months Ago	Current	12 Months
<b>5-Year</b>	-0.12%	-0.44%	0.45%	0.49%	1.79%
<b>7-Year</b>	-0.16%	-0.37%	0.48%	0.71%	1.84%
<b>10-Year</b>	-0.17%	-0.28%	0.53%	0.85%	1.89%
<b>30-Year</b>	0.16%	0.24%	0.89%	1.16%	1.93%

Source: FactSet



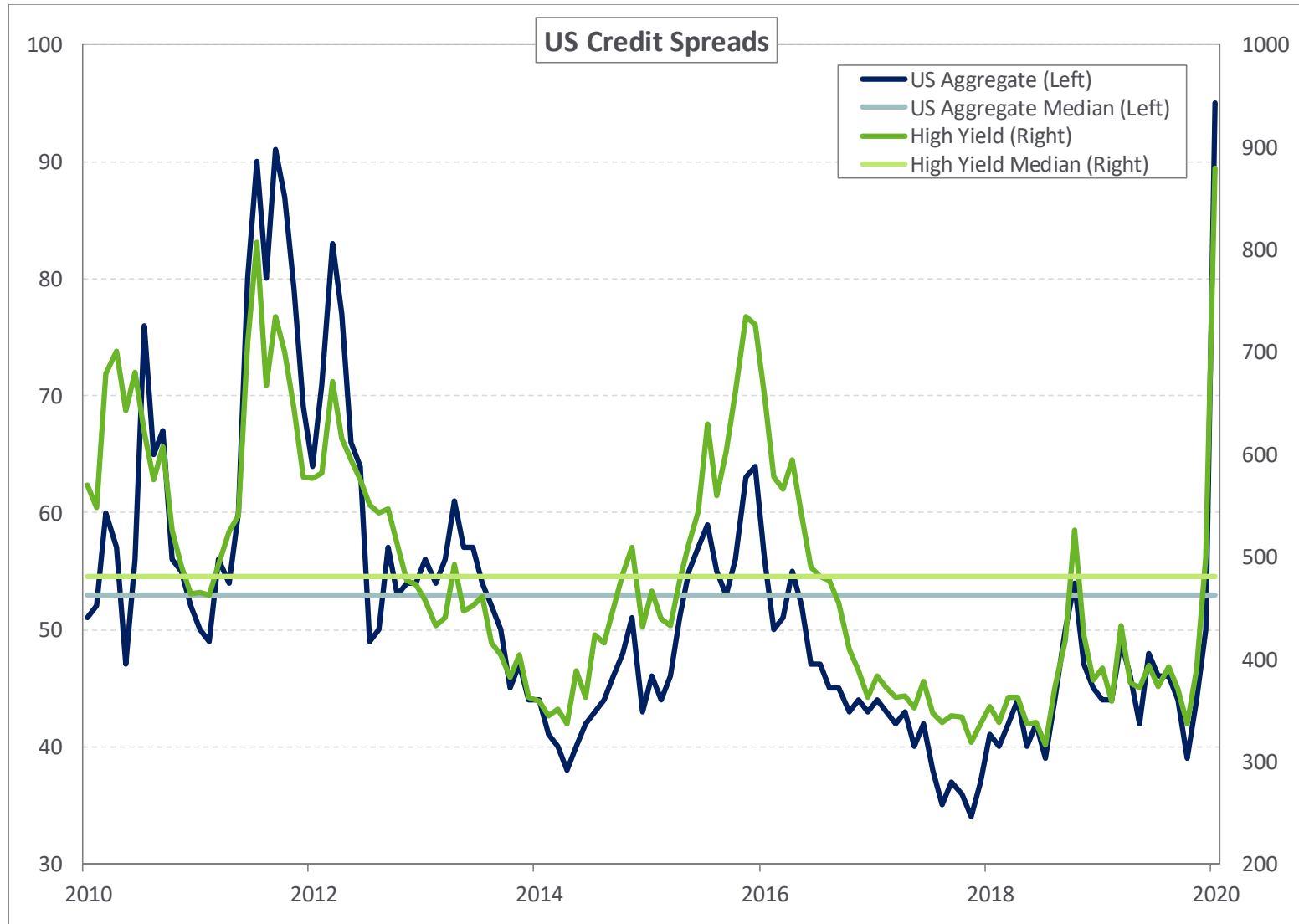
# NOMINAL YIELDS



Source: FactSet



# CREDIT SPREADS



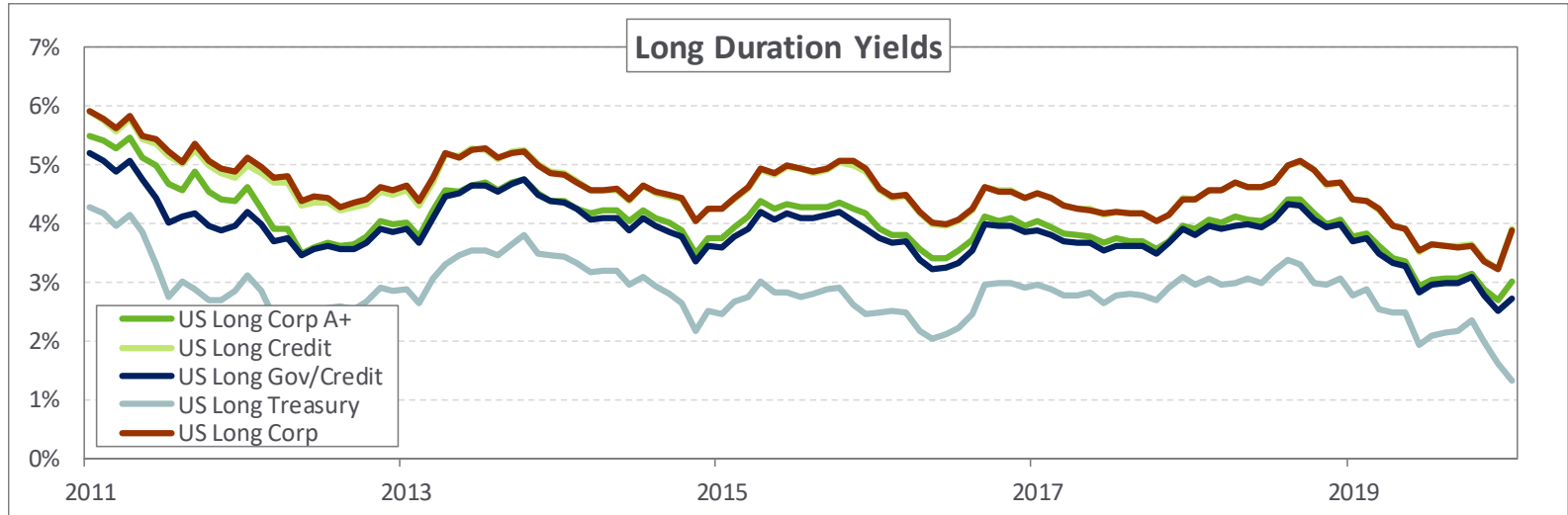
Source: Barclays, FactSet



# LONG DURATION

Index	Current	1 Month Ago	12 Months Ago	Duration
<b>Barclays Long Treasury</b>	1.3%	1.6%	2.8%	19.0
<b>Barclays 20+ STRIPS</b>	1.4%	1.7%	2.8%	26.8
<b>Barclays Long Credit</b>	3.9%	3.2%	4.4%	14.1
<b>Barclays Long Gov/Credit</b>	2.7%	2.5%	3.7%	16.4
<b>Barclays Long Corp A+</b>	3.3%	2.8%	4.0%	15.2

Source: Barclays, FactSet



Source: Barclays, FactSet



# REAL ASSETS

NEPC, LLC

---

# REAL ASSETS INDEX PERFORMANCE

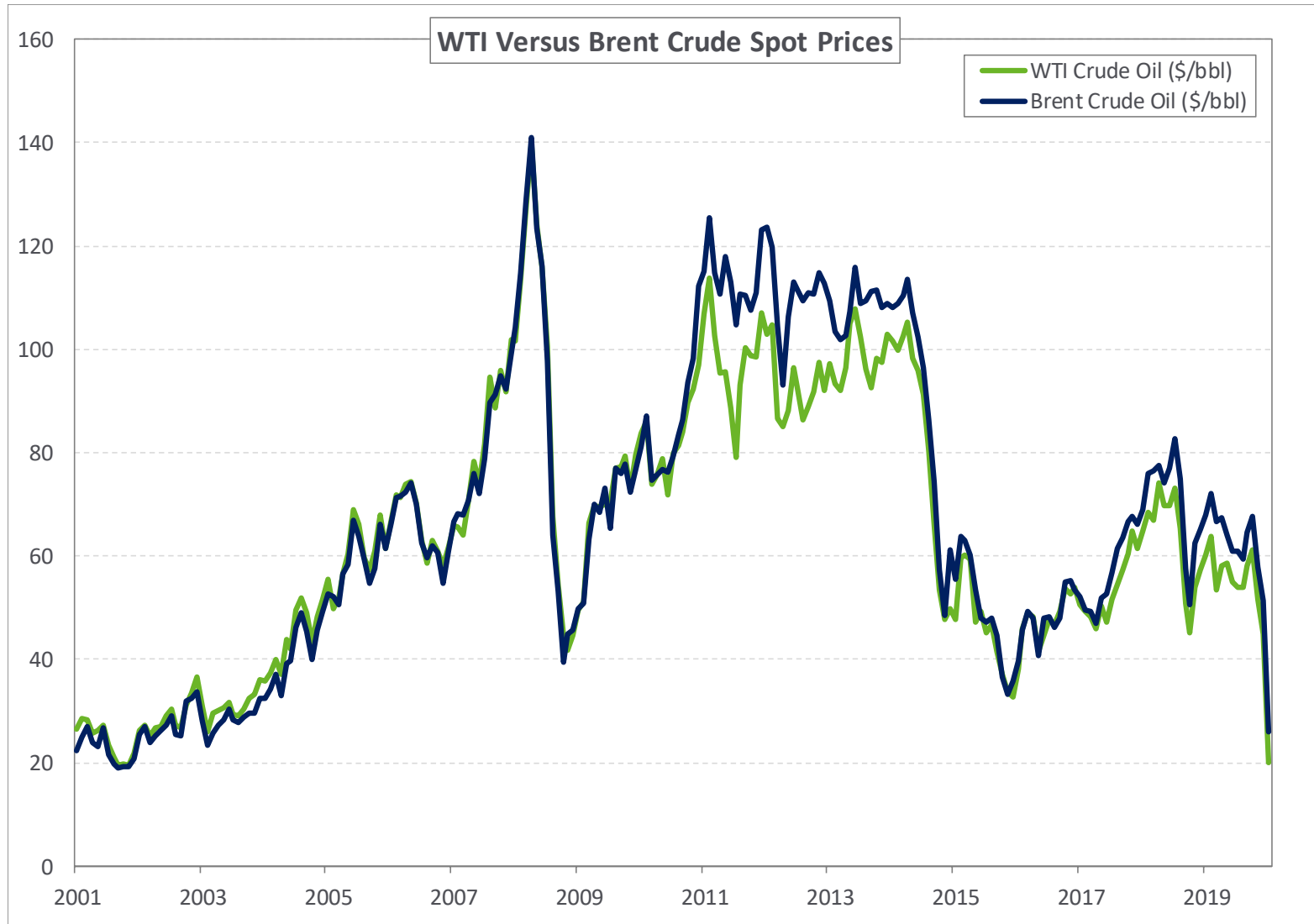
Index	1 Month	3 Month	YTD	1 Year	3 Year	5 Year
<b>Bloomberg Commodity Index</b>	<b>-12.8%</b>	<b>-23.3%</b>	<b>-23.3%</b>	<b>-22.2%</b>	<b>-8.6%</b>	<b>-7.7%</b>
<b>Bloomberg Sub Agriculture Index</b>	<b>-3.3%</b>	<b>-9.9%</b>	<b>-9.9%</b>	<b>-5.3%</b>	<b>-9.1%</b>	<b>-7.2%</b>
Coffee	7.4%	-9.4%	-9.4%	12.1%	-14.4%	-11.5%
Corn	-7.4%	-12.9%	-12.9%	-11.8%	-12.0%	-11.4%
Cotton	-16.8%	-26.4%	-26.4%	-35.0%	-12.6%	-4.7%
Soybean	-0.7%	-8.2%	-8.2%	-6.7%	-7.4%	-5.2%
Soybean Oil	-5.8%	-23.0%	-23.0%	-8.8%	-8.7%	-6.0%
Sugar	-26.3%	-20.0%	-20.0%	-22.8%	-19.4%	-8.5%
Wheat	8.4%	2.1%	2.1%	22.4%	-0.2%	-7.2%
<b>Bloomberg Sub Energy</b>	<b>-35.1%</b>	<b>-51.1%</b>	<b>-51.1%</b>	<b>-52.6%</b>	<b>-19.8%</b>	<b>-18.7%</b>
Brent Crude	-43.2%	-56.3%	-56.3%	-52.4%	-14.5%	-15.3%
Heating Oil	-32.0%	-50.0%	-50.0%	-47.6%	-12.4%	-13.6%
Natural Gas	-5.3%	-27.5%	-27.5%	-50.3%	-29.6%	-26.4%
Unleaded Gas	-59.9%	-68.1%	-68.1%	-63.3%	-27.1%	-20.7%
WTI Crude Oil	-54.4%	-66.5%	-66.5%	-65.1%	-25.5%	-23.3%
<b>Bloomberg Sub Industrial Metals</b>	<b>-9.7%</b>	<b>-18.5%</b>	<b>-18.5%</b>	<b>-22.5%</b>	<b>-5.5%</b>	<b>-3.4%</b>
Aluminum	-10.6%	-16.8%	-16.8%	-22.3%	-8.9%	-5.1%
Copper	-12.2%	-20.3%	-20.3%	-23.5%	-6.2%	-4.9%
Nickel	-6.4%	-18.4%	-18.4%	-10.8%	4.5%	-2.2%
Zinc	-5.9%	-16.2%	-16.2%	-31.2%	-7.7%	0.1%
<b>Bloomberg Sub Precious Metals</b>	<b>-1.4%</b>	<b>-1.1%</b>	<b>-1.1%</b>	<b>15.6%</b>	<b>3.7%</b>	<b>3.2%</b>
Gold	1.8%	4.5%	4.5%	22.1%	7.7%	5.4%
Silver	-13.9%	-21.1%	-21.1%	-7.6%	-9.2%	-4.4%
<b>Bloomberg Sub Livestock</b>	<b>-13.5%</b>	<b>-28.1%</b>	<b>-28.1%</b>	<b>-35.3%</b>	<b>-11.0%</b>	<b>-9.7%</b>
Lean Hogs	-19.9%	-36.8%	-36.8%	-51.9%	-20.4%	-15.1%
Live Cattle	-9.1%	-22.6%	-22.6%	-23.3%	-5.9%	-6.8%

Source: Bloomberg, FactSet

Bloomberg subindex total return indices reflects the return of the underlying one month commodity futures price movements



# OIL MARKETS



Source: FactSet



# INFORMATION DISCLAIMER

**Past performance is no guarantee of future results.**

**The goal of this report is to provide a basis for monitoring financial markets. The opinions presented herein represent the good faith views of NEPC as of the date of this report and are subject to change at any time.**

**Information on market indices was provided by sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.**

**All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.**

**This report is provided as a management aid for the client's internal use only. This report may contain confidential or proprietary information and may not be copied or redistributed to any party not legally entitled to receive it.**

