



## **AGENDA**

### **RETIREMENT BOARD MEETING**

#### REGULAR MEETING

February 24, 2021, 9:00 a.m.

Due to the Contra Costa County and State of California Coronavirus (COVID-19) Shelter In Place Orders, and as permitted by Executive Order N-29-20 issued on March 17, 2020, the Board of Retirement shall hold its meeting via teleconferencing. The meeting is accessible telephonically at (669) 900-6833, Webinar ID: 979 6853 0188, Passcode: 906699, or via the web at

<https://zoom.us/j/97968530188?pwd=b3FzTWswKzBqcEt0ZUYzdDd3U2d6QT09> Passcode:906699

**Persons who wish to make public comment may submit their comment to:**

[publiccomment@cccera.org](mailto:publiccomment@cccera.org) on the day of the meeting, either before or during the meeting.

Public comments are limited to any item of interest to the public that is within the subject matter jurisdiction of the Board of Retirement. (Gov't Code Section 54954.3(a).) All comments submitted will be included in the record of the meeting. The comments will be read into the record at the meeting, subject to a three-minute time limit per comment.

**THE RETIREMENT BOARD MAY DISCUSS AND TAKE ACTION ON THE FOLLOWING:**

1. Pledge of Allegiance.
2. Roll Call.
3. Accept comments from the public.
4. Approve minutes from the January 27, 2021 meeting.
5. Presentation from staff and Sit Investment Advisors regarding a potential allocation to Sit LLCAR strategy.
6. Consider and take possible action to approve an investment in Sit LLCAR strategy.
7. Consider and take possible action to authorize the CEO to execute a contract with Milliman for Other Post-Employment Benefits (OPEB) Trust Actuarial Services.

The Retirement Board will provide reasonable accommodations for persons with disabilities planning to attend Board meetings who contact the Retirement Office at least 24 hours before a meeting.

8. Review of total portfolio performance for period ending December 31, 2020.
  - a. Presentation from Verus
  - b. Presentation from staff
9. Investment benchmark recommendations.
10. Annual statement of compliance with Board resolutions.
11. Consider authorizing the attendance of Board:
  - a. Siguler Guff's 2021 Annual Conference, April 28-29, 2021, Virtual.  
(Note: Conflict with meeting)
12. Miscellaneous
  - a. Staff Report
  - b. Outside Professionals' Report
  - c. Trustees' comments

The Retirement Board will provide reasonable accommodations for persons with disabilities planning to attend Board meetings who contact the Retirement Office at least 24 hours before a meeting.



## **RETIREMENT BOARD MEETING MINUTES**

REGULAR MEETING

January 27, 2021

9:00 a.m.

The Board of Retirement meeting was accessible telephonically at (872) 240-3212, access code 454-753-685 due to the Contra Costa County and State of California Coronavirus (COVID-19) Shelter In Place Orders, and as permitted by Executive Order N-29-20 issued on March 17, 2020.

### **1. Pledge of Allegiance**

The Board and staff joined in the *Pledge of Allegiance*.

### **2. Roll Call**

Present: Candace Andersen, Donald Finley, Scott Gordon, Jerry Holcombe, Louie Kroll, Jay Kwon, David MacDonald, John Phillips, Mike Sloan, Todd Smithey and Russell Watts

Absent: None

Staff: Gail Strohl, Chief Executive Officer; Christina Dunn, Deputy Chief Executive Officer; Timothy Price, Chief Investment Officer; Karen Levy, General Counsel; Wrally Dutkiewicz, Compliance Officer; Anne Sommers, Administrative/HR Manager; Henry Gudino, Accounting Manager; Tim Hoppe, Retirement Services Manager; and Jasmine Lee, Member Services Manager

Outside Professional Support: Representing:

Harvey Leiderman	Reed Smith LLP
Scott Whalen	Verus Consulting
Stuart Odell	Verus Consulting

### **3. Accept comments from the public**

No member of the public offered comment.

## **CLOSED SESSION**

The Board moved into Closed Session pursuant to Govt. Code Section 54957.6, 54957 and 54956.9(d)(1).

The Board moved into open session.

4. There was no reportable action related to Govt. Code Section 54957.6.
5. There was no reportable action related to Govt. Code Section 54957.
6. There was no reportable action related to Govt. Code Section 54956.9(d)(1). Trustee MacDonald recused himself from this item and was not present for subsequent discussion and voting.

7. **Educational presentation on fiduciary duties presented by fiduciary counsel**

Leiderman discussed the roles and responsibilities of fiduciaries.

8. **Educational presentation on Ralph M. Brown Act open meetings laws**

Levy gave a presentation on the Ralph M. Brown Act open meetings laws.

Andersen and Finley were no longer present for subsequent discussions and voting.

9. **Consider and take possible action to adopt a cost-of-living increase for retirees as of April 1, 2021**

It was **M/S/C** to adopt a cost-of-living increase for retirees as of April 1, 2021 as stated in Segal's January 15, 2021 letter and exhibits. (Yes: Gordon, Holcombe, Kroll, Kwon, MacDonald, Phillips, Smithey and Watts)

10. **Presentation of asset allocation implementation timeline**

Price reviewed the implementation timeline for the new asset allocation targets.

Whalen reviewed the decisions made by the Board in 2020 and decisions that need to be made in 2021.

11. **Miscellaneous**

(a) Staff Report –

Strohl reported there was only one applicant for the vacant Alternate Safety seat, Reginald Powell, Fire Engineer with the Contra Costa County Fire Protection District. The Contra Costa County Board of Supervisors is expected to appoint Mr. Powell to the Alternate Safety seat at their February 2, 2021 meeting, in lieu of holding an election, as required by law.

(b) Outside Professionals' Report -



None

(c) Trustees' comments –

None

It was **M/S/C** to adjourn the meeting. (Yes: Gordon, Holcombe, Kroll, Kwon, MacDonald, Phillips, Smithey and Watts)

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Todd Smithey, Chairman

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David MacDonald, Secretary



Meeting Date  
**02/24/2021**  
Agenda Item  
**#5**

## MEMORANDUM

Date: February 24, 2021  
To: CCCERA Board of Retirement  
From: Tim Price, Chief Investment Officer, Mitchell Taylor, Investment Officer and Greg Ter-Zakhariants, Investment Analyst  
Subject: Sit Investment Associates Liquid Low Correlation Absolute Return Strategy (LLCAR)

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### Summary and Investment Thesis

After satisfactory due diligence, CCCERA investment staff recommends making an investment in the Sit Investment Associates Liquid Low Correlation Absolute Return Strategy (“the Strategy”, “LLCAR”) totaling up to 1.5% of the CCCERA portfolio (\$150 million at year-end 2020). This strategy would fit within the Risk Diversifying portion of the CCCERA asset allocation. This multi-asset strategy focuses on fixed-income assets in a combination that meets CCCERA’s goals for diversifying strategies. Sit Investment Associates, Inc. is an SEC registered investment management firm founded in 1981 and headquartered in Minneapolis, MN with \$15.0 billion of assets under management. The Strategy is managed by Sit Fixed Income Advisors II, LLC, (“Sit” or “the Manager”), a registered investment advisor.

Sit currently manages a significant part of CCCERA’s Liquidity Sub-Portfolio, and Sit Short Duration has consistently generated top-quartile returns since on-boarding in November of 2016. As a result, the Sit team is well-known to CCCERA’s investment office, and communication between the two groups is strong. Sit designed a customized strategy, LLCAR, to satisfy the requirements of the Risk-Diversifying Sub-Portfolio. The design process was iterative and demonstrated Sit’s clear understanding of the Functionally-Focused Portfolio and CCCERA’s needs. Unlike the Short Duration liquidity strategy, LLCAR is a hybrid comprising a variety of bond sectors of both long and short duration, equities and options to hedge equity market risk. The LLCAR strategy combines securities from four of Sit’s currently managed strategies (the “Sub-Strategies”) with US government securities. Sit has managed these strategies, on average, in excess of twenty years. We summarize the Sub-Strategies in the table below providing a description of each, its portfolio function, allocation ranges, and risk and return metrics.

**Table 1: LLCAR Sub-Strategy Summary**

Sit LLCAR Sub-Strategy Summary											
Sub-Strategy Description				Static Allocation	Dynamic Allocation Range		Market		Risk & Return Metrics (10-Years)		
					Low	High			Returns	Correlation to S&P 500	Max Drawdown
Sub-Strategy	Inception	Assets Held	Portfolio Function				Size	Characteristics			
<b>Taxable Municipal Bonds</b>	Aug-05	Taxable Municipal Revenue bonds, small issues, intermediate and callable bonds	Core, Negative Correlation & Yield	40%	25%	80%	\$203Bn (3)	Niche & less Efficient	7.1%	(0.15)	4.6%
<b>CEFs, Bonds &amp; Equity (1)</b>					<b>0%</b>	<b>50%</b>					
<b>Taxable Return Plus</b>	Apr-96	Closed-End Funds; Bonds only	Opportunistic, Yield Enhancement	30%			\$67Bn	Niche, Inefficient (assets trade often at a discount to NAV) & Dominated by Retail Investors	7.2%	0.58	10.0%
<b>Targeted Opportunity</b>	Jan-13	Closed-End Funds; Equity & Bond. Equity Hedged with, S&P Index Options	Opportunistic, Yield Enhancement. S&P Options Hedge Equity Risk	20%			\$75Bn	Niche, Inefficient (assets trade often at a discount to NAV) & Dominated by Retail Investors	9.7%	0.89	17.3%
<b>Sit Short Duration</b>	Dec-87	Seasoned Mortgage-Backed Securities	Duration Adjustment; Yield Enhancement	0%	5%	15%	\$1.9T	Deep & Efficient	3.5%	(0.23)	1.7%
<b>US Govt Strips, TIPS (2)</b>				<b>10%</b>	<b>5%</b>	<b>15%</b>					
<b>US Govt Strips</b>		30-year STRIPS, aka US Treasury Zeros	Efficient Drawdown Protection				\$2.4T	Deep & Efficient	7.2%	(0.41)	13.8%
<b>TIPS</b>		Treasury Inflation-Protected Securities	Inflation Protection				\$1.5T	Deep & Efficient	7.1%	0.04	17.8%
<b>Cash</b>		90-day T-Bills			0%	10%	\$2.2T	Deep & Efficient	0.6%	(0.06)	0.0%

Source: eVestment

(1) Allocation range is the sum of CEFs, Taxable Returns Plus & Targeted Opportunity, and is 0-50%

(2) Allocation range is the sum of STRIPS & TIPS and is 5-15%. Recall STRIPS are Separate Trading Registered Interest and Principal Securities. TIPS are Treasury Inflation-Protected Securities.

(3) Revenue bonds are approximately 45% of the Taxable Muni market

Please note that although each of the four Sub-Strategies have strong stand-alone track records, Sit has never combined these Sub-Strategies into a single strategy, and as such there is no performance history. We have evaluated a backtest provided by Sit using static allocations (the “Static LLCAR”) to the sub-strategies and dynamic allocations (the “Dynamic LLCAR”) based on the table ranges. In the backtest, Static LLCAR was negatively correlated to the Growth Sub-Portfolio (correlation -0.14 over 8 years through December 2020), and returned 4.5% with a Sharpe ratio of 0.5, net of fees (over 10 years through December 2020). Additionally, backtests indicate positive returns to the Strategy in all major equity drawdowns since 2007.

The four Sub-Strategies – Taxable Municipal Bonds, Taxable Return Plus, Targeted Opportunity and Short Duration – each contribute uniquely to the overall risk and return characteristics of LLCAR. We note that Taxable Munis, Taxable Return Plus and Targeted Opportunity all participate in smaller, niche markets that are, on the whole, relatively inefficient in terms of price discovery and information transmission. Such smaller, less competitive markets, all else being equal, generate higher returns and are uniquely scalable to the CCCERA investment platform.

While Taxable Munis, the core holding in the Strategy, are negatively correlated to equities, the closed-end funds, or CEFs, in the Taxable Return Plus and Targeted Opportunity sub-strategies are moderately to highly correlated to equities. The CEFs are higher return, short-term and opportunistic investment vehicles. Recall that Sit Short Duration is currently held in the Liquidity

Sub-Portfolio. Short Duration buys seasoned, call-constrained mortgage-backed securities, which is a subset of the overall MBS market and therefore more liquid and efficient than the other three Sub-Strategies. Short Duration's primary function is to manage duration and interest rate risk and secondarily as an opportunistic yield enhancement. Finally, the government securities provide low to negatively correlated returns to protect against inflation and equity drawdowns.

Sit LLCAR is a strong candidate for inclusion in the Risk Diversifying Sub-Portfolio as it demonstrates all three required characteristics; 1) positive real rate of returns & income source 2) Low to negative correlation to the Growth Sub-Portfolio returns and 3) Liquidity. With daily liquidity, LLCAR's characteristic low correlation provides assurance of little or no loss of capital to rebalance CCCERA portfolios in an equity drawdown. Although an asset may be liquid, without a positive rate of return, selling, realizing a loss and rebalancing to other assets is a challenge.

LLCAR will invest across a variety of assets including taxable municipal bonds, long duration US Treasury bonds, Treasury inflation-protected securities (TIPS), closed-end funds (CEFs), and government mortgage-backed securities (MBS). Excepting Treasuries, LLCAR exploits mispricings using long-only positions. Within these asset classes, LLCAR weights each asset based on correlation, relative value and market conditions. Weighting ranges to each asset are prescribed to provide flexibility and maximize returns across diverse market and economic conditions. LLCAR targets an absolute return of Bloomberg Barclays Agg plus 1%, net of fees, 4-6% volatility, and low correlation to the Growth and Risk Sub-Portfolios. Management fees will range between 0.39-0.43% depending on the size of CCCERA's investment (See Appendix A for full terms).

The Strategy's track record is based on "Static LLCAR", an unchanging allocation to four strategies Sit has actively managed since 2007: Taxable Municipal Bonds (40%), Taxable Return Plus (30%), Targeted Opportunity (20%) and Treasury Strips (10%). LLCAR will be a separately managed account with the flexibility to adjust these weighting based on relative value and market conditions. We expect the "Dynamic LLCAR" to improve absolute and risk-adjusted returns.

We have confidence in the organization, the team and the strategy. Sit is employee-owned, organizationally flat, with consistent AUM growth within the fixed income group. It exhibits low turnover and has developed deep expertise in a series of niche market sub-sectors. Sit has a proven track record generating superior returns, and maintains strong communication with the CCCERA investment office.

The seven-member team, with an average 19 years of investment experience and led by Bryce Doty, is supported by 20 other personnel. Sit's senior management facilitates direct communication between CCCERA and Sit's portfolio managers and analysts.

We recognize the inherent inflation and interest rate risk, but are comfortable with these risks due to our exposure level, credit quality and duration of the assets and Sit's ability to manage these risks. We also note the low correlation to Growth Sub-Portfolio assets that are either less impacted by or benefit from conditions associated with increased interest rates and inflation. Finally, we recognize that the LLCAR is an unproven strategy, and although we cannot guarantee

performance based on backtests, the strong record of the underlying strategies and the Sit team provide comfort in recommending the strategy.

### CCCERA Risk Diversifying Sub-Portfolio

Per CCCERA's Investment Policy Statement in Section 6.B.3, the Risk Diversifying Portfolio (RDP) should offset risk inherent in the Growth Sub-Portfolio. It should also offer additional income, a return in excess of inflation and liquidity during periods of market stress. The RDP's current and long-term target allocations are 5.1% and 7.0%, respectively. Investments in the RDP should have low correlation to the Growth Sub-Portfolio and moderate volatility of the entire portfolio. Currently, the RDP includes three strategies: AFL-CIO Housing Investment Trust, Parametric Volatility Risk Premium and Acadian Multi-Asset Absolute Return. Allocating \$150MM to LLCAR brings CCCERA close to the 7.0% target allocation for the RDP (see Table 2 below).

**Table 2: Allocation: Risk Diversifying Portfolio Pro Forma Static LLCAR**

Risk Diversifying Portfolio Pro Forma Sit LLCAR				
Total CCCERA Portfolio	10,154.8			
Long-Term Target %	7.0%			
Long Target in \$MMs	710.8			
	<b>12/31/2020</b>	<b>Change</b>	<b>Pro Forma</b>	<b>% of CCCERA</b>
<b>Risk Diversifying Funds</b>				
AFL-CIO	270.7	-	270.7	2.7%
Acadian	127.6	-	127.6	1.3%
Parametric	108.3	-	108.3	1.1%
Sit LLCAR	-	150.0	150.0	1.5%
<b>Total</b>	<b>506.5</b>	<b>150.0</b>	<b>656.5</b>	<b>6.5%</b>
% of CCCERA Target	71.3%		92.4%	
% of CCCERA Portfolio	5.0%		6.5%	

While we have underwritten to Static LLCAR, we expect Dynamic LLCAR to generate better risk-adjusted returns. We provide performance metrics for the Static LLCAR in Table 3 below. On a stand-alone basis, Static LLCAR provides absolute and risk-adjusted returns superior to the RDP. We note the positive returns during periods of market stress in FH2020. We base our pro forma RDP analysis on an initial, conservative \$50MM to LLCAR at its inception of January 2007. For all periods a year or longer, pro forma RDP's absolute and risk-adjusted returns are higher RDP's actual experience.

**Table 3: Risk Diversifying Portfolio Returns Pro Forma Static LLCAR**

Period		Risk		Pro Forma			
		Diversifying Sub-portfolio	Sit LLCAR	incl. Sit LLCAR	S&P 500	ACWI	60%/40%
Q1 2020	Return	-5.1	2.4	-4.0	-19.6	-21.4	-13.2
Q2 2020	Return	1.6	0.1	1.3	20.5	19.2	12.8
Q3 2020	Return	0.8	1.4	1.2	12.1	14.7	10.2
Q4 2020	Return	1.1	4.1	-0.8	18.4	16.3	14.4
1Yr	Return	-1.7	4.1	-0.8	18.4	16.3	14.4
	Volatility	5.3	5.2	5.0	25.9	26.0	17.0
	RAR*	-0.3	0.8	-0.2	0.7	0.6	0.8
3Yr	Return	0.9	3.3	1.2	14.2	10.1	8.7
	Volatility	3.7	4.9	3.6	18.8	18.4	11.8
	RAR	0.2	0.7	0.3	0.8	0.5	0.7
5Yr	Return	1.2	4.1	1.6	15.2	12.3	9.8
	Volatility	3.3	4.4	3.2	15.3	15.1	9.8
	RAR	0.4	0.9	0.5	1.0	0.8	1.0
10Yr	Return	1.6	4.5	2.1	13.9	9.1	7.1
	Volatility	3.2	5.0	3.3	13.5	14.1	9.2
	RAR	0.5	0.9	0.7	1.0	0.6	0.8
SI**	Return	2.8	6.2	3.6	9.5	6.3	6.0
	Volatility	3.3	6.0	3.5	15.6	16.7	11.1
	RAR	0.9	1.0	1.0	0.6	0.4	0.5

Data frequency: monthly.

\*Risk-adjusted return: ratio of return/volatility.

\*\*Inception: January 2007.

Low correlation to equities and the Growth Sub-Portfolio are key requirements for inclusion in the RDP. From June 2012 to December 2020, Static LLCAR correlation to the Growth Sub-Portfolio was -0.1 (see Table 4). Further, returns skew slightly positive, demonstrated by volatility exceeding downside volatility (see Table 5). Volatility (standard deviation) as a risk metric quantifies dispersion around the mean, and is used in the Sharpe ratio to quantify risk-adjusted returns. Downside volatility focuses on negative returns, and the Sortino ratio quantifies this risk. A higher Sortino ratio than the Sharpe ratio implies greater chances of gains than losses.

**Table 4: Static LLCAR Correlation**

Portfolio	Sharpe Ratio*	Correlation to LLCAR*	Product
Sit Static LLCAR	0.5	--	
Total Fund	1.3	-0.1	-0.2
Growth	1.3	-0.1	-0.2
Liquidity	1.1	0.4	0.4
Risk Diversifying	0.0	0.5	0.0

\*Monthly. Liquidity, 11/2016-12/2020. All else, 6/2012-12/2020.

Risk-free index: ICE BofA US 3-month T-bill.

**Table 5: Static LLCAR Return and Risk Metrics**

Sit Static LLCAR Return and Risk Metrics, through December 2020					
Metric	1yr	3yr	5yr	10yr	SI*
Return, Net**	4.1	3.3	4.1	4.5	6.2
Real Return, Net***	2.8	1.4	2.1	2.7	4.3
Return over US Agg	-3.4	-2.1	-0.4	0.6	1.7
Volatility	5.2	4.9	4.4	5.0	6.0
Sharpe Ratio†	0.7	0.3	0.6	0.8	0.9
Downside Volatility	3.4	2.9	2.7	2.9	3.1
Sortino Ratio†	1.0	0.6	1.1	1.3	1.7

\*Inception: January 2007.

\*\*Net returns assume Term Sheet fee structure with \$50MM investment at inception.

\*\*\*Returns in excess of US CPI (Non-Seasonally Adjusted).

†Risk-free index: ICE BofA US 3-month T-bill

High liquidity is necessary but not sufficient for inclusion in the RDP. Funds must be available without realizing losses for rebalancing in an equity downturn to be effective. LLCAR has a proven record in the largest equity drawdowns since 2007 (see Table 6). Given the negative correlation to equities, Static and Dynamic LLCAR behave as expected: based on this backtested model, LLCAR generates returns when needed to rebalance in an equity downturn.

**Table 6: Static and Dynamic LLCAR Equity Drawdown Performance**

Sit LLCAR Downside Market Capture relative to S&P 500 - Notable Downturns					
	Return (%)			Downside Capture* (%)	
	S&P	LLCAR Static	LLCAR Risk OFF	LLCAR Static	LLCAR Risk OFF
11/2007 - 02/2009	-41.4	11.5	6.9	-10.7	-12.4
04/2010 - 06/2010	-11.4	10.4	9.5	-95.3	-78.4
06/2011 - 09/2011	-15.3	10.3	12.8	-86.9	-110.9
04/2013 - 12/2013**	19.7	-7.5	-3.1	55.5	71.3
06/2015 - 02/2016	-6.8	3.9	5.3	-27.6	-25.9
10/2018 - 12/2018	-13.5	3.2	2.6	-26.4	-14.9
01/2020 - 03/2020	-19.6	2.4	4.9	-17.3	-36.2

Source: eVestment and Sit Investments.

\*Measures loss as % of benchmark's loss. Negative downside capture denotes a gain.

\*\*Taper Tantrum (fixed income downturn).

## **2. Firm, Investment Objectives, Process, and Strategy**

### **a. Parent Firm**

Sit Investment Associates, Inc. is an independent, employee-owned investment management firm. Sit was founded in July 1981 by Roger Sit and registered with the SEC on September 18, 1981. 100% of the firm's revenues are derived from investment management. Sit is primarily a manager for institutional and large individual investors as well as mutual funds. As of 9/30/2020, Sit manages \$15.0Bn in assets for institutional and individual clients.

Sit Fixed Income Advisors II, LLC, the Manager for LLCAR, is a subsidiary of Sit Investment Associates, a registered investment advisor managing \$11.9Bn in taxable and tax-exempt fixed income. Sit Fixed Income and its parent share the same Minneapolis offices and all resources. Sit Investment Associates owns 77% of Sit Fixed Income Advisors II, LLC, and Sit employees own 23%.

### **b. Team and Strategy**

The LLCAR investment team is headed by Bryce Doty, who is responsible for overall asset allocation and management of all investment staff associated with LLCAR. Mr. Doty has 29 years of investment experience and 22 years with Sit. On average, the other six members of his team have over 19 years of investment experience, 16 with Sit. 20 other staff support LLCAR, including analysts, policy & oversight, trading, marketing and back office professionals. Employees are compensated with base salary, bonus, deferred compensation, profit sharing and equity participation. Of the 72 total employees, 25 own equity and total shareholder equity exceeds \$200MM. The CCCERA investment office has direct access to the team listed below.

- Bryce Doty, CFA: Responsible for overall asset allocation, direction of the portfolio team.
- Mark Book, CFA, CMA: Asset allocation, expertise in Taxable Municipal Bonds.
- Chris Rasmussen, CFA: Asset allocation, expertise in Closed-end Funds.
- Michael Reich, CFA: Research and analysis of Closed-end Funds.
- Andrew Tich, CFA: Research and analysis of Agency MBS.
- Jessica Ersfeld, CFA: Research and analysis of structured securities.
- Nick Ochsner, CFA: Research and analysis of corporate fixed income securities.

### **c. Investment Objectives and Process**

LLCAR targets real positive returns with low correlation to equities while maintaining a high degree of liquidity. The benchmark is the Bloomberg Barclays Aggregate Bond Index plus 1.0%. LLCAR will invest primarily in taxable municipal bonds, long duration U.S. Treasuries, closed-end funds and short- to intermediate-duration government agency mortgage securities. These securities have a track record of low correlation to equities which will provide liquidity to the Growth Sub-Portfolio during periods of market stress. Additionally, these asset classes exhibit moderate to negative correlations to each other.

Most performance metrics presented are based on the Static LLCAR, which invests in assets detailed below on a 40%/30%/20%/10% basis. The Dynamic LLCAR allows the Manager the



flexibility to vary these weights based on market conditions and relative value and provides for an allocation to Mortgage-Backed Securities, or MBS. The Sit team has a proven track record across these asset classes and dedicated analysts for each. Each asset class strategy is detailed below (see Appendix LLCAR Asset Classes).

Using return data for each sub-strategy, we modeled returns for the Static LLCAR. We model Dynamic LLCAR returns based on “allocation bookends”, which form the most concentrated asset class exposures available and correspond to extreme market and economic conditions. We think of these bookends as risk-on and risk-off markets. The market downturn due to COVID-19 provides an example of risk-off, while the period leading up to the downturn in 4Q20 is a typical risk-on market. These conditions are theoretical, in that the degree of certainty necessary to call a market peak or trough and put on these trades is unlikely; however, we model the extremes and are comfortable that historic results for the Dynamic LLCAR would fall inside the bookends.

Given low correlation to the Growth Sub-Portfolio, taxable municipal bonds will be a core allocation, averaging 40% of LLCAR. Treasuries are negatively correlated to equities and enhance the risk-diversifying characteristics of LLCAR. Due to the long duration of these securities the risk-diversifying impact will be achieved with an average allocation of less than 10%. The allocation to closed-end funds is based on analysis of 12-month forward return potential. Mortgage-backed securities, or MBS will be used to manage portfolio duration and enhance overall returns.

#### Static LLCAR – Fixed Asset Allocation

- A. **40% in Sit Taxable Municipal bonds.** An investment grade fixed income strategy offering higher yields than other comparable taxable bond sectors. Sit has a distinct expertise in the short and intermediate duration segments of this marketplace.
- B. **30% in Sit Taxable Return Plus (Closed-End Funds).** A fixed income strategy producing a high sustainable yield in investment grade securities without giving up liquidity. This
- C. **20% in Sit Targeted Opportunity (Closed-End Funds).** An event-driven strategy exhibiting low correlation to the S&P 500 Index and has a consistent earning potential. LLCAR invests in closed-end funds, both bonds and equities, though significantly weighted to bonds. Excess equity exposure will be hedged with short S&P 500 index futures. Targeted Opportunity benefits from arbitrage opportunity associated with funds’ structural changes such as rights offerings, mergers, and tender offers.
- D. **10% allocation to Long Treasury Strips.** This position further limits the downside risk of the overall strategy while providing another layer of liquidity.

#### Dynamic LLCAR Performance

Investment guidelines prescribe asset exposure ranges detailed below. In Table 7 we include the allocation bookends, or theoretical allocations under extreme market and economic conditions detailed above. Using these bookend allocations, we adjust the backtest to create risk-on and risk-off asset exposure levels. Table 8 validates Static LLCAR, demonstrating low correlation to broader equity market with 10-year downside capture at -43.8% (i.e. LLCAR *gained* as the S&P 500 *fell*), and that the flexibility of Dynamic LLCAR improves upside capture in risk-on markets and

downside capture in risk-off markets. Note improved 10-year downside capture for Dynamic LLCAR risk off at -47.4%.

**Table 7: Exposure Ranges for Dynamic LLCAR**

Asset	Dynamic LLCAR Ranges		Bookends	
	Low	High	Risk On	Risk Off
Taxable Munis	25%	80%	40%	80%
CEFs, Bonds & Equity	0%	50%	50%	0%
US Govt Strips	5%	15%	5%	10%
Agency MBS	5%	15%	5%	10%
Cash	0%	10%	0%	0%
<b>Total</b>			100%	100%

**Table 8: Upside and Downside Analysis**

Upside and Downside Capture to S&P500, through December 2020						
Allocation	Capture	1yr	3yr	5yr	10yr	SI*
Static	Upside	2.4	-2.8	2.3	0.0	3.6
	Downside	-14.0	-31.6	-31.5	-43.8	-37.1
Risk On	Upside	26.9	24.9	31.6	31.7	36.6
	Downside	27.6	15.5	12.7	0.4	7.0
Risk Off	Upside	7.8	5.5	9.3	10.1	8.7
	Downside	-20.0	-33.5	-34.1	-47.4	-39.7

\*Inception: January 2007.

Gross returns.

### Dynamic LLCAR Asset Classes

Per investment guidelines, the Strategy is allowed to invest in 1) Taxable Municipal bonds 2) Closed-end registered investment companies, or CEFs both bond and equity 3) U.S. Government bonds including TIPS 4) Agency mortgage- and asset-backed securities, and collateralized mortgage obligations 5) Cash. Short-term obligations, including U.S. government Treasury bills, bank certificates of deposit, bankers' acceptances, corporate commercial paper and other money market and 6) Exchange-traded futures contracts and options, but only for hedging purposes and not for speculative or leverage purposes. Options are used to hedge equity positions in closed-end funds, and short-term obligations are interest bearing cash positions. Please see Appendix B for detailed descriptions of each asset class.

### 3. Investment Rationale: Strengths and Weaknesses

#### Strengths

**Strong Performance.** The Static LLCAR backtest begins in 2007. For the ten years ended December 31, 2020, the Strategy would have generated 4.5% annualized, net of fees, with a 0.8 Sharpe ratio and negative correlation to equities. Equity drawdown performance was positive in all major equity market downturns since 2007.

**Low Correlation.** Static LLCAR exhibits low correlation to equity markets and to CCCERA’s sub-portfolios. Table 9 shows the Strategy’s correlations to CCCERA’s sub-portfolios as well as to indices representing US and global Equities, US and global Fixed Income, Cash, Hedge Funds, Real Estate, and Commodities.

**Table 9. LLCAR Correlations**

Sit LLCAR (Static) Correlations to Broad Asset Classes and CCCERA Sub-Portfolios, December 2020					
	1yr	3yr	5yr	10yr	SI*
S&P 500	0.0	-0.3	-0.3	-0.4	-0.3
MSCI ACWI-ND	0.1	-0.2	-0.2	-0.4	-0.2
Bloomberg Barclays US Aggregate	0.7	0.8	0.8	0.8	0.7
Bloomberg Barclays Global Aggregate	0.6	0.6	0.6	0.4	0.4
ICE BofAML US 3-Month Treasury Bill	-0.1	0.1	0.0	0.0	0.0
Barclay Hedge Fund Index	0.2	-0.1	-0.1	-0.3	-0.1
Wilshire REIT	0.3	0.2	0.2	0.1	0.1
S&P Goldman Sachs Commodity	0.3	0.0	-0.1	-0.2	-0.2
	1yr	3yr	5yr	8yr**	SI*
Total Fund	0.2	-0.1	-0.1	-0.1	---
Liquidity	0.4	0.6	---	---	---
Growth	0.2	-0.2	-0.1	-0.1	---
Risk Diversifying	0.5	0.5	0.5	0.5	0.5

Source: eVestment. Frequency: Monthly.

\*Inception: January 2007.

\*\*8-year period instead of 10-year due to availability of monthly return data.

**Liquidity.** The Strategy provides Daily liquidity in cash and has a drawdown record consistent with liquidity requirements, that is, its assets trade at or near par in equity downturns.

**Proprietary Approach in Inefficient Markets.** LLCAR focuses on smaller asset classes in which Sit has developed distinct expertise. These smaller markets do not have the capacity to attract larger competitors and participation is largely comprised of less sophisticated retail investors. Sit has invested in these asset classes for 20-30 years depending on the specific asset class.

**Strong Team.** LLCAR’s investment team is headed by Bryce Doty, a seasoned group with an average of 18 years of investment experience, 16 years with Sit. The team has support from another 20 staff, including analysts, policy and oversight, trading, marketing and back office professionals. The team meets twice daily for morning action calls and afternoon wrap-up

calls, meeting informally in response to market impacting events. Portfolio Managers and analysts understand market liquidity and their respective asset classes, which combined with a flat organization and delegated trading authority allows the Strategy to trade effectively in fast markets. Sit enjoys Tier One status with most broker dealers. The compensation structure aligns the interests of the employees with clients. The Strategy benefits from a strong compliance culture. All three members of the compliance and legal management staff are attorneys. Finally, we note that Sit currently manages \$600.7MM for the Liquidity Sub-Portfolio and has done so for three years, posting benchmark outperformance in all periods.

Sit Short Duration- Risk & Return Statistics			
	1 Yr.	3 Yrs.	ITD
<i>Period ended 12-31-2020</i>			
<i>Return Portfolio</i>	4.42	3.80	2.80
<i>Return Benchmark*</i>	3.14	2.77	1.95
<i>SD Portfolio</i>	1.61	1.94	1.76
<i>SD Benchmark*</i>	1.39	1.19	1.11
<i>Sharpe Portfolio</i>	2.38	1.16	0.84
<i>Sharpe Benchmark*</i>	1.85	1.01	0.57
<i>M2 Portfolio</i>	5.62	5.38	5.39
<i>TE Portfolio</i>	1.13	1.11	0.98
<i>IR Portfolio</i>	1.13	0.93	0.87

**Strong Parent.** Sit Investment Associates, Inc. was founded in 1981 and is an independent employee-owned firm headquartered in Minneapolis. It currently manages \$15.0B across equities and fixed income, with separately managed accounts, private investment funds, collective investment funds and mutual funds. Sit manages \$12.6Bn across a range of fixed income asset classes, including agencies, treasuries municipals and asset-backed securities.

**Structure and Fees.** The Strategy’s structure provides external oversight including external auditor Deloitte (since 2006). At 39-42.5bps per dollar invested (based on AUM) and no incentive fees, Sit LLCAR provides a cost-effective solution to portfolio diversification.

## Weaknesses

**Backtested Data.** The Strategy does not have an investment track record. Backtested performance data is hypothetical and not based on actual trading. Backtested performance data are calculated retroactively with the benefit of hindsight and should not be interpreted as an indication of actual performance. There are numerous factors related to the market and implementation that cannot be included in a backtested model. Actual results can be materially different from backtested models. Sit’s backtest is based on a static allocation of the Sub-Strategies, and we cannot guarantee that this combination of strategies will produce

results in line with the backtests, or that the Sit team will improve performance with the added flexibility of dynamic allocations.

Mitigants: The underlying Sub-Strategies do have actual performance results, which allows CCCERA to model a pro forma allocation. All the Sub-Strategies have generated results well-above their respective benchmarks.

**Interest Rate/Duration Risk.** Guidelines limit total portfolio duration to 7 years. Duration measures price sensitivity to interest rates and bond prices move inversely to interest rates. At a duration of 7, a 1% increase in interest rates results in 7% decrease in portfolio value.

Mitigants: Higher interest rates are correlated with higher growth rates and inflation, benefitting CCCERA's primary return drivers: equity, real asset and private debt allocations.

We expect interest rates to remain low for some time due to accommodative central banks. The Federal Reserve has lowered the Federal Funds rate to zero and guided to an outcome-based approach tied to progress on employment and inflation goals. While unemployment has declined from its 14.7% April 2020 peak, it remains high at 6.7%, well above the 3.5% pre-COVID level. Inflation remains well below the Fed's 2% target rate at 1.2%. The Fed has committed to accommodation through lower rates and an expanded balance sheet, both policies benefitting LLCAR. While both higher interest rates and inflation negatively impact LLCAR, its average credit rating of A2/A is sufficiently high to make the probability of a permanent loss of capital very low (10-year cumulative Expected Loss = 2.75% \* 60% or 1.65%). We will report interest rate trends as part of ongoing monitoring.

**Inflation Risk.** The Strategy invests primarily in securities with fixed rate coupons, so it is subject to inflation risk. As inflation increases, fixed coupons become less attractive, investors rotate out of bonds into other assets and demand a lower price for existing debt.

Mitigants. Over the last 10 years inflation, as measured by the personal consumption expenditure has averaged 1.5%. Concurrently, the money supply increased substantially but has not given rise to inflation leading many to conclude that accommodative monetary policy is not a sufficient driver of inflation. Inflation does not impact our equity, real asset and private debt allocations to the same extent. Stocks with pricing power keep pace with inflation as do real assets. Our private debt allocation is mainly floating rate debt that adjusts to inflation, expecting positive returns with inflation. Finally, LLCAR's employs TIPS that hedge against this risk. We cannot be certain of future inflation but expect to remain contained in the short to mid-term. We will report inflation trends as part of ongoing monitoring.

**Correlation.** Central to our thesis is the negative correlation of bond and equity returns. However, over longer periods of time this relationship has not been stable ranging from -0.8 to +0.8 on a trailing 12-month basis, and on average +0.4 since 1926.

Mitigants. Research on bond-equity correlation indicates four causal factors: high/low GDP growth, high/low inflation, high/low market volatility and easy/tight monetary policy. High inflation and tight monetary policy tend to move correlations higher. We do not expect significant increases in inflation or tighter monetary policy in the short to mid-term.

**Scalability.** The Strategy exploits smaller markets and is therefore not very scalable.

Mitigants: CCCERA total fund is small enough to accommodate a less scalable strategy. Although a limiting factor to larger plans, this is not an issue for CCCERA.

**Key Person Risk.** The Strategy is headed by Bryce Doty, and as such we have identified Mr. Doty as the Fund's key individual.

Mitigants: We acknowledge this risk but believe Sit has strong compensation incentives to retain team members. We are satisfied with the withdrawal provisions and liquidity terms in the event Mr. Doty leaves the firm and we are not satisfied with his replacement.

## 4. Appendix A - Summary of Terms

**Management Fees:** 1) If the average market value of assets during any calendar quarter is equal to or less than \$100 million:

<u>Net Asset Value</u>	<u>Annual Rate</u>
First \$50MM	0.45%
Next \$50MM	0.40%

2) If the average market value of assets during any calendar quarter is equal to or greater than \$100 million:

<u>Net Asset Value</u>	<u>Annual Rate</u>
First \$200MM	0.39%
Over \$200MM	0.35%

**Performance Fee:** None.

**Liquidity:** Monthly with 30-day advance notice.

**Hard Lock:** None.

**Fiduciary:** Investment Manager and Fiduciary under the applicable law of the State of California, including without limitation the County Employees Retirement Law of 1937 (Cal. Gov. Code 31450 *et seq.*) and applicable provisions of the California Constitution. Fiduciary with respect to the Client under applicable state laws and the Investment Advisers Act of 1940 and the fiduciary standards applicable to investment advisers registered with the U.S. Securities and Exchange Commission under the Advisers Act.

**Reporting:** Adviser will regularly provide Client with information and reports on Client's Account, including monthly reports with position-level transparency and quarterly and annual reports including the fees and expenses that Client pays directly to Adviser or to related parties and the gross and net rate of return for Client's Account, since inception.

**Investment Guidelines:** The Account primarily seeks to obtain a low downside risk to U.S. equities while maintaining a high degree of liquidity and earning positive returns by investing primarily in taxable municipal bonds, long duration U.S. Treasuries, closed-end funds, and short to intermediate duration government agency mortgage securities.

## **5. Appendix B - Dynamic LLCAR Asset Descriptions**

### **Taxable Municipal Bonds**

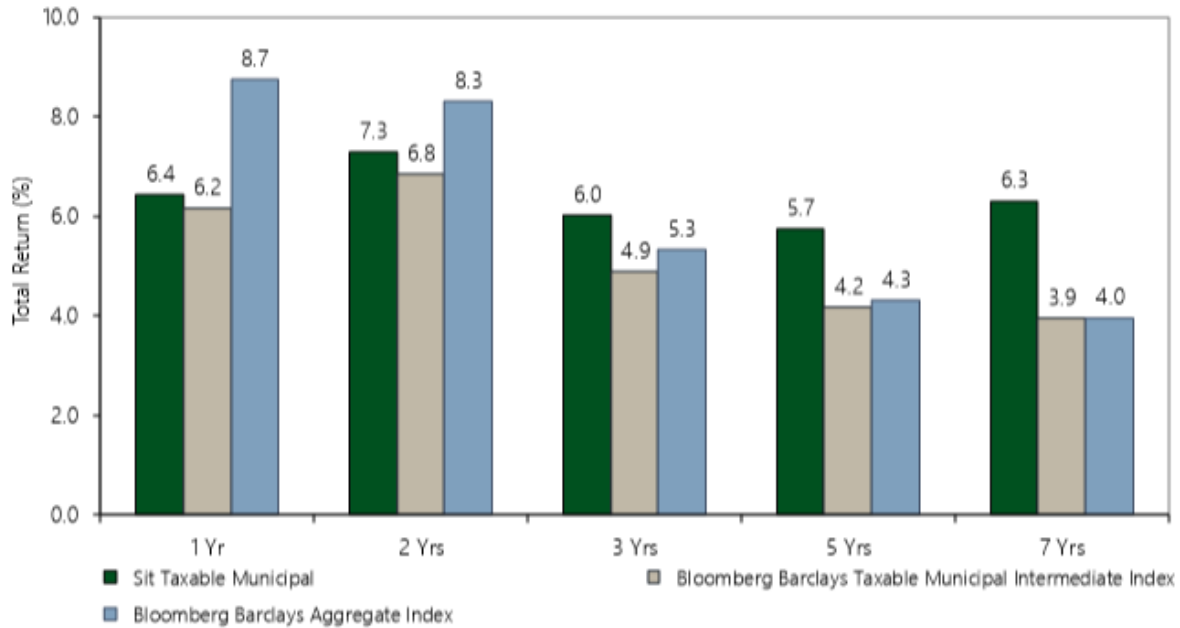
Taxable municipal bonds will be a core portfolio holding, and Sit currently manages \$1.8Bn in taxable municipals. Over 70% of the municipal market is owned by individuals either directly or through mutual funds. Taxable municipal bonds represent a small but growing sector in US fixed income. The US taxable municipal bond market represents about 18% or \$700Bn of the \$3.9T municipal market. Taxable municipal bonds provide borrowers more flexibility in use of proceeds and flexibility in call structure or in muni parlance advanced refunding. Given CCCERA tax status, taxable municipals offer higher yield for municipal bonds of the same credit quality and lower duration, and in fact offer yields comparable to corporate bonds but have substantially less credit risk and duration (source: ICE BAML 5-10-year indices). Default rates for municipal bonds are much lower than corporate bonds of similar credit quality, and recovery rates on defaulted bonds are higher. Per Moody's, the 10-year cumulative default rate for A-rated municipal bonds is 0.1%, which compares to 2.1% 10-year cumulative default rate for A-rated corporate bonds. Defaulted muni bonds recover, on average, 66 cents on the dollar as compared to 42 cents on the dollar for defaulted corporate bonds. Taxable bonds are secured by the same revenue streams and tax pledges that secure tax-exempt bonds from the same issuer.

The Sit LLCAR Taxable Municipal strategy invests primarily in revenue bonds. Proceeds from these bonds fund cash hospitals, private colleges, airports, marine ports, student housing, infrastructure, convention centers and stadiums, and the bonds are secured by revenue these projects generate. Revenue bonds total approximately 45% of the taxable muni market with general obligation bonds, or GOs making up the remainder. GOs are general obligation bonds of the issuer and backed by the taxing authority of the municipality. As noted above, municipal defaults are very low; however, close to 90% of defaults are revenue bonds, and as a result, require more credit analysis. Sit conducts fundamental credit analysis of each issuer/project, as well as structural analysis related to early redemption and call provisions. Additionally, Sit exploits market inefficiencies related to small, index ineligible issues (less than \$300MM). The team sacrifices credit quality to increase yield and reduces interest rate risk with lower duration. Average duration is currently 5.8 (index 9) and average credit quality is A+ (index AA-). The strategy has generated top quartile returns over the past 3, 5, 7 and 10-year periods (see below)



## TOTAL RETURN

As of June 30, 2020



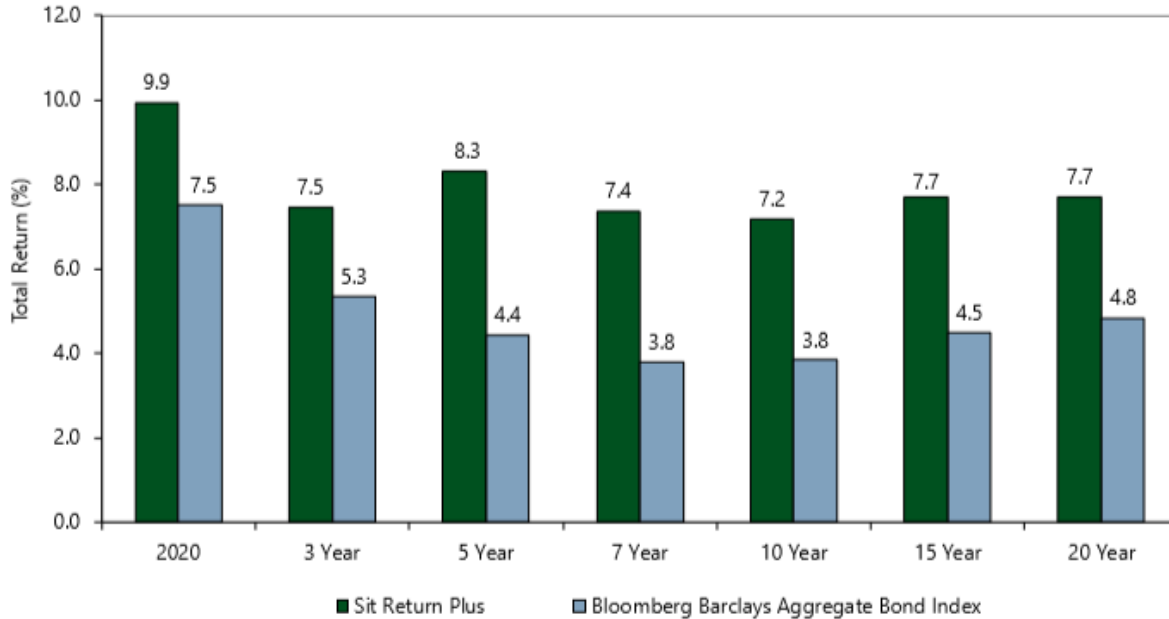
Source: Sit Investment Associates. Returns are gross of fees and time-weighted.

### Taxable Return Plus – CEFs Bonds

Taxable Returns Plus invests in taxable closed-end bond funds, or CEFs, with an average duration of 5.1 years. These funds hold taxable investment grade bonds and employ leverage of 25-50% to enhance returns. As of 11-30-2020, there are 152 taxable CEF bond funds with a total market value of \$67Bn. The strategy actively invests in 40 of these funds selected based on an initial screen for yield and NAV discount and bottom up analysis that includes, but is not limited to, portfolio composition, dividend sustainability, unique events, e.g., tender or rights offers, leverage and expense ratios. Taxable Return Plus generates a total rate of return based on CEFs that trade below NAV resulting in significant positive yield differential versus the benchmark. The strategy targets lower average duration and slightly lower credit quality. The Agg and Taxable Return Plus average duration is 6.1 and 5.1, respectively. Agg and Taxable Return Plus average credit quality is Aa and A, respectively. This difference amounts to a 10-year expected cumulative loss of 100bps based on Moody's historical 10-year cumulative default rate of 70bps and 240bps for Aa and A rated credit, respectively and an assumed 40% recovery. As of December 2020, 10-year annualized Taxable Return Plus returns totaled 7.2%.

## SIT RETURN PLUS – ANNUALIZED TOTAL RETURN

As of December 31, 2020



Source: Sit Investment Associates. Returns are gross of fees and time-weighted.

### Targeted Opportunity - CEFs Bonds and Equity

Targeted Opportunity invests in closed-end bond and equity funds (CEFs). CEFs benefit from market inefficiencies that misprice rights offerings, mergers, liquidations, tender offers and other technical factors that result in a mismatch of NAV and market pricing. Recall a Closed-End Fund is portfolio of pooled assets that raises a fixed amount of capital, hence closed, through an IPO and then lists shares for trade on a stock exchange. CEFs are principally a retail product held by less sophisticated buyers, and as a result, share prices may or may not reflect underlying fundamentals. As of 12-31-2020, the CEF universe consisted of 485 funds as follows: 181 investment grade bond funds, 117 high yield funds, 135 domestic equity funds and 52 international equity funds. Sit invests in CEFs expected to generate, at a minimum, a 10% annualized return comprised of dividends and recapture of market discount to NAV. Average holding periods range from 1-12 months. Target absolute returns objective is 8%. As of December 2020, since inception annualized Targeted Opportunity returns totaled 10.8% (see below). Equity futures are used to hedge equity CEF exposures.

## SIT TARGETED OPPORTUNITY – ANNUALIZED TOTAL RETURN

As of December 31, 2020



Source: Sit Investment Associates. Returns are gross of fees and time-weighted.

### Treasury STRIPS and TIPS

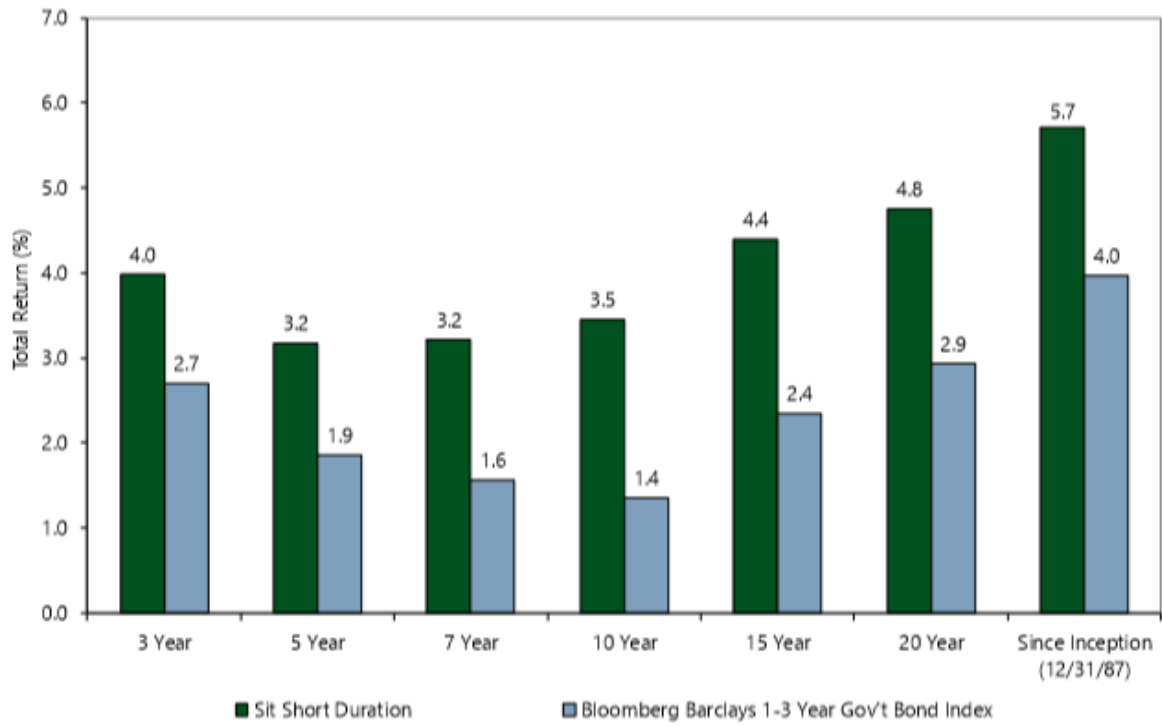
**STRIPS.** Treasury STRIPS are obligations of the US government sold at a discount to par with no scheduled interest payments, essentially a zero-coupon bond. STRIPS is an acronym for separate trading of registered interest and principal of securities. The coupon is sold as a separate investment. Sit LLCAR targets a 0-10% allocation to longer-dated STRIPS to hedge periods of market volatility.

**TIPS.** Treasury Inflation-Protected Securities, or TIPS are obligations of the government that are indexed to inflation as measured by CPI. Sit LLCAR has the flexibility to hedge inflation risk with TIPS. TIPS are particularly valuable in periods of stagflation when bond-equity return correlation is positive and both assets generate low to negative returns. The principal value of the bond increases/decreases with inflation/deflation, and the payment adjusts with the principal of the bond. The holder receives the greater of par value or the inflation-adjusted principal. For example, and investor owns \$1,000 in TIPS with a 1% coupon rate, or \$10. If CPI increases 2.0%, the principal is adjusted to \$1,020, and the subsequent coupon will be \$10.20, reflecting the increase in principal.

**Mortgage-Backed Securities.** Mortgage-backed Securities, or MBS will be used to enhance yield and manage portfolio duration. The team will focus on short to intermediate duration securities including seasoned mortgages much like the Sit Short Duration portfolio that CCCERA holds in the Liquidity Sub-Portfolio. Sit has consistently outperformed the benchmark with respect to absolute and risk-adjusted returns (see below).

## SHORT DURATION ANNUALIZED RETURNS

As of July 31, 2020



Source: Sit Investment Associates. Returns are gross of fees and time-weighted.

**Option & Futures.** To the extent that Sit LL CAR invests in closed-end equity funds, options and futures will be used to hedge market beta.

Meeting Date  
**02/24/2021**  
Agenda Item  
**#5**



## INVESTMENT PRESENTATION



**FEBRUARY 24, 2021**

Bryce Doty CFA, Senior Vice President and Senior Portfolio Manager – Fixed Income

Mark Book CFA CMA, Vice President and Portfolio Manager - Fixed Income

Chris Rasmussen CFA, Vice President and Portfolio Manager - Fixed Income

John Gibas, Vice President – Institutional Relationships

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- JYG@SITINVEST.COM

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Minneapolis, MN 55402-2211  
612.332.3223  
[www.sitinvest.com](http://www.sitinvest.com)

# PRESENTATION OUTLINE

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- I. Introduction
- II. Risk-Diversifying Strategy
- III. Taxable Municipal Strategy
- IV. Closed-End Mutual Funds
- V. Miscellaneous

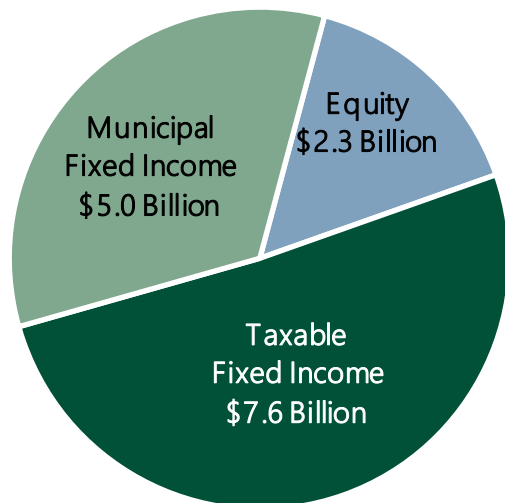


# INTRODUCTION

# SIT INVESTMENT ASSOCIATES : FIRM OVERVIEW



**\$14.9B Total Gross AUM**  
as of December 31, 2020



75%: Separately Managed Accounts

13%: Private Investment Funds

12%: Mutual Funds

## Independent & Employee-owned Firm

- Founded in 1981 by Eugene Sit
- Independent: Sit family and employee ownership
- One of the largest minority-owned advisory firms in the U.S.

## Seasoned Team, Aligned With Our Investors

- Experienced investment team with long Sit tenure
- Focus on investment results, controlled AUM growth
- Significant internal investment in Sit strategies

## Consistent Process & Compelling Track Record

- Value-added, active management philosophy
- Time-tested and consistent investment process
- Unique traditional and alternative strategies complement portfolios



# LEADING FIXED INCOME TRACK RECORD & DIFFERENTIATED APPROACH

## Sit Fixed Income: Investment Philosophy

Consistently achieve superior risk-adjusted returns using a conservative investment approach emphasizing:

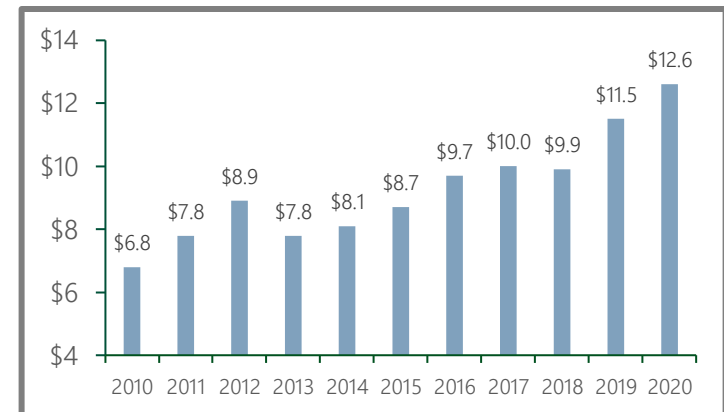
- Investment grade securities
- Income component of total return
- Active management and building portfolios distinctly different from benchmark indices

## Sit Fixed Income: Our Advantage

- Focus on select, high relative value areas of the market where we have recognized expertise
- Consistent and repeatable approach has produced top quartile performance across strategies
- Strong, differentiated commitment to client service, which includes:
  - Direct access to portfolio managers and monthly commentary letter
  - Assistance in crafting investment guidelines and responsiveness to changing needs
  - Invitation to Sit's Annual Client Workshop, a unique educational event

**Sit Fixed Income**  
Controlled AUM Growth Driven by  
Strong Investment Performance &  
Committed Client Service

**Sit Fixed Income: Annual AUM**  
2010-20 (in \$B)



# TRADITIONAL & ALTERNATIVE STRATEGIES TO COMPLEMENT PORTFOLIOS

	Taxable Fixed Income	Tax-Free Municipal Fixed Income	Growth Equity
Traditional Strategies	<ul style="list-style-type: none"> <li>Total Return</li> <li>Intermediate Duration</li> <li>Short Duration</li> <li>Quality Income</li> <li>Long Duration Quality Income</li> <li>Taxable Municipal</li> </ul>	<ul style="list-style-type: none"> <li>Total Return</li> <li>Intermediate Duration</li> <li>Short Duration</li> </ul>	<p><u>US Focus</u></p> <ul style="list-style-type: none"> <li>Large Cap</li> <li>Mid/Small Cap</li> <li>Small Cap</li> <li>Dividend Growth</li> <li>Small Cap Dividend Growth</li> <li>Balanced</li> </ul>
Alternative Strategies: <u>Closed-End Funds</u>	<ul style="list-style-type: none"> <li>Return Plus (Investment Grade)</li> <li>HY Return Plus (HY/Bank Loans)</li> <li>Targeted Opportunity (Event)</li> <li>Energy/MLP (Infrastructure)</li> </ul>	<ul style="list-style-type: none"> <li>Municipal Return Plus (Municipal Fixed Income)</li> </ul>	<p><u>Global &amp; International Focus</u></p> <ul style="list-style-type: none"> <li>Global</li> <li>ESG Growth</li> <li>EAFE+</li> <li>Pacific Basin</li> <li>Developing Markets</li> </ul>
Alternative Strategies: <u>Custom Alpha</u>	<ul style="list-style-type: none"> <li>Alpha Bond</li> <li>Rising Rates</li> <li>S&amp;P 500</li> <li>EAFE</li> <li>5-Year Treasury</li> <li>30-Year Treasury</li> </ul>	<p>Short Duration</p> <p><i>The Custom Alpha Series employs the <u>Taxable Short Duration</u> strategy, duration hedged and levered. This return stream can be ported on to a range of beta exposures</i></p>	

**Available Investment Structures:** Separately Managed Accounts, Private Investment Funds, Collective Investment Trusts, Mutual Funds *(select strategies)*

# SIT INVESTMENT ASSOCIATES PROFESSIONALS

## GLOBAL EQUITY

	Years of Investment Experience	Years with SIA
Roger J. Sit	30	23
Kent L. Johnson, CFA	27	31
Ronald D. Sit, CFA	36	36
David A. Brown, CFA	25	23
Denise A. Anderson, Ph.D.	22	12
Joseph R. Eshoo	25	12
Michael T. Manns	33	6
Michael C. Marzolf	22	4
Mark A. Pepper	21	17
Raymond E. Sit	29	29
Robert W. Sit, CFA	29	29
Stacey M. Curme	23	28
Ningning Tang, CFA	16	13
Bradley W. Meyer	17	19
Lee J. Feltman, CFA	13	13
Eric M. Manthe	9	16
Nicholas D. Tich	12	15
Samuel K. V. Krawczyk	6	6
Michael J. Sit	6	0

**Total Investment Experience: 401 Years**  
**Average Investment Experience: 21.1 Years**

## FIXED INCOME

	Years of Investment Experience	Years with SIA
Roger J. Sit	30	23
Bryce A. Doty, CFA	30	25
Paul J. Jungquist, CFA, CPA	26	26
Mark H. Book, CFA, CMA	34	20
Kurt van Kuller, CFA	40	2
Christopher M. Rasmussen, CFA	20	21
Todd S. Emerson, CFA	26	14
Jessica A. Ersfeld, CFA	13	13
Michael C. Hubbard, CFA	15	9
Michael J. Reich, CFA	16	16
Kevin P. O'Brien, CFA	17	20
Jason B. Miller, CFA	13	7
Andrew J. Tich, CFA	13	14
Nick F. Ochsner, CFA	8	3
Joseph H. Lepinski, CFA	15	13
Marci A. Lorge	36	32
Brian R. Gilbert	26	26
Michael J. Book	5	1

**Total Investment Experience: 353 Years**  
**Average Investment Experience: 20.8 Years**

# RISK-DIVERSIFYING STRATEGY

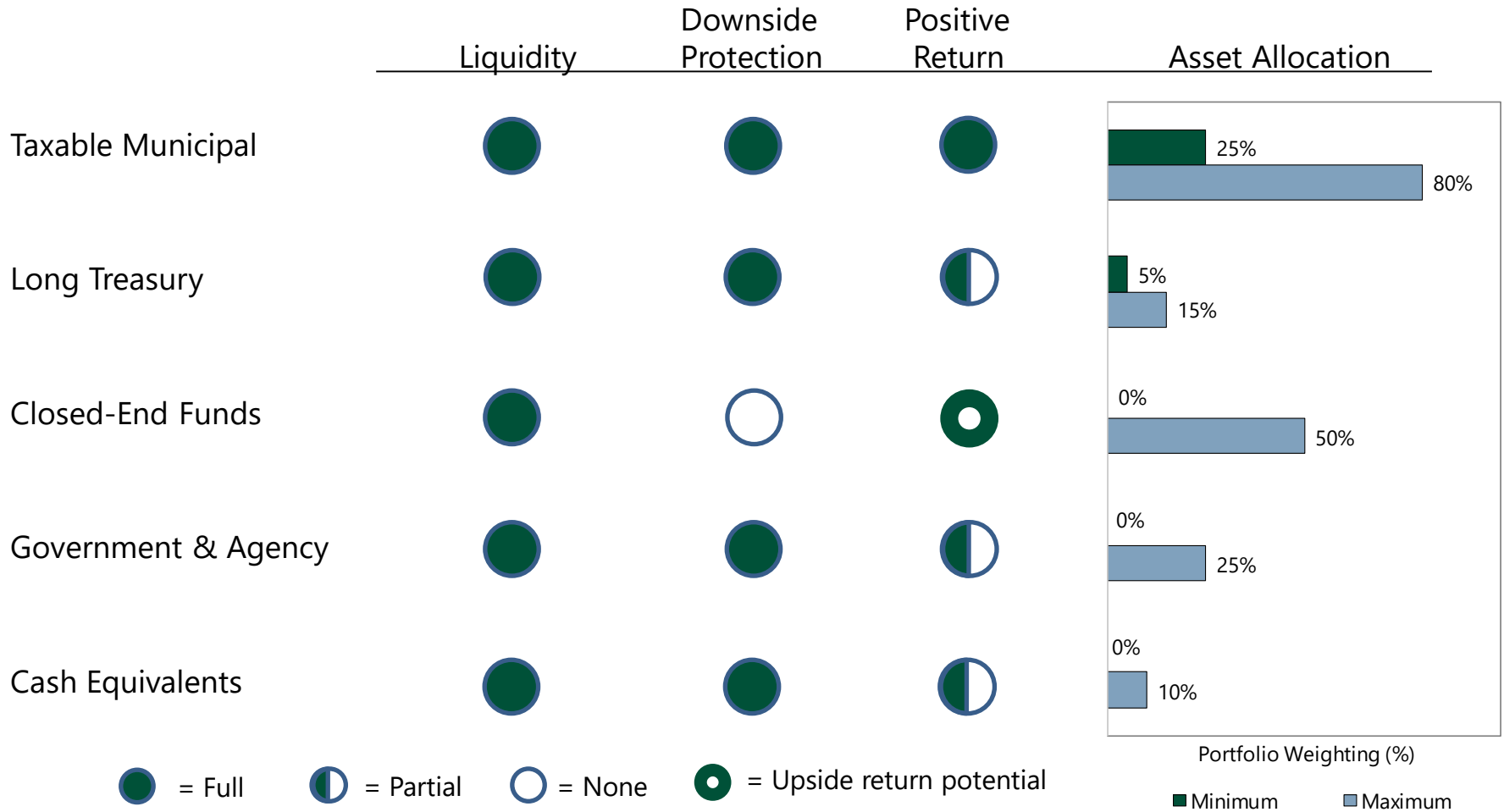
The Investment Objective is three-fold:

1. Positive expected returns in normal market environments
2. High degree of liquidity in periods of market stress
3. Low to negative correlation to the broad equity market

# SIT RISK-DIVERSIFYING STRATEGY

## Dynamic Asset Allocation to Meet Client Objectives

Portfolio allocations will vary based on the investment team's assessment of the optimal mix to achieve the client's strategic objectives.



## POSITIVE CARRY WITH EQUITY DOWNSIDE PROTECTION

<b>Sit Risk-Diversifying Strategy - Risk &amp; Reward Characteristics</b>					
As of 12/31/20					
	<u>1 Yr</u>	<u>3 Yrs</u>	<u>5 Yrs</u>	<u>7 Yrs</u>	<u>10 Yrs</u>
Annualized Return %	4.5	3.4	4.1	4.4	4.5
Standard Deviation	5.0	4.8	4.4	4.4	5.0
Ann Rtn/Std Dev	0.9x	0.7x	0.9x	1.0x	0.9x
Beta to S&P500	0.0	-0.1	-0.1	-0.1	-0.2
Correlation (R <sup>2</sup> )	0.0	0.1	0.1	0.1	0.2
Downside Market Capture %	-14.0	-32.1	-32.2	-34.9	-45.1
Upside Market Capture %	2.4	-2.3	3.1	3.1	0.9
Sharpe Ratio	0.8	0.4	0.7	0.8	0.8
Alpha	4.0	3.0	4.3	4.9	6.2

# SIT RISK DIVERSIFYING STRATEGY – INVESTMENT PROCESS

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## Process Summary

Sit will be blending asset classes with low correlations to each other, which will serve to diversify the portfolio, protect against downside risk, and generate consistent return.

Due to their negative beta to equities, taxable municipal bonds and, to a much smaller degree, long duration treasuries will be core holdings in the portfolio. Closed-end funds will be purchased if they are considered to have significant upside potential. Short and intermediate agency mortgage securities may be used to supplement the yield of the portfolio, manage portfolio duration, and/or lessen the downside risk to equities.

## Investment Components

- Taxable municipal bonds will focus on high quality investment grade currently callable and intermediate duration securities.
- Long duration Treasuries have a very significant negative beta to equities because a flight to quality generally pushes stock prices down and Treasury bond prices up and vice versa. However, to balance this protection against falling equity prices and the risk from rising interest rates, the overall portfolio duration will be capped at a maximum of seven years.
- Closed-end funds rarely have market prices equal to their Net Asset Value (NAV); often they trade below NAV, and this provides an opportunity. Active allocation to CEFs will be determined by the funds' 12-month forward return potential.

# SIT RISK DIVERSIFYING STRATEGY – INVESTMENT PROCESS

## Asset Allocation

### Dynamic Asset Allocation

Portfolio allocations will vary based on the investment team's assessment of the optimal mix to achieve the strategy's objectives.

Taxable Municipal Bonds	25% to 80%
Long Treasuries	5% to 15%
Closed-End Funds	0% to 50%
Gov't Agency Bonds	0% to 25%
Cash Equivalents	0% to 10%

## Active Management

- Minimizing downside volatility and downside risk is the primary focus.
- The strategy will maintain a negative correlation to equity markets while still capturing some of the upside potential by managing allocations across the portfolio segments listed above.
- Sit will invest in taxable closed-end bond funds that reach a relative discount/premium level consistent with a 12-month forward return potential that is in the top third of all historical observations.
- Closed-end equity and tax-exempt municipal bond funds will be included if they reach relative value levels in the top 20%.



# TAXABLE MUNICIPAL BONDS

Strategy	Duration (years)		Yield (12/31/2020)		Benchmark
	Range	12/31/2020	Sit	Benchmark	
Taxable Municipal Bonds	4 – 7	6.2	2.91%	1.16%	Bloomberg Barclays Taxable Municipal Intermediate Bond Index

# TAXABLE MUNICIPAL BOND STRATEGY

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## Investment Opportunity

- Taxable municipals often offer yields in excess of similarly rated corporate bonds.
- Taxable municipal bonds are higher rated on average than corporate bonds, have much lower default rates, have generally less volatile ratings, and more conservative ratings.
  - The intermediate taxable municipal marketplace allows Sit to be defensive while capturing significantly more yield than the Barclays Aggregate Bond Index.
  - Taxable municipal bonds are a valuable diversification tool as an alternative asset class to corporate bonds, mortgage-backed securities, and U.S. Agency bonds.
- Taxable municipal bonds often finance U.S. infrastructure and as such are compatible with Sustainable Investing goals and often meet requirements of Sustainability mandates.
  - Further, many taxable municipal bonds qualify for preferential regulatory classification. European regulatory bodies now provide significantly lower capital charges for investment grade infrastructure project bonds with certain attributes, under the “Qualifying Infrastructure Investment” provision.

# TAXABLE MUNICIPALS HAVE LOWER DEFAULT RATES THAN CORPORATE BONDS

---

## Cumulative Default Rates of Moody's Rated Debt by Year 10, 1970-2019

<u>Municipal</u>	<u>Municipal</u>	<u>Corporate</u>
Aaa	0.0%	0.4%
Aa	0.0%	0.8%
A	0.1%	2.1%
Baa	1.1%	3.6%
All Inv Grade	0.1%	2.3%
All Spec Grade	7.3%	28.7%
All Rated	0.2%	10.2%

- The default rate by year 10 (most cited) between Investment Grade corporates and municipals is over 22:1.
- The default rate by year 20 (longest in study) ratio between Investment Grade corporates and municipals is 30:1.
- The default rate by year 10 between corporate bonds of all ratings and municipals of all ratings is over 63:1.
- Only one-third of the municipal defaults occurred in the General Government and Municipal Utilities sectors.

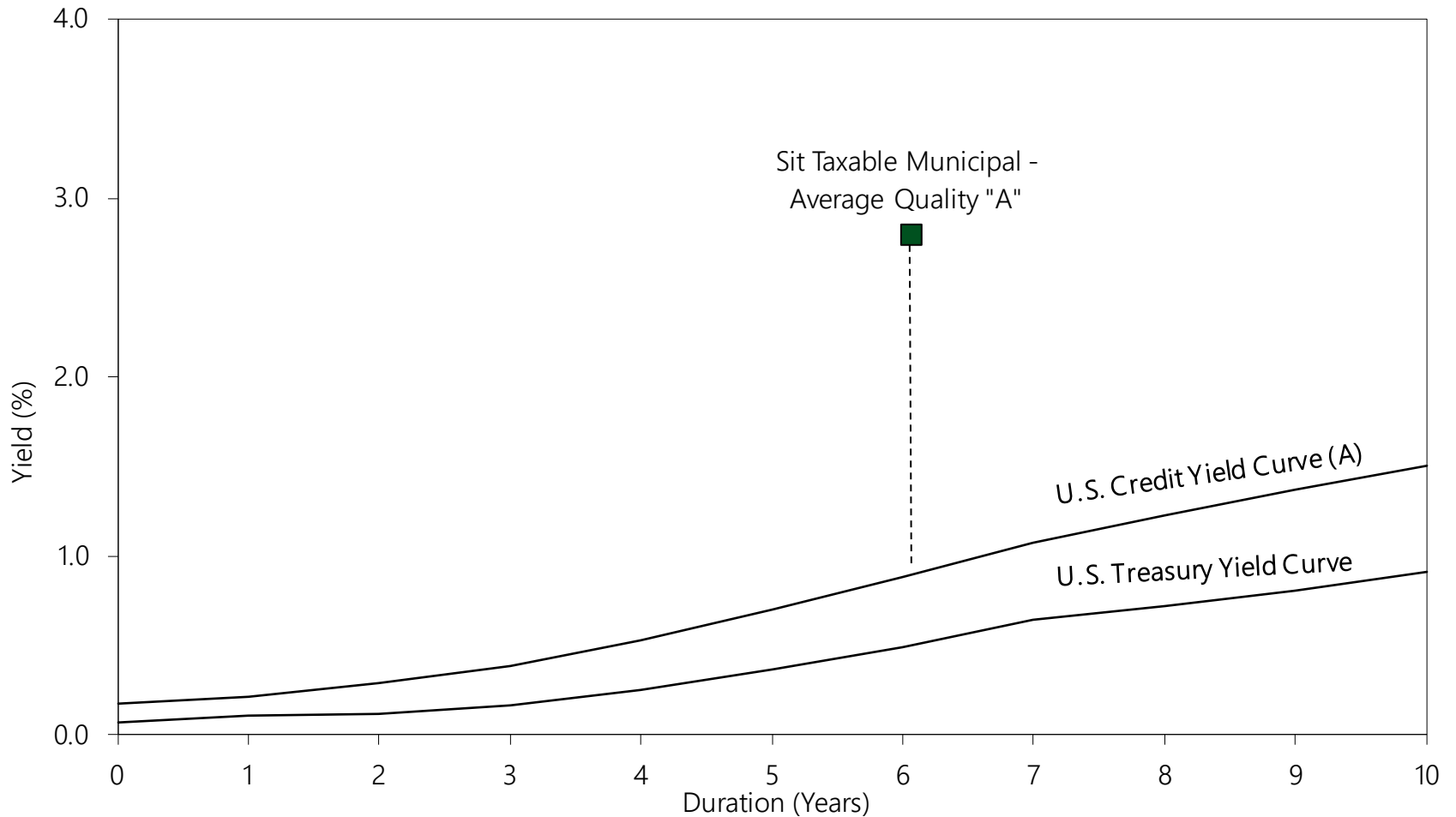
*Source: Moody's Investors Service: "U.S. Municipal Bond Defaults and Recoveries 1970-2019", July 2020*

## TAXABLE MUNICIPALS HAVE LESS DOWNSIDE RISK THAN CORPORATE BONDS

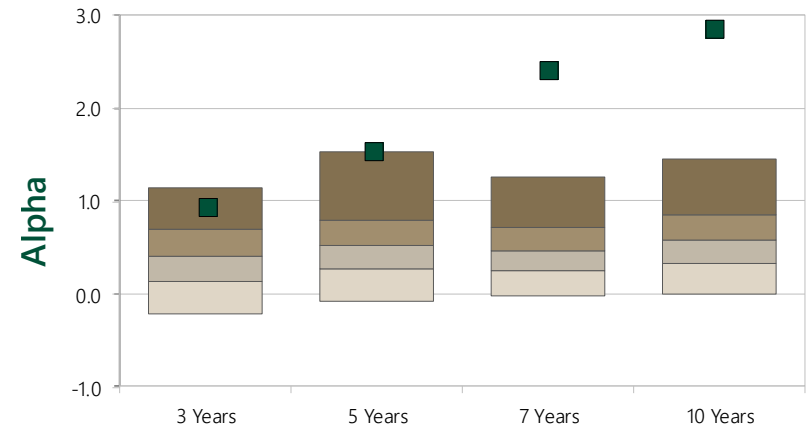
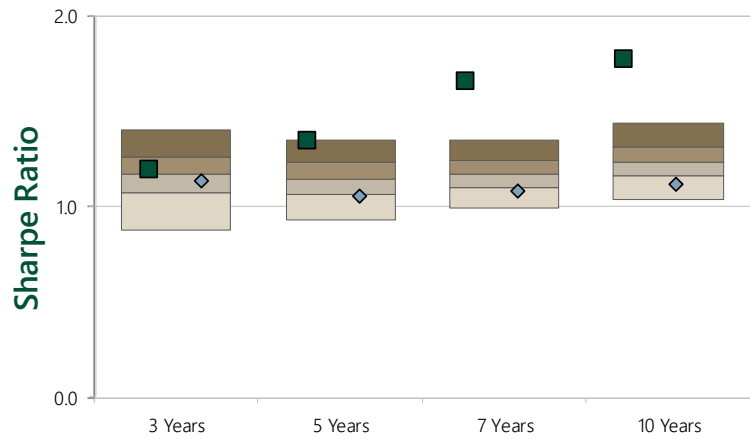
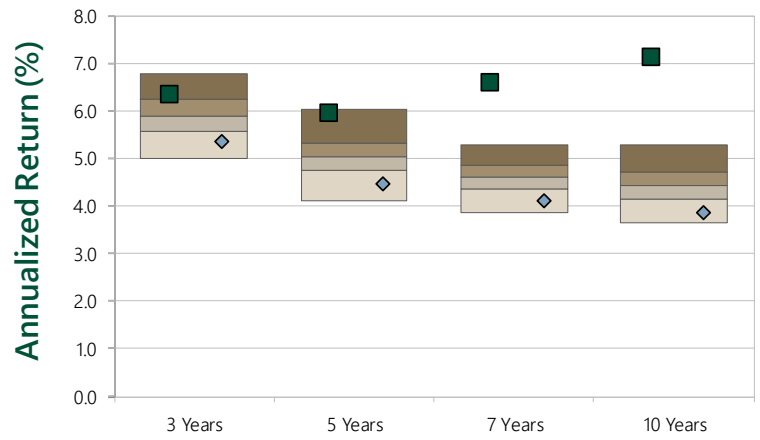
	2008		2015		2018		1Q-2020	
	Return (%)	Corp. Spread Widening	Return (%)	Corp. Spread Widening	Return (%)	Corp. Spread Widening	Return (%)	Corp. Spread Widening
Blmbg Barc Corp. Inv. Grade	-4.94	357 bp	-0.68	34 bp	-2.51	60 bp	-3.63	179 bp
ICE BofAML High Yield	-26.39	1093 bp	-4.64	177 bp	-2.26	183 bp	-13.12	503 bp
S&P 500	-37.00		1.38		-4.38		-19.60	
<b>Sit Taxable Muni</b>	<b>2.89</b>		<b>2.60</b>		<b>3.44</b>		<b>1.82</b>	
Blmbg Barc Taxable Muni	-4.15		1.03		0.62		1.17	
Blmbg Barc Tax Mun Intermed	1.49		2.57		2.35		1.82	

# YIELD CURVE POSITIONING – SIT TAXABLE MUNICIPAL

As of December 31, 2020



# SIT TAXABLE MUNICIPAL STRATEGY VS. THE UNIVERSE – AS OF 12/31/20



■ Sit Taxable Municipal     
 ◆ Bloomberg Barclays Aggregate

Universe: eVestment US Core Fixed Income. (Observations on 1/29/2021: 3yr=234; 5yr=228; 7yr=222; 10yr=216). eVestment Alliance and its affiliated entities (collectively, "eVestment") collect information directly from investment management firms and other sources believed to be reliable; however, eVestment does not guarantee or warrant the accuracy, timeliness, or completeness of the information provided and is not responsible for any errors or omissions. Performance results may be provided with additional disclosures available on eVestment's systems and other important considerations such as fees that may be applicable. All categories not necessarily included, and totals may not equal 100%. Copyright: 2012-2019 eVestment Alliance, LLC. All Rights Reserved.



Past performance is not indicative of future performance. Returns are gross of fees and calculated on a time-weighted total return basis. The information above is supplemental to and complements the composite presentation at the end of the disclosure section. The account information set forth above is for the composite, and is provided for illustrative purposes only. Please refer to the disclosure section for performance information and the composite presentation including net of fees results.

# CLOSED-END MUTUAL FUNDS



# TAXABLE BOND STRATEGY FOR ENHANCED TOTAL RETURN

## Strategy

### Closed-End Investment Grade Bond Funds

The objective of the closed-end investment grade bond strategy is to opportunistically take advantage of inefficiencies in the closed-end investment grade taxable bond fund universe while providing diversification to a traditional fixed income portfolio. Relative incremental value is achieved with significant investments in perpetual and term closed-end bond mutual funds. The strategy utilizes perpetual funds which offer high levels of income and quality are typically purchased at prices which are 5-10% below the fund's Net Asset Value (NAV) per share. The strategy also invests opportunistically in funds where structural changes are occurring, often enhancing their value to full NAV. The strategy may invest in other sectors of the fixed income market in order to achieve its objective.

## Market

As of December 31, 2020, there are 152 taxable closed-end bond funds with a total market value of \$70 billion.

Sit actively focuses on 39 taxable investment grade funds with a total market value of \$18 billion.

### Primary Differences Between Open-End and Closed-End Funds

#### Open-End Funds

Transactions determined by NAV

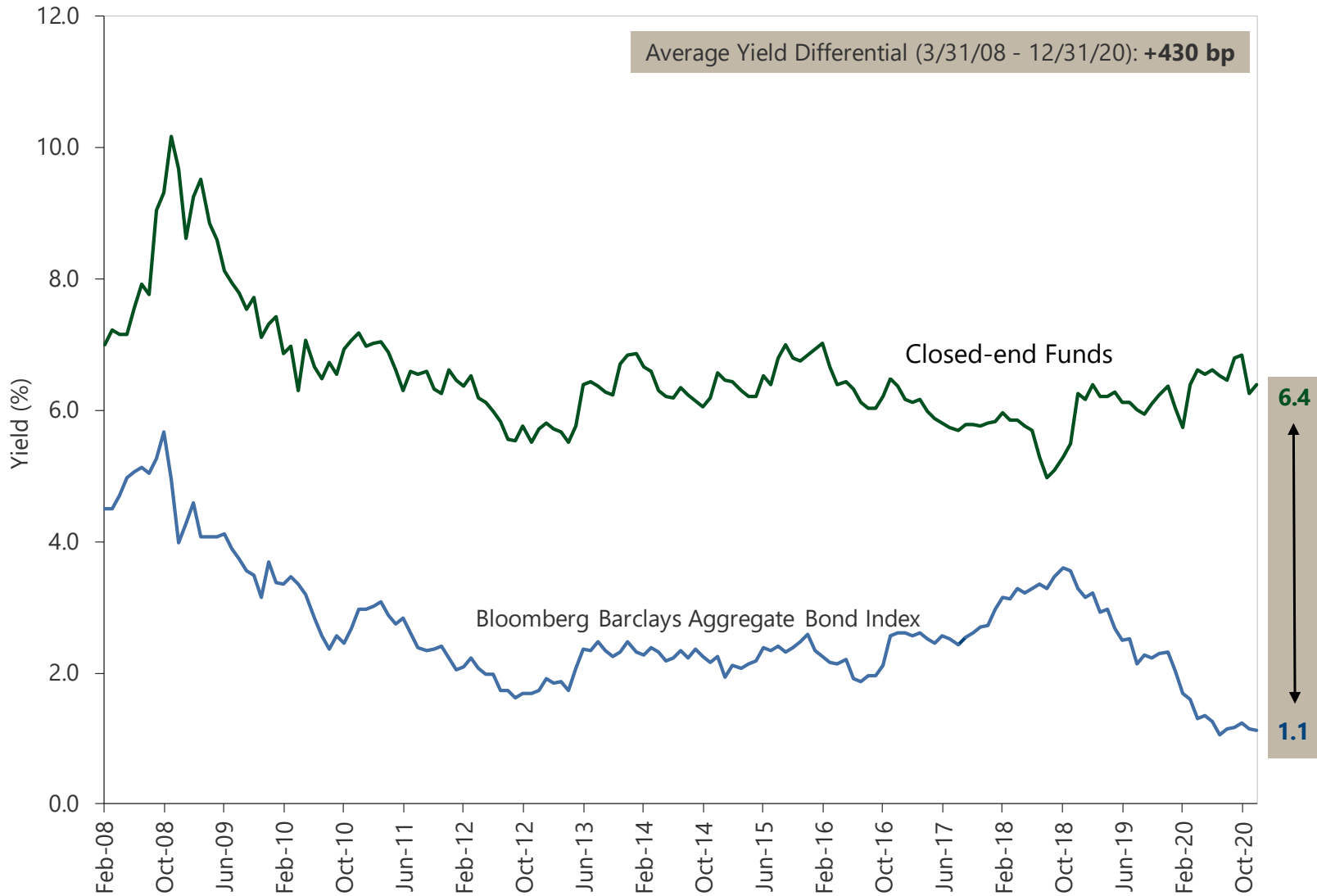
Leverage not employed

#### Closed-End Funds

Transactions based on the auction market (NYSE)

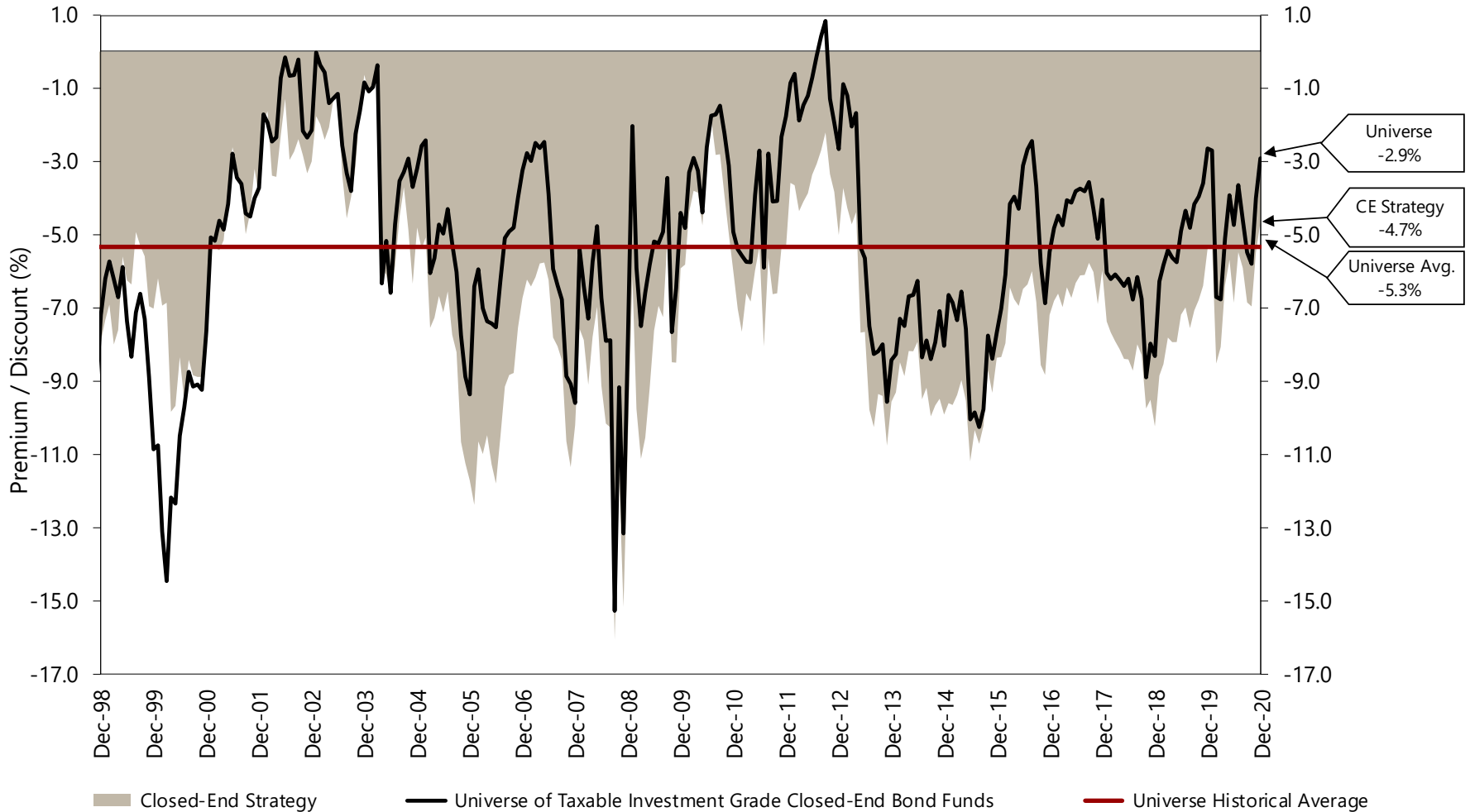
Funds may leverage by 25% - 50% to enhance yield

# SIT CLOSED-END FUNDS YIELD ADVANTAGE



# CLOSED-END BOND FUND DISCOUNT HISTORY

As of December 31, 2020



# ABSOLUTE RETURN STRATEGY FOR ENHANCED TOTAL RETURN

## Strategy

Targeted Opportunity: Closed-End Mutual Funds

A targeted strategy that seeks to benefit from structural changes in closed-end mutual funds. The strategy seeks to achieve strong absolute returns. The objective of the strategy is to identify and invest in closed-end mutual funds that the advisor believes exhibit a minimum annualized return potential of 10%.

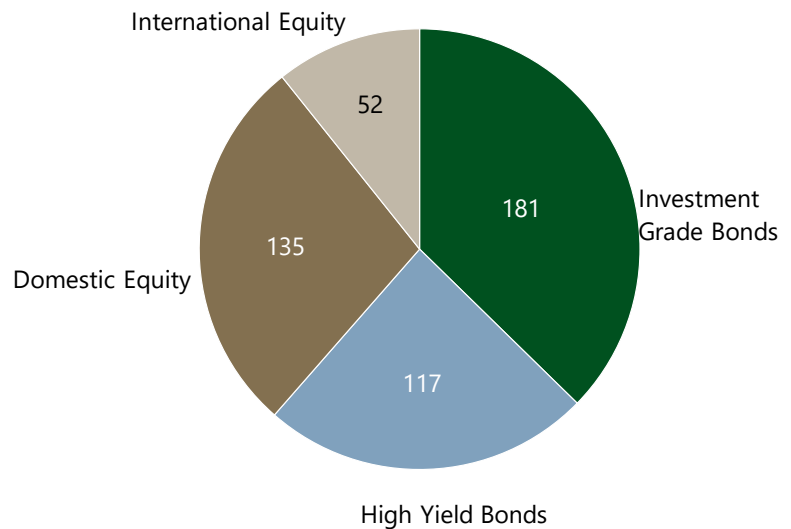
### Strategy Highlights:

- 1.) Total Return Expectation: 8-12% per year
- 2.) Annualized Return Threshold for Investment: 10%
- 3.) Average Estimated Holding Period: 1-10 months
- 4.) Ability to manage underlying market exposure

### Opportunities Include:

- 1.) Rights Offerings
- 2.) Mergers
- 3.) Liquidations / Open-Endings
- 4.) Tender Offers
- 5.) Other situations with exploitable inefficiencies

Closed-End Mutual Fund Universe Totals 485 Funds  
As of 12/31/20



# KEY FACTORS

## Rights Offerings

- Subscription Price Methodology
- Magnitude of Dilution
- Oversubscription Privilege

## Mergers

- Relative Discount
- Relative Size
- Investment Objectives

## Liquidations / Open Endings

- Discount
- Likelihood

## Tender Offers

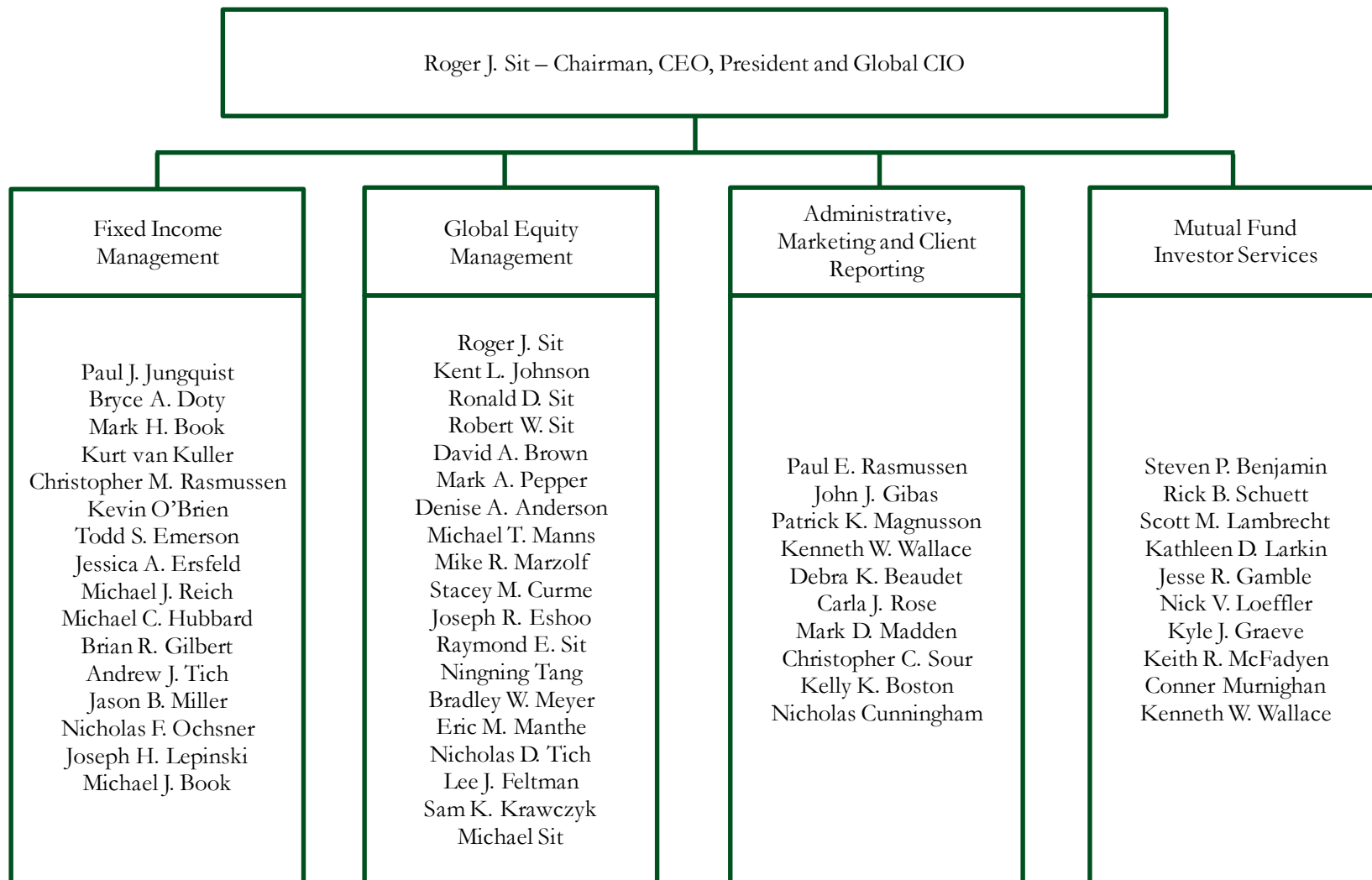
- Discount
- Size
- Shareholder Participation

## Other Opportunities

- Shareholder Initiative
- Tax Loss Trades
- Management Position/Change

# MISCELLANEOUS

# INVESTMENT PROFESSIONALS ORGANIZATION CHART



## BIOGRAPHIES



### **Roger J. Sit**

**CEO and Global Chief Investment Officer**  
29 years investment experience

1998 - Present Sit Investment Associates, Inc.  
1991 - 1998 Goldman Sachs & Co., Vice President  
1984 - 1990 Captain, United States Air Force

Harvard Business School, MBA (1991)  
University of Southern California, MS (1987)  
United States Air Force Academy, BS (1984)

[rjs@sitinvest.com](mailto:rjs@sitinvest.com)



### **Paul J. Jungquist, CFA, CPA, CGMA**

**Senior Vice President, Senior Portfolio Manager**  
26 years investment experience

1994 - Present Sit Investment Associates, Inc.  
1990 - 1994 Twin Cities Testing, Assistant Controller  
1984 - 1990 Grant Thornton, Auditor

University of Minnesota, MBA (1993)  
University of Notre Dame, BBA (1984)

[pjj@sitinvest.com](mailto:pjj@sitinvest.com)



### **Bryce A. Doty, CFA**

**Senior Vice President, Senior Portfolio Manager**  
29 years investment experience

1995 - Present Sit Investment Associates, Inc.  
1988 - 1995 Minnesota Mutual Life Insurance Company,  
Investment Analyst

University of Minnesota, MBA (1992)  
Hamline University, BA (1988)

[bad@sitinvest.com](mailto:bad@sitinvest.com)



### **Kurt van Kuller, CFA**

**Vice President, Portfolio Manager**  
40 years investment experience

2018 - Present Sit Investment Associates, Inc.  
2010 - 2018 MUFG Union Bank, Managing Director  
2009 - 2010 Northeast Securities, Inc., Director Inst Sales  
2007 - 2009 1861 Capital Management, Asst. Portfolio Mgr.  
1991 - 2007 Merrill Lynch, Sr. Director & Manager  
1987 - 1991 Leberthal & Co., Inc., Managing Director  
1984 - 1987 Mosely Securities Corp., Research Director  
1980 - 1984 Standard & Poor's, Rating Officer

SUNY Albany, MBA (1980)  
SUNY Albany, BA (1977)  
[kvk@sitinvest.com](mailto:kvk@sitinvest.com)



### **Mark H. Book, CFA, CMA**

**Vice President, Portfolio Manager**  
34 years investment experience

2000 - Present Sit Investment Associates, Inc.  
1998 - 2000 US Bancorp Piper Jaffray, Corp., VP, Strategist  
1997 Norwest Investment Mgmt., Portfolio Manager  
1991 - 1996 Insight Investment Mgmt., Portfolio Manager  
1986 - 1991 Reliastar Financial Corp., Security Trader

University of Minnesota, MBA (1992)  
University of Minnesota, BA (1986)

[mhb@sitinvest.com](mailto:mhb@sitinvest.com)



### **Christopher M. Rasmussen, CFA**

**Vice President, Portfolio Manager**  
19 years of investment experience

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# FIXED INCOME BIOGRAPHIES



## **Todd S. Emerson, CFA**

**Vice President**

**25 years investment experience**

2006 - Present Sit Investment Associates, Inc.  
2002 - 2006 Thomson West, Finance Manager  
1998 - 2001 U.S. Bank, Senior Financial Analyst  
1994 - 1998 RBC Dain Rauscher, Public Finance Associate  
1991 - 1993 Avco Financial Services, Assistant Manager

University of Minnesota, MBA (1994)  
University of Wisconsin - Eau Claire, BBA (1991)

[tse@sitinvest.com](mailto:tse@sitinvest.com)



## **Jessica A. Ersfeld, CFA**

**Vice President**

**13 years of investment experience**

2007 - Present Sit Investment Associates, Inc.  
2002 - 2007 Wells Fargo Bank, Relationship Specialist II

University of Minnesota, MBA (2006)  
University of St. Thomas, BA (2000)

[jae@sitinvest.com](mailto:jae@sitinvest.com)



## **Michael J. Reich, CFA**

**Vice President, Portfolio Manager**

**15 years investment experience**

2004 - Present Sit Investment Associates, Inc.

University of Minnesota, MBA (2009)  
University of St. Thomas, BA (2005)

[mjr@sitinvest.com](mailto:mjr@sitinvest.com)



## **Michael C. Hubbard, CFA**

**Research Analyst**

**14 years investment experience**

2011 - Present Sit Investment Associates, Inc.  
2008 - 2011 State Street Investment Analytics, Consultant  
2005 - 2008 Adviser Investments, Analyst

Boston College, BS (2001)

[mch@sitinvest.com](mailto:mch@sitinvest.com)



## **Kevin P. O'Brien, CFA**

**Vice President**

**17 years investment experience**

2008 - Present Sit Investment Associates, Inc.  
2005 - 2008 Captain, Minnesota Army National Guard  
1997 - 2005 Sit Investment Associates, Inc.

University of Maryland University College, MS (2015)  
University of St. Thomas, BA (1997)

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## **Andrew J. Tich, CFA**

**Research Analyst**

**12 years investment experience**

2006 - Present Sit Investment Associates, Inc.

University of Minnesota, MBA (2016)  
University of St. Thomas, BS (2009)

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# FIXED INCOME BIOGRAPHIES



## **Jason B. Miller, CFA**

**Municipal Credit Analyst**  
12 years investment experience

2013 - Present Sit Investment Associates, Inc.  
2011 - 2013 Alerus Financial, Investment Research Analyst  
2007 - 2011 Edward Jones, Investment Advisor

Minnesota State University, BS (2007)

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## **Nicholas F. Ochsner, CFA**

**Taxable Credit Analyst**  
8 years investment experience

2017 - Present Sit Investment Associates, Inc.  
2015 - 2017 Health Care Service Corporation, Analyst  
2012 - 2015 Blue Rock Advisors, Analyst

University of Minnesota, BS (2011)

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## **Joseph H. Lepinski, CFA**

**Municipal Credit Assistant**  
14 years investment experience

2007 - Present Sit Investment Associates, Inc.  
2005 - 2007 Raymond James, Financial Advisor

University of St. Thomas, MBA (2015)  
University of St. Thomas, BA (2005)

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## **Michael J. Book**

**Municipal Credit Associate**  
4 years investment experience

2019 - Present Sit Investment Associates, Inc.  
2015 - 2009 Piper Jaffray

University of Wisconsin-Eau Claire, BA (2015)

[mjb@sitinvest.com](mailto:mjb@sitinvest.com)



## **Brian R. Gilbert**

**Decision Support Systems**  
25 years investment experience

1994 - Present Sit Investment Associates, Inc.  
1992 - 1994 Norwest Mortgage, Inc.,  
Conventional Post-Closing Coordinator  
1990 - 1992 Carlson Companies, T5 Project Coordinator

Northwestern College, BA and BS (1990)

[brg@sitinvest.com](mailto:brg@sitinvest.com)



## **John J. Gibas**

**Vice President - Institutional Marketing**

2012 - Present Sit Investment Associates, Inc.  
2010 - 2012 RBC Global Asset Management,  
Institutional Marketing  
2008 - 2010 Piper Jaffray Investment Management,  
Institutional Marketing  
1998 - 2008 USBancorp, FAF Advisors,  
Institutional Marketing

1979 - 1998 Piper Jaffray, Institutional  
University of Minnesota, MBA (1981), BS (1977)

[jjg@sitinvest.com](mailto:jjg@sitinvest.com)

# IMPORTANT DISCLOSURES

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## **Performance Results – Gross of Fees**

Gross returns were calculated on a time-weighted total return basis, including all dividends and interest, accrued income, realized and unrealized gains or losses. Returns for periods greater than one year are annualized. Gross of fees performance is presented net of brokerage commissions and execution costs, but does not reflect deduction for custodial and investment advisory fees, or the impact of income taxes. These expenses will reduce a client's return. For example, a \$5 million portfolio earning a 10% annualized return over 5 years would be valued at \$8.1 million. The same portfolio with an annual fee of 0.75% would be valued at \$7.8 million net of investment management fees. Advisory fees are described in Form ADV part 2. Please see the composite presentation including net of fees results at the end of the disclosure section.

The composite presentation includes a description of the securities held in the composite portfolio.

Index returns are presented as total returns, reflecting both price performance and income from dividend payments. The indexes are unmanaged and reflect no fees or expenses.

Past performance is not indicative of future performance. Investment return and principal value of an investment will fluctuate so that the value of an account may be worth more or less than the original invested cost.

**This gross performance presentation is intended for use in meetings with certain investors, or to be provided to consultants who are instructed to provide this information only on a one-on-one basis with qualified clients with the above disclosures.**

## **Supplemental Information**

Portfolio characteristic information is supplemental to and complements the composite presentation at the end of the disclosure section. The account characteristic information presented is for the composite and is provided for illustrative purposes only. Characteristics of the composite may differ from other accounts in the composite. Allocations and security selection are subject to change. There is no assurance that any security discussed herein will remain in an account's portfolio.

The information provided in this report should not be considered a recommendation of any particular security or strategy.

## **eVestment Alliance Peer Ranks**

Peer rankings represent percentile rankings which are based on monthly gross of fee returns and reflect where the Sit Investment composite returns fall within the indicated eVestment Alliance, LLC ("eVestment") universe. eVestment provides the institutional investment database which consists of institutional managers, investment consultants, plan sponsors and other similar financial institutions reporting on investment products. Performance figures are provided to eVestment by individual investment management firms for informational purposes only. eVestment does not guarantee the accuracy, adequacy, completeness or availability of any information and is not responsible for any errors or omissions or for the results obtained from the use of such information. Additional information regarding eVestment rankings is available on eVestment's website. This presentation is intended for institutional investor use only.

## THE SIT FIXED INCOME ADVANTAGE

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- Disciplined investment philosophy
- Enthusiastic client base
- Comprehensive monthly reporting
- Strong commitment to client service
- Demonstrated track record
- Compelling risk-adjusted returns
- Highly motivated investment team
- Independently owned — Financially sound
- Strategies tailored to client needs
- Consistent return



Meeting Date  
**02/24/2021**  
Agenda Item  
**#7**

## MEMORANDUM

Date: February 24, 2021  
To: CCCERA Board of Retirement  
From: Gail Strohl, Chief Executive Officer  
Subject: Consider and take possible action to authorize the CEO to execute a contract with Milliman Inc. for Other Post-Employment Benefits (OPEB) Trust actuarial services

---

### ***Background***

As an employer, CCCERA is responsible for the cost of retiree health benefits for CCCERA employees who retired on or after January 1, 2015, the date CCCERA became an independent employer. The funding set aside to fund the OPEB liability is being accumulated in an OPEB Irrevocable Trust and reported as part of CCCERA's audited Comprehensive Annual Financial Report (CAFR).

The OPEB Trust should obtain, at a minimum, an actuarial valuation every two years (biennial) along with a roll-forward valuation for the in-between year. The most recent OPEB Trust full valuation was as of December 31, 2018 and a full valuation is due as of December 31, 2020.

On November 18, 2020, the Board of Retirement approved the issuance of a request for proposal (RFP) for OPEB Trust actuarial services to determine the best value of service for CCCERA.

On December 18, 2020 an RFP was issued for OPEB Trust actuarial services with responses due by January 22, 2021.

CCCERA received seven proposals of which four were selected for further review by an evaluation committee consisting of the Deputy CEO, Accounting Manager, and Admin/HR Manager. The four firms selected for further review were:

1. Milliman Inc.
2. Van Iwaarden Associates
3. DFA Actuaries
4. Precision Actuarial Inc.

The evaluation committee reviewed the four proposals based on the following criteria: 1) respondent’s understanding of services required, 2) qualifications and related experience, 3) proposed fees, 3) competence and professional qualifications, 4) interview and references.

Milliman Inc. was selected as the finalist based on these criteria, including its continuing familiarity and knowledge of CCCERA’s current and on-going actuarial needs relating to the OPEB Trust.

The proposed fixed fees for OPEB Trust biennial valuation actuarial services and hourly rates for additional work are as follows:

<i>Actuarial Services</i>	<i>Fiscal Year Ending</i>	<i>Fees</i>
Full Valuation	2020	\$13,500
Roll Forward Valuation	2021	\$5,000
Full Valuation	2022	\$14,000
Roll Forward Valuation	2023	\$5,500
Full Valuation	2024	\$15,000
Roll Forward Valuation	2025	\$5,500

<i>Consulting Team</i>	<i>Role</i>	<i>Hourly Rate</i>
John Botsford	Lead Principal Consulting Actuary	\$480
Reid Earnhardt	Associate Consulting Actuary	\$345
David Yu	Senior Actuarial Analyst	\$280
Other	Technical, Administrative Support	\$100-\$200

***Recommendation***

Consider and take possible action to authorize the CEO to execute a contract with Milliman, Inc. for OPEB Trust actuarial services for the six fiscal years 2020-2025.



*Meeting Date*  
**02/24/2021**  
*Agenda Item*  
**#8a.**

**Verus**<sup>777</sup>



**PERSPECTIVES  
THAT DRIVE  
ENTERPRISE  
SUCCESS**



**PERIOD ENDING: DECEMBER 31, 2020**

Investment Performance Review for

**Contra Costa County Employees' Retirement Association**

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Investment Landscape

TAB I

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Investment Performance  
Review

TAB II





**PERSPECTIVES  
THAT DRIVE  
ENTERPRISE  
SUCCESS**

1<sup>ST</sup> QUARTER 2021  
Investment Landscape



# Recent Verus research

Visit: <https://www.verusinvestments.com/insights/>

## Topics of interest

### IS PAINLESS DIVERSIFICATION DEAD?

Interest rates have collapsed in developed economies in past years, and more recently at home in the United States, which has greatly dampened investors' performance outlook for diversified portfolios. These events have led many investors to question the traditional role of fixed income. In this Topic of Interest white paper, we outline some issues that investors must come to terms with, and we begin to unpick ways of thinking about diversification and preservation of capital in the new market environment.

### INTEGRATING ESG INTO ACTIVE PORTFOLIOS

In this paper, we address how environmental, social, and governance (ESG) considerations are integrated into our manager research process. We address Verus' approach to ESG issues when advising clients and link that to what ESG due diligence looks like in researching investment managers. Next, we consider the spectrum of ESG integration as defined by the primary objective of the product. Finally, we address the challenges that ESG considerations pose for hedge fund managers and private equity general partners.

### QUANTIFYING ESG IN PORTFOLIO CONSTRUCTION

Environmental, social, and governance (ESG) investing is a wide-ranging field that encompasses many different approaches. Investors are integrating ESG into the creation of their policies, investment beliefs, strategic asset allocations, manager selection decisions, and much more. ESG ratings and scores allow investors to understand and compare the ESG profile of companies and managers. ESG screens can serve as an effective tool for investors to identify exposures that may conflict with their institutional values.

### AGREEING ON ESG

This paper sheds light on the difficulty institutional investors face as they embark on their journey toward implementing a thoughtful ESG policy that fits their specific organization and is designed to help them cut through the clutter by providing a detailed, practical "soup-to-nuts" methodology to determine the best policy for their organization.

## Annual research

### 2021 CAPITAL MARKET ASSUMPTIONS

Learn about the 2020 market movements and how these shifts have affected our long-term outlook.

## Sound thinking

### FINDING COMFORT IN AN UNCOMFORTABLE WORLD

An outline of various topics that an investor might want to add to their agenda for the coming year.

## Up and coming event

### EMERGING & DIVERSE MANAGERS DILIGENCE DAYS

For the third consecutive year, Verus is inviting qualified managers to participate in one-on-one meetings with its senior staff during its 3rd Emerging and Diverse Manager Diligence Days.

- March 16-18
- March 22
- March 24
- March 26

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Economic environment 6

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Fixed income rates & credit 21

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Equity 26

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Other assets 36

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Appendix 38

# 4<sup>th</sup> quarter summary

## THE ECONOMIC CLIMATE

- Real GDP grew at a -2.8% rate year-over-year in the third quarter (+33.4% quarterly annualized rate) as the U.S. economy recovered much of the economic activity lost in the second quarter. **p. 11**
- Joe Biden was elected President of the United States. The market seemed to interpret a Biden win as a mild positive for risk assets, on the expectation of larger economic stimulus. Democrats also took both seats in the Georgia run-off election, completing the party's "Blue Wave". **p. 7**
- Several new, more-infectious strains of COVID-19 emerged and spread around the world, though experts remain confident in the efficacy of the currently-approved arsenal of vaccines. **p. 7**

## PORTFOLIO IMPACTS

- Emerging market equities (+19.7%) outperformed U.S. (+12.1%) and international developed equities (+16.0%) once again in Q4. Latin American equities showed significant outperformance (+34.8%), after years of lagging behind other emerging markets. **p. 32**
- The U.S. 10-year TIPS breakeven inflation rate headed notably higher over the quarter, from 1.6% in September to 2.0% in December. Although U.S. inflation is lower than pre-pandemic levels, market pricing for inflation is the highest since 2018. **p. 12**

## THE INVESTMENT CLIMATE

- Congress passed an omnibus spending bill, including \$900 billion earmarked for COVID-19 relief. Key features of the package included a re-up of the Paycheck Protection Program, \$600 stimulus checks for most individuals, and \$300 per week in additional unemployment benefits over a 10-week period. **p. 11**
- According to FactSet, S&P 500 Q4 earnings are expected to be down -8.8%. This estimate improved from the -12.7% drop expected on September 30th. For full year 2020, analysts are expecting a -13.3% earnings decline. **p. 26**

## ASSET ALLOCATION ISSUES

- U.S. equities delivered +12.1% during the quarter, ending the year at an all-time-high. The S&P 500 was one of the strongest equity markets in 2020, up +18.4% despite an earnings recession and considerable uncertainty. **p. 28**
- Weakness in the U.S. dollar remained a theme in Q4, and the Bloomberg Dollar Spot Index fell to a two and a half year low. Analysts attributed some of the weakness in the US dollar to lower relative real yields in the U.S. **p. 37**
- Within the U.S. market, a sizable rotation occurred in Q4 as certain sectors that had been beaten-down during the pandemic performed strongly. Rising energy prices boosted the Energy sector, while higher interest rates improved the outlook for Financials. **p. 28**

A more neutral risk positioning may be warranted in the current environment

There seems to be a high degree of uncertainty regarding the future market path

# What drove the market in Q4?

**“The Mass Distribution of Covid-19 Vaccines Is Under Way. ‘Everything Has to Come Together.’”**

## COVID-19 U.S. HOSPITALIZATION RATE

7/25	8/29	9/26	10/31	11/28	12/26
7.6%	4.4%	4.1%	8.7%	16.6%	10.4%

Article Source: Wall Street Journal, December 13<sup>th</sup>, 2020

**“Congress agrees to \$900 billion Covid stimulus deal after months of failed negotiations”**

## U.S. TOTAL PUBLIC DEBT OUTSTANDING (TRILLIONS)

Jul	Aug	Sep	Oct	Nov	Dec
\$26.5	\$26.7	\$26.9	\$27.1	\$27.4	\$27.7

Article Source: CNBC, December 20<sup>th</sup>, 2020

**“Powell says stock prices are not necessarily high considering the low level of interest rates”**

## TEN-YEAR U.S. REAL YIELD (NOMINAL YIELD MINUS BREAKEVEN INFLATION)

Jul	Aug	Sep	Oct	Nov	Dec
-1.03%	-1.10%	-0.95%	-0.83%	-0.95%	-1.07%

Article Source: CNBC, December 16<sup>th</sup>, 2020

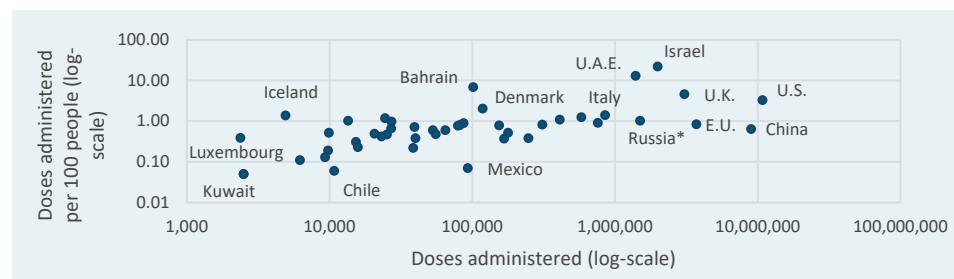
**“Dollar’s Slump Propels Global Peers Toward Multi-Year Peaks”**

## BLOOMBERG DOLLAR SPOT INDEX

Jul	Aug	Sep	Oct	Nov	Dec
1179	1161	1177	1172	1145	1120

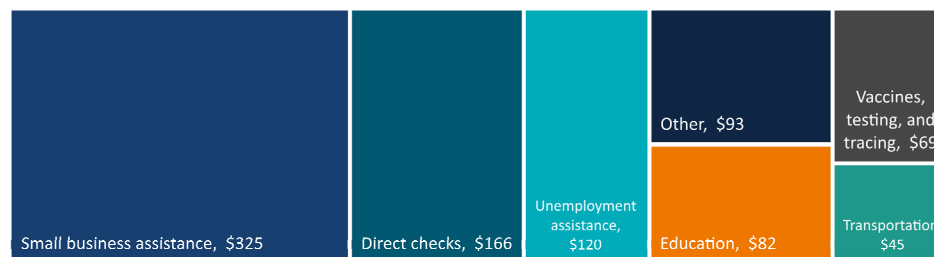
Article Source: Bloomberg, November 29<sup>th</sup>, 2020

## GLOBAL VACCINATION CAMPAIGN



Source: Bloomberg, as of 1/13/21, or most recent release

## MOST RECENT FISCAL STIMULUS PACKAGE ALLOCATIONS (BILLIONS)



Source: U.S. House of Representatives, as of 12/21/20

## S&P 500 INDEX



Source: Standard & Poor's, Bloomberg, as of 12/31/20

# Economic environment

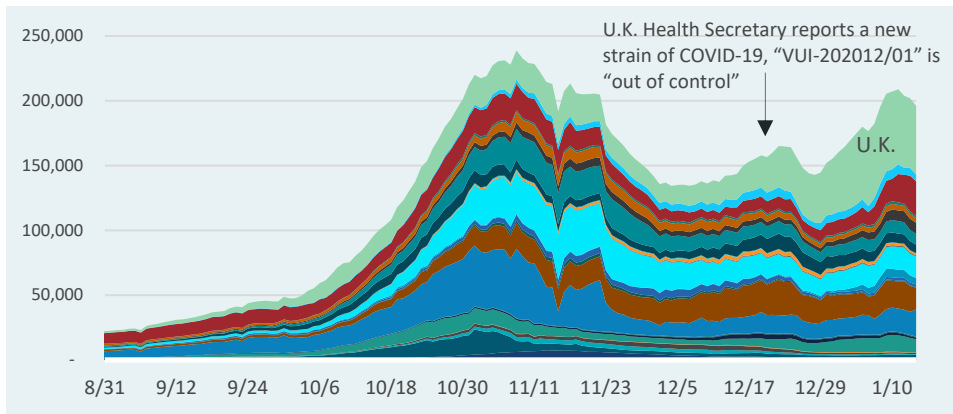
# U.S. economics summary

- Real GDP grew at a -2.8% rate year-over-year in the third quarter (+33.4% quarterly annualized rate) as the U.S. economy recovered much of the economic activity lost in the second quarter.
- The Atlanta Fed’s forecast for fourth quarter growth was 7.4% quarter-over-quarter, as of January 15<sup>th</sup>, suggesting further economy expansion.
- Joe Biden was elected President of the United States in November. Jon Ossoff and Raphael Warnock both won in the Georgia Senate runoff elections in January, which ensured democratic control of both the White House and the Senate with V.P.-elect Kamala Harris as the swing vote. The wins completed the democratic “Blue Wave” many have associated with extensive fiscal support. Slim democratic majorities in both chambers of Congress, however, may constrain Biden’s policy scope.
- After impressive employment gains in Q3, the recovery appeared to be stalling in recent months. Unemployment fell from 7.8% in September to 6.7% in December.
- Consumer sentiment remained stubbornly low, despite broad recoveries in consumer spending, auto sales, and the housing market.
- Home sales activity continued to grow at an extremely fast pace in the fourth quarter, as record-low interest rates and the work-from-home environment fueled demand. Existing home sales were 25.8% higher than one-year prior.
- Several new, more-infectious strains of COVID-19 emerged and spread around the world, though experts remain confident in the efficacy of the currently-approved arsenal of vaccines. The global vaccination campaign began in December, and 44 million doses have been distributed so far.

	Most Recent	12 Months Prior
GDP (YoY)	(2.8%) 9/30/20	2.1% 9/30/19
Inflation (CPI YoY, Core)	1.6% 12/31/20	2.3% 12/31/19
Expected Inflation (5yr-5yr forward)	2.0% 12/31/20	1.8% 12/31/19
Fed Funds Target Range	0% – 0.25% 12/31/20	1.50% – 1.75% 12/31/19
10-Year Rate	0.9% 12/31/20	1.9% 12/31/19
U-3 Unemployment	6.7% 12/31/20	3.5% 12/31/19
U-6 Unemployment	11.7% 12/31/20	6.7% 12/31/19

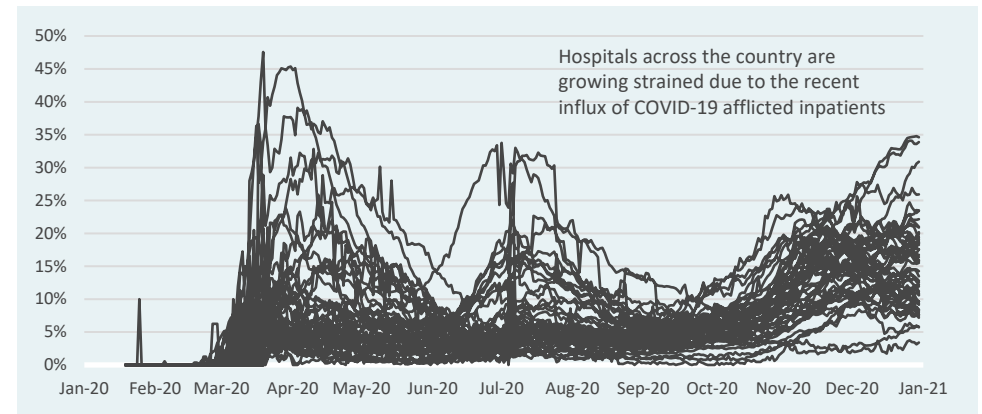
# COVID-19 update

## SEVEN-DAY AVERAGE DAILY CASE GROWTH – EUROPE AND THE U.K.



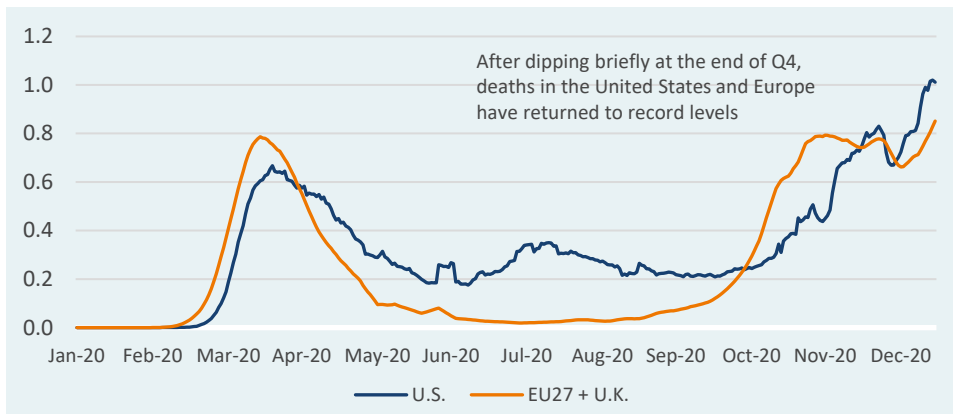
Source: Bloomberg, as of 1/14/21

## COVID-19 INPATIENTS BY U.S. STATE (%)



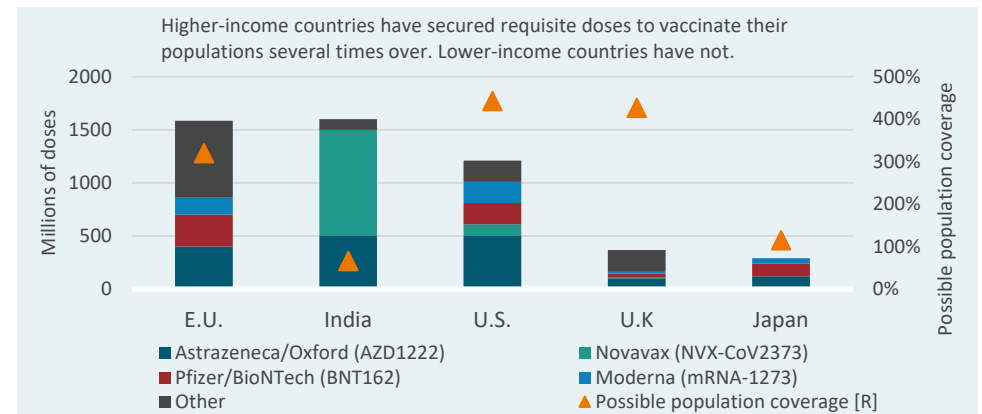
Source: Bloomberg, as of 1/9/21

## SEVEN-DAY AVERAGE DAILY DEATHS PER 100,000 IN POPULATION



Source: Bloomberg, as of 1/14/21

## VACCINE COVERAGE BY COUNTRY

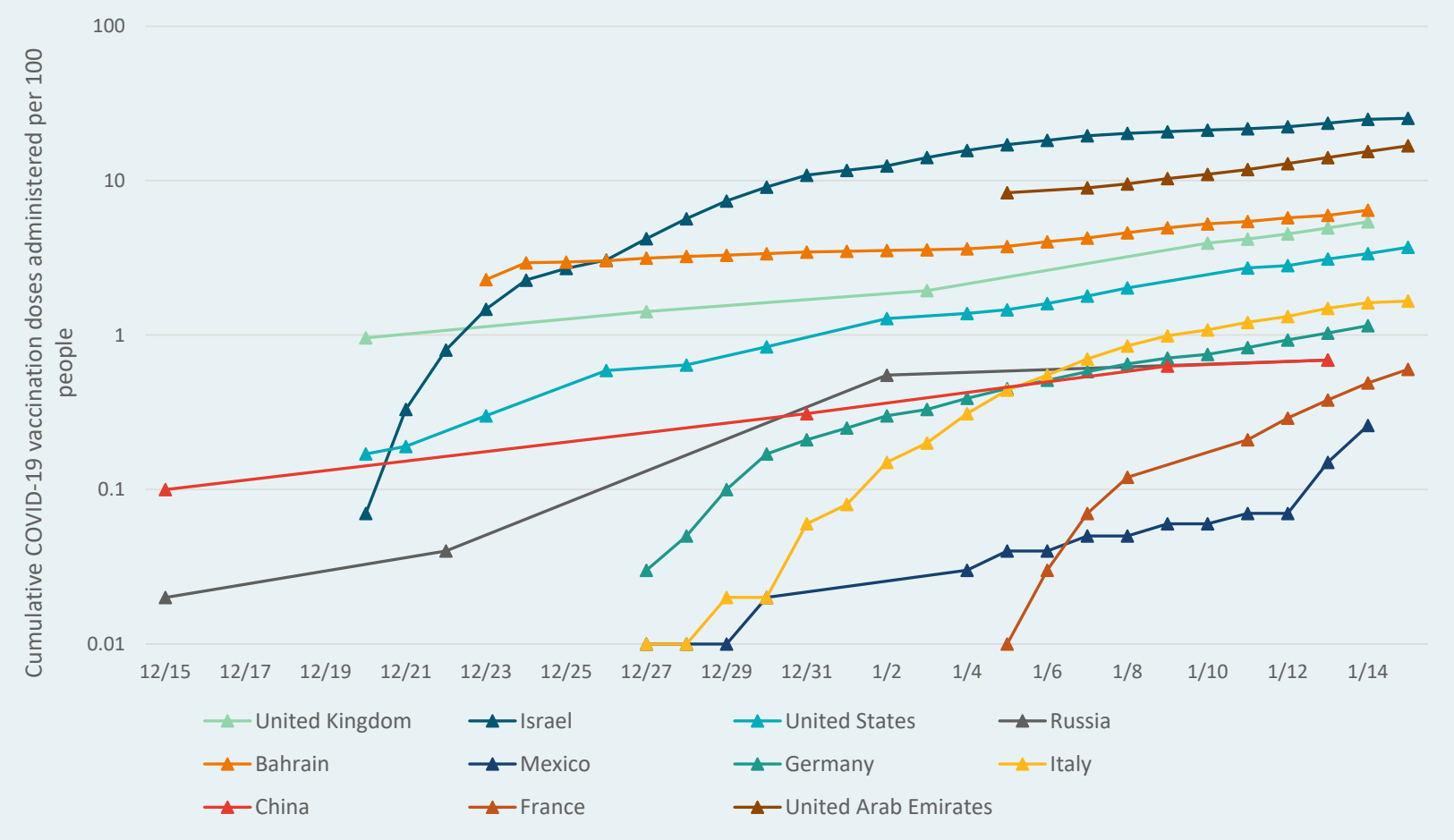


Source: Duke Global Health Innovation Center, as of 1/8/21; possible population coverage includes confirmed and potential doses committed to – it is possible not all vaccines will be approved.



# Global vaccination campaign

CUMULATIVE COVID-19 VACCINE DOSES ADMINISTERED PER 100 PEOPLE

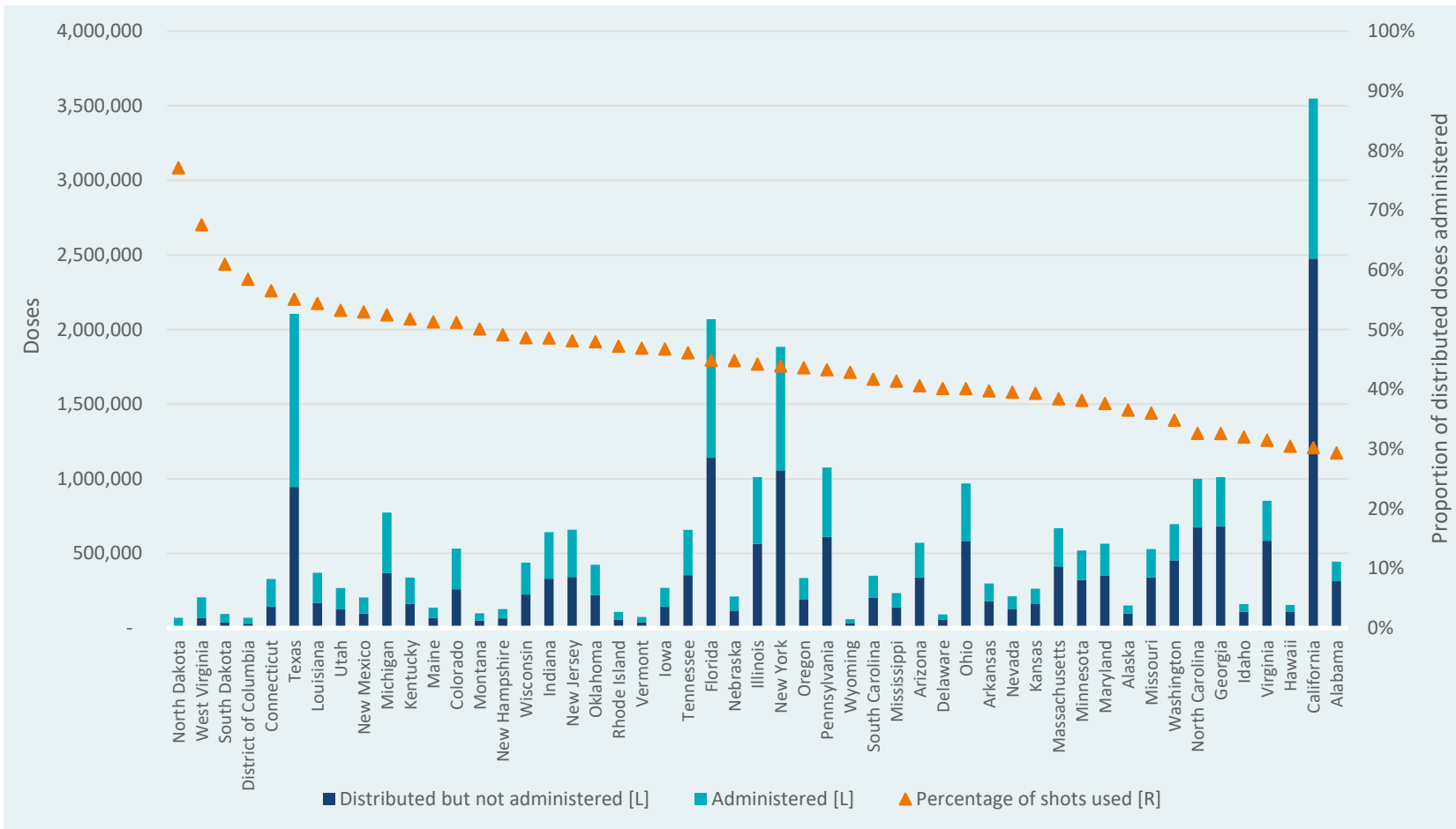


Israel has led the way so far, but it is a country with a size and population comparable to New Jersey

Source: Our World in Data, as of 1/15/21

# Administration issues in the U.S.

THE GAP BETWEEN DISTRIBUTED AND ADMINISTERED VACCINE DOSES



As of January 15<sup>th</sup>, roughly 13 million doses had been administered nationwide, accounting for roughly 42% of all doses distributed

President Biden is aiming to achieve 100 million vaccine dose administrations in his first 100 days in office

Source: Bloomberg, as of 1/15/21

# GDP growth

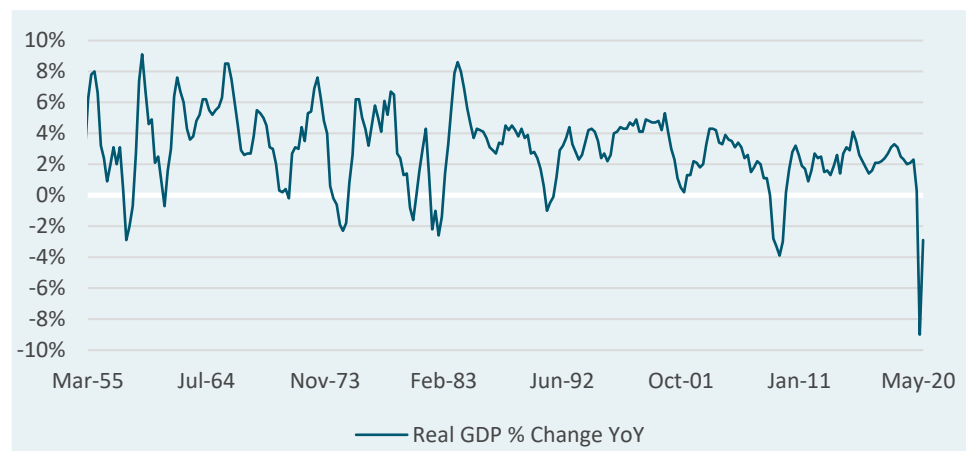
Real GDP grew at a -2.8% rate year-over-year in the third quarter (+33.4% quarterly annualized rate) as the U.S. economy recovered much of the economic activity lost during the depths of the pandemic. Personal consumption expenditures expanded at a quarterly annualized pace of -25.4%. Growth was broad-based, and included strong private investment, exports, and inventory builds.

Not only was this bounce-back a product of pent-up demand released by the economic reopening, it was also the result of a coordinated and historic stimulus effort by the U.S.

government. After the Federal Reserve took interest rates to zero and flooded the markets with liquidity, Congress passed an omnibus spending bill, including \$900 billion earmarked for COVID-19 relief. Key features of the package included a re-up of the Paycheck Protection Program, \$600 stimulus checks for most individuals, and \$300 per week in additional unemployment benefits over a 10-week period.

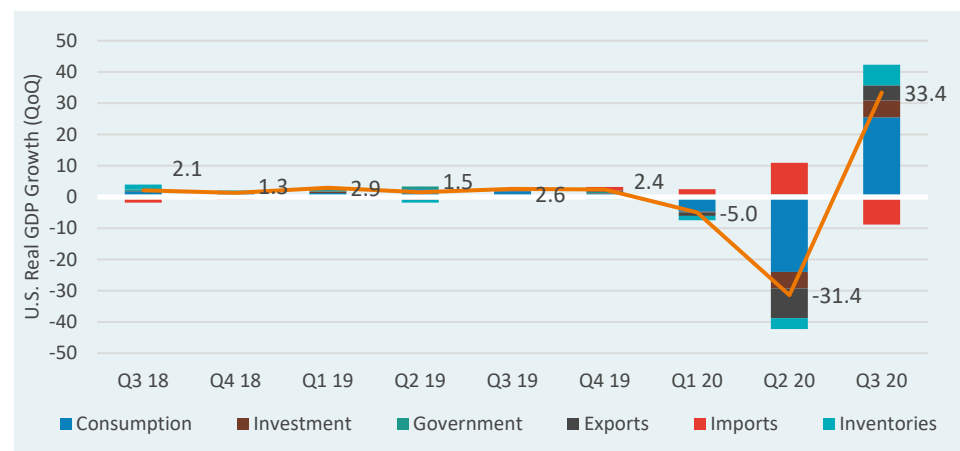
The Atlanta Fed's forecast for Q4 growth was 7.4% on a quarter-over-quarter annualized basis (-1.7% year-over-year) as of January 15<sup>th</sup>, suggesting further economic recovery.

**U.S. REAL GDP GROWTH (YOY)**



Source: Bloomberg, as of 9/30/20

**U.S. GDP GROWTH ATTRIBUTION**



Source: BEA, annualized quarterly rate, as of 9/30/20

# Inflation

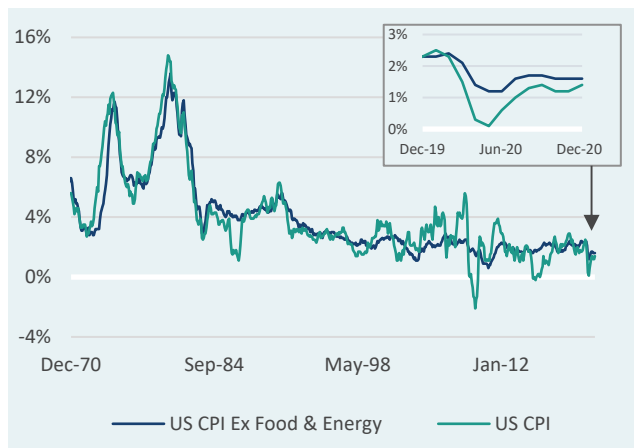
Headline inflation stayed relatively stable during Q4, at 1.4% year-over-year in December. Energy prices have acted as a drag on inflation, with gasoline (-15.2%) and fuel oil (-20.0%) showing the largest moves. Food (+3.9%), as well as used cars & trucks (+10.0%), had a lifting effect on inflation during the year. Inflation excluding volatile food and energy prices increased 1.6%.

The U.S. 10-year TIPS breakeven inflation rate headed notably higher over the quarter, from 1.6% in September to

2.0% in December. Although U.S. inflation is lower than pre-pandemic levels, market pricing for inflation is the highest since 2018.

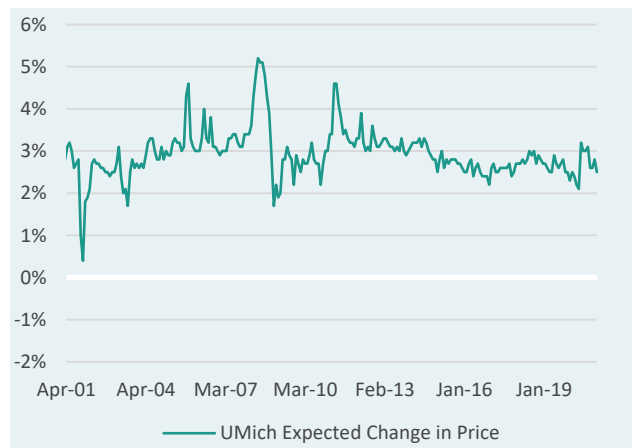
Consumer inflation expectations, as indicated by the University of Michigan survey, proved volatile throughout the year. After starting 2020 at an expected 2.3% rate of inflation, expectations fell to 2.1% in April before spiking to 3.2% in May. Expectations fell in the fourth quarter and settled at 2.5% in December.

**U.S. CPI (YOY)**



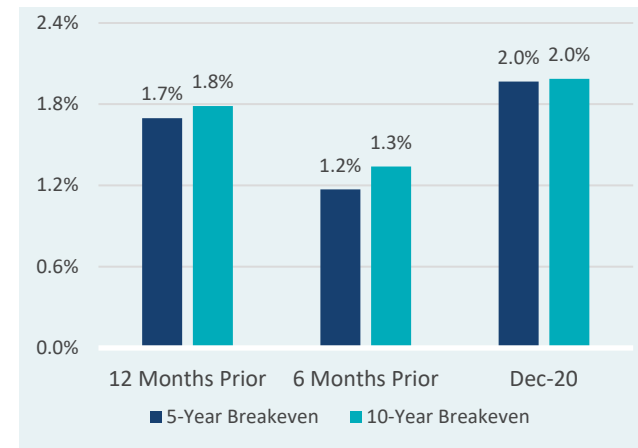
Source: Bloomberg, as of 12/31/20

**CONSUMER INFLATION EXPECTATIONS**



Source: University of Michigan, as of 12/31/20

**BREAKEVEN INFLATION RATES**



Source: Bloomberg, as of 12/31/20

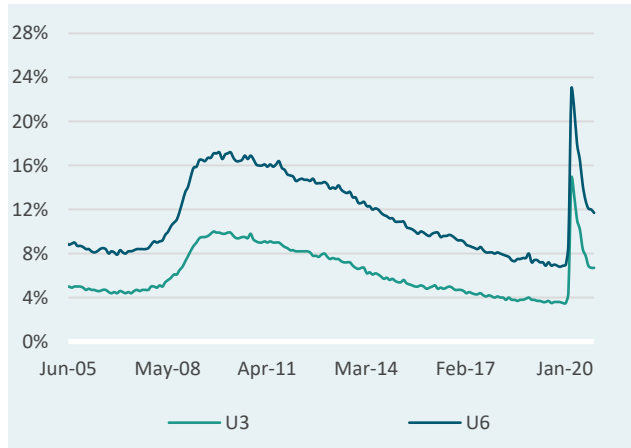
# Labor market

After impressive employment gains in Q3, the recovery appeared to be stalling in recent months. Unemployment fell from 7.8% in September to 6.7% in December—a small improvement compared to previous months. Additionally, while the current unemployment rate does not seem exceptionally weak from a historical perspective, this metric masks the fact that the U.S. labor force participation rate also fell during COVID-19. In simpler terms, since the pandemic, roughly 3% of workers are now unemployed and seeking work, and an additional 2% of workers are now unemployed and *not* seeking work.

During an economic recession, it is important to understand the portion of newly unemployed workers who seek to quickly rejoin the workforce (cyclical unemployment), relative to the portion of workers who lose their jobs and end up more permanently out of work due to lack of opportunities or discouragement (structural unemployment). As shown in the chart below, a growing share of unemployed workers have remained out of work since the onset of the economic recession.

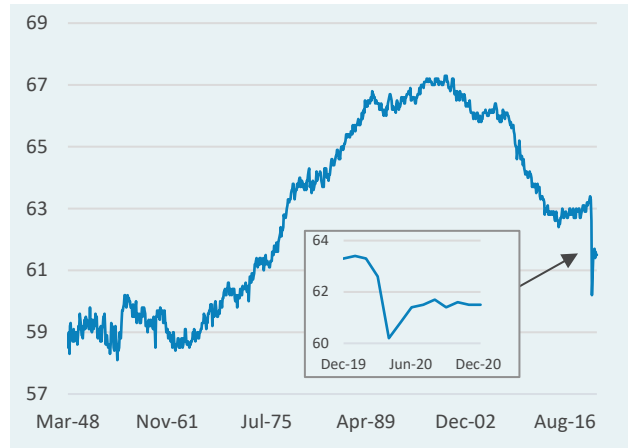
The U.S. employment recovery appears to be stalling

U.S. UNEMPLOYMENT



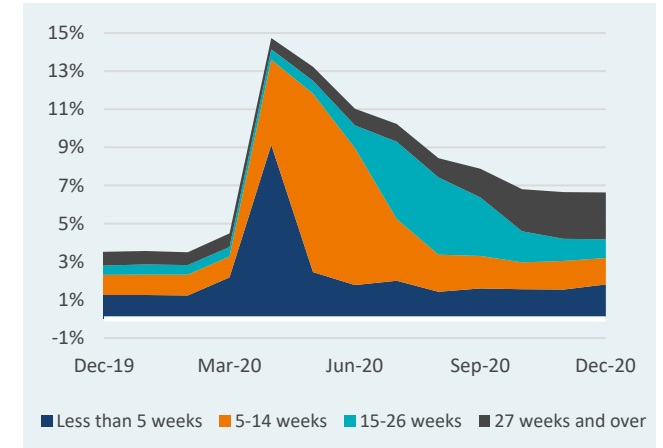
Source: FRED, as of 12/31/20

LABOR PARTICIPATION RATE



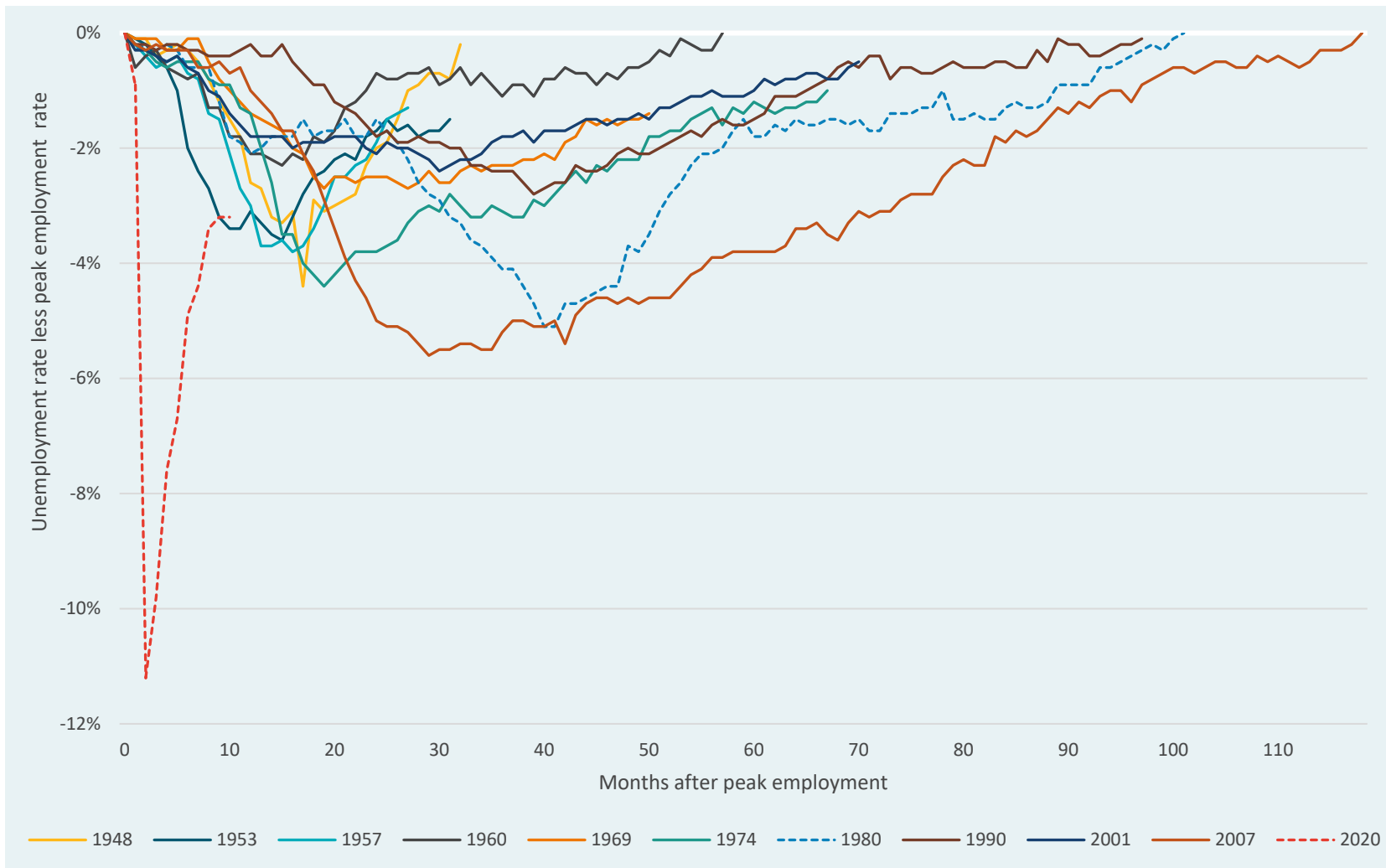
Source: FRED, as of 12/31/20

UNEMPLOYMENT DECOMPOSITION BY DURATION



Source: BLS, as of 12/31/20

# U-3 unemployment rates relative to peaks

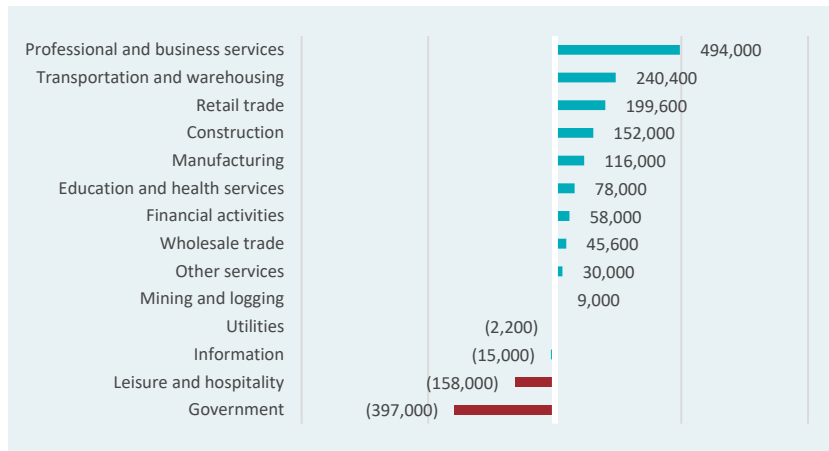


The Covid-19 recession features a historically-abrupt loss and subsequent rebound in broad unemployment

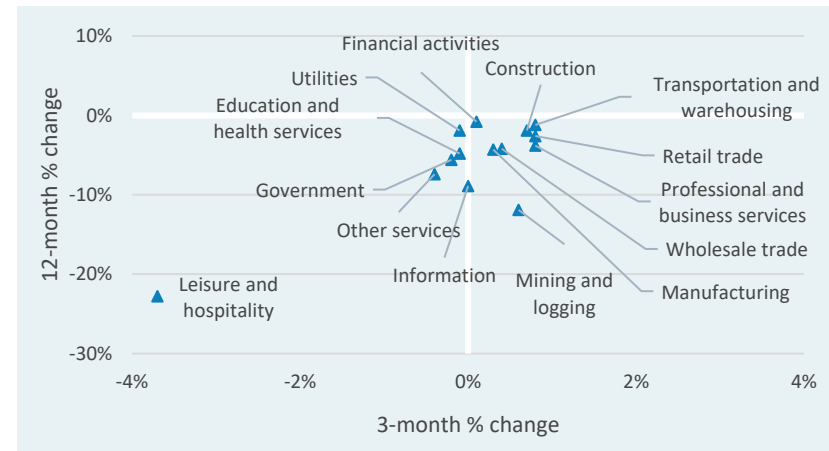
Source: Bloomberg, BLS, as of 12/31/20

# Employment conditions

## Q4 2020 NONFARM PAYROLLS CHANGES

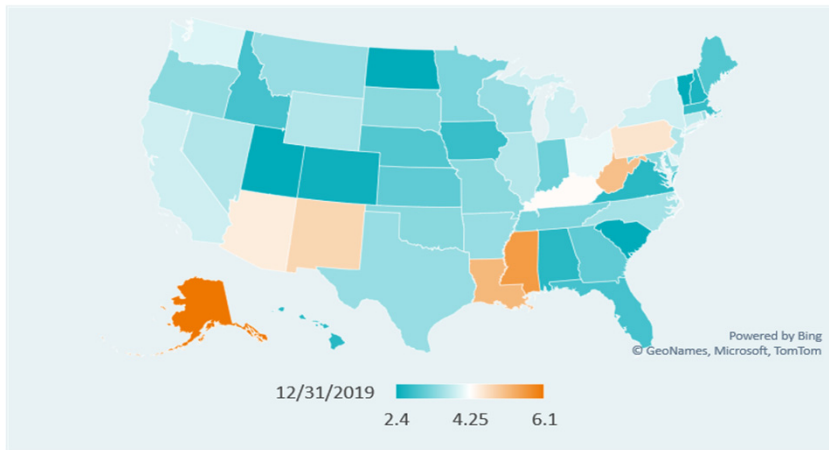


## NONFARM PAYROLL GROWTH BY SECTOR

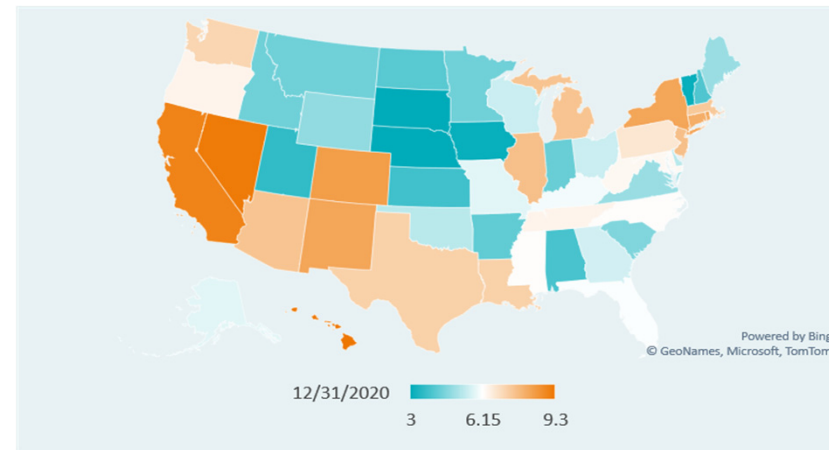


While employment in many sectors bounced back in Q4, jobs in the leisure and hospitality sector dipped as the impact of state lockdowns began to show up in the payrolls data

## U-3 UNEMPLOYMENT (12/31/2019)



## U-3 UNEMPLOYMENT (12/31/2020)



Despite the broad gains in the 4<sup>th</sup> quarter, nonfarm payrolls shrunk in every sector over the full calendar year

Source: BLS, as of 12/31/20 – or most recent release

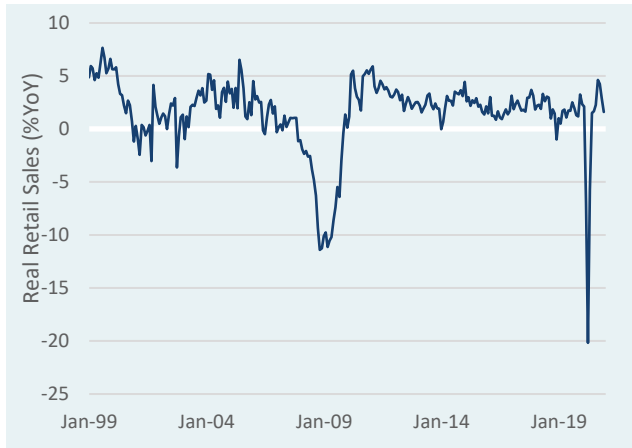
# The consumer

U.S. retail sales have shown a surprising recovery after falling -20% year-over-year in April. Retail sales, after adjusting for inflation, increased 1.6% in December. Spending patterns have shown resiliency despite the economic slowdown. Automobile and home sale activity, for example, has recovered to previous levels.

However, recent spending patterns have been vastly affected by unprecedented government stimulus. Because this expansion was far from a “natural” recovery, it will be worth watching how consumption trends change as the various economic stimulus programs end. This effect may already be apparent as retail sales growth slowed from 4.6% in September to 1.6% in December.

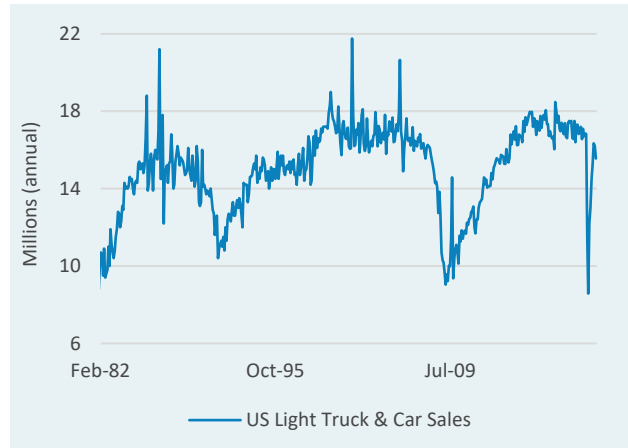
According to anonymized cellular phone data collected by Google for COVID-19 public health research, Americans began returning to their daily routines through late spring and summer, as activity began moving back to normalcy. However, these improvements plateaued across certain types of activities such as workplace travel, retail & recreation, and transit station usage, and this activity has slowed down once again. Continued weak activity, or even a further slowdown due to renewed government restrictions, could cast doubt on the U.S. economic recovery.

**REAL RETAIL SALES GROWTH (YOY)**



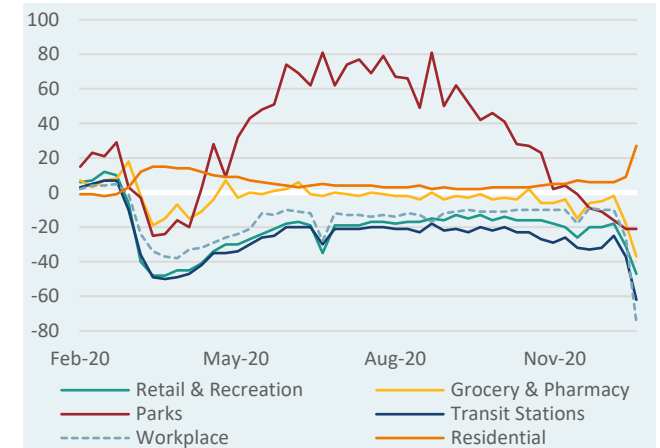
Source: FRED, as of 12/31/20

**AUTO SALES**



Source: Federal Reserve, as of 11/30/20

**GOOGLE U.S. ACTIVITY TRACKER**



Source: Google anonymized U.S. citizen mobility, as of 12/31/20



# Sentiment

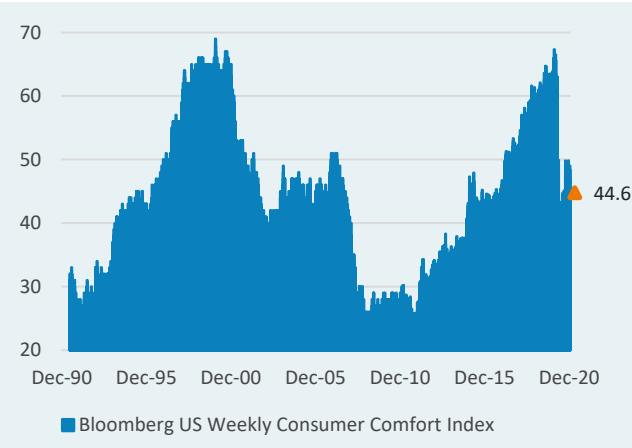
Consumer sentiment remained stubbornly low during the fourth quarter, despite broad recoveries in consumer spending, auto sales, and the housing market.

The Bloomberg Consumer Comfort Index attempts to gauge Americans’ views on the economy, their personal financial situation, and buying conditions. The index fell from 49.3 to 44.6 during the quarter. The University of Michigan Consumer Sentiment Survey attempts to gauge attitudes about the business climate, personal finances, and spending conditions. The index was flat at 80.7 in Q4—down from a

cycle high of 101.0 in February.

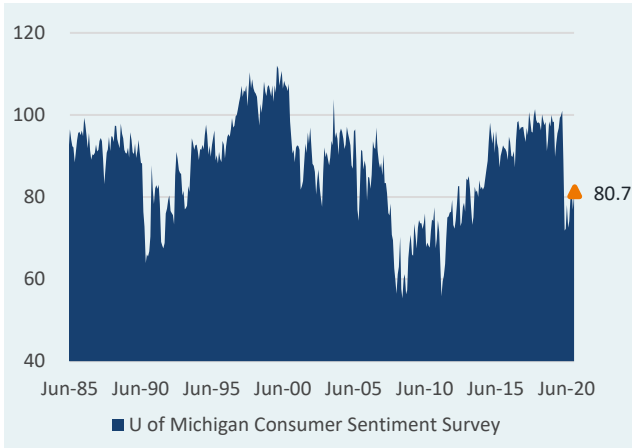
The NFIB Small Business Optimism Index exhibited a sharp decline to 95.9 in Q4, bringing the index back towards pandemic lows. The survey suggested that most business owners expect deteriorating conditions over the next six months. The survey also showed that concerns exist regarding government-mandated business closures due to COVID-19, and that the new U.S. administration may be less friendly toward the business community.

**CONSUMER COMFORT**



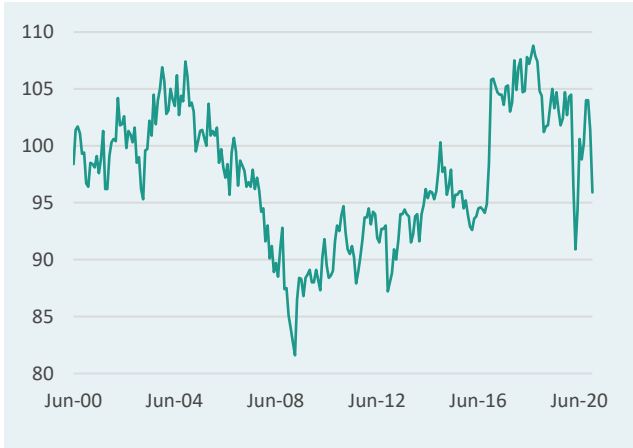
Source: Bloomberg, as of 12/31/20

**CONSUMER SENTIMENT**



Source: University of Michigan, as of 12/31/20

**SMALL BUSINESS OPTIMISM**



Source: NFIB, as of 12/31/20

# Housing

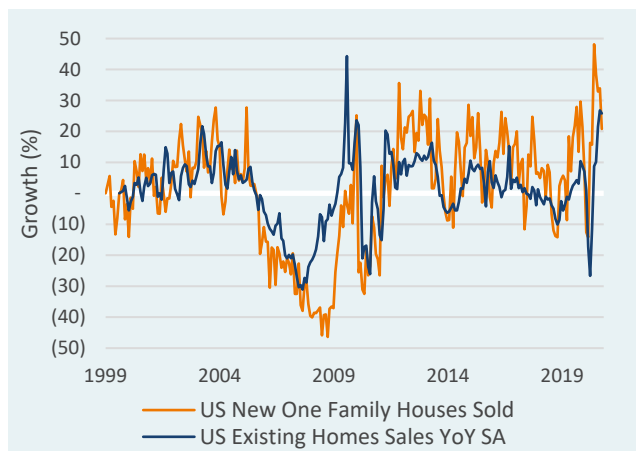
Home sales activity continued to grow at an extremely fast pace in the fourth quarter, as record-low interest rates and the work-from-home environment fueled demand. It remains to be seen the degree to which business work-from-home policies become permanent, post-pandemic. The direction of these trends may have a far-reaching impact on home sales as workers seek more space for home offices, and perhaps also feel greater freedom to move outside of major urban areas. Existing home sales were 25.8% higher than one-year prior, an overall rate of growth not experienced in over a decade.

Despite a gradual bounce-back of U.S. Treasury interest rates,

the 30-year U.S. Fixed Mortgage Rate has continued to move lower. The direction of mortgage rates from here will likely have a material impact on home prices.

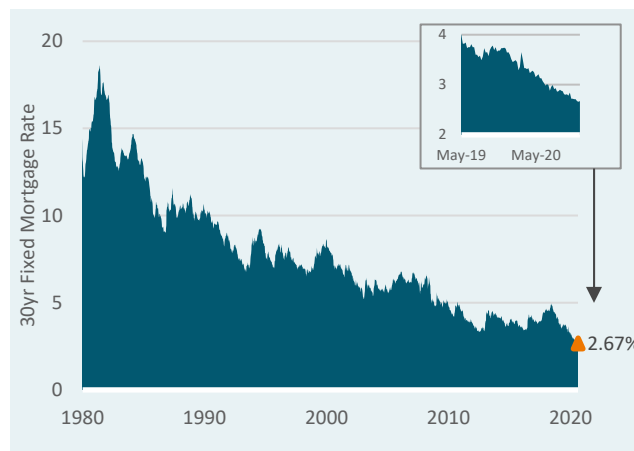
It is important to note that the overall cost of owning a home is a combination of home prices and borrowing rates (among many other variables, of course). While the price of a new home in the U.S. is, on average, higher than ever before, record-low interest rates have compensated for higher prices. As suggested by the Housing Affordability Index, the overall cost of owning a home today is below-average, historically speaking.

**U.S. HOME SALES (YOY)**



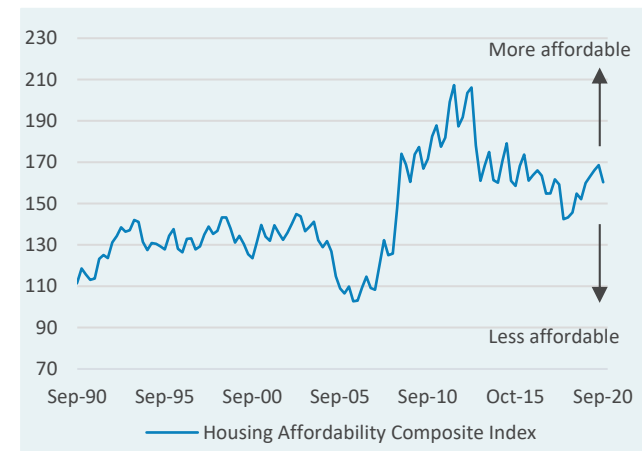
Source: FRED, as of 11/30/20

**30-YEAR FIXED MORTGAGE RATE (AVERAGE)**



Source: FRED, as of 12/31/20

**HOUSING AFFORDABILITY INDEX**



Source: National Association of Realtors, as of 9/30/20

# International economics summary

- Economic growth in Q3, although negative on a year-over-year basis, painted an optimistic picture of the recovery. Consumers and businesses around the world have attempted to continue on, despite recent lockdowns, restrictions, and safety concerns. GDP growth figures have improved markedly from the depths of Q2. Most economies have recovered more than half of lost activity experienced during the prior quarter.
- European Union leaders agreed on a historic €1.8 trillion budget-and-recovery plan for 2021-2027, paving the way for a €750-billion pandemic relief package which will be financed by joint debt issuance.
- U.K. and E.U. officials reached an official trade deal at the 11<sup>th</sup> hour before the December 31<sup>st</sup>, 2020 conclusion of the transition period following Britain's official cutting of ties with the E.U. last January. The

agreement marked the beginning of a new chapter in the history of British relations with Europe.

- Governments have taken different approaches to supporting workers, and while many approaches have had similar economic effects, they have often had drastically different impacts on official unemployment figures. We believe official unemployment figures are of limited value in this environment—more in-depth analysis is likely required.
- The pandemic placed downward pressure on inflation. Since then, inflation levels have generally remained muted in developed markets while recovering moderately in emerging economies. China appears to be an outlier, as inflation has recently dipped below zero. This move was fueled by falling pork prices, which had been moving higher in recent years and pushing up inflation.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	(2.8%) 9/30/20	1.4% 12/31/20	6.7% 12/31/20
Eurozone	(4.3%) 9/30/20	(0.3%) 12/31/20	8.3% 11/30/20
Japan	(5.7%) 9/30/20	(1.3%) 12/31/20	2.8% 11/30/20
BRICS Nations	1.9% 9/30/20	1.5% 12/31/20	5.1% 12/31/20
Brazil	(3.9%) 9/30/20	4.5% 12/31/20	14.3% 10/31/20
Russia	(3.4%) 9/30/20	4.9% 12/31/20	6.1% 11/30/20
India	(7.5%) 9/30/20	4.6% 12/31/20	9.1% 12/31/20
China	2.3% 12/31/20	0.2% 12/31/20	4.2% 12/31/20

*NOTE: India lacks reliable government unemployment data. Unemployment rate shown above is estimated from the Centre for Monitoring Indian Economy*

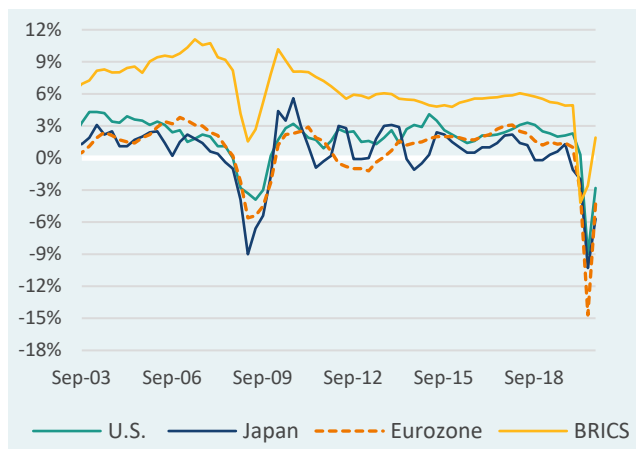
# International economics

Economic growth in Q3, although negative on a year-over-year basis, painted an optimistic picture of the recovery. Consumers and businesses around the world have attempted to continue on, despite recent lockdowns, restrictions, and safety concerns. GDP growth figures have improved markedly from the depths of Q2. Most economies have recovered more than half of lost activity seen during the prior quarter. The direction of recovery was similar across the emerging markets, and these economies have maintained their growth “premium” over developed markets throughout the crisis.

Unemployment in the Eurozone has fallen slightly to 8.3%

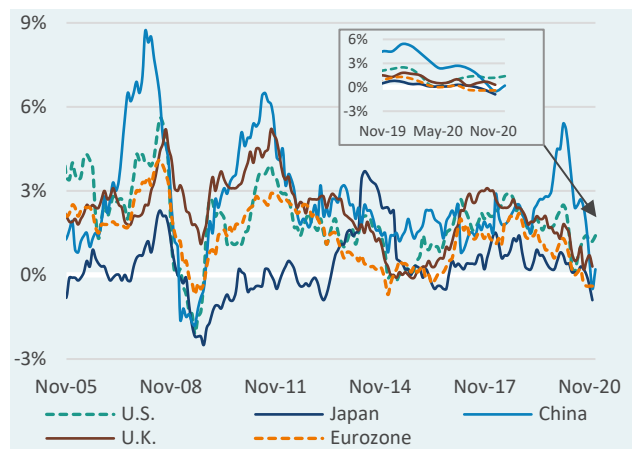
from a high of 8.7% in July. Governments around the world have taken different approaches to supporting workers. One approach, as taken by the U.S., was to provide greater financial support to workers who had lost their jobs. Another approach, such as that taken by the UK, was for government to effectively pay workers’ wages to keep them on payroll. These approaches, which may be very similar in overall economic effect, can appear drastically different in the official rate of unemployment statistics (shown below). In short, official unemployment figures may be of limited value in this environment—more in-depth analysis is required.

**REAL GDP GROWTH (YOY)**



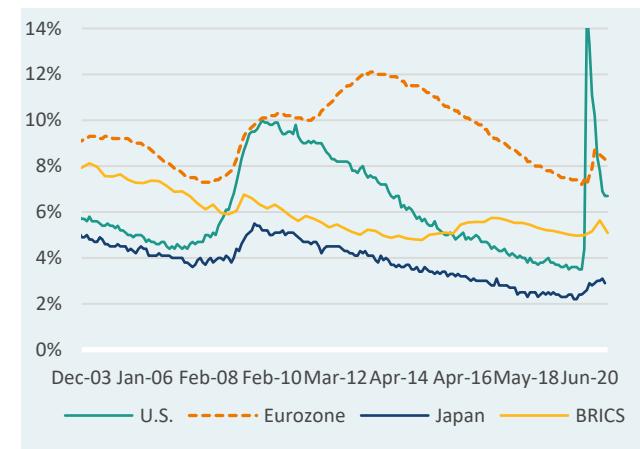
Source: Bloomberg, as of 9/30/20

**INFLATION (CPI YOY)**



Source: Bloomberg, as of 12/31/20 – or most recent release

**UNEMPLOYMENT**



Source: Bloomberg, as of 12/31/20 – or most recent release

# Fixed income rates & credit

# Interest rate environment

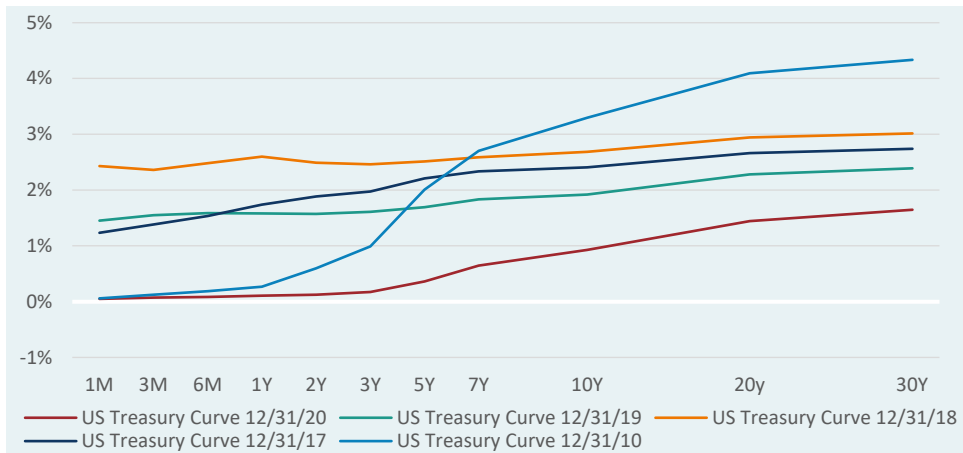
- Longer-dated U.S. Treasury yields moved upward in the fourth quarter, with the U.S. 10-year rising above 1.0% to begin 2021. Higher interest rates may place pressure on equity valuations if this trend continues. The yield of shorter-dated bonds and cash has not moved and is expected to stay near zero.
- Ten-year breakeven inflation rates rallied from 1.6% to 2.0% in Q4, likely propelled higher by expectations that Biden’s fiscal approach paired with vaccine rollouts will result in higher longer-term growth and inflation. The rise in priced inflation outpaced the rise in nominal Treasury yields, leading the 10-year U.S. real yield to decline from -0.95% to -1.07%, near record lows.
- Officials at the Federal Reserve remained committed to a \$120 billion monthly pace of bond purchases until there is “substantial progress” toward employment and inflation objectives. Fed Chair Powell left the door open to adjusting the pace of those purchases as necessary, and stated that the Fed would “let the world know...well in advance of active consideration of beginning a gradual taper of asset purchases.”
- The European Central Bank expanded the size of its Pandemic Emergency Purchase Program (PEPP) by €500 billion, bringing the new total to €1.85 trillion. The ECB also extended the horizon for purchases under PEPP to March 2022, and the timeline for reinvestment of maturing PEPP assets to the end of 2023.
- Joe Biden nominated Janet Yellen, Jerome Powell’s predecessor, as U.S. Treasury Secretary. Throughout the pandemic, central bankers have been calling for further coordination of fiscal and monetary action, and Yellen’s nomination could represent the next step down that path.

Area	Short Term (3M)	10-Year
United States	0.06%	0.91%
Germany	(0.83%)	(0.57%)
France	(0.77%)	(0.34%)
Spain	(0.83%)	0.04%
Italy	(0.65%)	0.54%
Greece	(0.38%)	0.62%
U.K.	(0.06%)	0.20%
Japan	(0.12%)	0.02%
Australia	0.02%	0.97%
China	2.28%	3.14%
Brazil	2.00%	6.91%
Russia	3.54%	6.01%

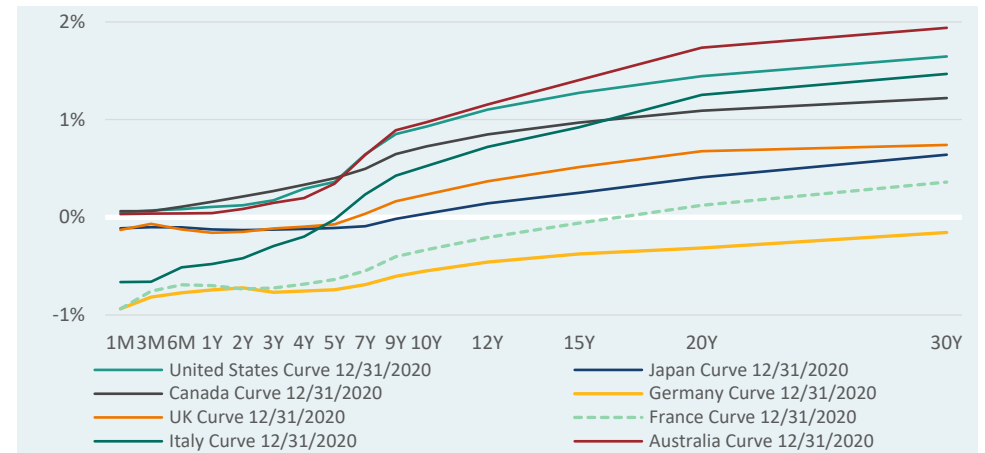
Source: Bloomberg, as of 12/31/20

# Yield environment

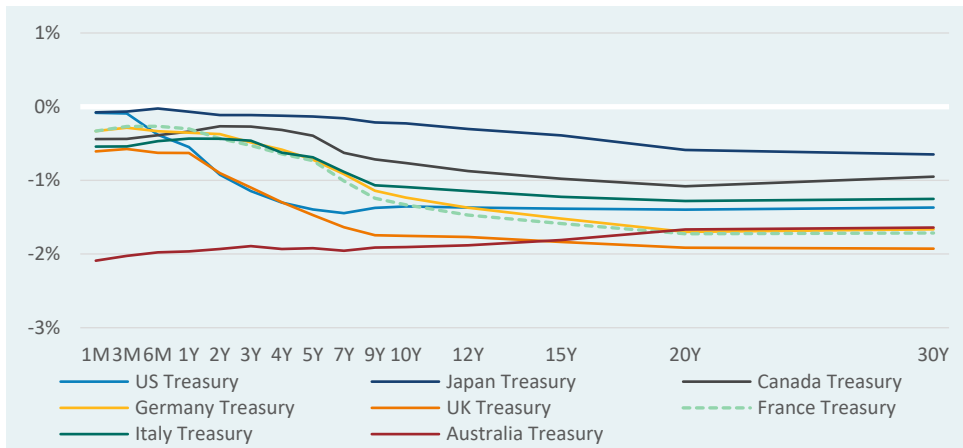
## U.S. YIELD CURVE



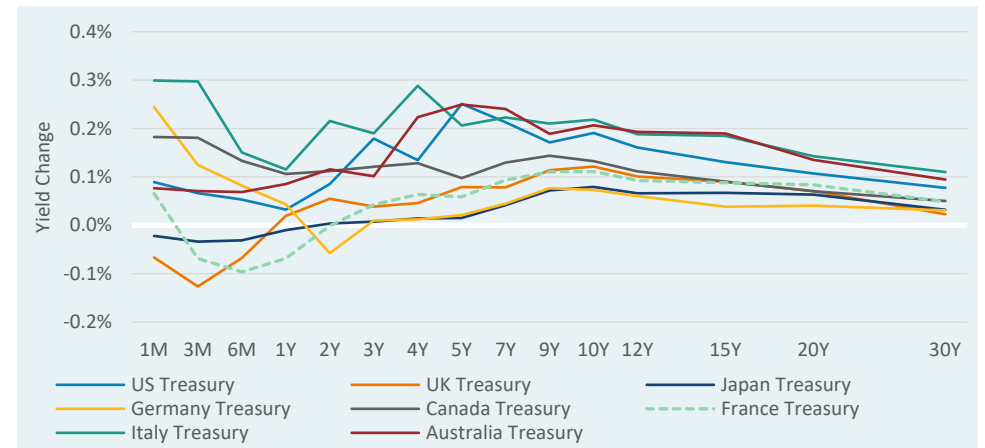
## GLOBAL GOVERNMENT YIELD CURVES



## YIELD CURVE CHANGES OVER LAST FIVE YEARS



## IMPLIED CHANGES OVER NEXT YEAR



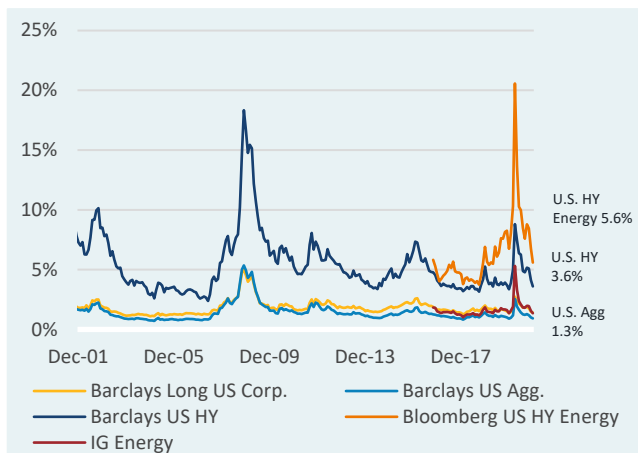
Source: Bloomberg, as of 12/31/20

# Credit environment

After four quarters of exceptional volatility, credit market spreads ended 2020 roughly in line with where they started. Both investment grade and below investment grade assets experienced positive performance, driven in part by increased investor demand for yield but mainly by the unprecedented Fed action in March which led rates to all-time lows. For the calendar year, investment grade credit returned 9.4%, outperforming high yield (+7.1%), and banks loans (+2.8%). The effects of COVID market disruptions created wide dispersion among sectors as metals/mining, freight, and food/drug retail outperformed while energy and domestic telecom underperformed.

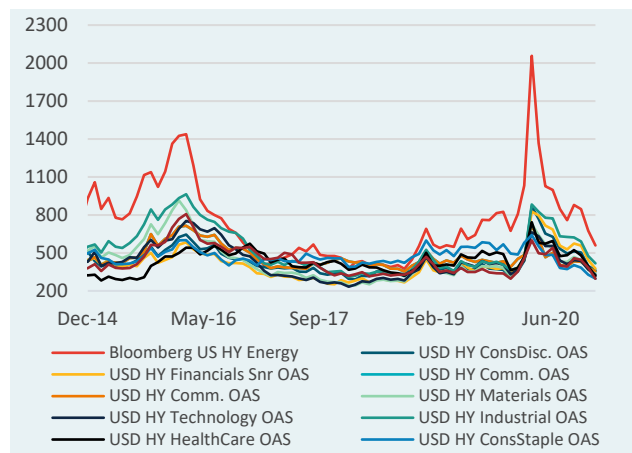
In the fourth quarter, high yield bonds returned 6.5%, outperforming bank loans (+3.6%) and investment grade credit (+2.8%). Positive vaccine news and conclusion of the presidential election led to strong risk-on sentiment during the quarter, driving longer duration and lower quality bonds to outperform within U.S. credit. In addition, credit spreads continued to tighten, with high yield spreads tightening 157 bps to 360 bps and investment grade spreads falling 40 bps to finish the year at 92 bps.

## SPREADS



Source: Barclays, Bloomberg, as of 12/31/20

## HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 12/31/20

Market	Credit Spread (OAS)	
	12/31/20	12/31/19
Long U.S. Corp	1.4%	1.4%
U.S. Inv Grade Corp	1.0%	0.9%
U.S. High Yield	3.6%	3.7%
U.S. Bank Loans*	4.6%	4.4%

Source: Barclays, Credit Suisse, Bloomberg, as of 12/31/20

\*Discount margin (4-year life)



# Default & issuance

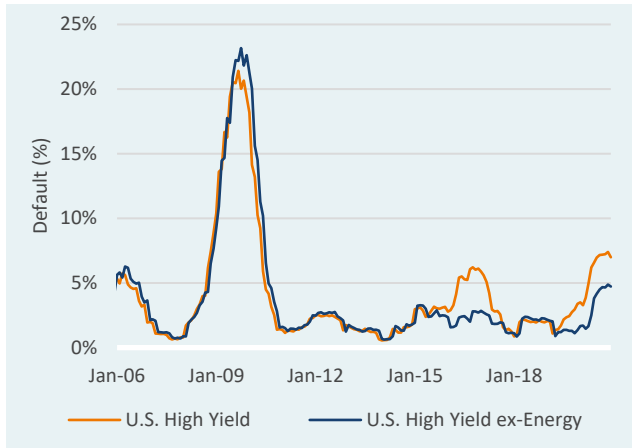
A total of 88 companies defaulted in 2020, representing \$130 billion. This activity was led by the energy, telecom, and retail sectors. The \$130 billion in defaults in 2020 ranked second only to the \$185 billion experienced in 2009.

The par weighted U.S. high yield default rate increased 0.4% during the quarter to 6.2%—well above the long-term average of 3.0-3.5%. If the energy sector is excluded (which showed an annual default rate of 20.5%), the high yield default rate came in at a more modest 4.5%. During the fourth quarter, the leveraged loan default rate came in at 4.0%—moderately above the long-term average of 3.0%.

High yield bond issuance fell from the record levels posted in Q2 and Q3 but remained elevated in Q4. Total issuance for 2020 was the highest on record at \$511 billion, outpacing 2013's historical peak of \$378 billion.

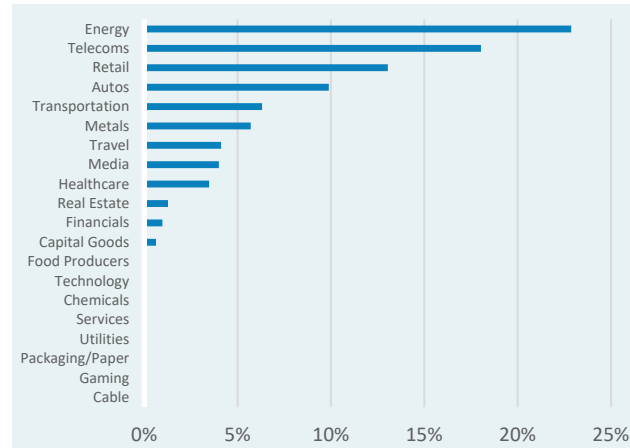
Investment grade issuance for 2020 totaled \$1.8 trillion, which was 40% higher than the prior record achieved in 2017. The fourth quarter was the slowest of the year with \$215 billion in new issues—a level that was in line with the four-year average

HY DEFAULT RATE (ROLLING 1-YEAR)



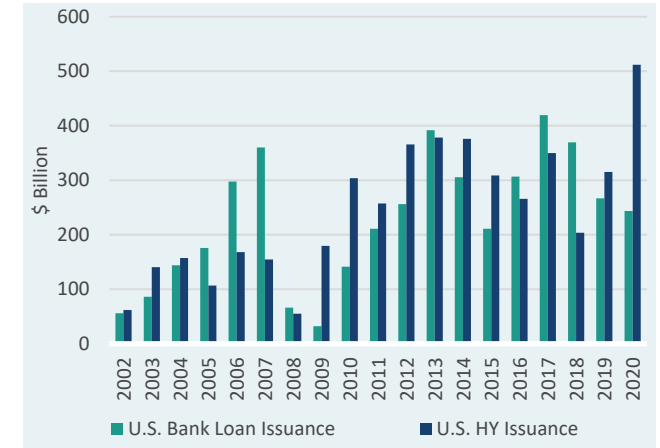
Source: BofA Merrill Lynch, as of 12/31/20

U.S. HY SECTOR DEFAULTS (LAST 12 MONTHS)



Source: BofA Merrill Lynch, as of 12/31/20 – par weighted

U.S. ISSUANCE (\$ BILLIONS)



Source: BofA Merrill Lynch, as of 12/31/20

# Equity

# Equity environment

- U.S. equities delivered +12.1% during the quarter, ending the year at an all-time-high. The S&P 500 was one of the strongest equity markets in 2020, up +18.4% despite an earnings recession and considerable economic uncertainty.
- Emerging market equities (MSCI EM +19.7%) once again outperformed U.S. (S&P 500 +12.1%) and international developed equities (MSCI EAFE +16.0%) in Q4. Latin American equities showed significant outperformance during the quarter (MSCI Latin America +34.8%), after years of lagging behind other emerging markets.
- According to FactSet, S&P 500 Q4 earnings are expected to be down -8.8%. This estimate improved materially from the -12.7% drop expected on September 30<sup>th</sup>. Analysts are expecting a -13.3% earnings decline for full-year 2020.
- The Cboe VIX Index remained rangebound in the fourth quarter, ending the year at 22.8. Priced volatility is moderately elevated relative to the longer-term average of 19.
- Weakness in the U.S. dollar relative to both emerging market and developed market currencies remained a theme during the fourth quarter, as the Bloomberg Dollar Spot Index fell to a two and a half year low. Analysts attributed some of the weakness in the greenback to lower relative real yields in the United States, as nominal Treasury yields picked up.
- Within the index, a sizable rotation occurred in Q4 as certain sectors that had been beaten-down during the pandemic performed strongly. Rising energy prices boosted the Energy sector, while higher interest rates on the longer end of the yield curve improved the outlook for Financials.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
US Large Cap (S&P 500)	12.1%		18.4%	
US Small Cap (Russell 2000)	31.4%		20.0%	
US Large Value (Russell 1000 Value)	16.3%		2.8%	
US Large Growth (Russell 1000 Growth)	11.4%		38.5%	
International Large (MSCI EAFE)	16.0%	11.9%	7.8%	2.5%
Eurozone (Euro Stoxx 50)	16.2%	12.2%	5.5%	(1.2%)
U.K. (FTSE 100)	17.2%	11.4%	(8.9%)	(10.2%)
Japan (NIKKEI 225)	21.1%	18.8%	24.2%	19.4%
Emerging Markets (MSCI Emerging Markets)	19.7%	16.0%	18.3%	19.6%

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 12/31/20

# Domestic equity

U.S. equities delivered +12.1% during the quarter, ending the year at an all-time-high. The S&P 500 was one of the strongest equity markets in 2020, up +18.4% despite an earnings recession and considerable economic uncertainty.

Within the index, a sizable rotation occurred in Q4 as certain sectors that had been beaten-down during the pandemic performed strongly. Rising energy prices boosted the Energy sector, while higher interest rates improved the outlook for Financials. It remains to be seen whether certain consumer habits displayed during the pandemic (online shopping and heightened social media usage, for example) begin reverting to previous levels as the world moves back to normalcy or if

instead, these new habits become more permanent in nature. The answer to this question has important implications for future intra-sector performance.

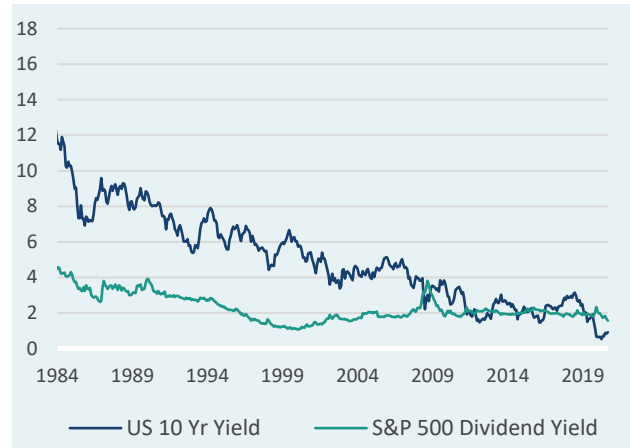
As equities move higher, it is difficult not to notice a disconnect between the US. market and the economy. We believe this rally is the result of a confluence of forces. Ultra-low interest rates, extremely accommodative monetary and fiscal policy, plus the implicit guarantee that further economic weakness will be met with more support and stimulus, seems to be creating a new type of “Goldilocks market” that harkens back to the post-Global Financial Crisis market expansion.

## S&P 500 INDEX



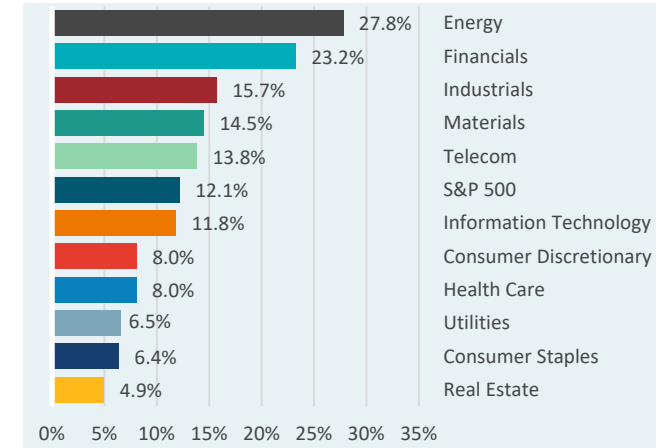
Source: Standard & Poor's, as of 12/31/20

## DIVIDEND YIELD VS BOND YIELD



Source: Standard & Poor's, as of 12/31/20

## Q4 SECTOR PERFORMANCE



Source: Standard & Poor's, as of 12/31/20

# Domestic equity size & style

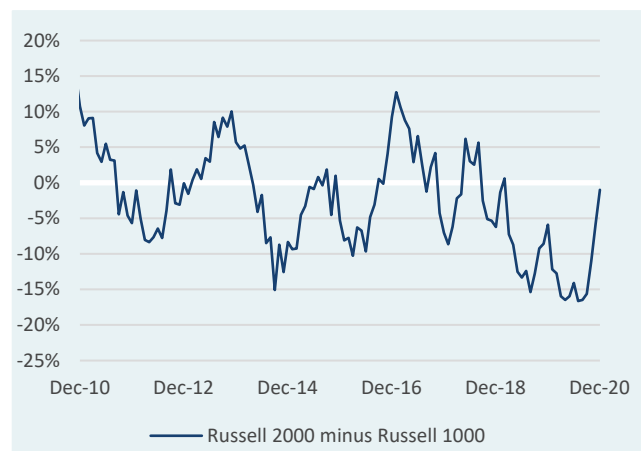
U.S. value stocks beat growth stocks during the fourth quarter (Russell 1000 Value +16.3%, Russell 1000 Growth +11.4%), reversing an extended run of value underperformance. The moderate bounce in value stock performance appeared to be partly driven by sector movements. Energy, Financials, and Materials sectors tend to contain an outsized number of value stocks. These sectors were among the top performers in Q4. Small cap stocks delivered sizable outperformance over large cap stocks (Russell 2000 +31.4%, Russell 1000 +13.7%).

A variety of risks seem to be boiling up around large U.S. technology companies. Given the significant market role that

these businesses play, along with their *growth* rather than *value* characteristics, this regulatory risk could have implications for 2021. First, it is easy to argue that firms such as Google, Amazon, and Facebook have exercised some degree of monopoly power (the FTC recently sued Facebook for alleged illegal monopolistic conduct, and numerous other investigations abound). Further anti-trust actions are likely to come. Second, in recent years there has been a degree of bipartisan consensus that social media companies are doing a poor job of moderating content (though each political party has very different ideas as to the appropriate solution). These risks, which rest perhaps solely on the shoulders of “growth stocks”, will be worth watching in 2021.

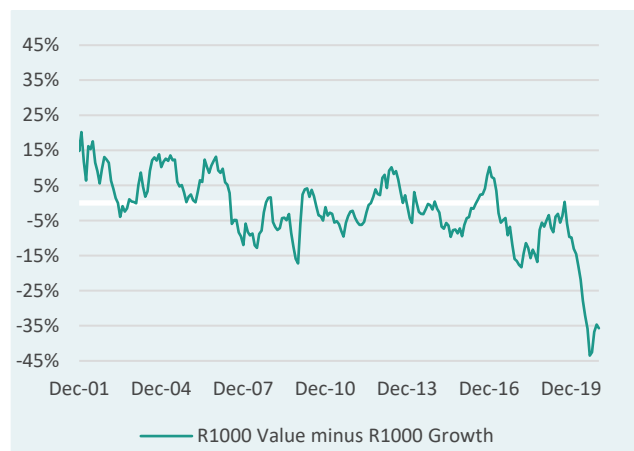
Sector performance has fueled dramatic negative performance of the value premium

SMALL CAP VS LARGE CAP (YOY)



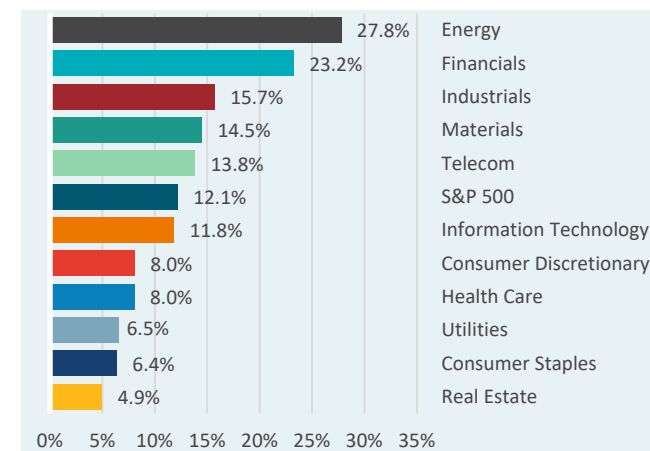
Source: FTSE, as of 12/31/20

VALUE VS GROWTH (YOY)



Source: FTSE, as of 12/31/20

Q4 SECTOR PERFORMANCE



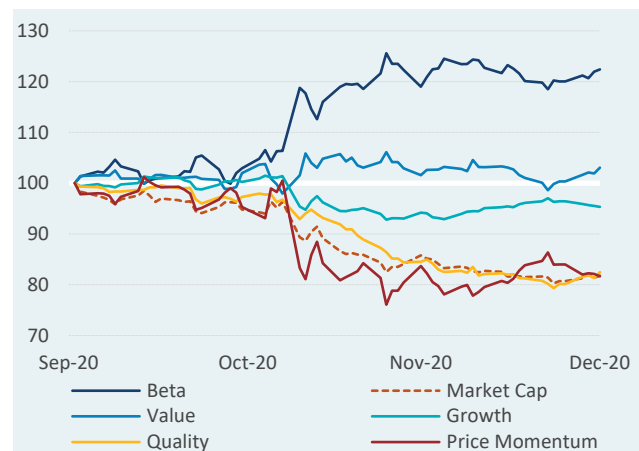
Source: Standard & Poor's, as of 12/31/20

# Factor portfolios in 2020

After a quiet October, factor results significantly diverged in November as investors strongly reacted to positive COVID-19 vaccine news. Anticipating a path toward post-pandemic normalcy, investors rotated into stocks with higher betas and higher volatility (long/short, sector-neutral, S&P 500 Index quintiles). Small-cap stocks also performed well while the value factor modestly gained ground, mostly due to strong results from stocks with attractive price-to-book ratios. Investors funded this rotation by selling large-cap and high-quality positions. Poor price momentum results were further evidence of the strength of the move.

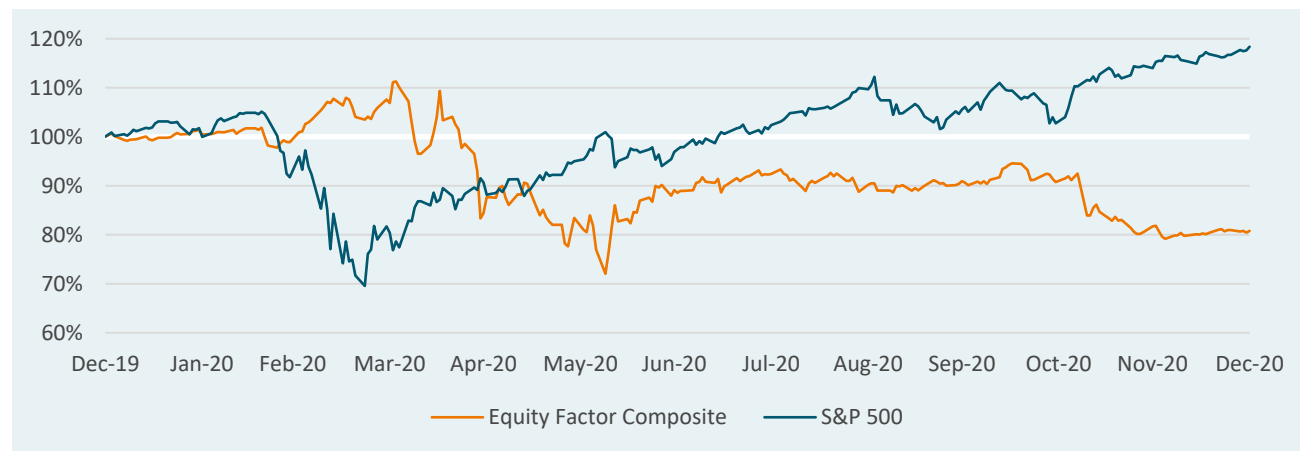
Equity factors had a very difficult year in 2020 and subsequently trailed the equity market by a very wide margin. Quality factors provided some protection during the periods of market turmoil. However other market neutral risk premia strategies did not enjoy consistent recoveries, particularly as market preferences quickly reversed back and forth during the pandemic.

## Q4 2020 PERFORMANCE



Source: J.P. Morgan, as of 12/31/20

## CUMULATIVE RETURN (INDEXED 12/31/19=100%)



Source: J.P. Morgan, as of 12/31/20; Equity Factor Composite represents the performance of a 10-factor model designed as a simple proxy for quant performance. The factors are combined so that the long and short portfolios contain the most- and least-attractive quant stocks.

# International developed equity

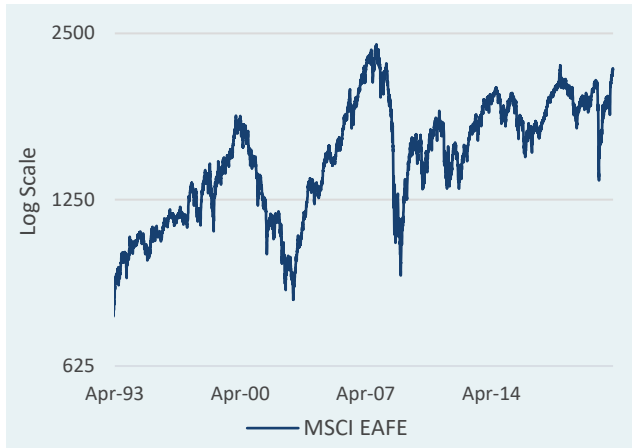
International equities delivered exceptional performance in the fourth quarter, as most global markets have now fully recovered from the March drawdown. The MSCI EAFE Index (+16.0%) outperformed the S&P 500 Index (+12.1%) while lagging the MSCI Emerging Markets Index (+19.7). Continuing U.S. dollar weakness was a notable theme, boosting international equity performance by 5% over the past year.

The recent depreciation of the U.S. dollar has acted as a tailwind to many unhedged international investments. The MSCI EAFE Index unhedged returned 16.0% in Q4, compared

to 11.9% if currency had been hedged. The three largest currency exposures embedded in the MSCI EAFE Index—the euro (32%), the yen (26%), and the pound sterling (13%)—appreciated +4.3%, +2.2%, and +5.7% relative to the U.S. dollar during the quarter, respectively.

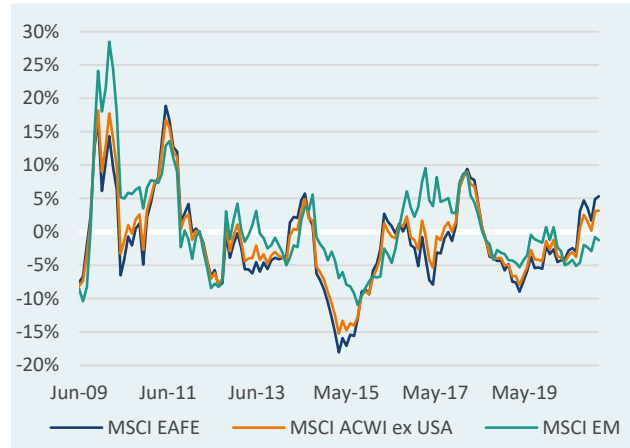
European equities (+17.2%) outperformed Hong Kong (+15.5%) and Japanese (+15.3%) equities in Q4, supported by strong performance in Austria (+47.3%) and Spain (+27.7%). In Oceania, Australia posted solid returns (+22.9%), which were bolstered by a firmer Australian dollar.

**INTERNATIONAL DEVELOPED EQUITIES**



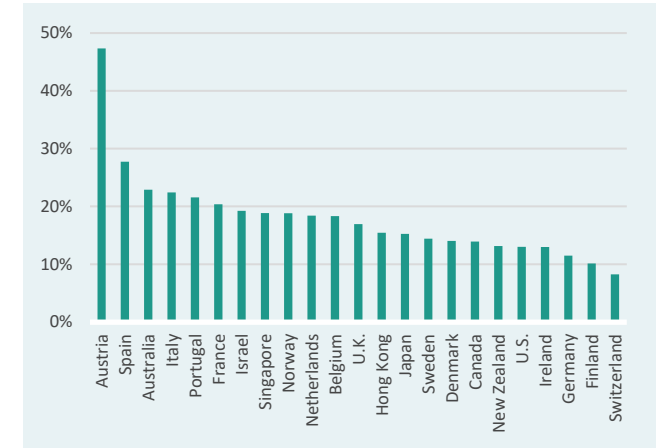
Source: MSCI, as of 12/31/20

**EFFECT OF CURRENCY (1-YEAR ROLLING)**



Source: MSCI, as of 12/31/20

**Q4 2020 PERFORMANCE (ALL IN USD)**



Source: MSCI, Bloomberg, as of 12/31/20

# Emerging market equity

Emerging market equities (MSCI EM +19.7%) outperformed U.S. (S&P 500 +12.1%) and international developed equities (MSCI EAFE +16.0%) once again in Q4. Latin American equities showed significant outperformance during the quarter (MSCI Latin America +34.8%), after years of lagging behind other emerging markets.

The pandemic placed downward pressure on inflation earlier in 2020. Since then, the rate of price movement has recovered in many markets. China appears to be an outlier, as inflation recently dipped below zero. This move was fueled by falling pork prices, which had been moving higher

in recent years and causing above-average levels of inflation.

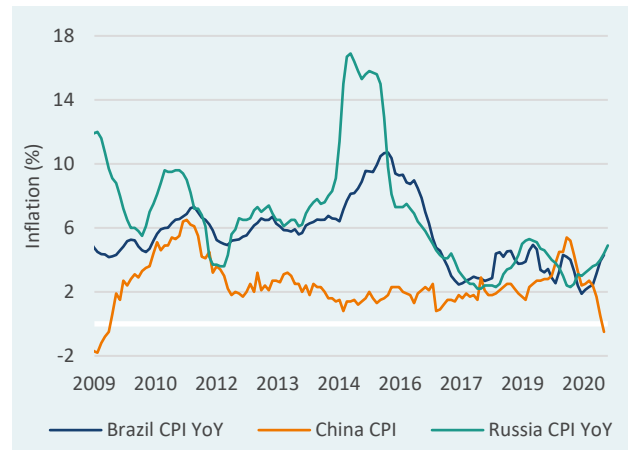
Emerging market currencies sold off significantly during the beginning of the year as investors bid up safe-haven currencies, including the U.S. dollar, amid unprecedented economic and market uncertainty. Since March, however, the embedded currency portfolio of the MSCI Emerging Markets Index began to recover significantly and ended the year nearly on par with where it had started. Continued appreciation of emerging market currencies could provide tailwinds for unhedged U.S. investors in the asset class.

**EMERGING MARKET EQUITY**



Source: MSCI, as of 12/31/20

**INFLATION (YOY)**



Source: Bloomberg, as of 12/31/20 or most recent data

**MSCI EM INDEX EMBEDDED CURRENCY**



Source: Bloomberg, as of 12/31/20



# Equity valuations

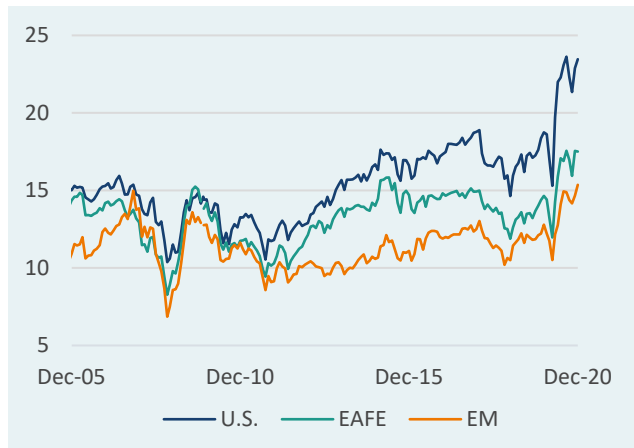
Particularly during the last two months of the year, valuations shot higher alongside equity prices as markets digested news that several COVID-19 vaccine candidates proved more effective than anticipated. Today, price-to-earnings multiples appear stretched relative to long-term averages.

Markets have shown a remarkable ability to look past the pandemic-related disruptions and focus on the light at the end of the tunnel. Some in the industry have viewed the exceptional performance of U.S. equities in 2020 as the “check” that fundamentals will need to “cash” next year, and that if sales and earnings do not recover at the strong pace

they are expected (+8.2%/+22.6%), there could be room for a correction.

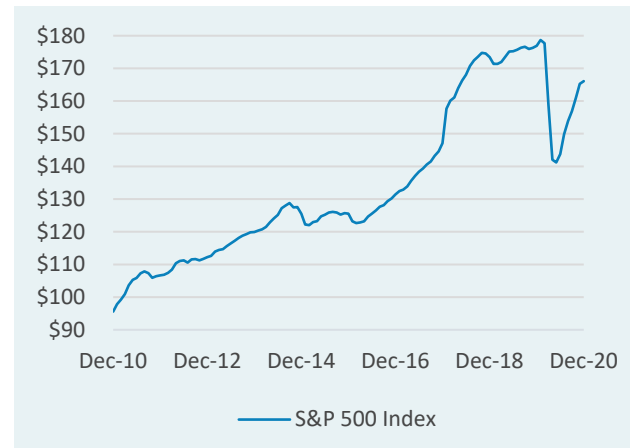
On a trailing-earnings basis, international developed equities appear most expensive as the second series of lockdowns which swept over the continent toward the end of the year have severely impacted earnings. The question in Europe, however, is largely the same one we are grappling with in the U.S.: are earnings temporarily depressed and ripe for a quick rebound next year, or are the earnings streams impaired and equity prices less justified?

## FORWARD P/E RATIOS



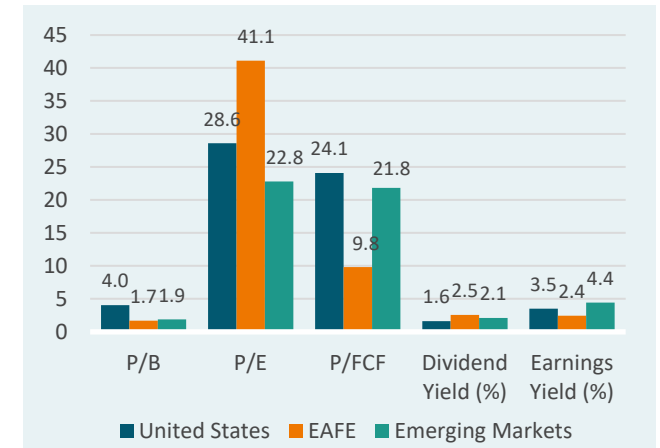
Source: MSCI, 12m forward P/E, as of 12/31/20

## BLENDED 12-MONTH EARNINGS EXPECTATIONS



Source: Bloomberg, as of 12/31/20

## VALUATION METRICS (3-MONTH AVERAGE)



Source: Bloomberg, MSCI as of 12/31/20 - trailing P/E

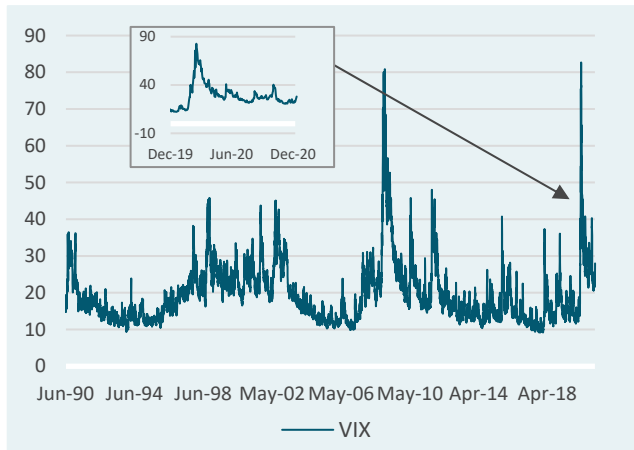
# Equity volatility

The Cboe VIX Index remained rangebound in the fourth quarter, ending the year at 22.8. Priced volatility is moderately elevated relative to the longer-term average of 19.

The U.S. equity market exhibited surprisingly high volatility in 2020 relative to other global markets. The domestic market has typically been a lowest risk market. In recent years, this relationship has flipped, with U.S. stocks showing higher volatility than developed market stocks, and nearly on par with emerging market equities.

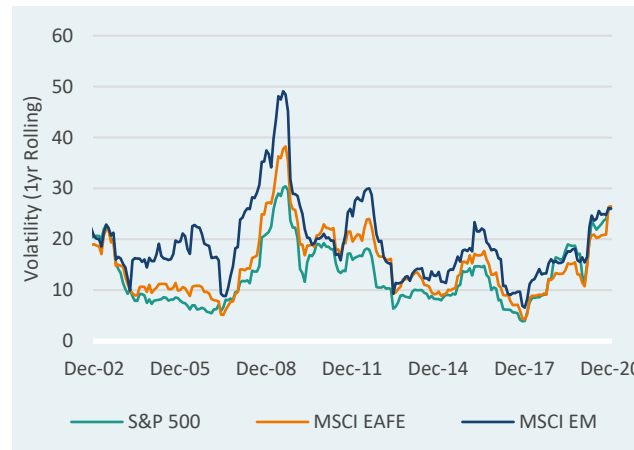
Since implied and realized volatility spiked in the first quarter, options-implied volatility has receded significantly, back toward more normal levels. As equity markets climbed to new highs in the final few months of the year, the U.S. implied volatility curve began to steepen. During the fourth quarter, the implied volatility of deeply out-of-the-money puts was little changed, while the implied volatility of deeply out-of-the-money call options declined to more-average levels. The steepening of the implied volatility curve likely demonstrates the market's marginal preference for downside protection over upside participation at current price levels.

## U.S. IMPLIED VOLATILITY (VIX)



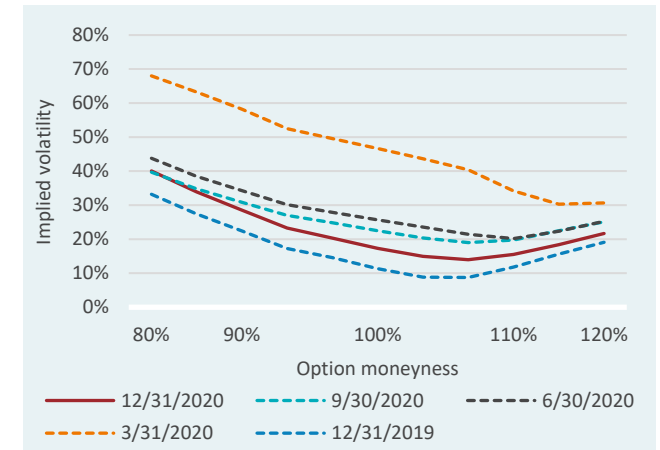
Source: Cboe, as of 12/31/20

## REALIZED VOLATILITY



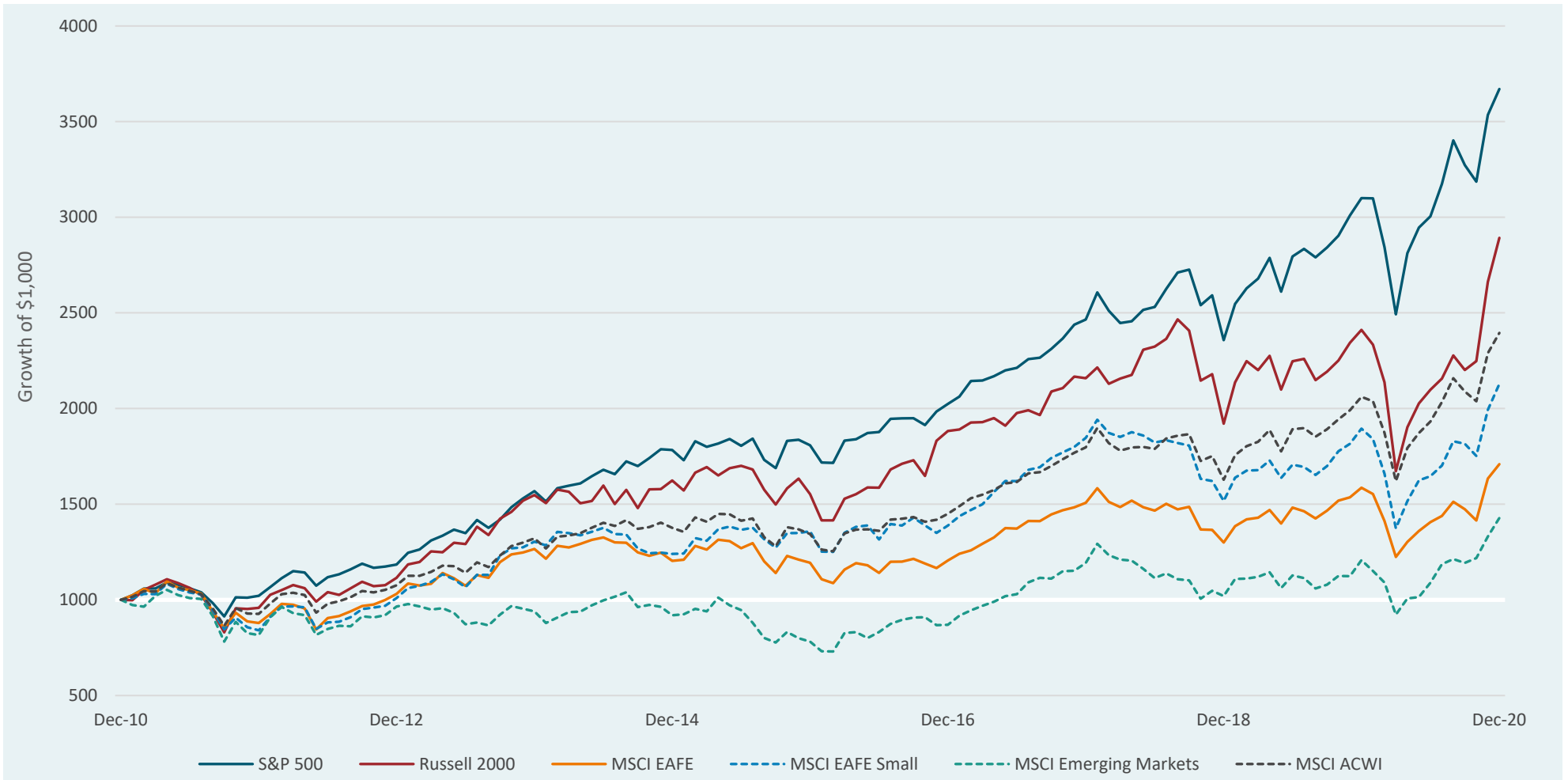
Source: Standard & Poor's, MSCI, as of 12/31/20

## 1-MONTH U.S. IMPLIED VOLATILITY CURVE



Source: Bloomberg, as of 12/31/20

# Long-term equity performance



Source: Morningstar, as of 12/31/20

# Other assets

# Currency

Weakness in the U.S. dollar relative to both emerging market and developed market currencies remained a theme in the fourth quarter, as the Bloomberg Dollar Spot Index fell to a two and a half year low. Analysts attributed some of the weakness of the greenback to lower relative real yields in the United States, as nominal Treasury yields rose less than inflation expectations. Many in the industry have made calls for a continuation of dollar weakness into 2021. If that weakness were to materialize, it would supply significant tailwinds for unhedged U.S. investors in non-U.S. equities. We continue to believe that unhedged currency exposure results in uncompensated risk, which is a suboptimal approach for many investors.

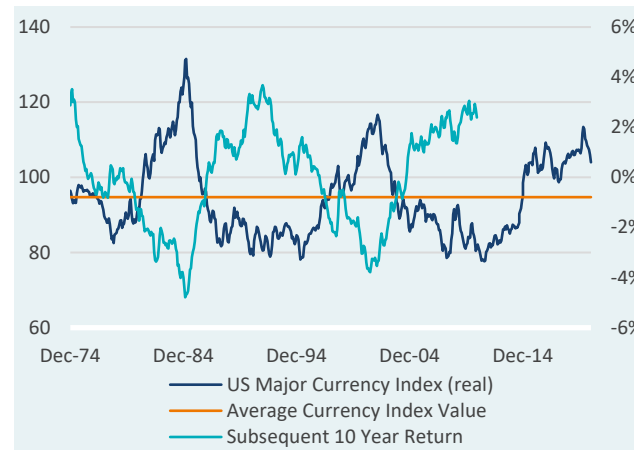
The onshore Chinese renminbi rallied significantly over the fourth quarter. The strength has been primarily credited to the apparently-blistering pace of China's recovery from pandemic-related disruptions, which has fueled capital inflows from offshore investors. Looking ahead, the election of Joe Biden has been viewed largely as constructive for the yuan, as the expectation remains that Biden's stance on China will be less confrontational than his predecessor's, reducing trade tensions. On the other hand, the rising value of the yuan may make China's exports less-affordable for Europeans still recovering from the pandemic. This dynamic has stoked speculation that the People's Bank of China might soon step in to cool the rally.

**BLOOMBERG DOLLAR SPOT INDEX**



Source: Bloomberg, as of 12/31/20

**USD CURRENCY LEVEL & SUBSEQUENT RETURN**



Source: Federal Reserve, as of 12/31/20

**USD/CNY CROSS RATE**



Source: Bloomberg, as of 12/31/20

# Appendix

# Periodic table of returns

BEST

↑

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	5-Year	10-Year
Large Cap Growth	38.7	66.4	31.8	14.0	25.9	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	6.7	36.4	38.5	21.0	17.2
Small Cap Growth	27.0	43.1	22.8	8.4	10.3	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	30.2	1.9	31.4	34.6	16.4	14.0
Large Cap Equity	20.3	33.2	12.2	7.3	6.7	47.3	20.7	20.1	23.5	15.8	-6.5	34.5	24.5	2.6	17.9	34.5	13.0	0.9	17.3	25.0	0.0	28.5	21.0	15.6	13.5
Small Cap Equity	19.3	27.3	11.6	3.3	1.6	46.0	18.3	14.0	22.2	11.8	-21.4	32.5	19.2	1.5	17.5	33.5	11.8	0.6	12.1	22.2	-1.5	26.5	20.0	13.3	11.2
Emerging Markets Equity	16.2	26.5	7.0	2.8	1.0	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	21.7	-3.5	25.5	18.3	12.8	10.5
60/40 Global Portfolio	8.7	21.3	4.1	-2.4	-6.0	29.9	14.3	6.3	15.5	10.3	-33.8	23.3	16.1	-2.1	15.3	23.3	4.9	-0.8	11.2	14.6	-6.0	22.4	14.0	9.7	8.9
Hedge Funds of Funds	15.6	24.3	6.0	2.5	-5.9	30.0	14.5	7.1	16.6	10.9	-28.9	27.2	16.7	0.1	16.3	32.5	5.6	-0.4	11.3	17.1	-4.8	22.0	10.3	9.7	8.7
International Equity	4.9	20.9	-3.0	-5.6	-11.4	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	13.7	-8.3	18.6	7.8	9.5	6.8
US Bonds	1.2	13.2	-7.3	-9.1	-15.5	25.2	11.4	4.7	13.3	7.0	-36.8	19.7	13.1	-4.2	11.5	11.0	3.4	-2.5	7.1	7.8	-9.3	18.4	7.5	7.4	5.5
Small Cap Value	-2.5	11.4	-7.8	-9.2	-15.7	23.9	9.1	4.6	10.4	5.8	-37.6	18.9	10.2	-5.5	10.5	9.0	2.8	-3.8	5.7	7.7	-11.0	8.7	4.6	5.7	3.8
Large Cap Value	-5.1	7.3	-14.0	-12.4	-20.5	11.6	6.9	4.6	9.1	4.4	-38.4	11.5	8.2	-5.7	4.8	0.1	0.0	-4.4	2.6	7.0	-11.2	7.8	2.8	4.4	3.6
Real Estate	-6.5	4.8	-22.4	-19.5	-21.7	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	3.5	-12.9	7.7	0.5	4.4	3.3
Cash	-25.3	-0.8	-22.4	-20.4	-27.9	4.1	4.3	3.2	4.3	-1.6	-43.1	0.2	5.7	-13.3	0.1	-2.3	-4.5	-14.9	0.5	1.7	-13.8	6.4	0.5	1.1	0.6
Commodities	-27.0	-1.5	-30.6	-21.2	-30.3	1.0	1.4	2.4	2.1	-9.8	-53.2	-16.9	0.1	-18.2	-1.1	-9.5	-17.0	-24.7	0.3	0.9	-14.6	2.1	-3.1	1.0	-6.5

↓

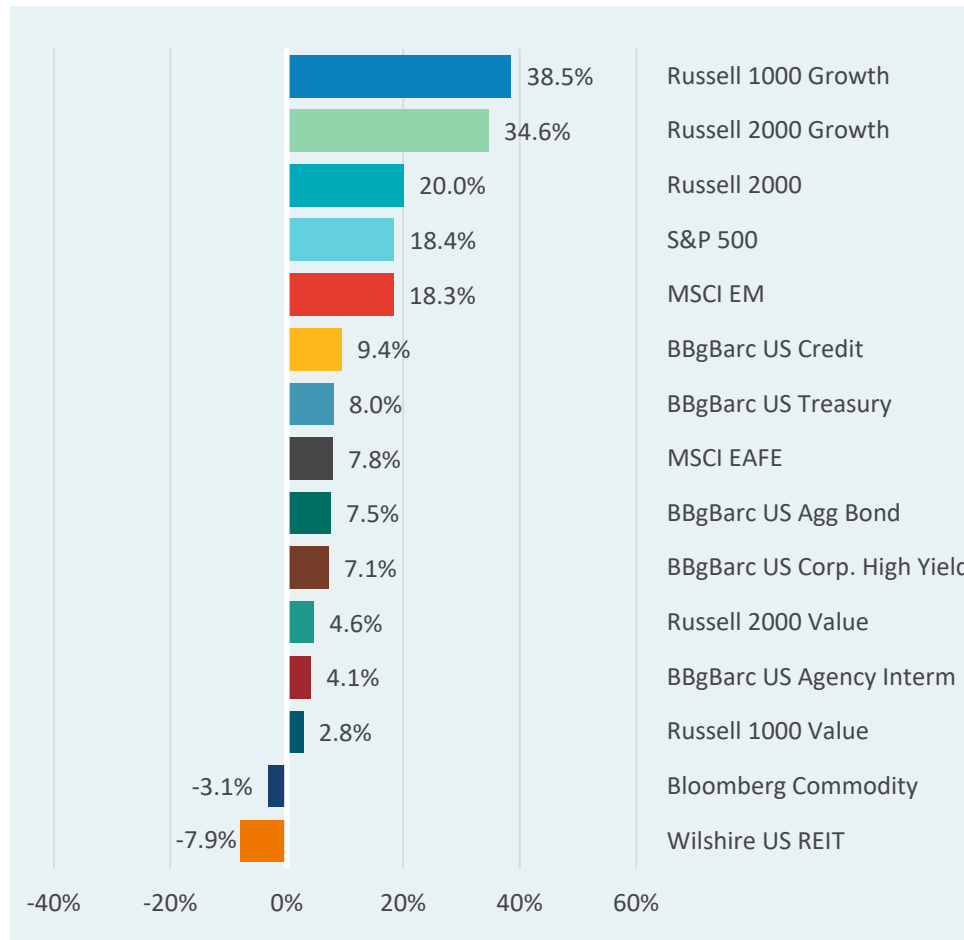
WORST



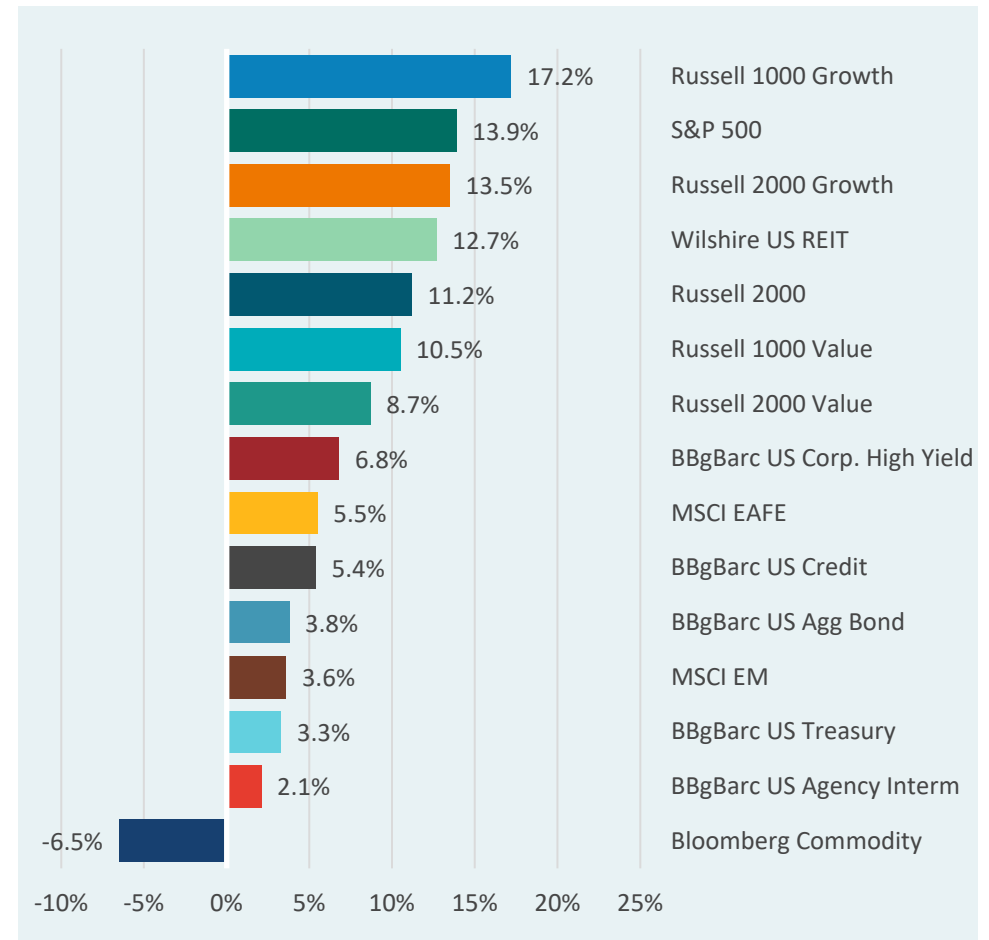
Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, BBgBarc US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, BBgBarc Global Bond. NCREIF Property Index performance data as of 9/30/20.

# Major asset class returns

ONE YEAR ENDING DECEMBER



TEN YEARS ENDING DECEMBER



\*Only publicly traded asset performance is shown here. Performance of private assets is typically released with a 3- to 6-month delay.

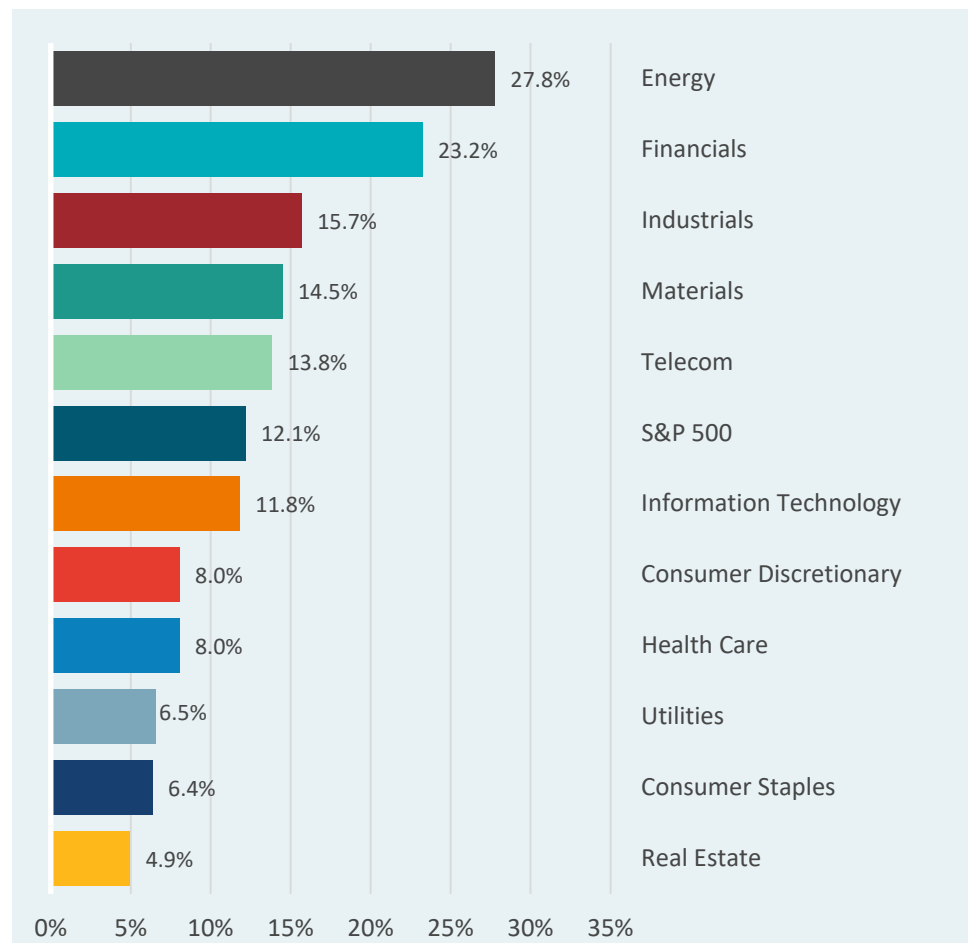
Source: Morningstar, as of 12/31/20

Source: Morningstar, as of 12/31/20



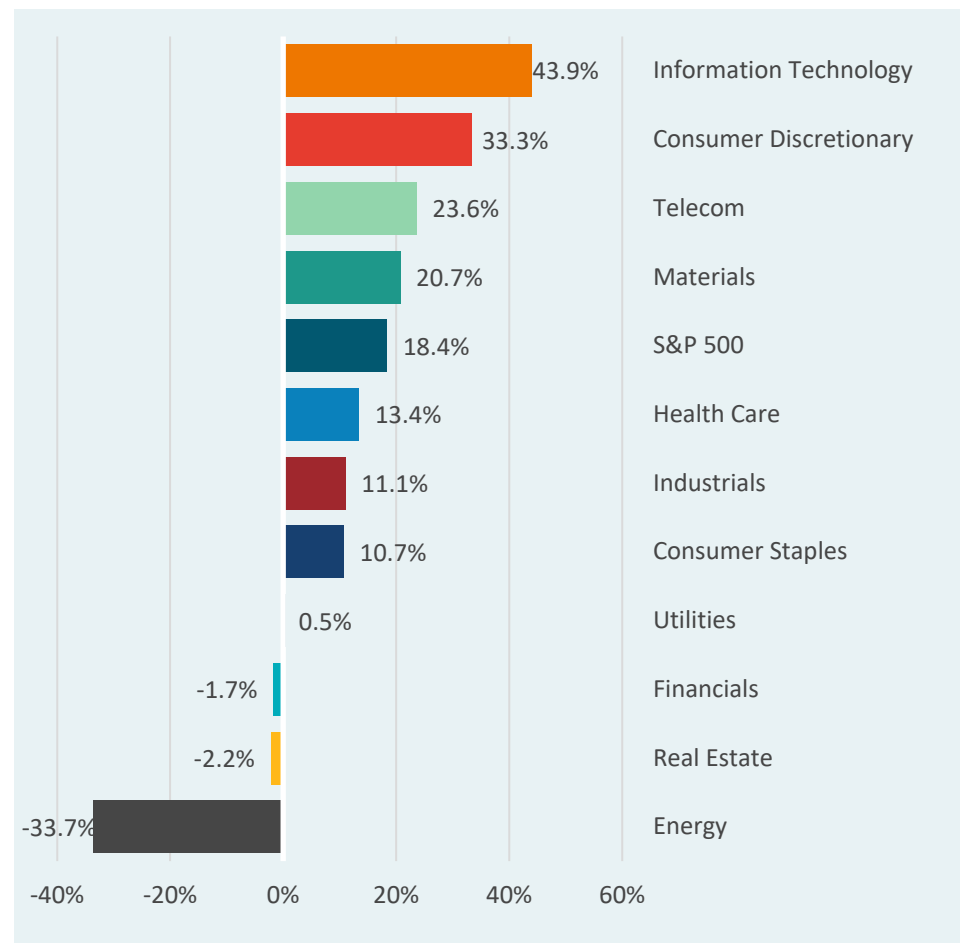
# S&P 500 sector returns

Q4 2020



Source: Morningstar, as of 12/31/20

ONE YEAR ENDING DECEMBER

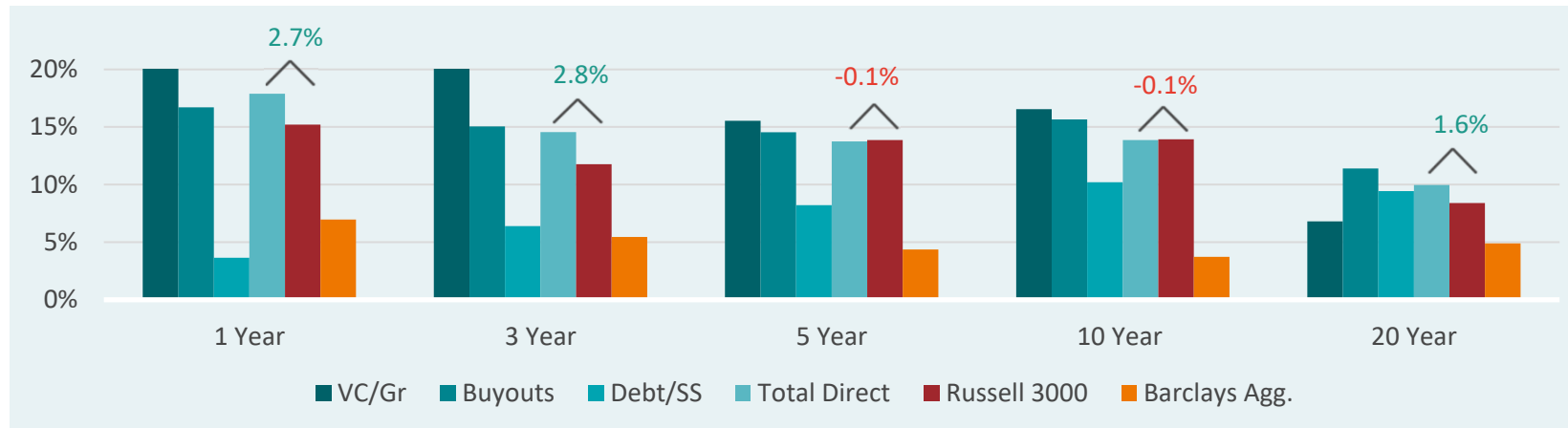


Source: Morningstar, as of 12/31/20

# Private equity vs. public performance

As of 9/30/2020

## DIRECT PRIVATE EQUITY FUND INVESTMENTS



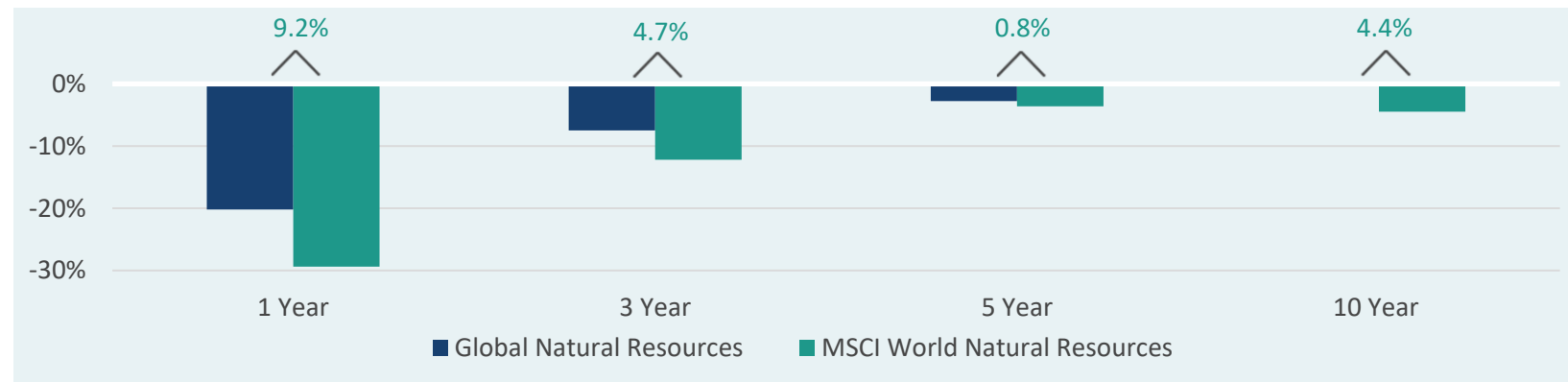
Direct private equity fund investments outperformed comparable public equities across most time periods

Sources: Thomson Reuters Cambridge Universe's PME Module: U.S. Private Equity Funds sub asset classes as of September 30, 2020. Public Market Equivalent returns resulted from "Total Direct's" identical cash flows invested into and distributed from respective traditional asset comparable.

# Private equity vs. liquid real assets performance

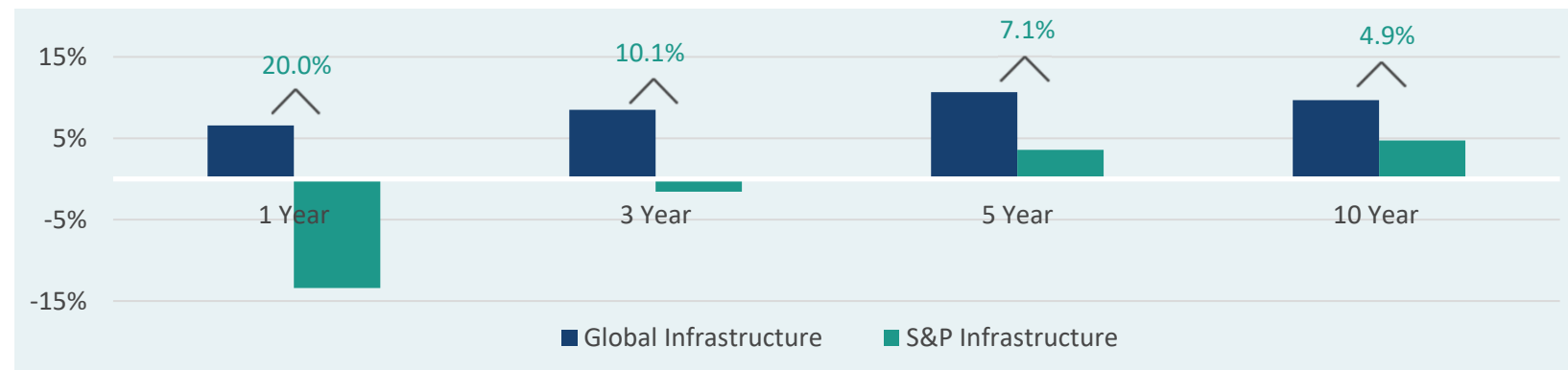
As of 9/30/2020

## GLOBAL NATURAL RESOURCES FUNDS



Natural resource funds outperformed the MSCI World Natural Resources benchmark across all time periods

## GLOBAL INFRASTRUCTURE FUNDS



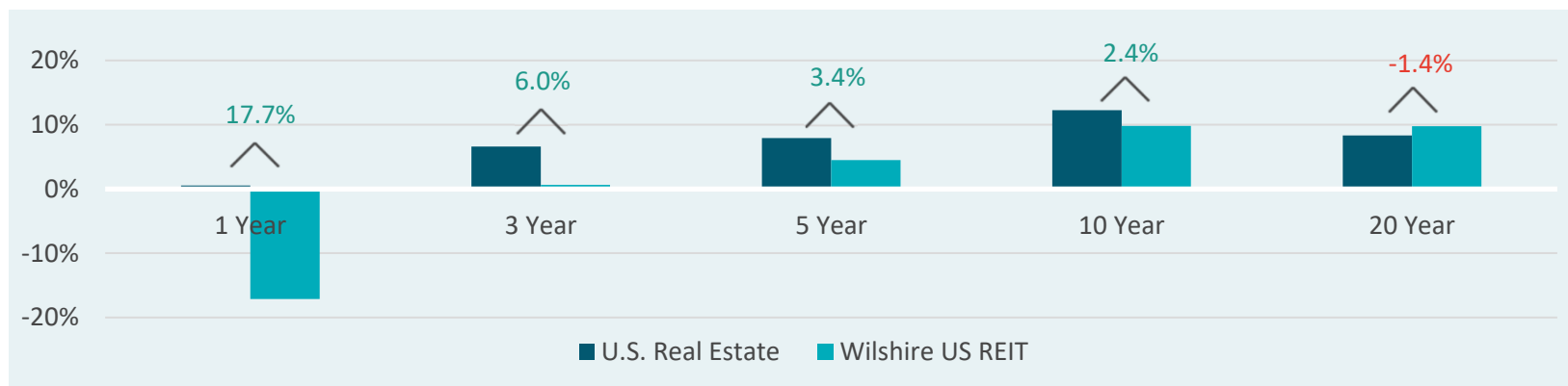
Infrastructure funds outperformed the S&P Infra. Index across all periods

Sources: Thomson Reuters C|A PME: Global Natural Resources (vintage 1999 and later, inception of MSCI World Natural Resources benchmark) and Global Infrastructure (vintage 2002 and later, inception of S&P Infrastructure benchmark) universes as of September 30, 2020. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

# Private vs. liquid & core real estate performance

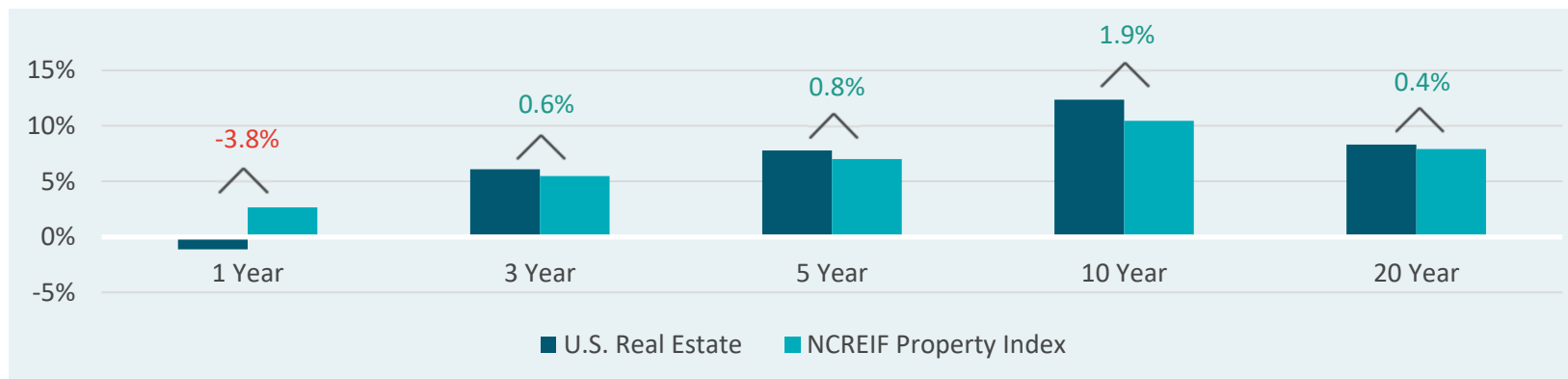
As of 9/30/2020

## U.S. PRIVATE REAL ESTATE FUNDS VS. LIQUID UNIVERSE



U.S. private real estate funds outperformed the Wilshire U.S. REIT Index across most time periods

## U.S. PRIVATE REAL ESTATE FUNDS VS. CORE FUNDS



U.S. private real estate funds outperformed the NCREIF Property Index over all time periods, aside from the past year

Sources: Thomson Reuters C|A PME: U.S. Real Estate universes as of September 30, 2020. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real estate universes.

# Detailed index returns

## DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
<b>Core Index</b>							
S&P 500	3.8	12.1	18.4	18.4	14.2	15.2	13.9
S&P 500 Equal Weighted	4.3	18.5	12.8	12.8	10.4	13.0	12.7
DJ Industrial Average	3.4	10.7	9.7	9.7	9.9	14.7	13.0
Russell Top 200	4.1	11.6	22.4	22.4	16.0	16.4	14.6
Russell 1000	4.2	13.7	21.0	21.0	14.8	15.6	14.0
Russell 2000	8.7	31.4	20.0	20.0	10.2	13.3	11.2
Russell 3000	4.5	14.7	20.9	20.9	14.5	15.4	13.8
Russell Mid Cap	4.7	19.9	17.1	17.1	11.6	13.4	12.4
<b>Style Index</b>							
Russell 1000 Growth	4.6	11.4	38.5	38.5	23.0	21.0	17.2
Russell 1000 Value	3.8	16.3	2.8	2.8	6.1	9.7	10.5
Russell 2000 Growth	9.3	29.6	34.6	34.6	16.2	16.4	13.5
Russell 2000 Value	7.9	33.4	4.6	4.6	3.7	9.7	8.7

## INTERNATIONAL EQUITY

<b>Broad Index</b>							
MSCI ACWI	4.6	14.7	16.3	16.3	10.1	12.3	9.1
MSCI ACWI ex US	5.4	17.0	10.7	10.7	4.9	8.9	4.9
MSCI EAFE	4.6	16.0	7.8	7.8	4.3	7.4	5.5
MSCI EM	7.4	19.7	18.3	18.3	6.2	12.8	3.6
MSCI EAFE Small Cap	6.8	17.3	12.3	12.3	4.9	9.4	7.8
<b>Style Index</b>							
MSCI EAFE Growth	4.9	13.1	18.3	18.3	9.7	10.5	7.5
MSCI EAFE Value	4.4	19.2	(2.6)	(2.6)	(1.2)	4.2	3.4
<b>Regional Index</b>							
MSCI UK	5.5	16.9	(10.5)	(10.5)	(2.4)	2.6	3.0
MSCI Japan	4.1	15.3	14.5	14.5	6.1	8.7	6.5
MSCI Euro	4.0	17.2	6.6	6.6	3.1	7.0	5.0
MSCI EM Asia	7.1	18.9	28.4	28.4	9.0	14.4	6.6
MSCI EM Latin American	11.9	34.8	(13.8)	(13.8)	(1.8)	8.9	(3.4)

## FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
<b>Broad Index</b>							
BBgBarc US TIPS	1.1	1.6	11.0	11.0	5.9	5.1	3.8
BBgBarc US Treasury Bills	0.0	0.0	0.7	0.7	1.6	1.2	0.7
BBgBarc US Agg Bond	0.1	0.7	7.5	7.5	5.3	4.4	3.8
<b>Duration</b>							
BBgBarc US Treasury 1-3 Yr	0.1	0.0	3.2	3.2	2.8	1.9	1.3
BBgBarc US Treasury Long	(1.2)	(3.0)	17.7	17.7	9.9	7.8	7.8
BBgBarc US Treasury	(0.2)	(0.8)	8.0	8.0	5.2	3.8	3.3
<b>Issuer</b>							
BBgBarc US MBS	0.2	0.2	3.9	3.9	3.7	3.1	3.0
BBgBarc US Corp. High Yield	1.9	6.5	7.1	7.1	6.2	8.6	6.8
BBgBarc US Agency Interm	0.1	0.1	4.1	4.1	3.4	2.5	2.1
BBgBarc US Credit	0.5	2.8	9.4	9.4	6.8	6.4	5.4

## OTHER

<b>Index</b>							
Bloomberg Commodity	5.0	10.2	(3.1)	(3.1)	(2.5)	1.0	(6.5)
Wilshire US REIT	2.8	10.6	(7.9)	(7.9)	3.3	4.3	8.3
CS Leveraged Loans	1.3	3.6	2.8	2.8	4.0	5.2	4.5
Alerian MLP	2.5	32.4	(31.6)	(31.6)	(13.7)	(7.0)	(2.1)
<b>Regional Index</b>							
JPM EMBI Global Div	1.9	5.8	5.3	5.3	5.0	7.1	6.2
JPM GBI-EM Global Div	3.5	9.6	2.7	2.7	3.0	6.7	1.5
<b>Hedge Funds</b>							
HFRI Composite	4.5	10.7	11.6	11.6	5.5	6.1	4.2
HFRI FOF Composite	3.1	7.5	10.3	10.3	4.7	4.4	3.3
<b>Currency (Spot)</b>							
Euro	2.3	4.3	9.0	9.0	0.6	2.4	(0.9)
Pound Sterling	2.4	5.7	3.2	3.2	0.3	(1.5)	(1.3)
Yen	1.0	2.2	5.3	5.3	2.9	3.1	(2.4)

Source: Morningstar, HFRI, as of 12/31/20

# Definitions

**Bloomberg US Weekly Consumer Comfort Index** - tracks the public's economic attitudes each week, providing a high-frequency read on consumer sentiment. The index, based on cell and landline telephone interviews with a random, representative national sample of U.S. adults, tracks Americans' ratings of the national economy, their personal finances and the buying climate on a weekly basis, with views of the economy's direction measured separately each month. ([www.lanqerresearch.com](http://www.lanqerresearch.com))

**University of Michigan Consumer Sentiment Index** - A survey of consumer attitudes concerning both the present situation as well as expectations regarding economic conditions conducted by the University of Michigan. For the preliminary release approximately three hundred consumers are surveyed while five hundred are interviewed for the final figure. The level of consumer sentiment is related to the strength of consumer spending. ([www.Bloomberg.com](http://www.Bloomberg.com))

**NFIB Small Business Outlook** - Small Business Economic Trends (SBET) is a monthly assessment of the U.S. small-business economy and its near-term prospects. Its data are collected through mail surveys to random samples of the National Federal of Independent Business (NFIB) membership. The survey contains three broad question types: recent performance, near-term forecasts, and demographics. The topics addressed include: outlook, sales, earnings, employment, employee compensation, investment, inventories, credit conditions, and single most important problem. (<http://www.nfib-sbet.org/about/>)

**NAHB Housing Market Index** - the housing market index is a weighted average of separate diffusion indices for three key single-family indices: market conditions for the sale of new homes at the present time, market conditions for the sale of new homes in the next six months, and the traffic of prospective buyers of new homes. The first two series are rated on a scale of Good, Fair, and Poor and the last is rated on a scale of High/Very High, Average, and Low/Very Low. A diffusion index is calculated for each series by applying the formula  $(\text{Good-Poor} + 100)/2$  to the present and future sales series and  $(\text{High/Very High-Low/Very Low} + 100)/2$  to the traffic series. Each resulting index is then seasonally adjusted and weighted to produce the HMI. Based on this calculation, the HMI can range between 0 and 100.

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# Contra Costa County Employees' Retirement Association

Investment Performance Review

Period Ending: December 31, 2020



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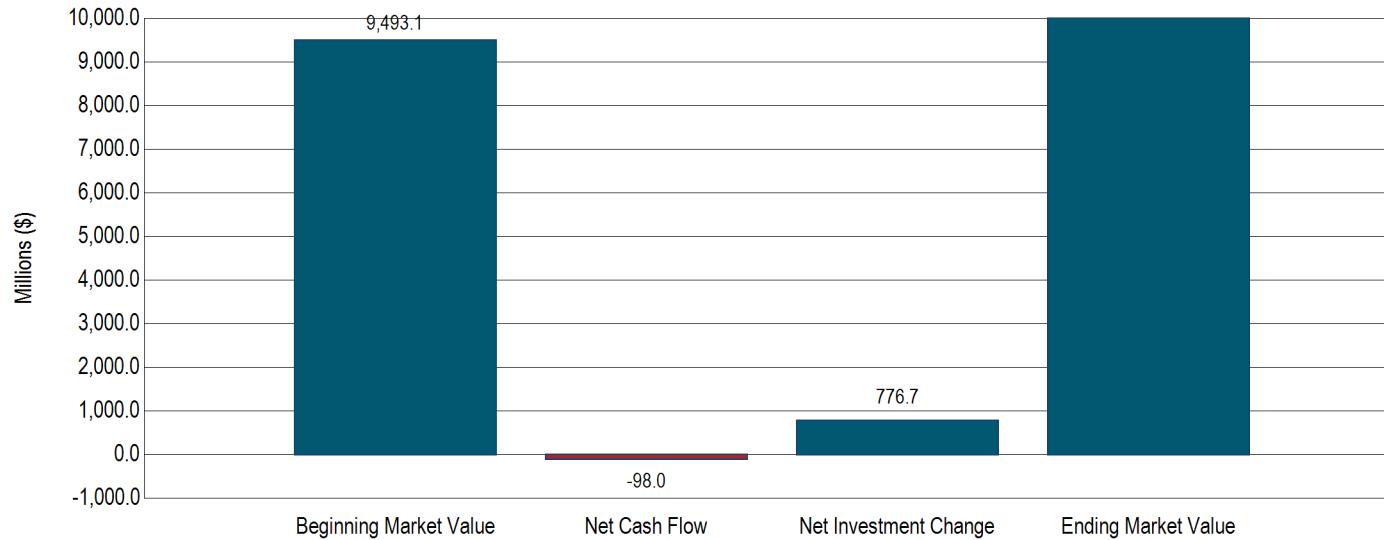
SAN FRANCISCO 415-362-3484

PITTSBURGH 412-784-6678

Portfolio Reconciliation

	Last Three Months	Year-To-Date
Beginning Market Value	\$9,493,124,547	\$9,390,188,036
Net Cash Flow	-\$98,017,356	-\$70,896,254
Net Investment Change	\$776,695,271	\$852,510,681
Ending Market Value	\$10,171,802,463	\$10,171,802,463

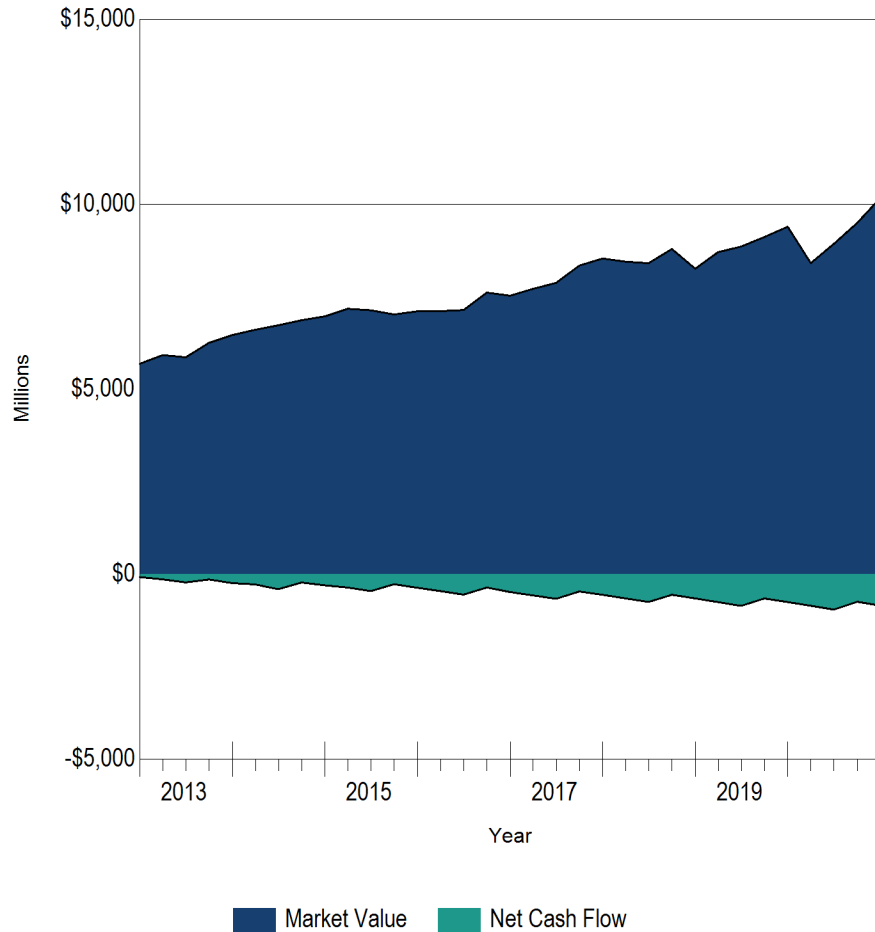
Change in Market Value  
Last Three Months



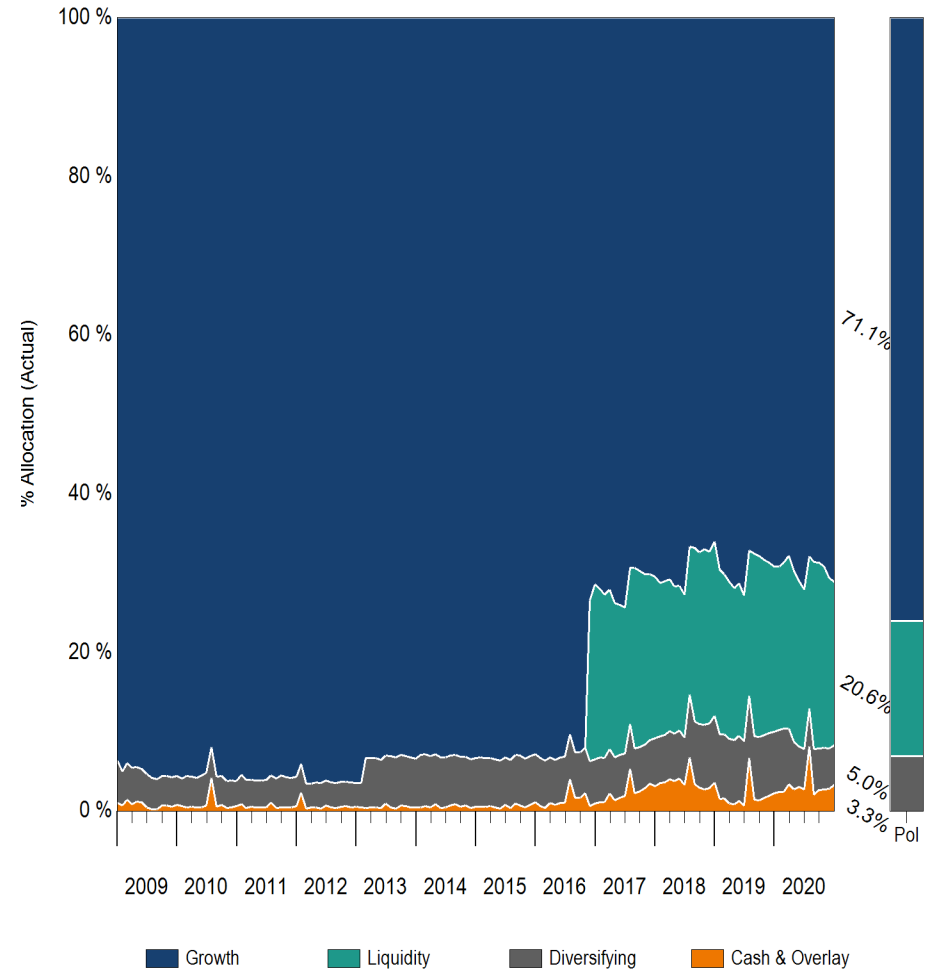
Contributions and withdrawals may include intra-account transfers between managers/funds.



Market Value History  
Cumulative Cash Flows



Asset Allocation History

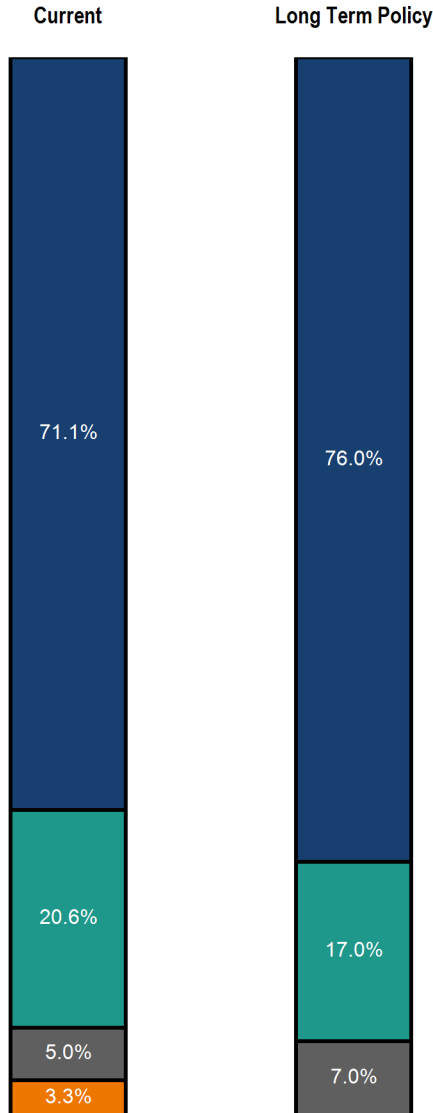


Policy reflects FFP 4-Yr allocations approved in June 2020.

# Total Fund

## Asset Allocation vs. Long Term Target Policy

Period Ending: December 31, 2020



### Allocation vs. Long Term Target

	Current Balance	Current Allocation	Long Term Target	Difference
Growth	\$7,232,247,227	71.1%	76.0%	-\$498,322,645
Liquidity	\$2,095,075,389	20.6%	17.0%	\$365,868,970
Diversifying	\$507,514,285	5.0%	7.0%	-\$204,511,887
Cash & Overlay	\$336,965,562	3.3%	--	\$336,965,562
<b>Total</b>	<b>\$10,171,802,463</b>	<b>100.0%</b>	<b>100.0%</b>	

### Allocation vs. Current Targets

	Current Balance	Current Allocation	Current Target	Difference
Growth	\$7,232,247,227	71.1%	68.5%	\$264,562,540
Liquidity	\$2,095,075,389	20.6%	25.0%	-\$447,875,227
Diversifying	\$507,514,285	5.0%	6.5%	-\$153,652,875
Cash & Overlay	\$336,965,562	3.3%	--	\$336,965,562
<b>Total</b>	<b>\$10,171,802,463</b>	<b>100.0%</b>	<b>100.0%</b>	

Long Term Targets reflect FFP 4-Yr allocations approved in June 2020.  
 Current Targets reflect targets approved in June 2020.

Total Fund  
Executive Summary (Net of Fees)

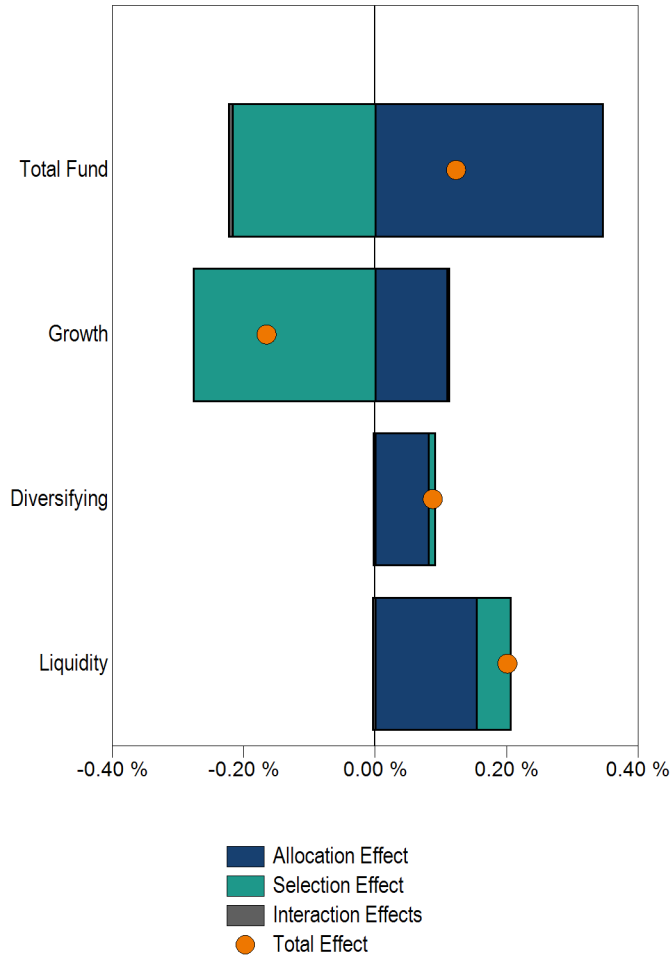
Period Ending: December 31, 2020

	% of Portfolio	QTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2020	2019	2018	2017	2016
<b>Total Fund</b>	<b>100.0</b>	<b>8.2</b>	<b>9.2</b>	<b>6.8</b>	<b>8.2</b>	<b>8.1</b>	<b>9.2</b>	<b>14.6</b>	<b>-2.7</b>	<b>13.9</b>	<b>6.9</b>
<i>Policy Index</i>		8.1	10.8	7.9	9.3	8.8	10.8	14.6	-0.9	13.7	8.9
<b>Growth</b>	<b>71.1</b>	<b>11.3</b>	<b>12.0</b>	<b>8.4</b>	<b>10.2</b>	<b>--</b>	<b>12.0</b>	<b>18.4</b>	<b>-3.9</b>	<b>18.7</b>	<b>7.6</b>
<i>Custom Growth Benchmark</i>		11.7	13.8	9.9	11.8	--	13.8	19.3	-2.1	19.3	10.1
<b>Diversifying</b>	<b>5.0</b>	<b>1.1</b>	<b>-1.7</b>	<b>0.9</b>	<b>1.2</b>	<b>1.6</b>	<b>-1.7</b>	<b>6.8</b>	<b>-2.3</b>	<b>2.6</b>	<b>0.8</b>
<i>Custom Diversifying Benchmark</i>		0.9	4.7	4.0	4.2	3.9	4.7	6.1	1.4	4.7	4.1
<b>Liquidity</b>	<b>20.6</b>	<b>0.4</b>	<b>3.4</b>	<b>3.3</b>	<b>--</b>	<b>--</b>	<b>3.4</b>	<b>4.8</b>	<b>1.7</b>	<b>1.4</b>	<b>--</b>
<i>BBgBarc US Govt/Credit 1-3 Yr. TR</i>		0.2	3.3	3.0	--	--	3.3	4.0	1.6	0.8	--

\*Correlation between the Growth and Diversifying composites is .85, .61 and .49 over the previous 1, 3 and 5 year periods respectively.

Policy Index (7/1/2020-Present): 9% Russell 3000, 18% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 25% BBgBarc 1-3 Yr Gov/Credit, 3% BBgBarc US Aggregate, 2% BBgBarc Global Aggregate, 7% ICE BofAML High Yield Master II +2%, 1.5% ICE BofAML High Yield Master II, 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 1.5% CPI +4%, 11% S&P 500 +4%(Lagged), 2% HFRI EH Equity Market Neutral. Policy Index (7/1/2019-6/30/2020): 10% Russell 3000, 18% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 24% BBgBarc 1-3 Yr Gov/Credit, 3.5% BBgBarc US Aggregate, 2% BBgBarc Global Aggregate, 5% ICE BofAML High Yield Master II +2%, 2% ICE BofAML High Yield Master II, 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 2.0% CPI +4%, 11% S&P 500 +4%(Lagged), 2.5% HFRI EH Equity Market Neutral.

**Attribution Effects**  
3 Months Ending December 31, 2020



**Performance Attribution**

	Quarter
Wtd. Actual Return	8.22%
Wtd. Index Return *	8.09%
<b>Excess Return</b>	<b>0.12%</b>
Selection Effect	-0.22%
Allocation Effect	0.35%
Interaction Effect	0.00%

\*Calculated from benchmark returns and weightings of each component.

**Attribution Summary**  
Last Three Months

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Growth	11.3%	11.7%	-0.4%	-0.3%	0.1%	0.0%	-0.2%
Diversifying	1.1%	1.0%	0.1%	0.0%	0.1%	0.0%	0.1%
Liquidity	0.4%	0.2%	0.2%	0.1%	0.2%	0.0%	0.2%
<b>Total</b>	<b>8.2%</b>	<b>8.1%</b>	<b>0.1%</b>	<b>-0.2%</b>	<b>0.3%</b>	<b>0.0%</b>	<b>0.1%</b>

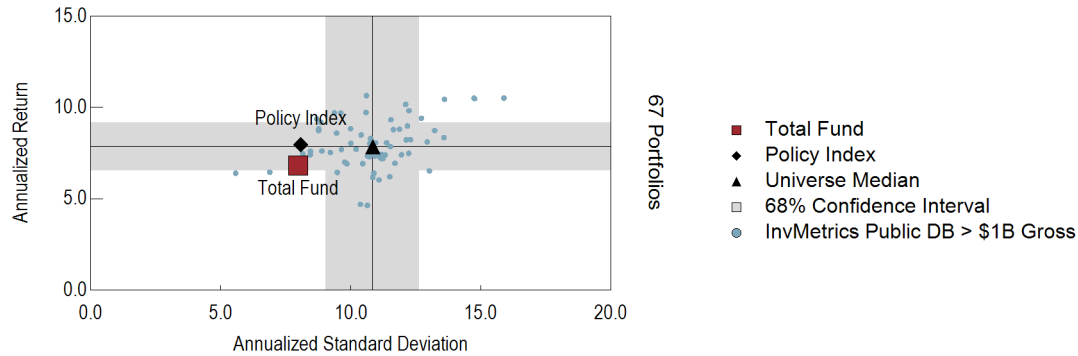
# Total Fund Executive Summary (Net of Fees)

Period Ending: December 31, 2020

## 3 Years

	Anlzd Return	Ann Excess BM Return	Anlzd Standard Deviation	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Total Fund	6.80%	-1.14%	7.98%	-0.72%	0.95	2.36%	0.92	0.67	-0.49	94.42%	105.04%

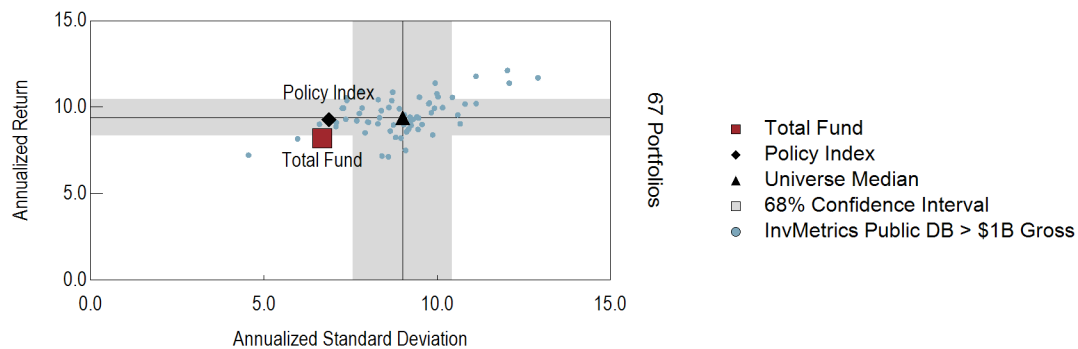
## Risk vs. Return



## 5 Years

	Anlzd Return	Ann Excess BM Return	Anlzd Standard Deviation	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Information Ratio	Up Mkt Capture Ratio	Down Mkt Capture Ratio
Total Fund	8.20%	-1.06%	6.68%	-0.39%	0.93	2.07%	0.91	1.06	-0.51	92.25%	103.32%

## Risk vs. Return



Total Fund  
Performance Summary (Gross of Fees)

Period Ending: December 31, 2020

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2020	2019	2018	2017	2016	Inception	Inception Date
<b>Total Fund</b>	<b>10,171,802,463</b>	<b>100.0</b>	<b>8.3</b>	<b>9.5</b>	<b>7.1</b>	<b>8.5</b>	<b>8.6</b>	<b>9.5</b>	<b>15.0</b>	<b>-2.5</b>	<b>14.2</b>	<b>7.4</b>		
Policy Index			8.1	10.8	7.9	9.3	8.8	10.8	14.6	-0.9	13.7	8.9		
InvMetrics Public DB > \$1B Gross Rank			89	79	80	88	33	79	83	25	83	74		
<b>Total Fund ex Overlay &amp; Cash</b>	<b>9,834,836,901</b>	<b>96.7</b>	<b>8.3</b>	<b>9.7</b>	<b>7.2</b>	<b>8.6</b>	<b>8.7</b>	<b>9.7</b>	<b>14.7</b>	<b>-2.1</b>	<b>14.1</b>	<b>7.4</b>		
Policy Index			8.1	10.8	7.9	9.3	8.8	10.8	14.6	-0.9	13.7	8.9		
InvMetrics Public DB > \$1B Gross Rank			89	72	78	86	32	72	84	20	84	74		
<b>Growth</b>	<b>7,232,247,227</b>	<b>71.1</b>	<b>11.4</b>	<b>12.4</b>	<b>8.8</b>	<b>10.6</b>	<b>--</b>	<b>12.4</b>	<b>18.8</b>	<b>-3.6</b>	<b>19.1</b>	<b>8.1</b>		
Custom Growth Benchmark			11.7	13.8	9.9	11.8	--	13.8	19.3	-2.1	19.3	10.1		
<b>Total Domestic Equity</b>	<b>1,067,112,641</b>	<b>10.5</b>	<b>19.5</b>	<b>22.2</b>	<b>12.8</b>	<b>14.7</b>	<b>13.8</b>	<b>22.2</b>	<b>26.7</b>	<b>-7.2</b>	<b>23.9</b>	<b>11.5</b>		
Russell 3000			14.7	20.9	14.5	15.4	13.8	20.9	31.0	-5.2	21.1	12.7		
InvMetrics Public DB US Eq Gross Rank			4	7	54	41	26	7	87	78	6	77		
BlackRock Russell 1000 Index	229,775,562	2.3	13.7	21.0	14.8	--	--	21.0	31.4	-4.8	--	--	15.9	Apr-17
Russell 1000			13.7	21.0	14.8	--	--	21.0	31.4	-4.8	--	--	15.9	Apr-17
eV US Large Cap Equity Gross Rank			40	36	39	--	--	36	39	47	--	--		
Jackson Square Partners	243,346,164	2.4	16.1	44.8	22.0	17.5	16.7	44.8	27.9	-2.0	29.3	-4.4	12.5	May-05
Russell 1000 Growth			11.4	38.5	23.0	21.0	17.2	38.5	36.4	-1.5	30.2	7.1	12.8	May-05
eV US Large Cap Growth Equity Gross Rank			9	19	50	74	41	19	93	59	47	98		
Boston Partners	234,795,447	2.3	18.8	3.0	5.3	10.1	11.3	3.0	24.3	-8.7	20.1	15.1	10.4	Jun-95
Russell 1000 Value			16.3	2.8	6.1	9.7	10.5	2.8	26.5	-8.3	13.7	17.3	9.2	Jun-95
eV US Large Cap Value Equity Gross Rank			25	61	70	60	45	61	77	55	23	50		
Emerald Advisers	194,942,957	1.9	26.2	39.0	17.6	18.2	16.4	39.0	30.3	-10.1	28.8	10.1	14.9	Apr-03
Russell 2000 Growth			29.6	34.6	16.2	16.4	13.5	34.6	28.5	-9.3	22.2	11.3	12.8	Apr-03
eV US Small Cap Growth Equity Gross Rank			61	56	68	64	41	56	45	85	26	54		
Ceredex	164,252,512	1.6	27.2	2.3	2.4	9.2	--	2.3	18.4	-11.3	11.4	29.8	10.3	Nov-11
Russell 2000 Value			33.4	4.6	3.7	9.7	--	4.6	22.4	-12.9	7.8	31.7	10.3	Nov-11
eV US Small Cap Value Equity Gross Rank			74	69	70	58	--	69	87	25	48	32		

Individual closed end funds are not shown in performance summary table.

Total Fund  
Performance Summary (Gross of Fees)

Period Ending: December 31, 2020

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2020	2019	2018	2017	2016	Inception	Inception Date
<b>Total International Equity</b>	<b>1,940,796,466</b>	<b>19.1</b>	<b>18.5</b>	<b>15.8</b>	<b>7.1</b>	<b>9.3</b>	<b>6.7</b>	<b>15.8</b>	<b>23.7</b>	<b>-14.3</b>	<b>25.5</b>	<b>1.2</b>		
MSCI ACWI ex USA Gross			17.1	11.1	5.4	9.4	5.4	11.1	22.1	-13.8	27.8	5.0		
MSCI EAFE Gross			16.1	8.3	4.8	8.0	6.0	8.3	22.7	-13.4	25.6	1.5		
InvMetrics Public DB ex-US Eq Gross Rank			24	22	22	64	30	22	28	44	90	89		
<b>International Equity</b>	<b>1,132,617,535</b>	<b>11.1</b>	<b>14.2</b>	<b>19.0</b>	<b>9.3</b>	<b>10.6</b>	<b>7.3</b>	<b>19.0</b>	<b>27.0</b>	<b>-13.6</b>	<b>25.3</b>	<b>1.2</b>		
MSCI ACWI ex USA Gross			17.1	11.1	5.4	9.4	5.4	11.1	22.1	-13.8	27.8	5.0		
InvMetrics Public DB ex-US Eq Gross Rank			96	12	9	27	15	12	7	21	93	89		
Pyrford	508,279,141	5.0	11.3	4.7	4.7	7.3	--	4.7	22.1	-10.1	19.8	3.4	4.5	May-14
MSCI ACWI ex USA Value			20.4	-0.8	-0.4	5.7	--	-0.8	15.7	-14.0	22.7	8.9	1.4	May-14
eV ACWI ex-US Value Equity Gross Rank			97	33	16	48	--	33	35	5	84	74		
William Blair	624,338,394	6.1	16.6	33.3	13.5	13.6	9.4	33.3	32.0	-16.8	30.9	-1.4	9.5	Oct-10
MSCI ACWI ex USA Growth			13.9	22.2	10.0	12.0	6.9	22.2	27.3	-14.4	32.0	0.1	7.3	Oct-10
eV ACWI ex-US Growth Equity Gross Rank			39	30	36	57	50	30	39	69	81	55		
<b>Emerging Markets Equity</b>	<b>808,178,931</b>	<b>7.9</b>	<b>25.2</b>	<b>11.4</b>	<b>4.0</b>	<b>--</b>	<b>--</b>	<b>11.4</b>	<b>19.4</b>	<b>-15.3</b>	<b>--</b>	<b>--</b>		
MSCI Emerging Markets			19.7	18.3	6.2	--	--	18.3	18.4	-14.6	--	--		
InvMetrics Public DB Emg Mkt Eq Gross Rank			8	81	64	--	--	81	31	51	--	--		
PIMCO RAE Emerging Markets	375,063,168	3.7	26.5	2.1	0.9	--	--	2.1	14.6	-12.3	--	--	4.9	Feb-17
MSCI Emerging Markets Value NR			23.0	5.5	1.8	--	--	5.5	12.0	-10.7	--	--	5.9	Feb-17
eV Emg Mkts All Cap Value Equity Gross Rank			29	85	79	--	--	85	72	44	--	--		
TT Emerging Markets	433,115,763	4.3	24.1	20.8	7.1	--	--	20.8	24.8	-18.4	--	--	9.9	Jul-17
MSCI Emerging Markets			19.7	18.3	6.2	--	--	18.3	18.4	-14.6	--	--	8.2	Jul-17
eV Emg Mkts Equity Gross Rank			18	39	42	--	--	39	24	83	--	--		
<b>Total Global Equity</b>	<b>1,084,011,804</b>	<b>10.7</b>	<b>10.8</b>	<b>25.3</b>	<b>14.2</b>	<b>14.7</b>	<b>10.7</b>	<b>25.3</b>	<b>28.9</b>	<b>-7.8</b>	<b>23.7</b>	<b>7.6</b>		
MSCI ACWI			14.7	16.3	10.1	12.3	9.1	16.3	26.6	-9.4	24.0	7.9		
InvMetrics Public DB Glbl Eq Gross Rank			90	3	1	1	3	3	3	60	79	40		
Artisan Partners	598,791,259	5.9	10.8	41.7	21.3	20.2	--	41.7	37.0	-7.9	32.9	5.6	16.9	Oct-12
MSCI ACWI			14.7	16.3	10.1	12.3	--	16.3	26.6	-9.4	24.0	7.9	10.6	Oct-12
eV All Global Equity Gross Rank			82	8	7	6	--	8	7	40	11	61		
First Eagle	485,083,633	4.8	10.9	8.5	6.6	9.3	--	8.5	21.0	-7.6	15.1	11.7	8.4	Jan-11
MSCI ACWI			14.7	16.3	10.1	12.3	--	16.3	26.6	-9.4	24.0	7.9	9.1	Jan-11
eV All Global Equity Gross Rank			81	70	69	74	--	70	82	38	89	19		

Individual closed end funds are not shown in performance summary table.

Total Fund  
Performance Summary (Gross of Fees)

Period Ending: December 31, 2020

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2020	2019	2018	2017	2016	Inception	Inception Date
<b>Private Credit</b>	<b>744,654,491</b>	<b>7.3</b>	<b>2.7</b>	<b>4.0</b>	<b>6.6</b>	<b>7.7</b>	<b>11.5</b>	<b>4.0</b>	<b>7.7</b>	<b>8.3</b>	<b>10.4</b>	<b>8.2</b>		
ICE BofAML High Yield Master II+2%			7.0	8.3	8.0	10.6	8.8	8.3	16.7	-0.3	9.6	19.8		
<b>Total High Yield</b>	<b>177,037,759</b>	<b>1.7</b>	<b>5.4</b>	<b>5.1</b>	<b>5.7</b>	<b>7.5</b>	<b>6.4</b>	<b>5.1</b>	<b>16.0</b>	<b>-3.2</b>	<b>6.5</b>	<b>14.3</b>		
ICE BofAML High Yield Master II			6.5	6.2	5.9	8.4	6.6	6.2	14.4	-2.3	7.5	17.5		
eV US High Yield Fixed Inc Gross Rank			65	75	69	64	76	75	15	88	74	47		
Allianz Global Investors	177,037,759	1.7	5.4	5.1	5.7	7.5	6.4	5.1	16.0	-3.2	6.5	14.3	7.0	Apr-00
ICE BofAML High Yield Master II			6.5	6.2	5.9	8.4	6.6	6.2	14.4	-2.3	7.5	17.5	7.1	Apr-00
eV US High Yield Fixed Inc Gross Rank			65	75	69	64	76	75	15	88	74	47		
<b>Total Real Estate</b>	<b>674,212,459</b>	<b>6.6</b>	<b>2.4</b>	<b>-5.9</b>	<b>3.0</b>	<b>5.1</b>	<b>9.6</b>	<b>-5.9</b>	<b>8.1</b>	<b>7.4</b>	<b>11.1</b>	<b>5.5</b>		
Real Estate Benchmark			2.3	0.6	4.9	5.7	8.9	0.6	7.5	6.8	7.1	6.7		
NCREIF-ODCE			1.3	1.2	4.9	6.2	9.9	1.2	5.3	8.3	7.6	8.8		
NCREIF Property Index			1.2	1.6	4.9	5.9	9.0	1.6	6.4	6.7	7.0	8.0		
Adelante	76,519,958	0.8	11.0	-4.6	5.1	5.4	9.3	-4.6	28.2	-5.0	7.8	4.1	9.9	Sep-01
Wilshire REIT			10.6	-7.9	3.3	4.3	8.3	-7.9	25.8	-4.8	4.2	7.2	9.4	Sep-01
<b>Private Equity</b>	<b>1,040,644,401</b>	<b>10.2</b>	<b>7.6</b>	<b>8.7</b>	<b>9.7</b>	<b>10.1</b>	<b>11.8</b>	<b>8.7</b>	<b>8.4</b>	<b>12.1</b>	<b>11.9</b>	<b>9.4</b>		
S&P 500 Index +4% (Lagged)			10.0	19.7	16.7	18.7	18.2	19.7	8.4	22.6	23.3	20.0		
<b>Risk Parity</b>	<b>503,777,206</b>	<b>5.0</b>	<b>8.6</b>	<b>10.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>10.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>		
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			10.1	14.0	--	--	--	14.0	--	--	--	--		
AQR Global Risk Premium-EL	250,241,057	2.5	7.5	6.2	--	--	--	6.2	--	--	--	--	12.3	Jan-19
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			10.1	14.0	--	--	--	14.0	--	--	--	--	16.3	Jan-19
PanAgora Risk Parity Multi Asset	253,536,149	2.5	9.7	14.0	--	--	--	14.0	--	--	--	--	15.1	Feb-19
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			10.1	14.0	--	--	--	14.0	--	--	--	--	13.7	Feb-19

Individual closed end funds are not shown in performance summary table.



Total Fund  
Performance Summary (Gross of Fees)

Period Ending: December 31, 2020

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2020	2019	2018	2017	2016	Inception	Inception Date
<b>Diversifying</b>	<b>507,514,285</b>	<b>5.0</b>	<b>1.3</b>	<b>-1.3</b>	<b>1.2</b>	<b>1.5</b>	<b>1.9</b>	<b>-1.3</b>	<b>7.1</b>	<b>-2.0</b>	<b>2.8</b>	<b>1.3</b>		
Custom Diversifying Benchmark			0.9	4.7	4.0	4.2	3.9	4.7	6.1	1.4	4.7	4.1		
<b>Diversifying Fixed Income</b>	<b>271,646,014</b>	<b>2.7</b>	<b>0.2</b>	<b>1.6</b>	<b>2.8</b>	<b>2.8</b>	<b>3.2</b>	<b>1.6</b>	<b>8.6</b>	<b>-1.7</b>	<b>2.8</b>	<b>2.8</b>		
eV US Core Fixed Inc Gross Rank			97	99	99	99	99	99	80	99	96	72		
AFL-CIO	271,523,975	2.7	0.2	6.6	5.1	4.3	4.0	6.6	8.2	0.6	3.6	2.4	6.2	Jun-91
BBgBarc US Aggregate TR			0.7	7.5	5.3	4.4	3.8	7.5	8.7	0.0	3.5	2.6	5.8	Jun-91
eV US Core Fixed Inc Gross Rank			97	96	95	93	86	96	88	16	76	87		
<b>Diversifying Equity</b>	<b>108,277,204</b>	<b>1.1</b>	<b>2.7</b>	<b>-8.9</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-8.9</b>	<b>3.3</b>	<b>--</b>	<b>--</b>	<b>--</b>		
Parametric Defensive Equity	108,277,204	1.1	2.7	-8.9	--	--	--	-8.9	3.3	--	--	--	-3.4	Jul-18
91 Day T-Bill +4%			1.0	4.5	--	--	--	4.5	6.1	--	--	--	5.4	Jul-18
<b>Diversifying Multi-Asset</b>	<b>127,591,067</b>	<b>1.3</b>	<b>2.5</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>		
FTSE 3-Month T-bill +5%			1.3	--	--	--	--	--	--	--	--	--		
Acadian Multi-Asset Absolute Return Fund	127,591,067	1.3	2.5	--	--	--	--	--	--	--	--	--	1.8	Aug-20
FTSE 3-Month T-bill +5%			1.3	--	--	--	--	--	--	--	--	--	2.1	Aug-20
<b>Liquidity</b>	<b>2,095,075,389</b>	<b>20.6</b>	<b>0.4</b>	<b>3.5</b>	<b>3.4</b>	<b>--</b>	<b>--</b>	<b>3.5</b>	<b>4.9</b>	<b>1.8</b>	<b>1.5</b>	<b>--</b>		
BBgBarc US Govt/Credit 1-3 Yr. TR			0.2	3.3	3.0	--	--	3.3	4.0	1.6	0.8	--		
eV US Short Duration Fixed Inc Gross Rank			54	77	51	--	--	77	34	24	50	--		
DFA Short Credit	426,576,384	4.2	0.5	2.9	3.1	--	--	2.9	5.2	1.2	1.9	--	2.8	Nov-16
ICE BofA 1-5 Yrs US Corp & Govt TR			0.4	4.6	3.7	--	--	4.6	5.1	1.4	1.3	--	3.0	Nov-16
eV US Short Duration Fixed Inc Gross Rank			45	90	78	--	--	90	21	93	26	--		
Insight Short Duration	1,069,317,369	10.5	0.6	3.2	3.2	--	--	3.2	4.7	1.7	1.5	--	2.7	Nov-16
BBgBarc US Govt/Credit 1-3 Yr. TR			0.2	3.3	3.0	--	--	3.3	4.0	1.6	0.8	--	2.4	Nov-16
eV US Short Duration Fixed Inc Gross Rank			35	86	72	--	--	86	45	38	50	--		
Sit Short Duration	599,181,635	5.9	0.0	4.6	4.0	--	--	4.6	4.9	2.5	1.3	--	3.2	Nov-16
BBgBarc US Govt 1-3 Yr TR			0.1	3.1	2.8	--	--	3.1	3.6	1.6	0.4	--	2.1	Nov-16
eV US Short Duration Fixed Inc Gross Rank			99	25	16	--	--	25	35	1	68	--		
<b>Total Cash</b>	<b>208,094,687</b>	<b>2.0</b>	<b>0.2</b>	<b>1.3</b>	<b>2.1</b>	<b>1.6</b>	<b>3.1</b>	<b>1.3</b>	<b>3.3</b>	<b>1.7</b>	<b>0.9</b>	<b>0.9</b>		
91 Day T-Bills			0.0	0.5	1.5	1.1	0.6	0.5	2.1	1.9	0.9	0.3		
Cash	208,073,614	2.0	0.2	1.3	2.1	1.6	3.2	1.3	3.4	1.7	0.9	0.9		
Northern Trust Transition	21,073	0.0	3.8	104.1	--	--	--	104.1	--	--	--	--		

Individual closed end funds are not shown in performance summary table. Effective 3/1/2019 the custodian of record switched from State Street to Northern Trust. Wellington Real Total Return was liquidated 4/30/2020. \$122,039.04 in residual value is reflected in the Diversifying Fixed Income composite. State Street Cash/Tax Reclaims balance of \$-28,918 in cash and \$223,127 in potential tax reclaims at State Street after assets were transferred to Northern Trust.

Total Fund  
Performance Summary (Net of Fees)

Period Ending: December 31, 2020

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2020	2019	2018	2017	2016	Inception	Inception Date
<b>Total Fund</b>	<b>10,171,802,463</b>	<b>100.0</b>	<b>8.2</b>	<b>9.2</b>	<b>6.8</b>	<b>8.2</b>	<b>8.1</b>	<b>9.2</b>	<b>14.6</b>	<b>-2.7</b>	<b>13.9</b>	<b>6.9</b>		
<i>Policy Index</i>			8.1	10.8	7.9	9.3	8.8	10.8	14.6	-0.9	13.7	8.9		
<b>Total Fund ex Overlay &amp; Cash</b>	<b>9,834,836,901</b>	<b>96.7</b>	<b>8.2</b>	<b>9.4</b>	<b>6.9</b>	<b>8.3</b>	<b>8.2</b>	<b>9.4</b>	<b>14.4</b>	<b>-2.4</b>	<b>13.8</b>	<b>6.9</b>		
<i>Policy Index</i>			8.1	10.8	7.9	9.3	8.8	10.8	14.6	-0.9	13.7	8.9		
<b>Growth</b>	<b>7,232,247,227</b>	<b>71.1</b>	<b>11.3</b>	<b>12.0</b>	<b>8.4</b>	<b>10.2</b>	<b>--</b>	<b>12.0</b>	<b>18.4</b>	<b>-3.9</b>	<b>18.7</b>	<b>7.6</b>		
<i>Custom Growth Benchmark</i>			11.7	13.8	9.9	11.8	--	13.8	19.3	-2.1	19.3	10.1		
<b>Total Domestic Equity</b>	<b>1,067,112,641</b>	<b>10.5</b>	<b>19.4</b>	<b>21.8</b>	<b>12.4</b>	<b>14.2</b>	<b>13.3</b>	<b>21.8</b>	<b>26.1</b>	<b>-7.6</b>	<b>23.5</b>	<b>11.1</b>		
<i>Russell 3000</i>			14.7	20.9	14.5	15.4	13.8	20.9	31.0	-5.2	21.1	12.7		
BlackRock Russell 1000 Index	229,775,562	2.3	13.7	20.9	14.8	--	--	20.9	31.4	-4.8	--	--	15.9	Apr-17
<i>Russell 1000</i>			13.7	21.0	14.8	--	--	21.0	31.4	-4.8	--	--	15.9	Apr-17
Jackson Square Partners	243,346,164	2.4	15.9	44.1	21.4	17.0	16.2	44.1	27.3	-2.4	28.7	-4.8	12.1	May-05
<i>Russell 1000 Growth</i>			11.4	38.5	23.0	21.0	17.2	38.5	36.4	-1.5	30.2	7.1	12.8	May-05
Boston Partners	234,795,447	2.3	18.7	2.6	5.0	9.7	11.0	2.6	23.8	-8.9	19.7	14.7	10.1	Jun-95
<i>Russell 1000 Value</i>			16.3	2.8	6.1	9.7	10.5	2.8	26.5	-8.3	13.7	17.3	9.2	Jun-95
Emerald Advisers	194,942,957	1.9	26.0	38.2	16.9	17.5	15.7	38.2	29.4	-10.7	28.0	9.4	14.2	Apr-03
<i>Russell 2000 Growth</i>			29.6	34.6	16.2	16.4	13.5	34.6	28.5	-9.3	22.2	11.3	12.8	Apr-03
Ceredex	164,252,512	1.6	27.0	1.7	1.8	8.6	--	1.7	17.7	-11.8	10.7	29.1	9.7	Nov-11
<i>Russell 2000 Value</i>			33.4	4.6	3.7	9.7	--	4.6	22.4	-12.9	7.8	31.7	10.3	Nov-11
<b>Total International Equity</b>	<b>1,940,796,466</b>	<b>19.1</b>	<b>18.4</b>	<b>15.2</b>	<b>6.6</b>	<b>8.8</b>	<b>6.2</b>	<b>15.2</b>	<b>23.2</b>	<b>-14.7</b>	<b>25.0</b>	<b>0.8</b>		
<i>MSCI ACWI ex USA Gross</i>			17.1	11.1	5.4	9.4	5.4	11.1	22.1	-13.8	27.8	5.0		
<i>MSCI EAFE Gross</i>			16.1	8.3	4.8	8.0	6.0	8.3	22.7	-13.4	25.6	1.5		
<b>International Equity</b>	<b>1,132,617,535</b>	<b>11.1</b>	<b>14.1</b>	<b>18.5</b>	<b>8.9</b>	<b>10.2</b>	<b>6.9</b>	<b>18.5</b>	<b>26.5</b>	<b>-13.9</b>	<b>24.8</b>	<b>0.8</b>		
<i>MSCI ACWI ex USA Gross</i>			17.1	11.1	5.4	9.4	5.4	11.1	22.1	-13.8	27.8	5.0		
Pyrford	508,279,141	5.0	11.2	4.2	4.3	6.9	--	4.2	21.6	-10.5	19.3	3.0	4.1	May-14
<i>MSCI ACWI ex USA Value</i>			20.4	-0.8	-0.4	5.7	--	-0.8	15.7	-14.0	22.7	8.9	1.4	May-14
William Blair	624,338,394	6.1	16.5	32.8	13.1	13.1	8.9	32.8	31.5	-17.1	30.4	-1.8	9.1	Oct-10
<i>MSCI ACWI ex USA Growth</i>			13.9	22.2	10.0	12.0	6.9	22.2	27.3	-14.4	32.0	0.1	7.3	Oct-10
<b>Emerging Markets Equity</b>	<b>808,178,931</b>	<b>7.9</b>	<b>25.0</b>	<b>10.7</b>	<b>3.5</b>	<b>--</b>	<b>--</b>	<b>10.7</b>	<b>18.7</b>	<b>-15.7</b>	<b>--</b>	<b>--</b>		
<i>MSCI Emerging Markets</i>			19.7	18.3	6.2	--	--	18.3	18.4	-14.6	--	--		
PIMCO RAE Emerging Markets	375,063,168	3.7	26.3	1.6	0.4	--	--	1.6	14.0	-12.6	--	--	4.3	Feb-17
<i>MSCI Emerging Markets Value NR</i>			23.0	5.5	1.8	--	--	5.5	12.0	-10.7	--	--	5.9	Feb-17
TT Emerging Markets	433,115,763	4.3	23.9	20.0	6.5	--	--	20.0	24.0	-18.9	--	--	9.2	Jul-17
<i>MSCI Emerging Markets</i>			19.7	18.3	6.2	--	--	18.3	18.4	-14.6	--	--	8.2	Jul-17

Individual closed end funds are not shown in performance summary table.

Total Fund  
Performance Summary (Net of Fees)

Period Ending: December 31, 2020

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2020	2019	2018	2017	2016	Inception	Inception Date
<b>Total Global Equity</b>	<b>1,084,011,804</b>	<b>10.7</b>	<b>10.6</b>	<b>24.4</b>	<b>13.3</b>	<b>13.8</b>	<b>10.0</b>	<b>24.4</b>	<b>27.9</b>	<b>-8.5</b>	<b>22.8</b>	<b>6.9</b>		
<i>MSCI ACWI</i>			14.7	16.3	10.1	12.3	9.1	16.3	26.6	-9.4	24.0	7.9		
Artisan Partners	598,791,259	5.9	10.6	40.6	20.4	19.3	--	40.6	36.0	-8.6	31.9	4.8	16.0	Oct-12
<i>MSCI ACWI</i>			14.7	16.3	10.1	12.3	--	16.3	26.6	-9.4	24.0	7.9	10.6	Oct-12
First Eagle	485,083,633	4.8	10.7	7.7	5.8	8.5	--	7.7	20.1	-8.3	14.3	10.9	7.6	Jan-11
<i>MSCI ACWI</i>			14.7	16.3	10.1	12.3	--	16.3	26.6	-9.4	24.0	7.9	9.1	Jan-11
<b>Private Credit</b>	<b>744,654,491</b>	<b>7.3</b>	<b>2.7</b>	<b>4.0</b>	<b>6.6</b>	<b>7.4</b>	<b>10.4</b>	<b>4.0</b>	<b>7.7</b>	<b>8.3</b>	<b>10.4</b>	<b>6.9</b>		
<i>ICE BofAML High Yield Master II+2%</i>			7.0	8.3	8.0	10.6	8.8	8.3	16.7	-0.3	9.6	19.8		
<b>Total High Yield</b>	<b>177,037,759</b>	<b>1.7</b>	<b>5.3</b>	<b>4.7</b>	<b>5.2</b>	<b>7.1</b>	<b>6.0</b>	<b>4.7</b>	<b>15.4</b>	<b>-3.6</b>	<b>6.1</b>	<b>13.9</b>		
<i>ICE BofAML High Yield Master II</i>			6.5	6.2	5.9	8.4	6.6	6.2	14.4	-2.3	7.5	17.5		
Allianz Global Investors	177,037,759	1.7	5.3	4.7	5.2	7.1	5.9	4.7	15.4	-3.6	6.1	13.9	6.6	Apr-00
<i>ICE BofAML High Yield Master II</i>			6.5	6.2	5.9	8.4	6.6	6.2	14.4	-2.3	7.5	17.5	7.1	Apr-00
<b>Total Real Estate</b>	<b>674,212,459</b>	<b>6.6</b>	<b>2.4</b>	<b>-6.0</b>	<b>2.9</b>	<b>4.9</b>	<b>8.9</b>	<b>-6.0</b>	<b>8.1</b>	<b>7.4</b>	<b>11.0</b>	<b>4.8</b>		
<i>Real Estate Benchmark</i>			2.3	0.6	4.9	5.7	8.9	0.6	7.5	6.8	7.1	6.7		
<i>NCREIF-ODCE</i>			1.3	1.2	4.9	6.2	9.9	1.2	5.3	8.3	7.6	8.8		
<i>NCREIF Property Index</i>			1.2	1.6	4.9	5.9	9.0	1.6	6.4	6.7	7.0	8.0		
Adelante	76,519,958	0.8	10.9	-5.2	4.6	4.9	8.7	-5.2	27.5	-5.5	7.2	3.6	9.3	Sep-01
<i>Wilshire REIT</i>			10.6	-7.9	3.3	4.3	8.3	-7.9	25.8	-4.8	4.2	7.2	9.4	Sep-01
<b>Private Equity</b>	<b>1,040,644,401</b>	<b>10.2</b>	<b>7.6</b>	<b>8.7</b>	<b>9.7</b>	<b>10.0</b>	<b>10.6</b>	<b>8.7</b>	<b>8.4</b>	<b>12.1</b>	<b>11.9</b>	<b>8.9</b>		
<i>S&amp;P 500 Index +4% (Lagged)</i>			10.0	19.7	16.7	18.7	18.2	19.7	8.4	22.6	23.3	20.0		
<b>Risk Parity</b>	<b>503,777,206</b>	<b>5.0</b>	<b>8.5</b>	<b>9.6</b>	--	--	--	<b>9.6</b>	--	--	--	--		
<i>60% MSCI ACWI Net/40% BBgBarc Global Aggregate</i>			10.1	14.0	--	--	--	14.0	--	--	--	--		
AQR Global Risk Premium-EL	250,241,057	2.5	7.4	5.8	--	--	--	5.8	--	--	--	--	11.9	Jan-19
<i>60% MSCI ACWI Net/40% BBgBarc Global Aggregate</i>			10.1	14.0	--	--	--	14.0	--	--	--	--	16.3	Jan-19
PanAgora Risk Parity Multi Asset	253,536,149	2.5	9.6	13.6	--	--	--	13.6	--	--	--	--	14.7	Feb-19
<i>60% MSCI ACWI Net/40% BBgBarc Global Aggregate</i>			10.1	14.0	--	--	--	14.0	--	--	--	--	13.7	Feb-19

Individual closed end funds are not shown in performance summary table.

# Total Fund

## Performance Summary (Net of Fees)

Period Ending: December 31, 2020

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2020	2019	2018	2017	2016	Inception	Inception Date
<b>Diversifying</b>	<b>507,514,285</b>	<b>5.0</b>	<b>1.1</b>	<b>-1.7</b>	<b>0.9</b>	<b>1.2</b>	<b>1.6</b>	<b>-1.7</b>	<b>6.8</b>	<b>-2.3</b>	<b>2.6</b>	<b>0.8</b>		
<i>Custom Diversifying Benchmark</i>			0.9	4.7	4.0	4.2	3.9	4.7	6.1	1.4	4.7	4.1		
<b>Diversifying Fixed Income</b>	<b>271,646,014</b>	<b>2.7</b>	<b>0.0</b>	<b>1.2</b>	<b>2.4</b>	<b>2.4</b>	<b>2.9</b>	<b>1.2</b>	<b>8.3</b>	<b>-2.0</b>	<b>2.6</b>	<b>2.3</b>		
AFL-CIO	271,523,975	2.7	0.0	6.2	4.7	3.8	3.6	6.2	7.8	0.2	3.2	1.9	5.8	Jun-91
<i>BBgBarc US Aggregate TR</i>			0.7	7.5	5.3	4.4	3.8	7.5	8.7	0.0	3.5	2.6	5.8	Jun-91
<b>Diversifying Equity</b>	<b>108,277,204</b>	<b>1.1</b>	<b>2.3</b>	<b>-9.4</b>	--	--	--	<b>-9.4</b>	<b>3.0</b>	--	--	--		
Parametric Defensive Equity	108,277,204	1.1	2.3	-9.4	--	--	--	-9.4	3.0	--	--	--	-3.8	Jul-18
<i>91 Day T-Bill +4%</i>			1.0	4.5	--	--	--	4.5	6.1	--	--	--	5.4	Jul-18
<b>Diversifying Multi-Asset</b>	<b>127,591,067</b>	<b>1.3</b>	<b>2.4</b>	--	--	--	--	--	--	--	--	--		
<i>FTSE 3-Month T-bill +5%</i>			1.3	--	--	--	--	--	--	--	--	--		
Acadian Multi-Asset Absolute Return Fund	127,591,067	1.3	2.4	--	--	--	--	--	--	--	--	--	1.6	Aug-20
<i>FTSE 3-Month T-bill +5%</i>			1.3	--	--	--	--	--	--	--	--	--	2.1	Aug-20
<b>Liquidity</b>	<b>2,095,075,389</b>	<b>20.6</b>	<b>0.4</b>	<b>3.4</b>	<b>3.3</b>	--	--	<b>3.4</b>	<b>4.8</b>	<b>1.7</b>	<b>1.4</b>	--		
<i>BBgBarc US Govt/Credit 1-3 Yr. TR</i>			0.2	3.3	3.0	--	--	3.3	4.0	1.6	0.8	--		
DFA Short Credit	426,576,384	4.2	0.5	2.8	3.0	--	--	2.8	5.2	1.1	1.8	--	2.7	Nov-16
<i>ICE BofA 1-5 Yrs US Corp &amp; Govt TR</i>			0.4	4.6	3.7	--	--	4.6	5.1	1.4	1.3	--	3.0	Nov-16
Insight Short Duration	1,069,317,369	10.5	0.6	3.1	3.1	--	--	3.1	4.6	1.7	1.5	--	2.7	Nov-16
<i>BBgBarc US Govt/Credit 1-3 Yr. TR</i>			0.2	3.3	3.0	--	--	3.3	4.0	1.6	0.8	--	2.4	Nov-16
Sit Short Duration	599,181,635	5.9	-0.1	4.4	3.8	--	--	4.4	4.7	2.3	1.1	--	3.1	Nov-16
<i>BBgBarc US Govt 1-3 Yr TR</i>			0.1	3.1	2.8	--	--	3.1	3.6	1.6	0.4	--	2.1	Nov-16
<b>Total Cash</b>	<b>208,094,687</b>	<b>2.0</b>	<b>0.2</b>	<b>1.3</b>	<b>2.1</b>	<b>1.6</b>	<b>3.1</b>	<b>1.3</b>	<b>3.3</b>	<b>1.7</b>	<b>0.9</b>	<b>0.9</b>		
<i>91 Day T-Bills</i>			0.0	0.5	1.5	1.1	0.6	0.5	2.1	1.9	0.9	0.3		
Cash	208,073,614	2.0	0.2	1.3	2.1	1.6	3.1	1.3	3.4	1.7	0.9	0.9		
Northern Trust Transition	21,073	0.0	3.8	104.1	--	--	--	104.1	--	--	--	--		

Individual closed end funds are not shown in performance summary table. Effective 3/1/2019 the custodian of record switched from State Street to Northern Trust. Wellington Real Total Return was liquidated 4/30/2020. \$122,039.04 in residual value is reflected in the Diversifying Fixed Income composite.

Total Fund  
Closed End Funds - Investment Summary

Period Ending: December 31, 2020

StepStone Group Analysis (*)												
Closing Date	Manager Name/Fund Name	Estimated Market Value as of 12/31/20 <sup>1</sup>	Total Commitment	% Called	Contributed Capital	Current Qtr. Change in Contributed Capital	Current Qtr. Change in Distributed Capital	Total Distributions	Remaining Commitment	Distrib./ Paid-In (DPI) <sup>2</sup>	Tot. Value/ Paid-In (TVPI) <sup>3</sup>	Latest Valuation
<b>Private Credit</b>												
8/31/2015	Angelo Gordon Energy Credit Opp. <sup>4</sup>	\$2,465,615	\$16,500,000	114%	\$18,750,000	\$0	\$0	\$18,829,566	\$2,319,783	1.00	1.14	9/30/2020
12/18/2017	Stepstone CC Opportunities Fund	\$711,825,537	\$1,020,000,000	68%	\$690,599,992	\$46,557,162	\$66	\$41,561,970	\$370,864,909	0.06	1.09	9/30/2020
7/1/2006	Torchlight II	-\$59,952	\$128,000,000	171%	\$218,263,562	\$0	\$59,952	\$208,623,727	\$0	0.96	0.96	9/30/2020
12/12/2008	Torchlight III	-\$13,696	\$75,000,000	112%	\$83,825,058	\$0	\$13,696	\$124,848,870	\$0	1.49	1.49	9/30/2020
8/1/2012	Torchlight IV	\$9,690,248	\$60,000,000	141%	\$84,866,971	\$0	\$0	\$104,809,507	\$0	1.23	1.35	9/30/2020
3/12/2015	Torchlight V	\$20,746,739	\$75,000,000	80%	\$60,000,000	\$0	\$0	\$55,039,262	\$15,000,000	0.92	1.26	9/30/2020
<b>Total Private Credit</b>		<b>\$744,654,491</b>										
<b>% of Portfolio (Market Value)</b>		<b>7.3%</b>										

\*All Data provided by StepStone Group

<sup>1</sup>Latest valuation + capital calls - distributions

<sup>2</sup>(DPI) is equal to (capital returned / capital called)

<sup>3</sup>(TVPI) is equal to (market value + capital returned) / capital called

<sup>4</sup>Capital has been fully called and fund is in redemption.

Total Fund  
Closed End Funds - Investment Summary

Period Ending: December 31, 2020

Verus Internal Analysis												
Inception Date	Manager Name/Fund Name	Estimated Market Value as of 12/31/2020 <sup>1</sup>	Total Commitment	Total % Called	Capital Called	Current Qtr. Capital Called	Current Qtr. Distributions	Total Distributions <sup>8</sup>	Remaining Commitment	Distrib./Paid-In (DPI) <sup>2</sup>	Tot. Value/Paid-In (TVPI) <sup>3</sup>	Latest Valuation
<b>Real Estate</b>												
1/23/2012	Angelo Gordon Realty Fund VIII <sup>7</sup>	\$19,602,199	\$80,000,000	94%	\$75,401,855	\$0	\$0	\$98,433,174	\$12,334,302	1.31	1.57	9/30/2020
12/8/2014	Angelo Gordon Realty Fund IX	\$62,555,495	\$65,000,000	93%	\$60,125,000	\$0	\$0	\$15,275,000	\$7,572,500	0.25	1.29	9/30/2020
6/23/2005	DLJ RECP III	\$16,536,501	\$75,000,000	134%	\$100,709,313 <sup>4</sup>	\$0	\$0	\$69,364,915	\$4,031,338	0.69	0.85	9/30/2020
2/11/2008	DLJ RECP IV	\$58,577,974	\$100,000,000	130%	\$129,892,605 <sup>5</sup>	\$0	\$1,175,942	\$90,463,629	\$3,162,610	0.70	1.15	9/30/2020
7/1/2014	DLJ RECP V	\$41,415,456	\$75,000,000	114%	\$85,612,038 <sup>6</sup>	\$0	\$0	\$58,913,882	\$20,556,753	0.69	1.17	9/30/2020
3/19/2019	DLJ RECP VI	\$16,254,417	\$50,000,000	51%	\$25,335,866	\$0	\$0	\$220,742	\$25,050,462	0.01	0.65	9/30/2020
6/17/1998	Hearthstone II <sup>7</sup>	-\$48	\$25,000,000	80%	\$19,932,386	\$0	\$0	\$27,473,662	\$0	1.38	1.38	9/30/2020
6/30/2013	Invesco Real Estate III <sup>7</sup>	\$167,336	\$35,000,000	93%	\$32,386,423	\$0	\$4,920,257	\$47,423,062	\$2,613,577	1.46	1.47	12/31/2020
6/30/2014	Invesco Real Estate IV <sup>7</sup>	\$17,651,734	\$35,000,000	87%	\$30,546,401	\$0	\$493,449	\$22,353,948	\$4,453,599	0.73	1.31	9/30/2020
6/30/2013	Invesco Real Estate V	\$43,740,919	\$75,000,000	65%	\$48,997,669	\$4,583,185	\$0	\$4,723,439	\$29,743,834 <sup>9</sup>	0.10	0.99	9/30/2020
7/16/2013	LaSalle Income & Growth VI <sup>7</sup>	\$24,364,448	\$75,000,000	95%	\$71,428,571	\$0	\$0	\$81,401,001	\$3,571,429	1.14	1.48	9/30/2020
2/28/2017	LaSalle Income & Growth VII	\$54,013,864	\$75,000,000	100%	\$74,650,531	\$2,496,216	\$1,706,521	\$33,471,843	\$349,469	0.45	1.17	9/30/2020
7/3/2013	Long Wharf Fund IV <sup>7</sup>	\$1,979,959	\$25,000,000	100%	\$25,000,000	\$0	\$735,225	\$34,528,873	\$0	1.38	1.46	12/31/2020
9/30/2016	Long Wharf Fund V <sup>7</sup>	\$36,414,512	\$50,000,000	100%	\$50,000,000	\$0	\$3,427,396	\$25,476,979	\$0	0.51	1.24	12/31/2020
6/27/2019	Long Wharf Fund VI	\$10,133,879	\$50,000,000	19%	\$9,276,511	\$2,507,433	\$0	\$0	\$40,723,489	0.00	1.09	12/31/2020
12/31/2011	Oaktree REOF V <sup>7</sup>	\$3,474,839	\$50,000,000	100%	\$50,065,841	\$12,113	\$320,000	\$75,692,733	\$5,000,000 <sup>9</sup>	1.51	1.58	9/30/2020
9/30/2013	Oaktree REOF VI <sup>7</sup>	\$27,795,386	\$80,000,000	100%	\$80,000,000	\$0	\$0	\$84,010,175	\$18,400,000 <sup>9</sup>	1.05	1.40	9/30/2020
4/1/2015	Oaktree REOF VII	\$50,293,904	\$65,000,000	96%	\$62,400,000	\$1,300,000	\$2,925,000	\$27,040,000	\$21,515,000 <sup>9</sup>	0.43	1.24	9/30/2020
11/10/2013	Paulson Real Estate Fund II <sup>7</sup>	\$22,310,720	\$20,000,000	97%	\$19,345,623	\$0	\$2,902,227	\$9,698,417	\$654,377	0.50	1.65	9/30/2020
1/25/2012	Siguler Guff DREOF	\$27,637,392	\$75,000,000	93%	\$69,375,000	\$0	\$15,155	\$94,133,401	\$5,625,000	1.36	1.76	9/30/2020
8/31/2013	Siguler Guff DREOF II	\$45,857,311	\$70,000,000	89%	\$61,985,000	\$0	\$25,600	\$38,550,019	\$8,015,000	0.62	1.36	9/30/2020
1/27/2016	Siguler Guff DREOF II Co-Inv	\$16,914,305	\$25,000,000	82%	\$20,537,862	\$0	\$0	\$10,273,350	\$4,462,138	0.50	1.32	9/30/2020
<b>Total Closed End Real Estate</b>		<b>\$597,692,501</b>	<b>\$1,275,000,000</b>	<b>94%</b>	<b>\$1,203,004,496</b>	<b>\$10,898,946</b>	<b>\$18,646,773</b>	<b>\$948,922,245</b>	<b>\$217,834,876</b>	<b>0.79</b>	<b>1.29</b>	
<b>% of Portfolio (Market Value)</b>		<b>5.9%</b>										

<sup>1</sup>Latest valuation + capital calls - distributions

<sup>2</sup>(DPI) is equal to (capital returned / capital called)

<sup>3</sup>(TVPI) is equal to (market value + capital returned) / capital called

<sup>4</sup>Includes \$7,360,987 in management fees charged outside the fund.

<sup>5</sup>Includes \$11,322,966 in management fees charged outside the fund.

<sup>6</sup>Includes \$986,559 in management fees charged outside the fund.

<sup>7</sup>Capital has been fully called and fund is in redemption.

<sup>8</sup>Total distributions may include recallable distributions

<sup>9</sup>Remaining commitment includes recallable distributions



Total Fund  
Closed End Funds - Investment Summary

Period Ending: December 31, 2020

StepStone Group Analysis (*)													
Closing Date	Manager Name/Fund Name	Estimated Market Value as of 12/31/20 <sup>1</sup>	Total Commitment	Total % Called	Contributed Capital	Current Qtr. Change in Contributed Capital	Current Qtr. Change in Distributed Capital	Total Distributions	Remaining Commitment	Distrib./Paid-In (DPI) <sup>2</sup>	Tot. Value/Paid-In (TVPI) <sup>3</sup>	Latest Valuation	
<b>Private Equity &amp; Venture Capital</b>													
2/11/2004	Adams Street Partners	\$150,088,795	\$210,000,000	89%	\$187,400,625	\$550,000	\$9,538,216	\$178,958,575	\$22,599,375	0.95	1.76	9/30/2020	
1/15/2009	Adams Street Partners II	\$5,475,271	\$30,000,000	95%	\$28,365,000	\$0	\$510,331	\$42,951,012	\$1,635,000	1.51	1.71	9/30/2020	
9/21/2012	Adams Street Partners - Fund 5	\$18,754,327	\$40,000,000	77%	\$30,845,875	\$0	\$947,372	\$19,013,512	\$9,154,125	0.62	1.22	9/30/2020	
1/18/1996	Adams Street Partners - BPF	\$1,764,025	\$59,565,614	97%	\$57,517,409	\$0	\$0	\$102,731,103	\$2,048,205	1.79	1.82	6/30/2020	
3/31/2016	Adams Street Venture Innovation	\$81,413,636	\$75,000,000	74%	\$55,537,500	\$0	\$0	\$0	\$19,462,500	0.00	1.47	9/30/2020	
5/18/2018	AE Industrial Partners Fund II, LP	\$17,071,102	\$35,000,000	47%	\$16,554,769	\$1,701,072	\$804,335	\$804,335	\$19,249,566	0.05	1.08	9/30/2020	
11/27/2013	Aether Real Assets III	\$18,557,689	\$25,000,000	98%	\$24,407,721	\$86,726	\$0	\$3,913,883	\$2,817,919	0.16	0.92	9/30/2020	
11/30/2013	Aether Real Assets III Surplus	\$45,451,358	\$50,000,000	103%	\$51,339,959	\$148,066	\$0	\$8,973,151	\$1,925,536	0.17	1.06	9/30/2020	
1/30/2016	Aether Real Assets IV	\$40,124,306	\$50,000,000	84%	\$42,219,774	\$1,117,485	\$23,646	\$3,474,286	\$10,382,683	0.08	1.03	9/30/2020	
4/30/2004	Bay Area Equity Fund I <sup>4</sup>	\$2,395,696	\$10,000,000	100%	\$10,000,000	\$0	\$0	\$37,018,019	\$0	3.70	3.94	9/30/2020	
6/29/2009	Bay Area Equity Fund II <sup>4</sup>	\$11,587,512	\$10,000,000	100%	\$10,000,000	\$0	\$0	\$3,684,910	\$0	0.37	1.53	9/30/2020	
6/30/2013	Commonfund	\$32,957,423	\$50,000,000	92%	\$45,899,994	\$874,999	\$187,499	\$12,693,451	\$4,100,006	0.28	0.99	9/30/2020	
7/15/2005	EIF US Power Fund II <sup>4</sup>	\$5,148,477	\$50,000,000	130%	\$65,029,556	\$0	\$0	\$74,001,371	\$0	1.14	1.22	9/30/2020	
5/31/2007	EIF US Power Fund III <sup>4</sup>	\$13,258,474	\$65,000,000	110%	\$71,409,097	\$0	\$144,063	\$73,782,321	\$0	1.03	1.22	9/30/2020	
11/28/2011	EIF US Power Fund IV	\$37,667,558	\$50,000,000	128%	\$64,155,474	\$0	\$0	\$31,740,306	\$4	0.49	1.08	9/30/2020	
11/28/2016	EIF US Power Fund V	\$40,749,622	\$50,000,000	106%	\$52,779,673	\$3,122,408	\$8,416,062	\$23,278,430	\$11,444,146	0.44	1.21	9/30/2020	
2/21/2019	Genstar Capital Partners IX, L.P.	\$22,514,824	\$50,000,000	39%	\$19,628,275	\$558,083	\$186,508	\$1,166,668	\$31,525,882	0.06	1.21	9/30/2020	
11/18/2009	Oaktree PIF 2009	\$1,186,622	\$40,000,000	87%	\$34,816,729	\$0	\$0	\$45,799,610	\$6,308,961	1.32	1.35	9/30/2020	
5/2/2013	Ocean Avenue Fund II	\$18,608,390	\$30,000,000	90%	\$27,000,000	\$0	\$6,600,000	\$22,639,096	\$3,000,000	0.84	1.53	6/30/2020	
4/15/2016	Ocean Avenue Fund III	\$45,724,819	\$50,000,000	87%	\$43,500,000	\$0	\$7,500,000	\$17,500,000	\$6,500,000	0.40	1.45	6/30/2020	
11/30/2007	Paladin III	\$25,153,606	\$25,000,000	137%	\$34,331,097	\$102,049	\$11,116,686	\$60,680,169	\$374,831	1.77	2.50	9/30/2020	
8/22/2011	Pathway 6	\$33,732,606	\$40,000,000	97%	\$38,675,323	\$72,000	\$2,793,709	\$32,744,755	\$3,780,282	0.85	1.72	6/30/2020	
7/10/2013	Pathway 7	\$72,285,121	\$70,000,000	96%	\$67,322,688	\$157,500	\$3,088,001	\$36,304,737	\$6,301,668	0.54	1.61	6/30/2020	
11/23/2015	Pathway 8	\$54,953,098	\$50,000,000	85%	\$42,514,381	\$98,610	\$1,048,086	\$8,415,627	\$10,132,486	0.20	1.49	6/30/2020	
1/19/1999	Pathway	\$10,767,061	\$125,000,000	100%	\$125,399,172	\$57,500	\$240,071	\$178,339,748	\$10,660,424	1.42	1.51	6/30/2020	
7/31/2009	Pathway 2008	\$16,550,490	\$30,000,000	98%	\$29,488,908	\$119,159	\$1,625,333	\$33,623,568	\$3,030,562	1.14	1.70	6/30/2020	
6/3/2014	Siguler Guff CCCERA Opportunities	\$160,994,198	\$200,000,000	85%	\$170,583,208	\$5,000,000	\$41,739,180	\$108,170,177	\$33,097,500	0.63	1.58	12/31/2020	
11/30/2016	Siguler Guff Secondary Opportunities <sup>4</sup>	\$13,758	\$50,000,000	60%	\$29,999,802	\$0	\$48,207	\$42,773,166	\$20,000,198	1.43	1.43	6/30/2020	
5/18/2018	Siris Partners IV, L.P.	\$18,459,239	\$35,000,000	56%	\$19,483,500	\$641,090	\$198,938	\$198,938	\$15,715,438	0.01	0.96	9/30/2020	
6/28/2019	TPG Healthcare Partners, L.P.	\$4,806,338	\$24,000,000	28%	\$6,796,104	\$2,514,452	\$1,088,292	\$1,088,292	\$18,197,468	-	-	9/30/2020	
5/24/2019	Trident VIII, L.P.	\$13,213,772	\$40,000,000	34%	\$13,549,528	\$6,554,659	\$0	\$565,951	\$26,912,492	-	-	-	
12/8/2015	Wastewater Opportunity Fund	\$19,378,947	\$25,000,000	100%	\$25,022,227	\$0	\$0	\$2,031,922	\$0	0.08	0.86	9/30/2020	
<b>Total Private Equity and Venture Capital</b>		<b>\$1,040,788,463</b>	<b>\$1,743,565,614</b>	<b>88%</b>	<b>\$1,541,573,367</b>	<b>\$23,475,858</b>	<b>\$97,844,536</b>	<b>\$1,209,061,091</b>	<b>\$300,357,256</b>	<b>0.78</b>	<b>1.46</b>		
<b>% of Portfolio (Market Value)</b>		<b>10.2%</b>											

\* All Data provided by StepStone Group

<sup>1</sup>Latest valuation + capital calls - distributions

<sup>2</sup>(DPI) is equal to (capital returned / capital called)

<sup>3</sup>(TVPI) is equal to (market value + capital returned) / capital called

<sup>4</sup>Capital has been fully called and fund is in redemption.

Total Fund

Closed End Funds - IRR Summary

Period Ending: December 31, 2020

Private Credit	Inception	Fund Level (G) <sup>2</sup>	CCCERA (G)	Fund Level (N) <sup>2,3</sup>	CCCERA (N) <sup>3</sup>	IRR Date
Angelo Gordon Energy Cred Opp. <sup>4</sup>	09/24/2015	-	-	-	5.9%	09/30/2020
Stepstone CC Opportunities Fund	02/02/2018	-	8.8%	-	7.4%	09/30/2020
Torchlight IV	08/01/2012	12.2%	12.7%	9.8%	10.5%	09/30/2020
Torchlight V	03/12/2015	14.9%	15.0%	10.4%	10.3%	09/30/2020
Real Estate	Inception	Fund Level (G) <sup>2</sup>	CCCERA (G)	Fund Level (N) <sup>2,3</sup>	CCCERA (N) <sup>3</sup>	IRR Date
Angelo Gordon VIII <sup>4</sup>	01/23/2012	-	-	-	13.9%	09/30/2020
Angelo Gordon IX	12/08/2014	-	-	-	8.7%	09/30/2020
DLJ RECP III	06/23/2005	-1.0%	-1.0%	-4.0%	-3.0%	09/30/2020
DLJ RECP IV	02/11/2008	4.0%	4.0%	2.0%	2.0%	09/30/2020
DLJ RECP V	07/01/2014	14.0%	14.0%	7.0%	7.0%	09/30/2020
DLJ RECP VI <sup>1</sup>	03/19/2019	-	-	-	-	-
Hearthstone II <sup>4</sup>	06/17/1998	-	30.1%	-	30.1%	03/31/2020
Invesco Fund III <sup>4</sup>	06/30/2013	16.9%	-	12.9%	-	09/30/2020
Invesco Fund IV <sup>4</sup>	06/30/2014	15.5%	-	11.9%	-	09/30/2020
Invesco Fund V	02/20/2019	7.9%	-	1.1%	-	09/30/2020
LaSalle Income & Growth VI <sup>4</sup>	07/16/2013	13.8%	13.8%	11.4%	11.5%	09/30/2020
LaSalle Income & Growth VII	02/28/2017	9.4%	9.4%	7.5%	7.5%	09/30/2020
Long Wharf IV <sup>4</sup>	07/03/2013	16.6%	16.7%	12.2%	12.2%	09/30/2020
Long Wharf V <sup>4</sup>	09/30/2016	11.2%	11.9%	8.1%	8.6%	09/30/2020
Long Wharf VI	06/27/2019	-0.8%	-0.2%	-19.2%	-4.8%	09/30/2020
Oaktree REOF V <sup>4</sup>	12/31/2011	16.7%	-	12.3%	-	09/30/2020
Oaktree REOF VI <sup>4</sup>	09/30/2013	12.9%	-	8.7%	-	09/30/2020
Oaktree REOF VII	04/01/2015	27.5%	-	16.6%	-	09/30/2020
Paulson <sup>4</sup>	11/10/2013	-	-	13.8%	-	12/31/2019
Siguler Guff I	01/25/2012	13.3%	16.0%	11.7%	12.9%	09/30/2020
Siguler Guff II	08/31/2013	10.7%	10.7%	9.3%	8.5%	09/30/2020
Siguler Guff DREOF II Co-Inv	01/27/2016	9.4%	9.8%	8.4%	7.8%	09/30/2020

<sup>1</sup>Manager has yet to report IRR figure.

<sup>2</sup>Fund level data includes CCCERA and all other fund investors.

<sup>3</sup>Net IRR calculated after deductions of management fees and carried interest to the General Partner.

<sup>4</sup>Capital has been fully called and fund is in redemption.



Total Fund  
Closed End Funds - IRR Summary

Period Ending: December 31, 2020

Private Equity & Venture Capital	Closing Date	Fund Level (G) <sup>2</sup>	CCCERA (G)	Fund Level (N) <sup>2,3</sup>	CCCERA (N) <sup>3</sup>	IRR Date
Adams Street Partners	2/11/2004	-	13.2%	-	10.9%	9/30/2020
Adams Street Partners II	12/31/2008	-	17.9%	-	14.2%	9/30/2020
Adams Street Partners - Fund 5	12/31/2008	-	8.0%	-	5.4%	9/30/2020
Adams Street Partners Venture	1/18/1996	-	28.9%	-	25.3%	9/30/2020
Adams Street Partners - BPF	3/31/2016	-	14.3%	-	11.6%	9/30/2020
AE Industrial Partners Fund II, LP	5/18/2018	13.9%	-	9.0%	-	9/30/2020
Aether Real Assets III	11/27/2013	1.1%	1.1%	-2.2%	-2.2%	9/30/2020
Aether Real Assets III Surplus	11/30/2013	3.4%	3.4%	1.5%	1.5%	9/30/2020
Aether Real Assets IV	1/30/2016	6.0%	6.0%	1.5%	1.5%	9/30/2020
Bay Area Equity Fund I <sup>9</sup>	11/26/2003	31.4%	31.4%	23.1%	23.1%	9/30/2020
Bay Area Equity Fund II <sup>9</sup>	11/26/2003	10.7%	10.7%	5.9%	5.9%	9/30/2020
CommonFund	6/30/2013	-	-	-	1.5%	9/30/2020
Energy Investor Fund II <sup>9</sup>	7/15/2005	6.2%	5.8%	3.5%	3.1%	9/30/2020
Energy Investor Fund III <sup>9</sup>	5/31/2007	5.8%	5.9%	3.3%	3.3%	9/30/2020
Energy Investor Fund IV	8/31/2010	5.7%	5.8%	2.3%	2.1%	9/30/2020
Energy Investor Fund V	11/28/2016	17.7%	14.6%	13.5%	10.6%	9/30/2020
Genstar Capital Partners IX, L.P. <sup>1</sup>	2/21/2019	26.4%	-	-	-	-
Oaktree PIF 2009	2/28/2010	6.7%	-	6.5%	-	9/30/2020
Ocean Avenue II	8/15/2013	-	-	14.5%	-	9/30/2020
Ocean Avenue III	4/15/2016	-	-	20.1%	-	9/30/2020
Paladin III	11/30/2007	22.2%	-	15.0%	-	9/30/2020
Pathway 6	8/22/2011	17.7%	17.7%	15.4%	15.4%	9/30/2020
Benchmark <sup>4</sup>		14.0%	-	-	-	9/30/2020
Pathway 7	7/10/2013	18.4%	18.4%	16.2%	16.2%	9/30/2020
Benchmark <sup>5</sup>		14.1%	-	-	-	9/30/2020
Pathway 8	11/23/2015	21.5%	21.8%	19.8%	20.3%	9/30/2020
Benchmark <sup>6</sup>		14.2%	-	-	-	9/30/2020
Pathway Private Equity Fund	1/19/1999	10.2%	10.2%	8.4%	8.4%	9/30/2020
Benchmark <sup>7</sup>		10.2%	-	-	-	9/30/2020
Pathway Private Equity Fund 2008	7/31/2009	15.1%	15.1%	12.7%	12.7%	9/30/2020
Benchmark <sup>8</sup>		12.9%	-	-	-	9/30/2020
Siguler Guff CCCERA Opportunities	6/3/2014	17.6%	18.2%	17.0%	15.5%	9/30/2020
Siguler Guff Secondary Opportunities <sup>9</sup>	8/31/2013	55.3%	118.4%	49.5%	69.0%	9/30/2020
Siris Partners IV, L.P. <sup>1</sup>	5/18/2018	-	-	-	-	-
TPG Healthcare Partners, L.P. <sup>1</sup>	6/28/2019	-	-	-	-	-
Trident VIII, L.P. <sup>1</sup>	5/24/2019	-	-	-	-	-
Wastewater Opportunity Fund	12/8/2015	-2.3%	-	-7.7%	-	9/30/2020

<sup>1</sup>Manager has yet to report IRR figure.

<sup>2</sup>Fund level data includes CCCERA and all other fund investors.

<sup>3</sup>Net IRR calculated after deductions of management fees and carried interest to the General Partner.

<sup>4</sup>Private iQ global all private equity median pooled return for vintage years 2011-2014, as of June 30, 2020.

<sup>5</sup>Private iQ global all private equity median pooled return for vintage years 2012-2016, as of June 30, 2020.

<sup>6</sup>Private iQ global all private equity median pooled return for vintage years 2015-2018, as of June 30, 2020.

<sup>7</sup>Private iQ global all private equity median pooled return for vintage years 1999-2011, as of June 30, 2020.

<sup>8</sup>Private iQ global all private equity median pooled return for vintage years 2008-2014, as of June 30, 2020.

<sup>9</sup>Capital has been fully called and fund is in redemption.

Total Fund  
Performance Analysis - 3 Years (Net of Fees)

Period Ending: December 31, 2020

	3 Years										
	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
BlackRock Russell 1000 Index	14.79%	-0.03%	19.36%	-0.03%	1.00	0.02%	1.00	0.69	-2.00	99.87%	100.00%
Jackson Square Partners	21.44%	-1.54%	19.80%	-0.74%	0.96	4.81%	0.94	1.01	-0.32	91.08%	96.53%
Boston Partners	4.99%	-1.07%	21.09%	-1.39%	1.05	2.78%	0.99	0.17	-0.39	101.67%	104.09%
Emerald Advisers	16.87%	0.68%	25.26%	1.20%	0.97	5.66%	0.95	0.61	0.12	99.68%	98.30%
Ceredex	1.83%	-1.89%	24.57%	-1.54%	0.91	5.82%	0.95	0.01	-0.33	83.55%	96.22%
Pyrford	4.28%	4.69%	15.21%	4.57%	0.71	7.43%	0.92	0.18	0.63	75.95%	74.48%
William Blair	13.11%	3.09%	18.32%	2.30%	1.08	3.51%	0.97	0.63	0.88	117.10%	101.25%
PIMCO RAE Emerging Markets	0.41%	-1.36%	23.26%	-1.56%	1.11	4.02%	0.98	-0.05	-0.34	103.71%	104.87%
Artisan Partners	20.44%	10.38%	17.52%	11.44%	0.89	6.33%	0.88	1.08	1.64	122.33%	80.94%
First Eagle	5.83%	-4.23%	14.11%	-1.76%	0.75	5.19%	0.97	0.31	-0.82	60.73%	81.04%
Allianz Global Investors	5.22%	-0.66%	8.39%	0.13%	0.86	2.09%	0.96	0.45	-0.32	88.93%	92.81%
Adelante	4.55%	1.25%	18.23%	1.46%	0.94	1.91%	0.99	0.17	0.66	96.52%	93.89%
AFL-CIO	4.66%	-0.68%	3.08%	0.03%	0.87	0.98%	0.92	1.03	-0.69	83.16%	78.84%

Performance Analysis excludes closed end funds and those funds without 3 years of performance.

Total Fund  
Performance Analysis - 5 Years (Net of Fees)

Period Ending: December 31, 2020

	5 Years										
	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
Jackson Square Partners	17.02%	-3.98%	16.47%	-3.01%	0.95	5.48%	0.89	0.96	-0.73	83.72%	102.83%
Boston Partners	9.70%	-0.04%	17.40%	-0.58%	1.06	2.96%	0.97	0.49	-0.01	103.28%	102.11%
Emerald Advisers	17.46%	1.10%	21.37%	1.59%	0.97	4.92%	0.95	0.76	0.22	99.66%	96.92%
Ceredex	8.58%	-1.07%	20.39%	0.11%	0.88	6.19%	0.93	0.37	-0.17	79.86%	93.71%
Pyrford	6.86%	1.16%	12.88%	2.89%	0.70	6.98%	0.87	0.44	0.17	64.31%	74.64%
William Blair	13.13%	1.15%	15.57%	0.44%	1.06	3.28%	0.96	0.77	0.35	110.53%	102.09%
Total Global Equity	13.83%	1.57%	13.09%	3.47%	0.85	3.78%	0.95	0.97	0.42	90.19%	84.75%
Artisan Partners	19.29%	7.03%	15.34%	7.89%	0.93	6.30%	0.84	1.18	1.12	132.13%	90.03%
First Eagle	8.47%	-3.79%	11.48%	-0.60%	0.74	4.80%	0.94	0.64	-0.79	55.26%	75.88%
Allianz Global Investors	7.08%	-1.36%	7.02%	-0.22%	0.87	1.84%	0.95	0.85	-0.73	84.59%	95.00%
Adelante	4.89%	0.64%	15.91%	0.89%	0.94	1.89%	0.99	0.24	0.34	92.92%	94.44%
AFL-CIO	3.81%	-0.63%	2.84%	-0.01%	0.86	0.94%	0.91	0.94	-0.67	81.07%	79.06%

Performance Analysis excludes closed end funds and those funds without 5 years of performance.

# Total Fund Investment Fund Fee Analysis

Period Ending: December 31, 2020

Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
BlackRock Russell 1000 Index	Growth	0.03% of Assets	\$229,775,562	\$68,933	0.03%
Jackson Square Partners	Growth	0.50% of First 100.0 Mil, 0.40% of Next 150.0 Mil, 0.35% Thereafter	\$243,346,164	\$1,073,385	0.44%
Boston Partners	Growth	0.50% of First 25.0 Mil, 0.30% Thereafter	\$234,795,447	\$754,386	0.32%
Emerald Advisers	Growth	0.75% of First 10.0 Mil, 0.60% Thereafter	\$194,942,957	\$1,184,658	0.61%
Ceredex	Growth	0.85% of First 10.0 Mil, 0.68% of Next 40.0 Mil, 0.51% Thereafter	\$164,252,512	\$939,688	0.57%
Pyrford	Growth	0.70% of First 50.0 Mil, 0.50% of Next 50.0 Mil, 0.35% Thereafter	\$508,279,141	\$2,028,977	0.40%
William Blair	Growth	0.80% of First 20.0 Mil, 0.60% of Next 30.0 Mil, 0.50% of Next 50.0 Mil, 0.45% of Next 50.0 Mil, 0.40% of Next 50.0 Mil, 0.30% Thereafter	\$624,338,394	\$2,288,015	0.37%
PIMCO RAE Emerging Markets	Growth	0.75% of First 50.0 Mil, 0.68% of Next 50.0 Mil, 0.50% of Next 100.0 Mil, 0.45% Thereafter	\$375,063,168	\$2,000,284	0.53%
TT Emerging Markets	Growth	0.70% of First 100.0 Mil, 0.65% of Next 100.0 Mil, 0.60% Thereafter	\$433,115,763	\$2,748,695	0.63%
Artisan Partners	Growth	0.75% of Assets	\$598,791,259	\$4,490,934	0.75%
First Eagle	Growth	0.75% of Assets	\$485,083,633	\$3,638,127	0.75%
Allianz Global Investors	Growth	0.50% of First 50.0 Mil, 0.40% of Next 50.0 Mil, 0.35% Thereafter	\$177,037,759	\$719,632	0.41%
AQR Global Risk Premium-EL	Growth	0.38% of Assets	\$250,241,057	\$950,916	0.38%

Mutual fund fees shown are sourced from Morningstar and are as of the most current prospectus.

Total Fund  
Investment Fund Fee Analysis

Period Ending: December 31, 2020

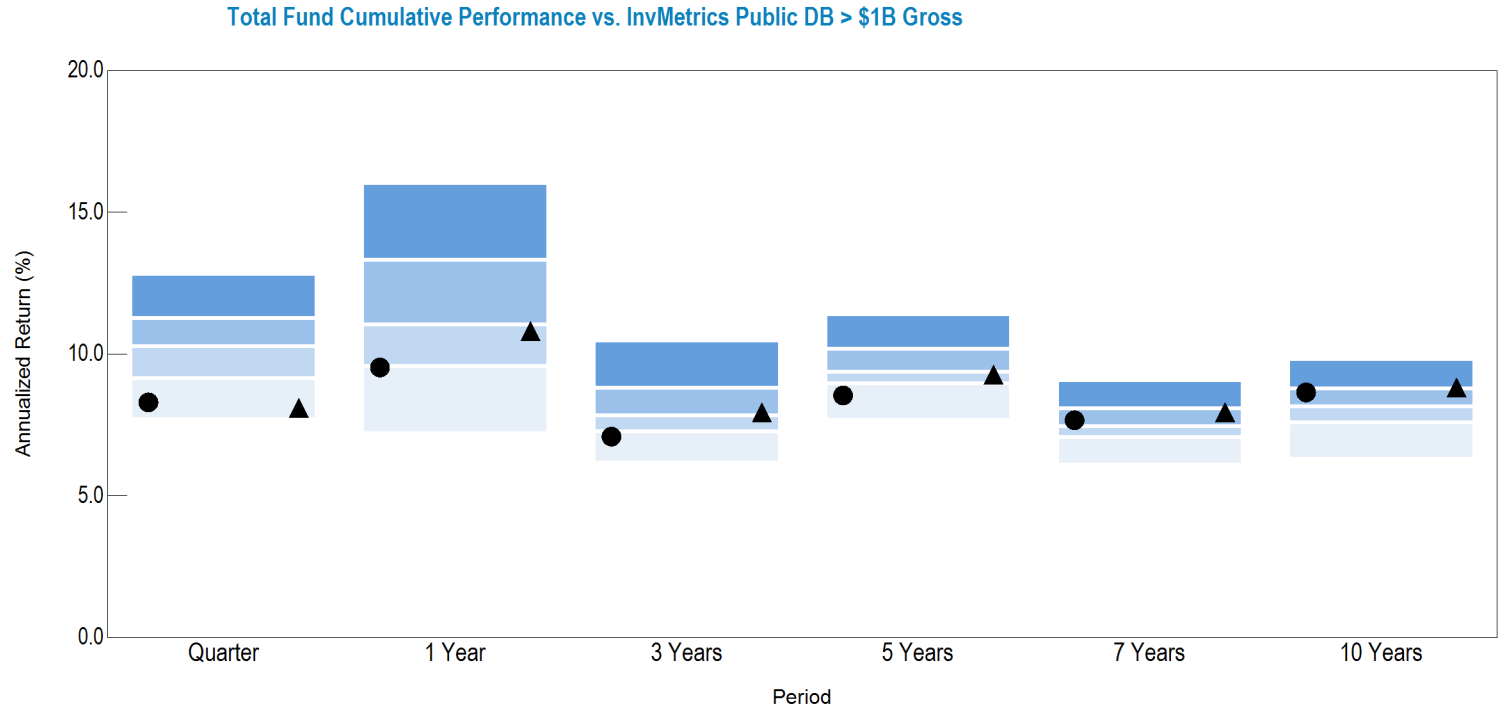
Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
PanAgora Risk Parity Multi Asset	Growth	0.35% of Assets	\$253,536,149	\$887,377	0.35%
AFL-CIO	Diversifying	0.43% of Assets	\$271,523,975	\$1,167,553	0.43%
Parametric Defensive Equity	Diversifying	0.42% of First 200.0 Mil, 0.39% Thereafter	\$108,277,204	\$454,764	0.42%
Acadian Multi-Asset Absolute Return Fund	Diversifying	0.50% of Assets	\$127,591,067	\$637,955	0.50%
DFA Short Credit	Liquidity	0.20% of First 25.0 Mil, 0.10% Thereafter	\$426,576,384	\$451,576	0.11%
Insight Short Duration	Liquidity	0.06% of First 500.0 Mil, 0.05% of Next 500.0 Mil, 0.04% Thereafter	\$1,069,317,369	\$577,727	0.05%

Mutual fund fees shown are sourced from Morningstar and are as of the most current prospectus.

Total Fund

Peer Universe Comparison: Cumulative Performance (Gross of Fees)

Period Ending: December 31, 2020



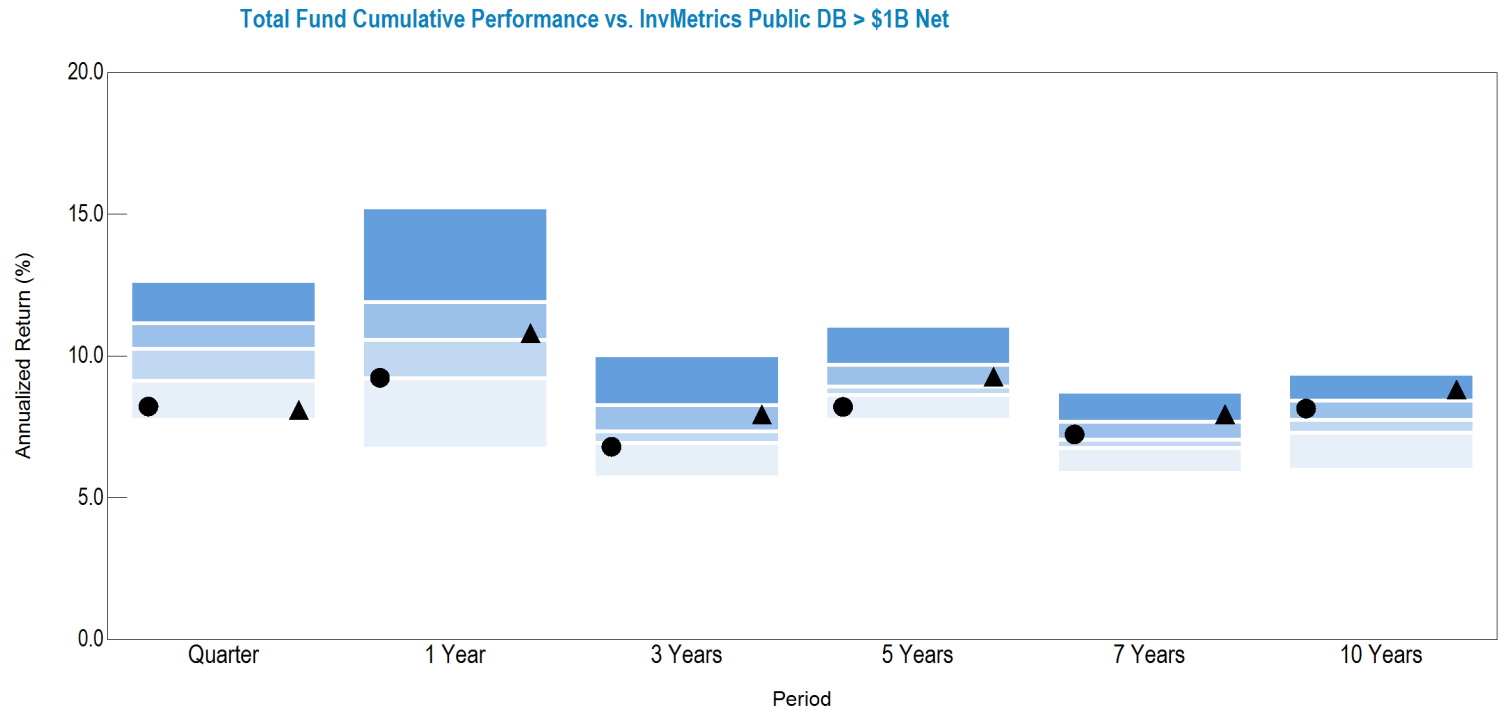
	Quarter		1 Year		3 Years		5 Years		7 Years		10 Years	
<b>Return (Rank)</b>												
5th Percentile	12.8	(89)	16.0	(79)	10.5	(80)	11.4	(88)	9.1	(41)	9.8	(33)
25th Percentile	11.3	(93)	13.3	(56)	8.8	(49)	10.2	(56)	8.1	(34)	8.8	(24)
Median	10.3		11.1		7.8		9.4		7.5		8.2	
75th Percentile	9.2		9.6		7.3		9.0		7.1		7.6	
95th Percentile	7.7		7.2		6.2		7.7		6.1		6.3	
# of Portfolios	67		67		67		67		65		63	
● Total Fund	8.3	(89)	9.5	(79)	7.1	(80)	8.5	(88)	7.7	(41)	8.6	(33)
▲ Policy Index	8.1	(93)	10.8	(56)	7.9	(49)	9.3	(56)	7.9	(34)	8.8	(24)

Effective 1/01/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation.

Total Fund

Peer Universe Comparison: Cumulative Performance (Net of Fees)

Period Ending: December 31, 2020

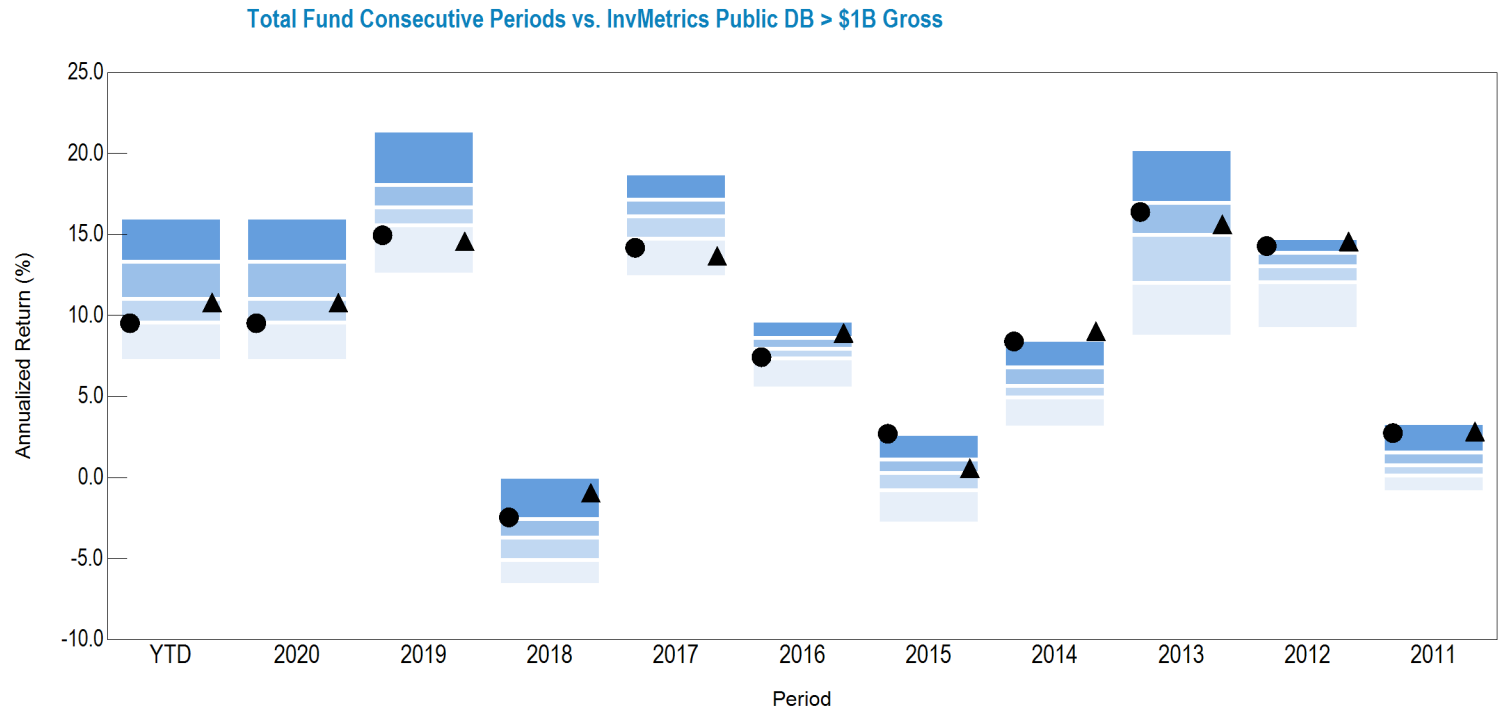


	Quarter		1 Year		3 Years		5 Years		7 Years		10 Years	
<b>5th Percentile</b>	12.6		15.2		10.0		11.1		8.7		9.4	
<b>25th Percentile</b>	11.2		11.9		8.3		9.7		7.7		8.4	
<b>Median</b>	10.3		10.6		7.4		8.9		7.1		7.8	
<b>75th Percentile</b>	9.1		9.2		6.9		8.6		6.8		7.3	
<b>95th Percentile</b>	7.8		6.8		5.7		7.8		5.9		6.0	
<b># of Portfolios</b>	61		61		61		61		58		55	
<b>● Total Fund</b>	8.2	(89)	9.2	(76)	6.8	(80)	8.2	(89)	7.2	(40)	8.1	(32)
<b>▲ Policy Index</b>	8.1	(92)	10.8	(45)	7.9	(34)	9.3	(38)	7.9	(17)	8.8	(14)

# Total Fund

## Peer Universe Comparison: Consecutive Periods (Gross of Fees)

Period Ending: December 31, 2020



	YTD	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
<b>Return (Rank)</b>											
<b>5th Percentile</b>	16.0	16.0	21.4	0.0	18.8	9.7	2.7	8.5	20.2	14.7	3.3
<b>25th Percentile</b>	13.3	13.3	18.1	-2.6	17.2	8.6	1.1	6.8	17.0	13.9	1.6
<b>Median</b>	11.1	11.1	16.7	-3.7	16.2	8.0	0.3	5.7	15.0	13.0	0.8
<b>75th Percentile</b>	9.6	9.6	15.6	-5.1	14.8	7.4	-0.7	4.9	12.0	12.1	0.1
<b>95th Percentile</b>	7.2	7.2	12.5	-6.6	12.4	5.5	-2.8	3.1	8.7	9.2	-0.9
<b># of Portfolios</b>	67	67	81	71	98	92	98	79	67	74	68
<b>● Total Fund</b>	9.5 (79)	9.5 (79)	15.0 (83)	-2.5 (25)	14.2 (83)	7.4 (74)	2.7 (5)	8.4 (6)	16.4 (33)	14.3 (13)	2.7 (9)
<b>▲ Policy Index</b>	10.8 (56)	10.8 (56)	14.6 (87)	-0.9 (8)	13.7 (89)	8.9 (15)	0.6 (40)	9.0 (2)	15.6 (43)	14.6 (8)	2.8 (9)

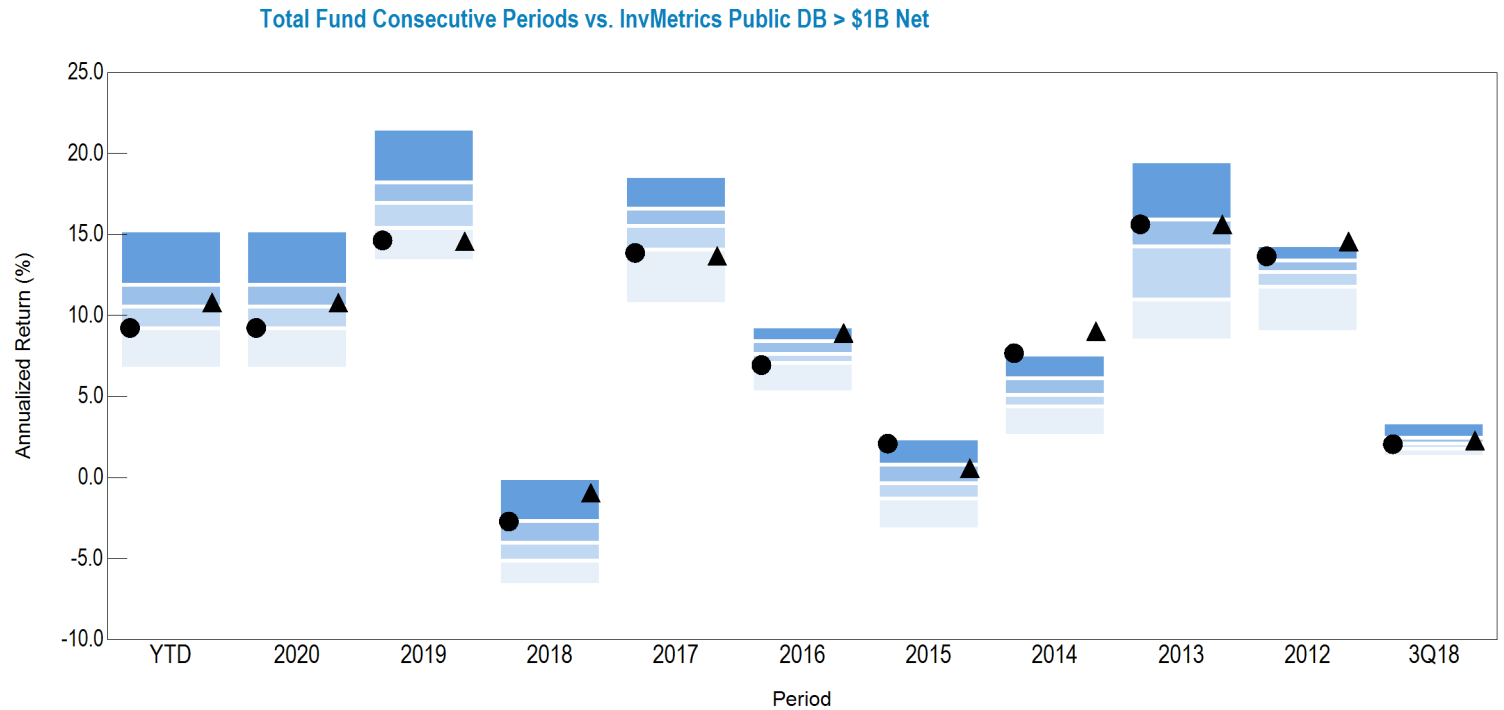
Effective 1/01/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation.



Total Fund

Peer Universe Comparison: Consecutive Periods (Net of Fees)

Period Ending: December 31, 2020

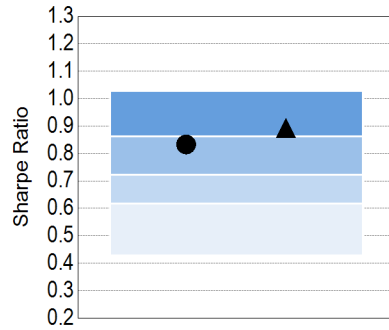


	YTD	2020	2019	2018	2017	2016	2015	2014	2013	2012	3Q18
<b>Return (Rank)</b>											
5th Percentile	15.2	15.2	21.5	-0.1	18.6	9.3	2.4	7.6	19.5	14.3	3.4
25th Percentile	11.9	11.9	18.2	-2.7	16.6	8.4	0.8	6.1	16.0	13.4	2.5
Median	10.6	10.6	17.0	-4.0	15.6	7.7	-0.4	5.1	14.3	12.7	2.1
75th Percentile	9.2	9.2	15.4	-5.1	14.1	7.1	-1.3	4.4	11.0	11.8	1.8
95th Percentile	6.8	6.8	13.4	-6.6	10.7	5.3	-3.2	2.6	8.5	9.0	1.3
# of Portfolios	61	61	69	63	61	62	57	55	48	44	63
● Total Fund	9.2 (76)	9.2 (76)	14.6 (92)	-2.7 (27)	13.9 (81)	6.9 (78)	2.1 (12)	7.7 (5)	15.6 (33)	13.6 (21)	2.1 (54)
▲ Policy Index	10.8 (45)	10.8 (45)	14.6 (92)	-0.9 (8)	13.7 (85)	8.9 (13)	0.6 (29)	9.0 (2)	15.6 (33)	14.6 (1)	2.3 (39)

Total Fund  
 Sharpe Ratio Ranking (Gross of Fees)

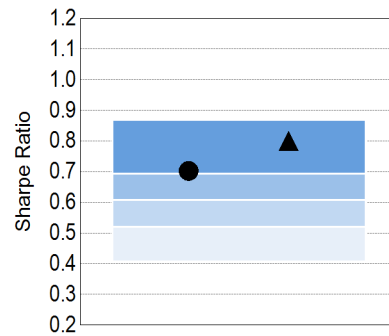
Period Ending: December 31, 2020

Sharpe Ratio  
 1 Year



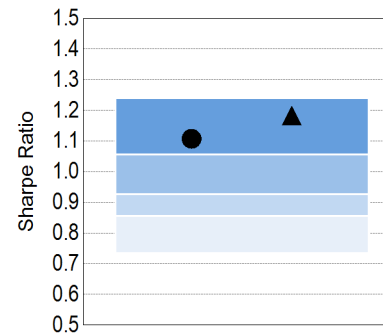
● Total Fund	
Value	0.8
Rank	32
▲ Policy Index	
Value	0.9
Rank	17
Universe	
5th %tile	1.0
25th %tile	0.9
Median	0.7
75th %tile	0.6
95th %tile	0.4

Sharpe Ratio  
 3 Year



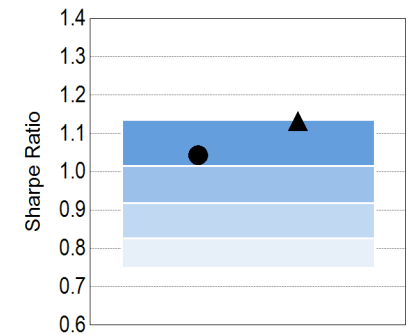
● Total Fund	
Value	0.7
Rank	25
▲ Policy Index	
Value	0.8
Rank	12
Universe	
5th %tile	0.9
25th %tile	0.7
Median	0.6
75th %tile	0.5
95th %tile	0.4

Sharpe Ratio  
 5 Year



● Total Fund	
Value	1.1
Rank	20
▲ Policy Index	
Value	1.2
Rank	11
Universe	
5th %tile	1.2
25th %tile	1.1
Median	0.9
75th %tile	0.9
95th %tile	0.7

Sharpe Ratio  
 10 Year



● Total Fund	
Value	1.0
Rank	20
▲ Policy Index	
Value	1.1
Rank	6
Universe	
5th %tile	1.1
25th %tile	1.0
Median	0.9
75th %tile	0.8
95th %tile	0.8

## **Domestic Equity Managers**

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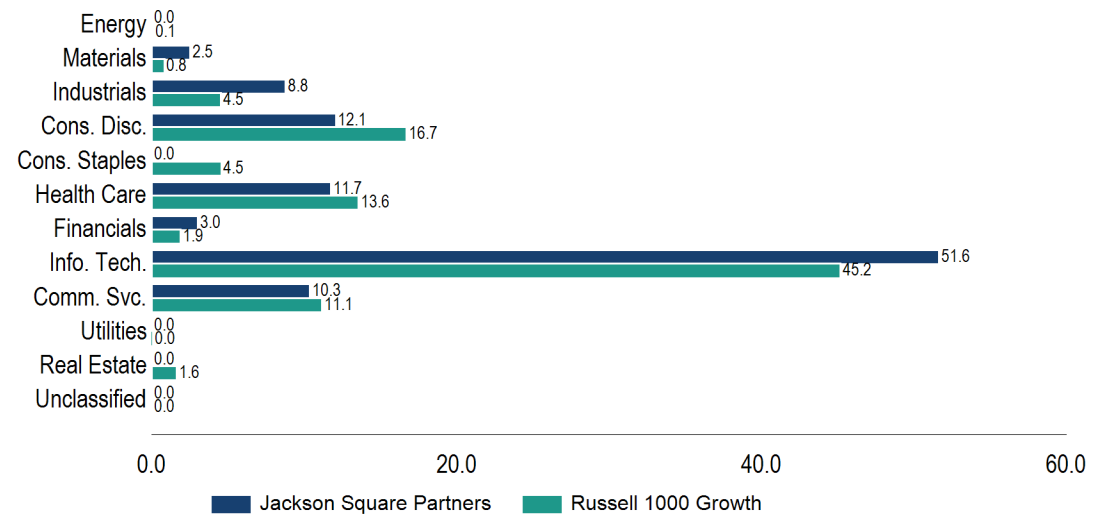
# Jackson Square Partners Manager Portfolio Overview

Period Ending: December 31, 2020

Domestic equity large cap growth portfolio concentrated in companies with sustainable long-term growth characteristics. Primary personnel include Jeffrey Van Harte, Christopher Bonavico, Christopher Ericksen, and Daniel Prislín.

	Portfolio	1000 Growth
Number of Holdings	28	453
Weighted Avg. Market Cap. (\$B)	380.37	713.18
Median Market Cap. (\$B)	94.25	16.70
Price To Earnings	59.31	40.02
Price To Book	11.67	12.08
Price To Sales	8.60	5.88
Return on Equity (%)	17.87	36.33
Yield (%)	0.33	0.79
Beta	0.94	1.00

Sector Allocation (%) vs Russell 1000 Growth



### Largest Holdings

	End Weight	Return
MICROSOFT CORP	7.87	6.03
AMAZON.COM INC	5.87	3.44
UBER TECHNOLOGIES INC	5.81	39.80
VISA INC	5.61	9.55
TWILIO INC	5.12	37.00
PAYPAL HOLDINGS INC	4.60	18.87
CHARTER COMMUNICATIONS INC	4.40	5.96
MASTERCARD INC	4.35	5.67
SERVICENOW INC	4.33	13.49
PAYCOM SOFTWARE INC	3.75	45.28

### Top Contributors

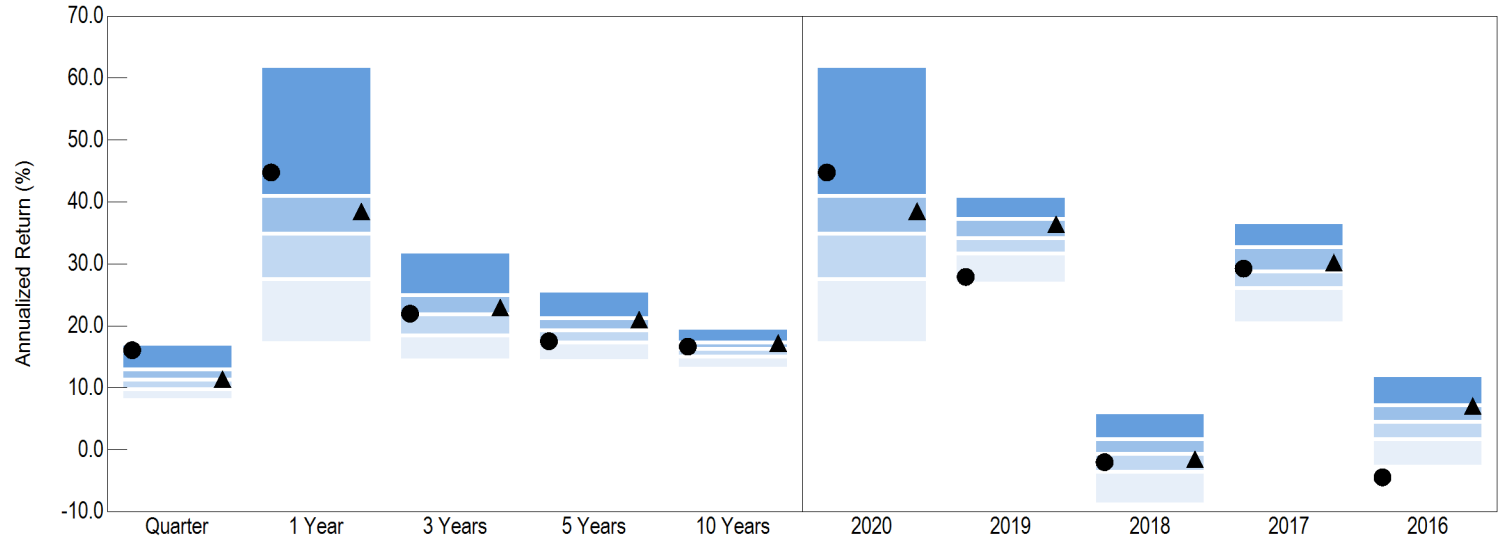
	Avg Wgt	Return	Contribution
UBER TECHNOLOGIES INC	1.59	39.80	0.63
TWILIO INC	1.47	37.00	0.54
PAYCOM SOFTWARE INC	1.06	45.28	0.48
AUTODESK INC.	1.05	32.18	0.34
PAYPAL HOLDINGS INC	1.48	18.87	0.28
COUPA SOFTWARE INC	0.97	23.58	0.23
SERVICENOW INC	1.54	13.49	0.21
ALPHABET INC	1.03	19.59	0.20
STARBUCKS CORP	0.79	25.11	0.20
KKR & CO INC	1.03	18.33	0.19

### Bottom Contributors

	Avg Wgt	Return	Contribution
WIX.COM LTD	0.65	-1.92	-0.01
ADOBE INC	0.81	1.98	0.02
WASTE MANAGEMENT INC.	1.09	4.69	0.05
AMAZON.COM INC	2.19	3.44	0.08
NETFLIX INC	1.05	8.14	0.09
MASTERCARD INC	1.58	5.67	0.09
CHARTER COMMUNICATIONS INC	1.60	5.96	0.10
BALL CORP	0.97	12.28	0.12
META FINANCIAL GRP INC	0.13	90.49	0.12
IQVIA HOLDINGS INC	1.02	13.67	0.14

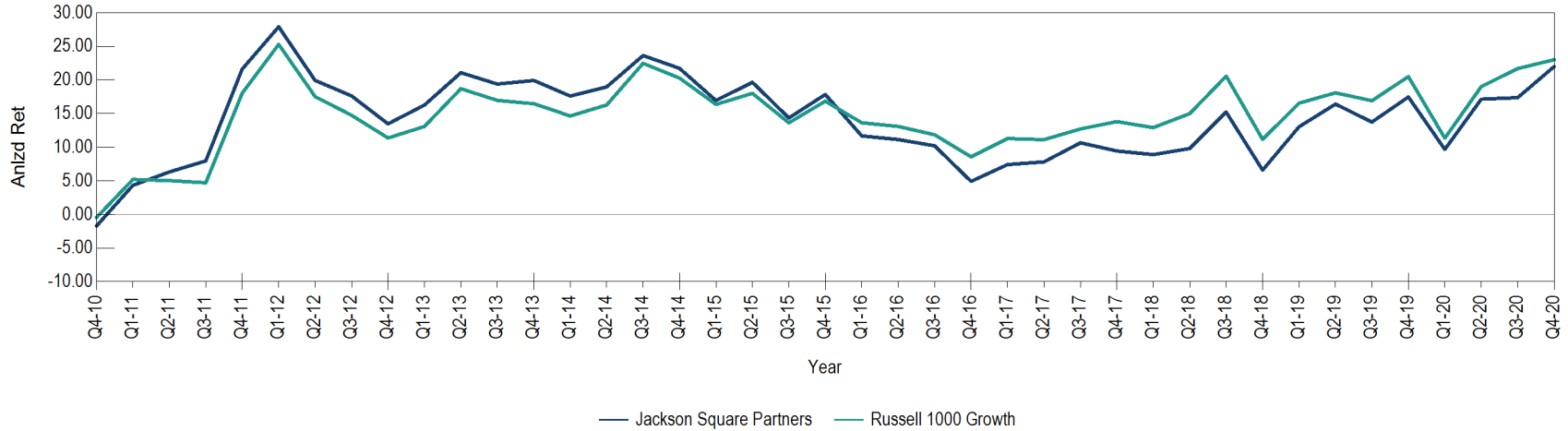
Unclassified sector allocation includes cash allocations.

Jackson Square Partners vs. eV US Large Cap Growth Equity Gross Universe

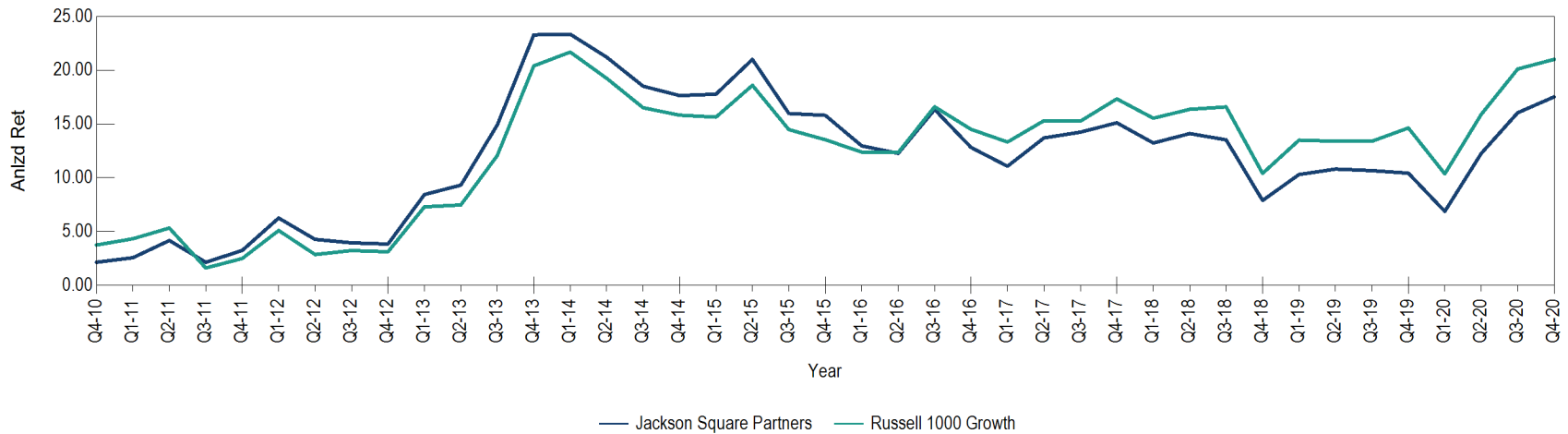


	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	17.1	61.9	32.0	25.7	19.6	61.9	41.0	6.1	36.7	12.0
25th Percentile	13.0	41.1	25.0	21.3	17.3	41.1	37.3	1.7	32.7	7.3
Median	11.4	34.9	22.0	19.4	16.3	34.9	34.2	-0.6	28.8	4.6
75th Percentile	9.8	27.6	18.5	17.4	15.1	27.6	31.7	-3.5	26.2	1.8
95th Percentile	8.1	17.3	14.4	14.4	13.1	17.3	26.9	-8.8	20.5	-2.7
# of Portfolios	257	256	250	234	211	256	253	255	265	282
● Jackson Square Partners	16.1 (9)	44.8 (19)	22.0 (50)	17.5 (74)	16.7 (41)	44.8 (19)	27.9 (93)	-2.0 (59)	29.3 (47)	-4.4 (98)
▲ Russell 1000 Growth	11.4 (50)	38.5 (34)	23.0 (41)	21.0 (28)	17.2 (27)	38.5 (34)	36.4 (32)	-1.5 (57)	30.2 (42)	7.1 (26)

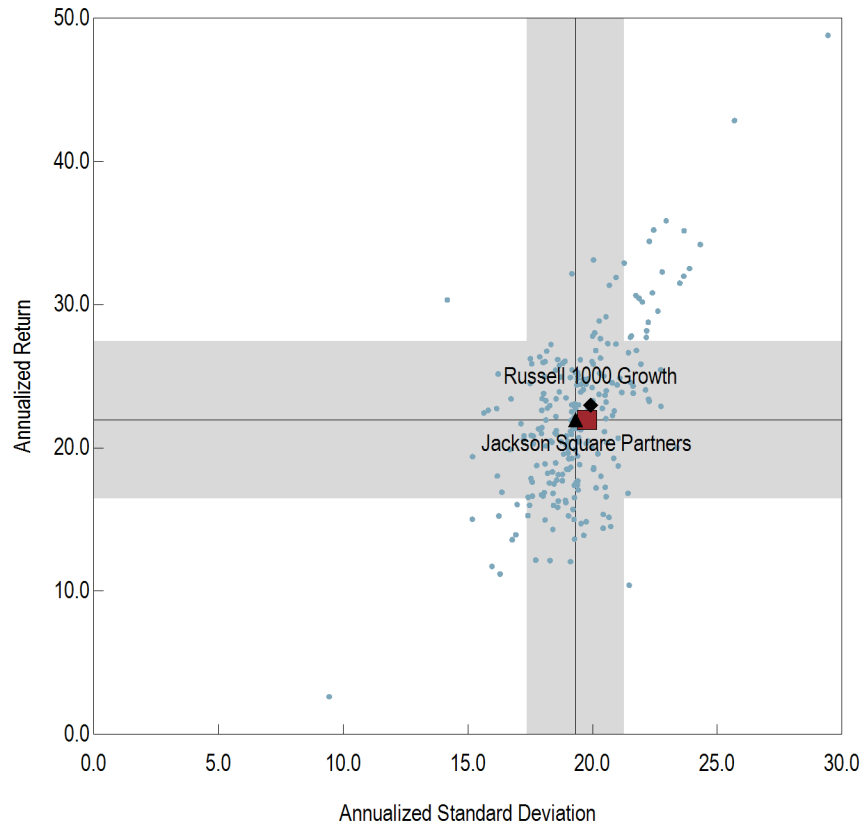
Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)



3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Jackson Square Partners	22.0%	19.8%	1.0
Russell 1000 Growth	23.0%	19.9%	1.1
eV US Large Cap Growth Equity Gross Median	22.0%	19.3%	1.1

5 Years

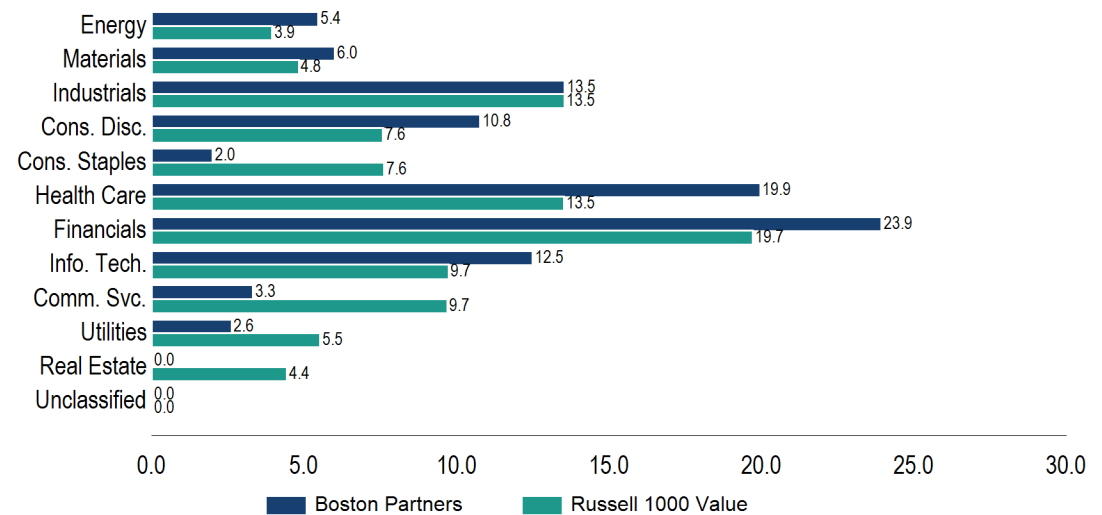
	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Jackson Square Partners	17.5%	16.4%	1.0
Russell 1000 Growth	21.0%	16.3%	1.2
eV US Large Cap Growth Equity Gross Median	19.4%	16.1%	1.1

# Boston Partners Manager Portfolio Overview

Period Ending: December 31, 2020

Domestic equity large cap value portfolio exhibiting low turnover in companies with low valuations relative to intrinsic value. Primary personnel include Mark Donovan and David Pyle.

	1000 value	
Number of Holdings	93	854
Weighted Avg. Market Cap. (\$B)	133.04	133.86
Median Market Cap. (\$B)	33.18	11.55
Price To Earnings	19.72	22.81
Price To Book	2.37	2.66
Price To Sales	1.42	1.91
Return on Equity (%)	13.00	12.04
Yield (%)	1.91	2.17
Beta	1.08	1.00



## Largest Holdings

	End Weight	Return
BERKSHIRE HATHAWAY INC	3.46	8.89
JOHNSON & JOHNSON	3.40	6.45
JPMORGAN CHASE & CO	3.27	33.19
BANK OF AMERICA CORP	2.72	26.60
CIGNA CORP	2.43	22.89
CISCO SYSTEMS INC	2.37	14.66
CHUBB LTD	2.09	33.23
ANTHEM INC	1.95	19.90
AUTOZONE INC	1.90	0.66
LAM RESEARCH CORP	1.89	42.72

## Top Contributors

	Avg Wgt	Return	Contribution
JPMORGAN CHASE & CO	1.29	33.19	0.43
MICRON TECHNOLOGY INC.	0.45	60.09	0.27
BANK OF AMERICA CORP	0.85	26.60	0.23
LAM RESEARCH CORP	0.52	42.72	0.22
CHUBB LTD	0.62	33.23	0.21
TAPESTRY INC	0.19	98.85	0.19
APPLIED MATERIALS INC.	0.41	45.58	0.19
CIGNA CORP	0.78	22.89	0.18
AMERICAN INTERNATIONAL GROUP INC	0.44	38.66	0.17
MARATHON PETROLEUM CORP	0.35	42.98	0.15

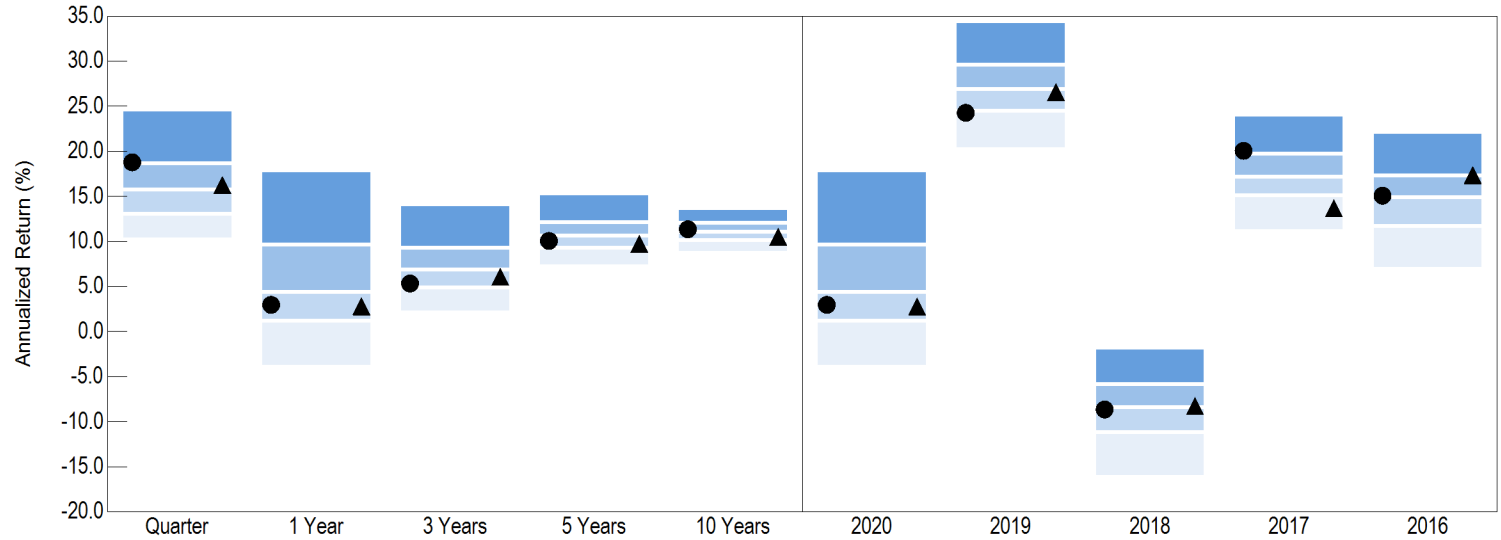
## Bottom Contributors

	Avg Wgt	Return	Contribution
BARRICK GOLD CORP	0.37	-18.64	-0.07
BEST BUY CO INC	0.60	-9.85	-0.06
KROGER CO. (THE)	0.51	-5.81	-0.03
KIMBERLY-CLARK CORP	0.33	-7.98	-0.03
KINROSS GOLD CORP	0.16	-16.20	-0.03
LENNAR CORP	0.32	-6.40	-0.02
NEWMONT CORPORATION	0.23	-4.97	-0.01
LOWE'S COS INC	0.33	-2.90	-0.01
NORTHROP GRUMMAN CORP	0.19	-2.96	-0.01
RENAISSANCERE HOLDINGS LTD	0.16	-2.10	0.00

Unclassified sector allocation includes cash allocations.



Boston Partners vs. eV US Large Cap Value Equity Gross Universe

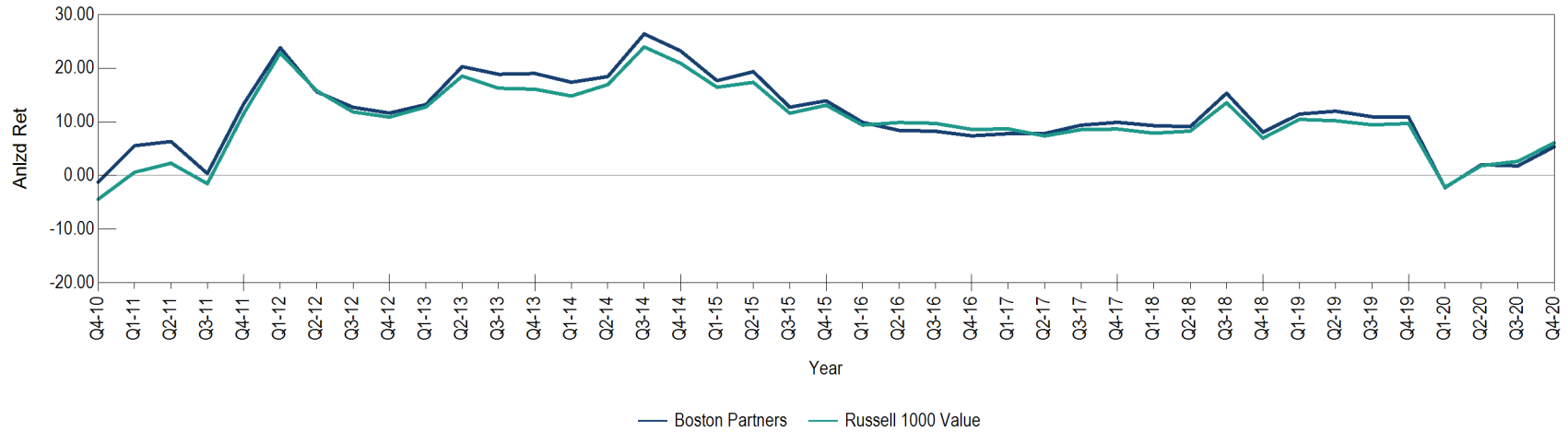


	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	24.6	17.9	14.1	15.3	13.6	17.9	34.4	-1.8	24.0	22.1
25th Percentile	18.7	9.7	9.3	12.2	12.1	9.7	29.6	-5.8	19.8	17.4
Median	15.8	4.4	6.9	10.6	11.1	4.4	26.9	-8.3	17.2	15.0
75th Percentile	13.1	1.2	4.9	9.3	10.2	1.2	24.5	-11.1	15.1	11.8
95th Percentile	10.2	-3.9	2.2	7.3	8.8	-3.9	20.3	-16.1	11.2	7.0
# of Portfolios	315	315	312	298	259	315	331	336	342	346
● Boston Partners	18.8 (25)	3.0 (61)	5.3 (70)	10.1 (60)	11.3 (45)	3.0 (61)	24.3 (77)	-8.7 (55)	20.1 (23)	15.1 (50)
▲ Russell 1000 Value	16.3 (42)	2.8 (62)	6.1 (60)	9.7 (66)	10.5 (67)	2.8 (62)	26.5 (54)	-8.3 (50)	13.7 (87)	17.3 (26)

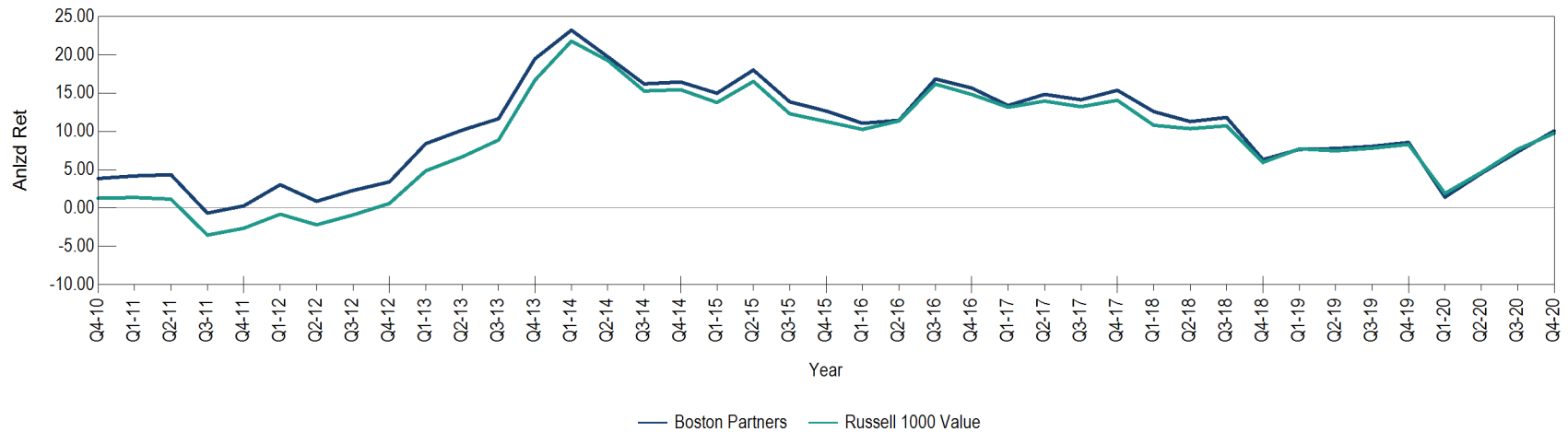
Boston Partners  
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2020

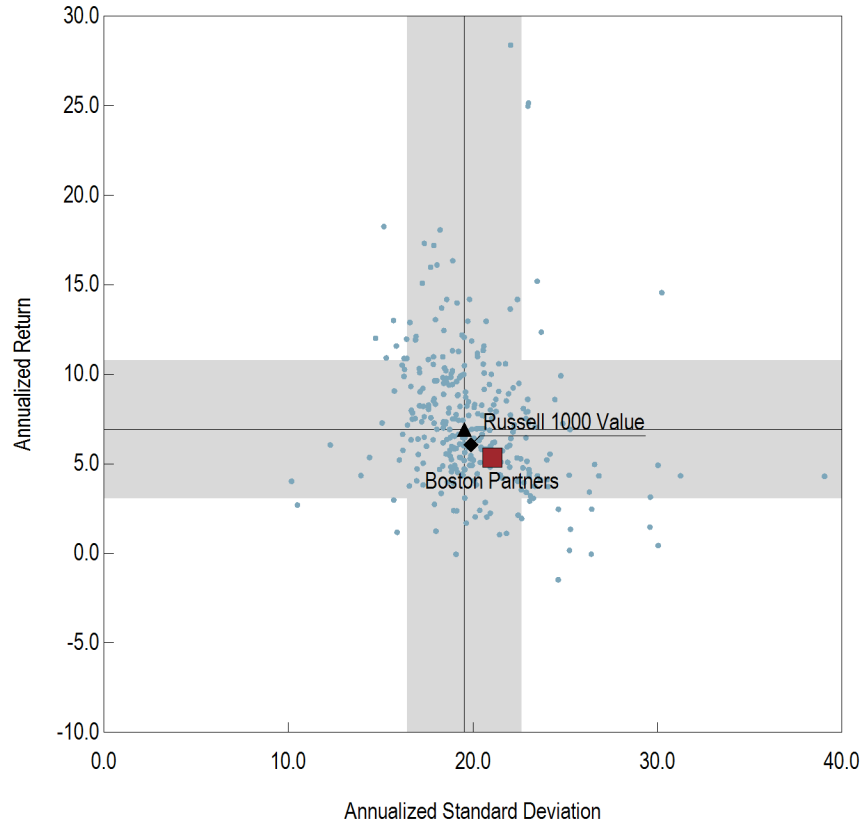
Rolling 3 Year Annualized Return (%)



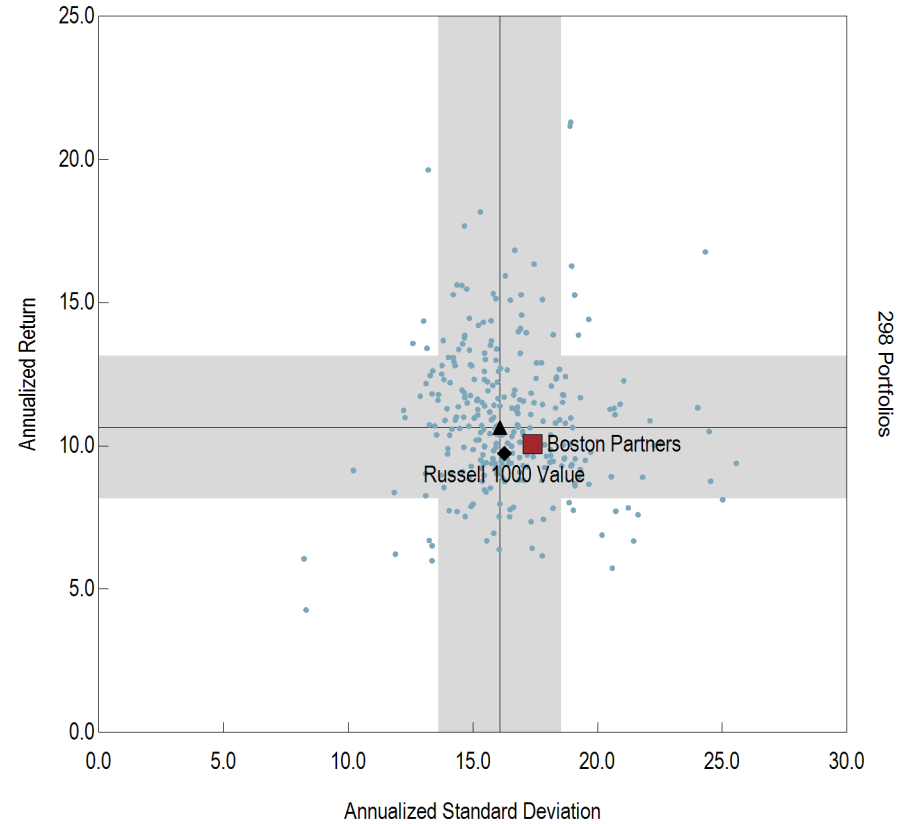
Rolling 5 Year Annualized Return (%)



3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Boston Partners	5.3%	21.1%	0.2
Russell 1000 Value	6.1%	19.9%	0.2
eV US Large Cap Value Equity Gross Median	6.9%	19.5%	0.3

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Boston Partners	10.1%	17.4%	0.5
Russell 1000 Value	9.7%	16.3%	0.5
eV US Large Cap Value Equity Gross Median	10.6%	16.1%	0.6

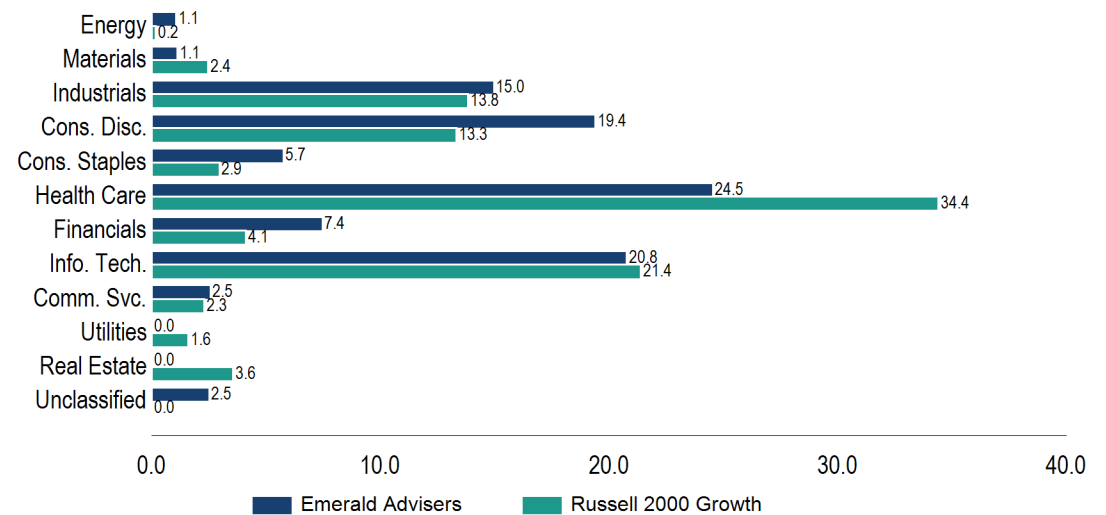
# Emerald Advisers Manager Portfolio Overview

Period Ending: December 31, 2020

Domestic equity small cap growth portfolio of companies with significantly high growth rates. Primary personnel include Kenneth Mertz, Joseph Garner, and Stacey Sears.

	Portfolio	2000 Growth
Number of Holdings	120	1,128
Weighted Avg. Market Cap. (\$B)	4.17	3.99
Median Market Cap. (\$B)	3.06	1.18
Price To Earnings	43.53	34.04
Price To Book	4.83	5.44
Price To Sales	3.35	2.94
Return on Equity (%)	-11.62	-12.06
Yield (%)	0.32	0.39
Beta	1.01	1.00

Sector Allocation (%) vs Russell 2000 Growth



### Largest Holdings

	End Weight	Return
CHEGG INC	2.44	26.44
FRESHPET INC	2.41	27.17
NEOGENOMICS INC	2.40	45.95
RAPID7 INC	2.21	47.23
VARONIS SYSTEMS INC	2.01	41.75
MACOM TECHNOLOGY SOLUTIONS HOLDINGS INC	1.79	61.83
KRATOS DEFENSE & SECURITY SOLUTIONS INC	1.74	42.27
CHART INDUSTRIES INC	1.73	67.62
CHURCHILL DOWNS INC	1.72	19.31
SIMPLY GOOD FOODS CO (THE)	1.69	42.22

### Top Contributors

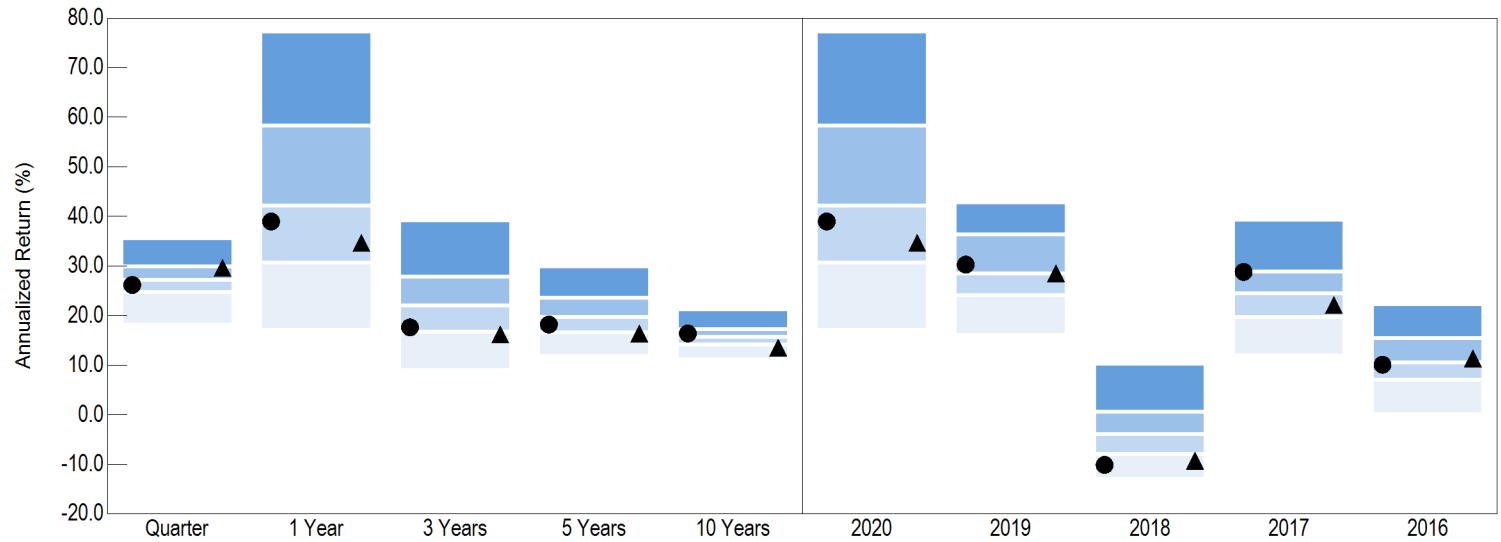
	Avg Wgt	Return	Contribution
NEOGENOMICS INC	0.72	45.95	0.33
VARONIS SYSTEMS INC	0.71	41.75	0.30
TWIST BIOSCIENCE CORP	0.34	85.98	0.29
RAPID7 INC	0.62	47.23	0.29
CHART INDUSTRIES INC	0.43	67.62	0.29
MACOM TECHNOLOGY SOLUTIONS HOLDINGS INC	0.46	61.83	0.28
FRESHPET INC	1.01	27.17	0.28
KRATOS DEFENSE & SECURITY SOLUTIONS INC	0.62	42.27	0.26

### Bottom Contributors

	Avg Wgt	Return	Contribution
MERITAGE HOMES CORP	0.64	-24.97	-0.16
PALOMAR HOLDINGS INC	0.65	-14.77	-0.10
ASSEMBLY BIOSCIENCES INC	0.08	-63.20	-0.05
STAMPS.COM INC	0.26	-18.58	-0.05
HORIZON THERAPEUTICS PUBLIC LTD CO	0.63	-5.83	-0.04
EHEALTH INC	0.20	-10.62	-0.02
PING IDENTITY HOLDING CORP	0.25	-8.23	-0.02
JAMF HOLDING CORP	0.07	-20.45	-0.01
OYSTER POINT PHARMA INC	0.10	-10.85	-0.01

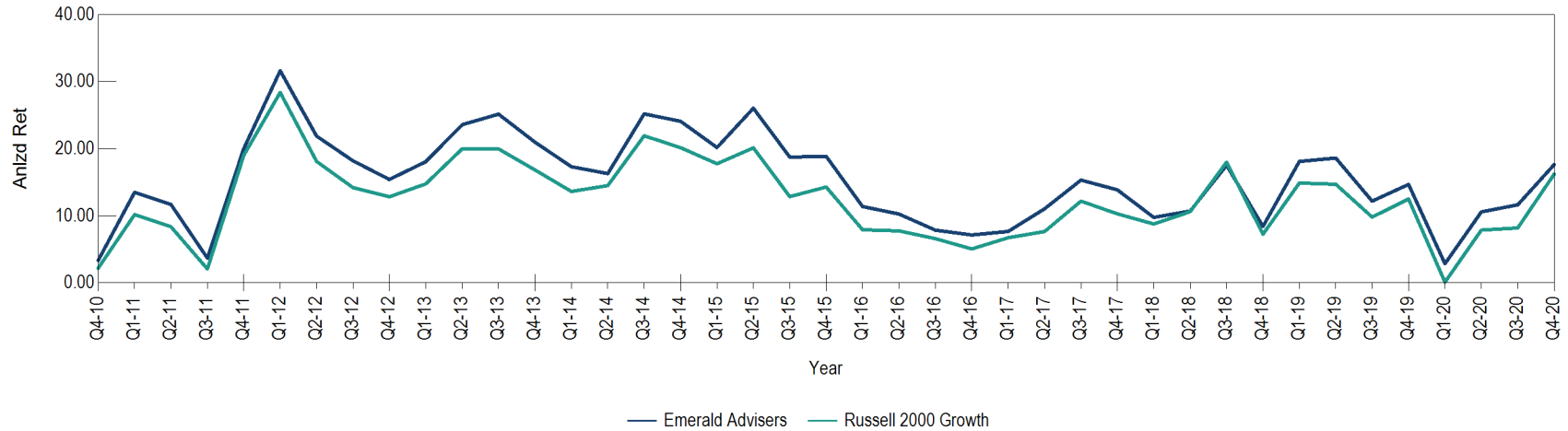
Unclassified sector allocation includes cash allocations.

Emerald Advisers vs. eV US Small Cap Growth Equity Gross Universe

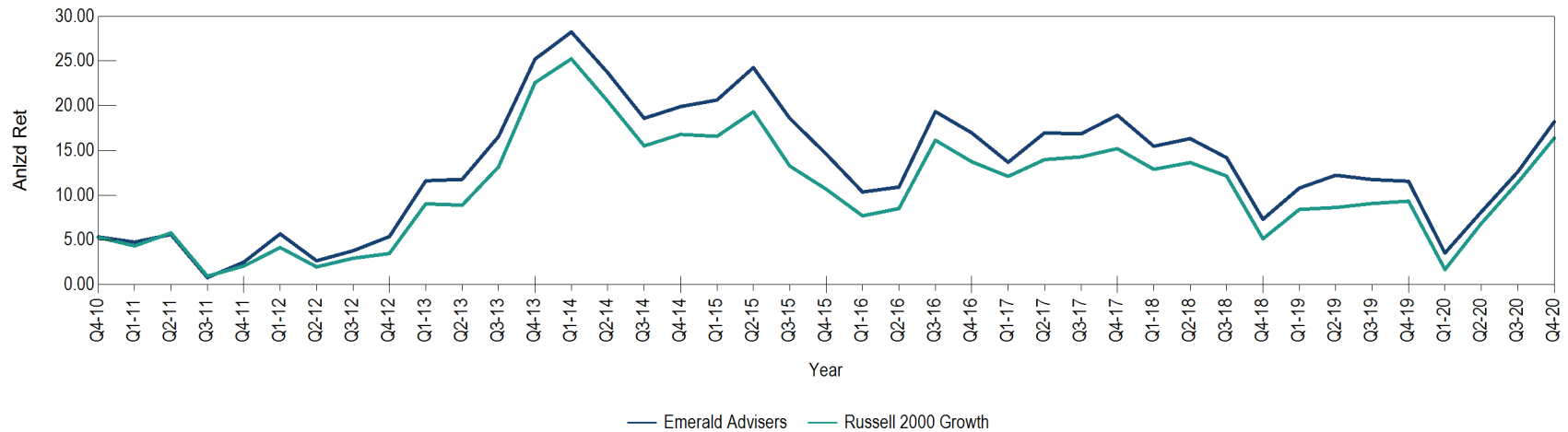


	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	35.6	77.2	39.1	29.8	21.2	77.2	42.8	10.2	39.2	22.2
25th Percentile	30.0	58.4	27.9	23.7	17.3	58.4	36.4	0.7	28.9	15.5
Median	27.3	42.2	22.1	19.7	15.8	42.2	28.5	-3.9	24.6	10.6
75th Percentile	24.8	30.7	16.9	16.6	14.2	30.7	24.2	-7.9	19.8	7.1
95th Percentile	18.2	17.1	9.0	11.9	11.2	17.1	16.2	-12.8	12.1	0.2
# of Portfolios	156	156	155	148	135	156	157	164	174	170
● Emerald Advisers	26.2 (61)	39.0 (56)	17.6 (68)	18.2 (64)	16.4 (41)	39.0 (56)	30.3 (45)	-10.1 (85)	28.8 (26)	10.1 (54)
▲ Russell 2000 Growth	29.6 (28)	34.6 (66)	16.2 (77)	16.4 (77)	13.5 (86)	34.6 (66)	28.5 (51)	-9.3 (80)	22.2 (62)	11.3 (49)

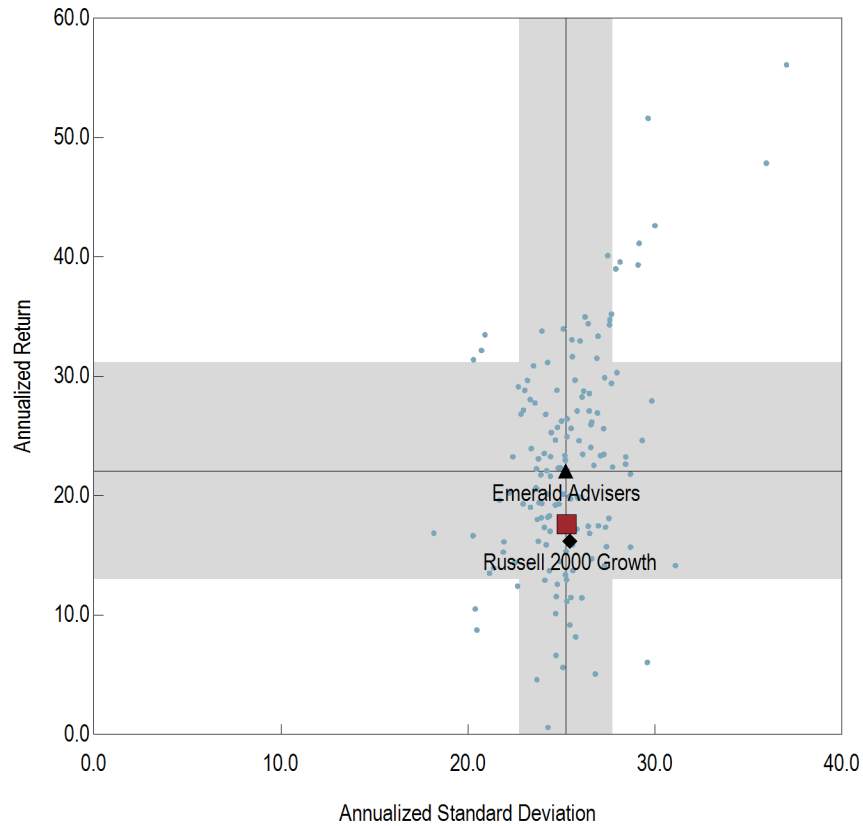
Rolling 3 Year Annualized Return (%)



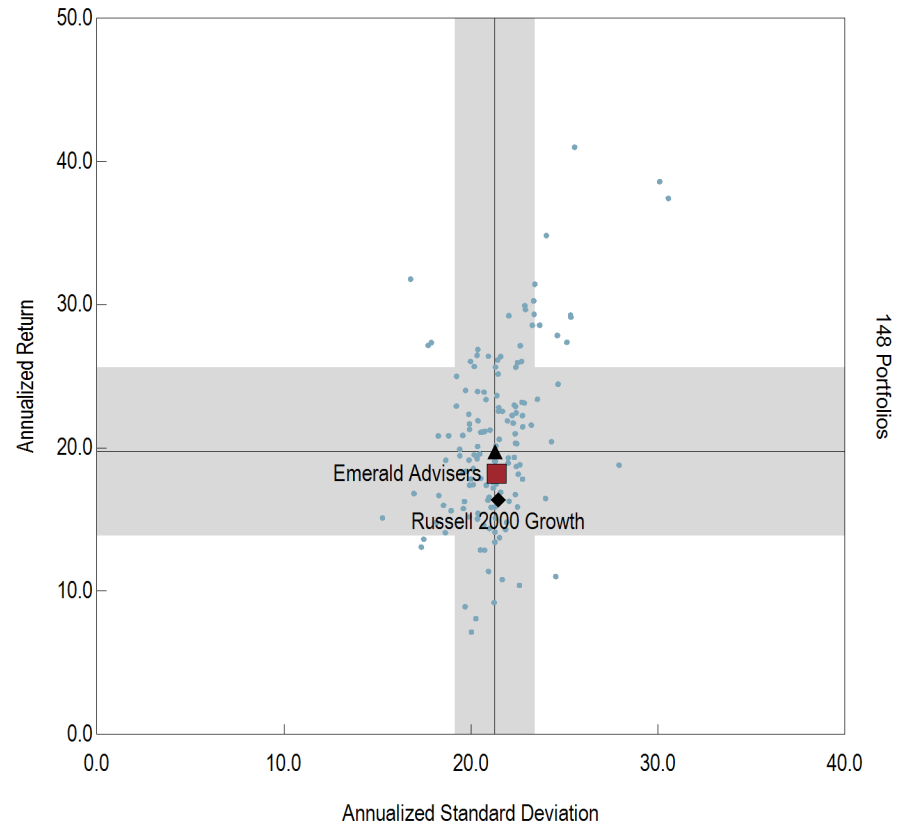
Rolling 5 Year Annualized Return (%)



3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Emerald Advisers	17.6%	25.3%	0.6
Russell 2000 Growth	16.2%	25.5%	0.6
eV US Small Cap Growth Equity Gross Median	22.1%	25.2%	0.8

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Emerald Advisers	18.2%	21.4%	0.8
Russell 2000 Growth	16.4%	21.5%	0.7
eV US Small Cap Growth Equity Gross Median	19.7%	21.3%	0.9

# Ceredex Manager Portfolio Overview

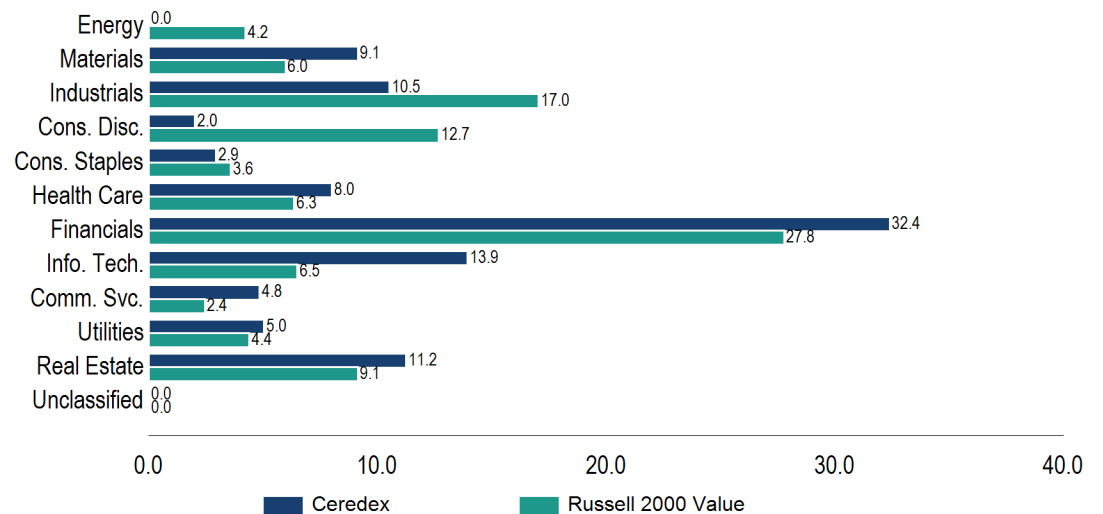
Period Ending: December 31, 2020

Domestic equity small cap value portfolio of companies with dividend yields and low valuations. Primary personnel include Brett Barner and David Maynard.

## Characteristics

	Portfolio	Russell 2000 Value
Number of Holdings	55	1,485
Weighted Avg. Market Cap. (\$B)	5.52	2.49
Median Market Cap. (\$B)	4.90	0.75
Price To Earnings	21.08	17.32
Price To Book	2.26	1.88
Price To Sales	1.93	0.98
Return on Equity (%)	10.34	-4.63
Yield (%)	2.27	1.71
Beta	0.88	1.00

## Sector Allocation (%) vs Russell 2000 Value



## Largest Holdings

	End Weight	Return
INTERPUBLIC GROUP OF COS INC (THE)	4.84	42.71
SLM CORP	4.53	53.55
APTARGROUP INC.	4.33	21.30
POWER INTEGRATIONS INC	4.32	47.99
KEMPER CORP	4.05	15.46
PHYSICIANS REALTY TRUST	3.83	0.66
HILL-ROM HOLDINGS INC	3.81	17.58
HEALTHCARE TRUST OF AMERICA INC	3.75	7.21
EVERCORE INC	3.53	68.60
FIRST AMERICAN FINANCIAL CORP	3.22	2.38

## Top Contributors

	Avg Wgt	Return	Contribution
POWER INTEGRATIONS INC	1.45	47.99	0.69
SLM CORP	1.28	53.55	0.69
EVERCORE INC	0.96	68.60	0.66
QUANTA SERVICES INC.	1.71	36.36	0.62
FIRST HAWAIIAN INC	0.64	64.93	0.41
CONMED CORP	0.76	42.64	0.33
MONOLITHIC POWER SYSTEMS INC	1.02	31.16	0.32
APTARGROUP INC.	1.44	21.30	0.31
INTERPUBLIC GROUP OF COS INC (THE)	0.68	42.71	0.29
LITTELFUSE INC	0.62	43.90	0.27

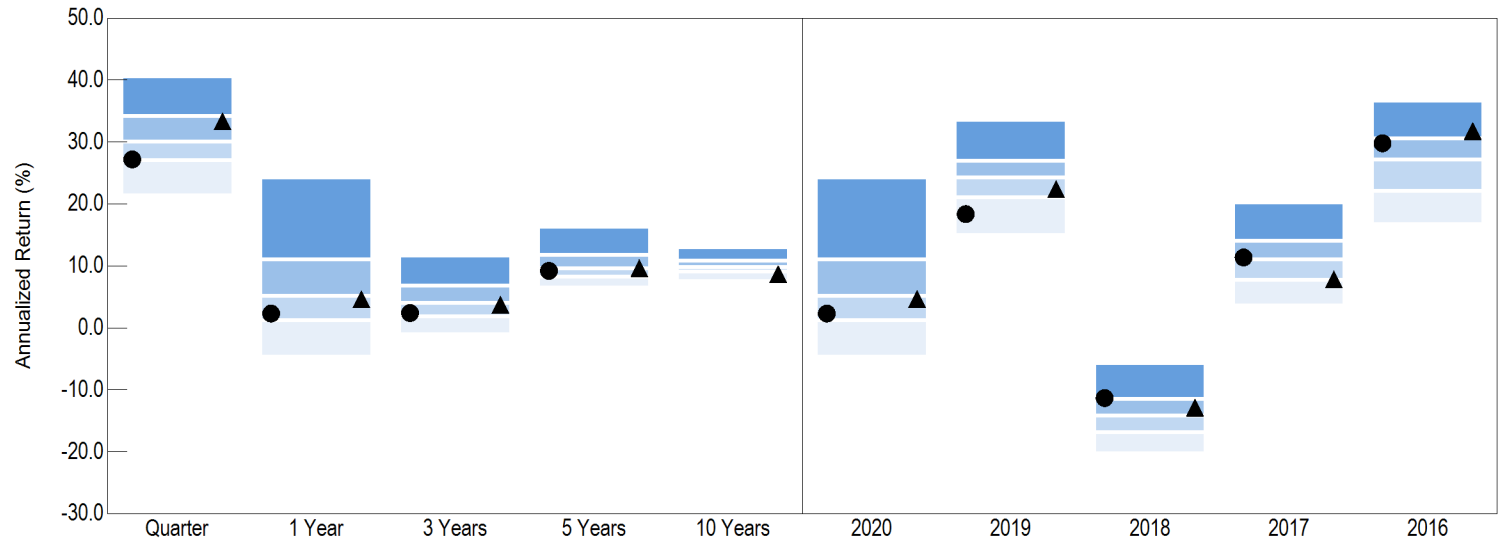
## Bottom Contributors

	Avg Wgt	Return	Contribution
HEALTHCARE REALTY TRUST INC	0.76	-0.81	-0.01
REYNOLDS CONSUMER PRODUCTS INC	0.38	-1.17	0.00
PHYSICIANS REALTY TRUST	1.56	0.66	0.01
AMERISAFE INC	0.24	6.66	0.02
ENERGIZER HOLDINGS INC	0.20	8.54	0.02
CUBESMART	0.38	5.08	0.02
TENNANT CO	0.15	16.64	0.02
IDACORP INC.	0.13	21.13	0.03
STANTEC INC	0.43	7.15	0.03
FIRST AMERICAN	1.30	2.38	0.03

Unclassified sector allocation includes cash allocations.

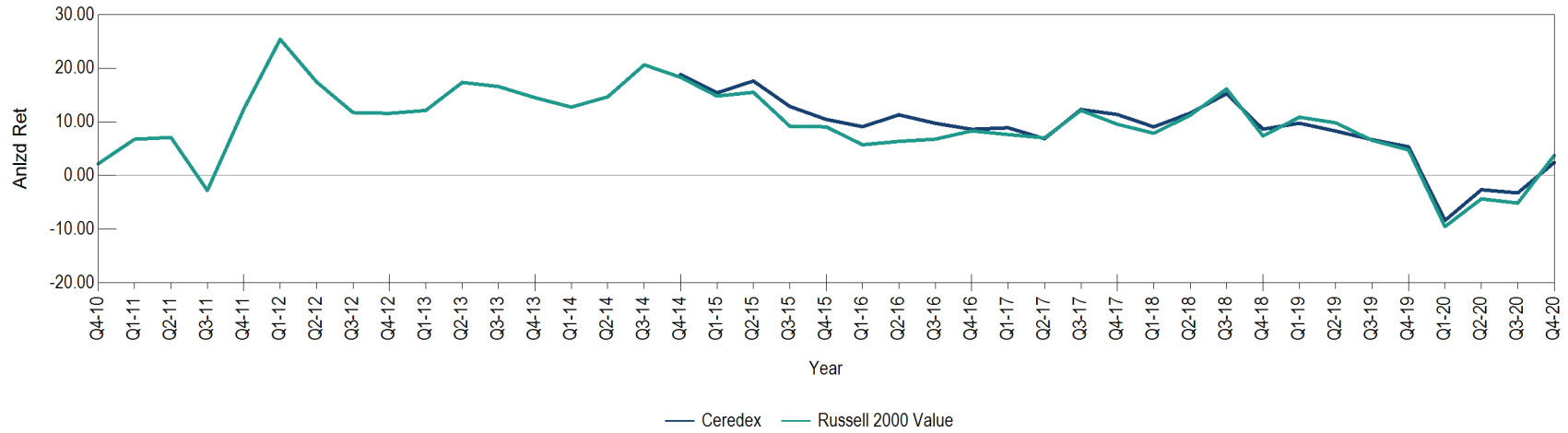


Ceredex vs. eV US Small Cap Value Equity Gross Universe

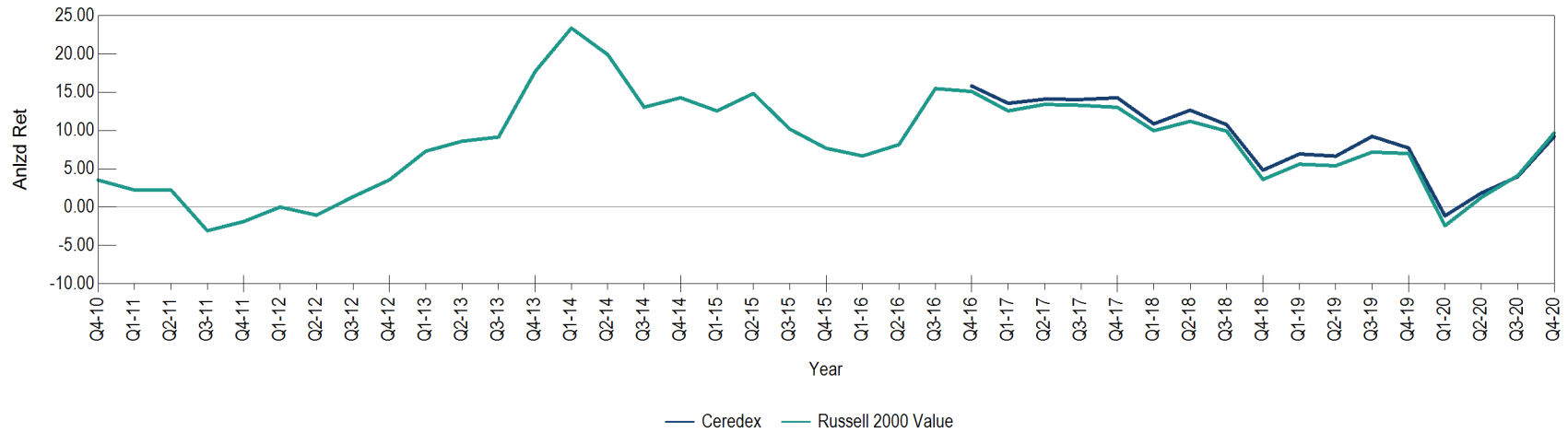


	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	40.6	24.2	11.7	16.3	13.0	24.2	33.6	-5.7	20.2	36.7
25th Percentile	34.3	11.1	6.9	11.8	10.9	11.1	27.0	-11.4	14.1	30.7
Median	30.1	5.3	4.1	9.6	9.9	5.3	24.4	-14.0	11.1	27.2
75th Percentile	27.1	1.3	2.0	8.4	9.1	1.3	21.2	-16.7	7.8	22.2
95th Percentile	21.4	-4.6	-0.9	6.6	7.6	-4.6	15.0	-20.2	3.7	16.8
# of Portfolios	218	218	209	203	183	218	217	220	224	222
● Ceredex	27.2 (74)	2.3 (69)	2.4 (70)	9.2 (58)	-- (--)	2.3 (69)	18.4 (87)	-11.3 (25)	11.4 (48)	29.8 (32)
▲ Russell 2000 Value	33.4 (29)	4.6 (53)	3.7 (55)	9.7 (50)	8.7 (83)	4.6 (53)	22.4 (69)	-12.9 (39)	7.8 (75)	31.7 (17)

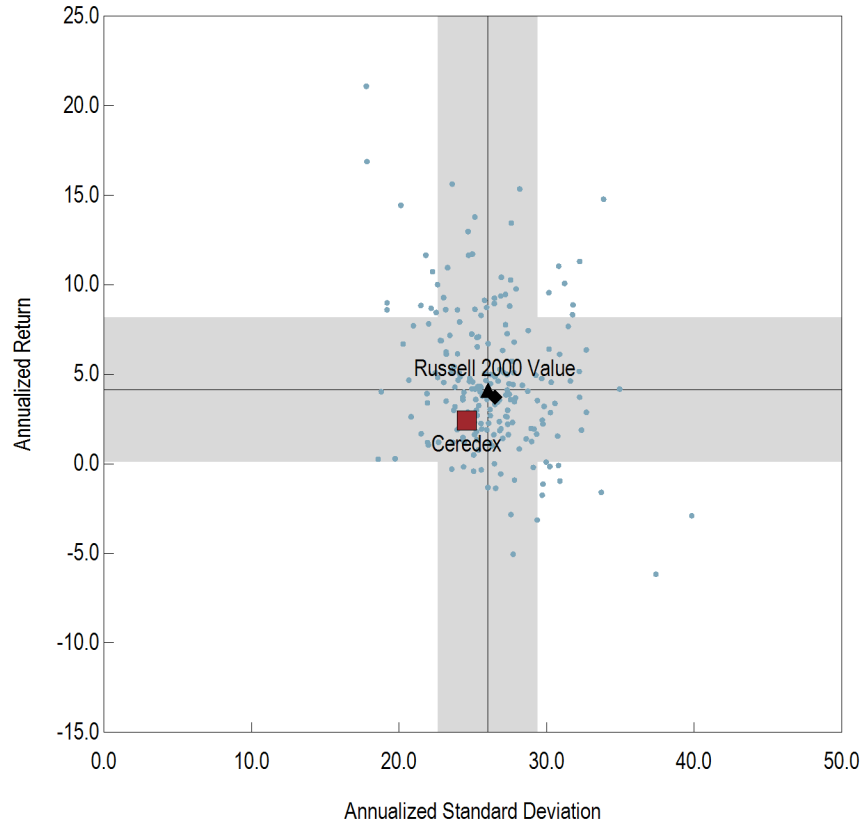
Rolling 3 Year Annualized Return (%)



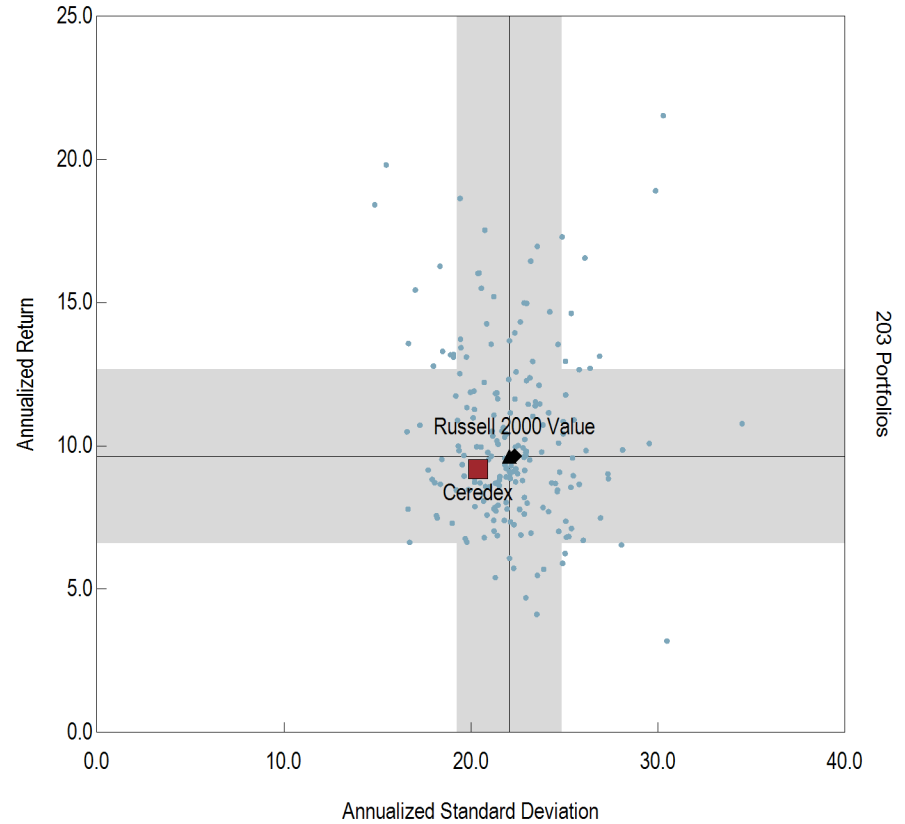
Rolling 5 Year Annualized Return (%)



3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Ceredex	2.4%	24.6%	0.0
Russell 2000 Value	3.7%	26.5%	0.1
eV US Small Cap Value Equity Gross Median	4.1%	26.0%	0.1

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Ceredex	9.2%	20.4%	0.4
Russell 2000 Value	9.7%	22.3%	0.4
eV US Small Cap Value Equity Gross Median	9.6%	22.1%	0.4

# International Equity Managers

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# Pyrford Manager Portfolio Overview

Period Ending: December 31, 2020

International equity value portfolio of non-US companies with low valuations at the country and stock level. Primary personnel include Tony Cousins, Daniel McDonagh, and Paul Simons.

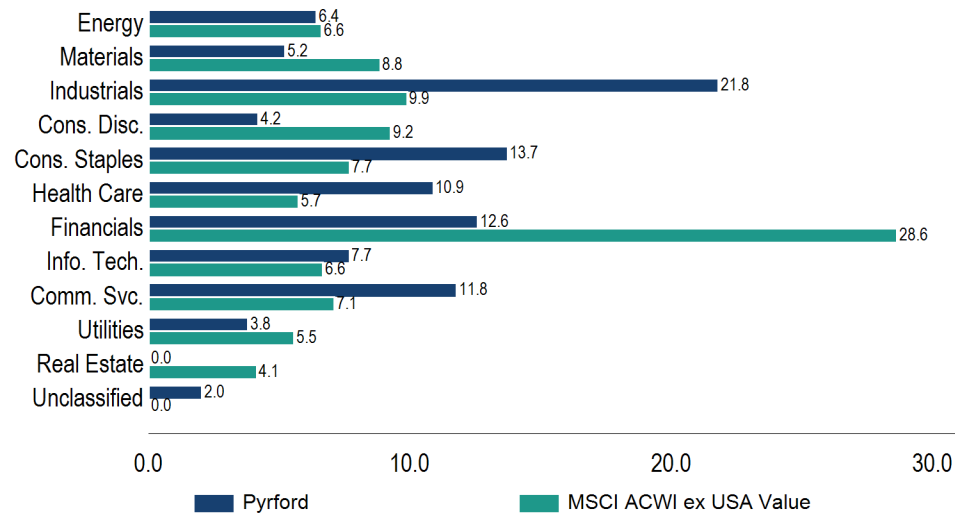
## Characteristics

	MSCI ACWI Portfolio	ex USA Value
Number of Holdings	70	1,611
Weighted Avg. Market Cap. (\$B)	67.19	60.22
Median Market Cap. (\$B)	28.54	8.62
Price To Earnings	18.98	15.29
Price To Book	2.38	1.83
Price To Sales	1.64	0.82
Return on Equity (%)	13.11	7.14
Yield (%)	3.85	3.37
Beta	0.72	1.00

## Country Allocation

	Manager Ending Allocation (USD)	Index Ending Allocation (USD)
<b>Totals</b>		
Developed	90.6%	69.5%
Emerging*	9.4%	30.5%
<b>Top 10 Largest Countries</b>		
United Kingdom	17.2%	11.7%
Japan	14.3%	15.2%
Switzerland	11.6%	4.1%
Australia	9.6%	4.8%
Germany	9.5%	7.1%
France	7.4%	7.3%
Singapore	5.3%	0.7%
Hong Kong	4.5%	2.0%
Taiwan*	4.3%	3.3%
Netherlands	3.2%	1.2%
<b>Total-Top 10 Largest Countries</b>	<b>86.9%</b>	<b>57.3%</b>

## Sector Allocation (%) vs MSCI ACWI ex USA Value



## Top Contributors

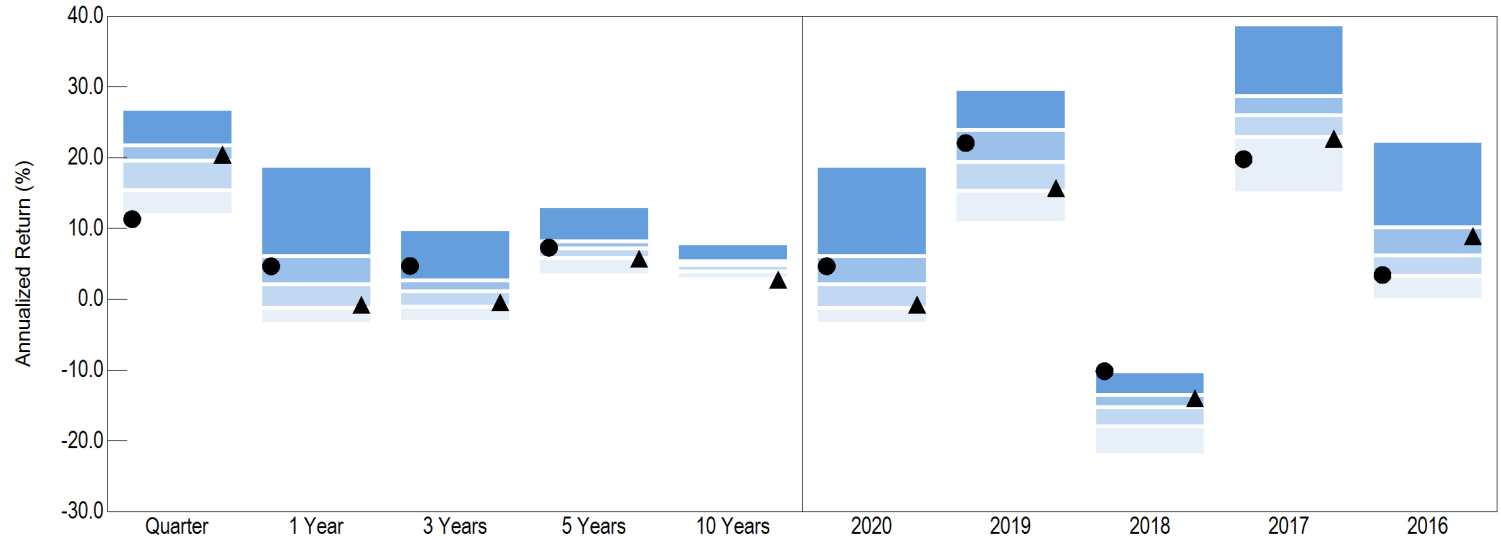
	Avg Wgt	Return	Contribution
LEGAL & GENERAL GROUP PLC	1.85	49.21	0.91
WOODSIDE PETROLEUM LTD	1.82	39.21	0.72
JAPAN TOBACCO INC	3.24	16.00	0.52
COMPUTERSHARE LTD CPU	1.67	28.49	0.48
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	1.72	26.77	0.46
MALAYAN BANKING BHD MAYBANK	1.82	23.05	0.42
ROYAL DUTCH SHELL PLC	0.97	43.01	0.42

## Bottom Contributors

	Avg Wgt	Return	Contribution
SAP SE	2.02	-15.87	-0.32
CHINA MOBILE LTD	1.59	-10.66	-0.17
RECKITT BENCKISER GROUP PLC	1.84	-8.64	-0.16
KONE OYJ	1.71	-7.76	-0.13
NEWCREST MINING LTD	0.89	-11.19	-0.10
KONINKLIJKE VOPAK NV	1.42	-6.81	-0.10
SANOFI	1.85	-3.92	-0.07
SUMITOMO RUBBER INDUSTRIES LTD	1.47	-4.25	-0.06
NESTLE SA, CHAM UND VEVEY	3.12	-1.14	-0.04
GLAXOSMITHKLINE PLC	1.76	-1.14	-0.02

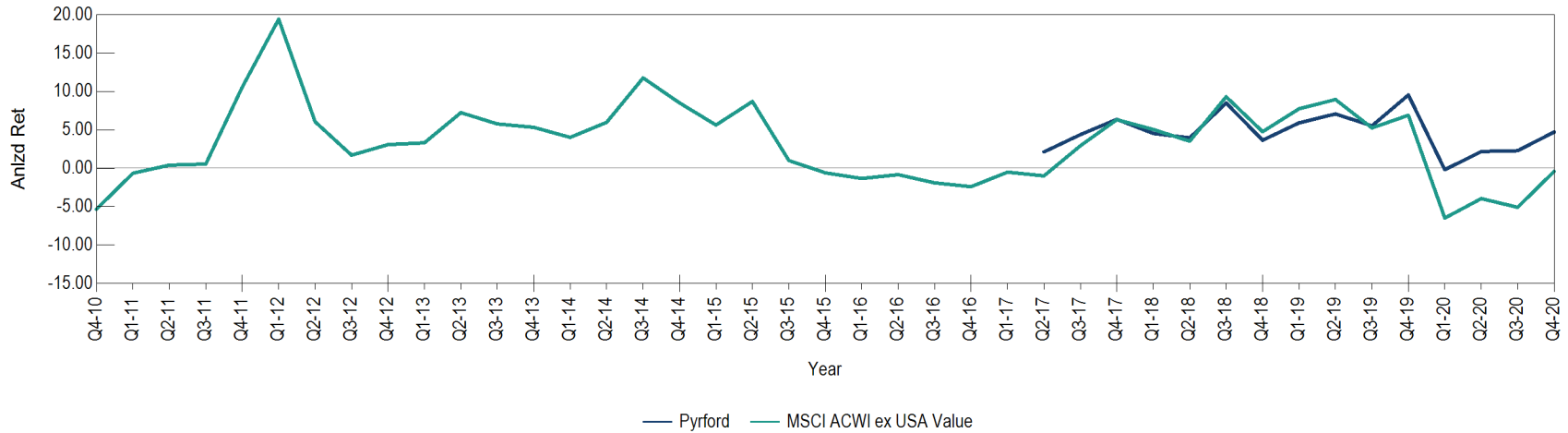
Unclassified sector allocation includes cash allocations.

Pyrford vs. eV ACWI ex-US Value Equity Gross Universe

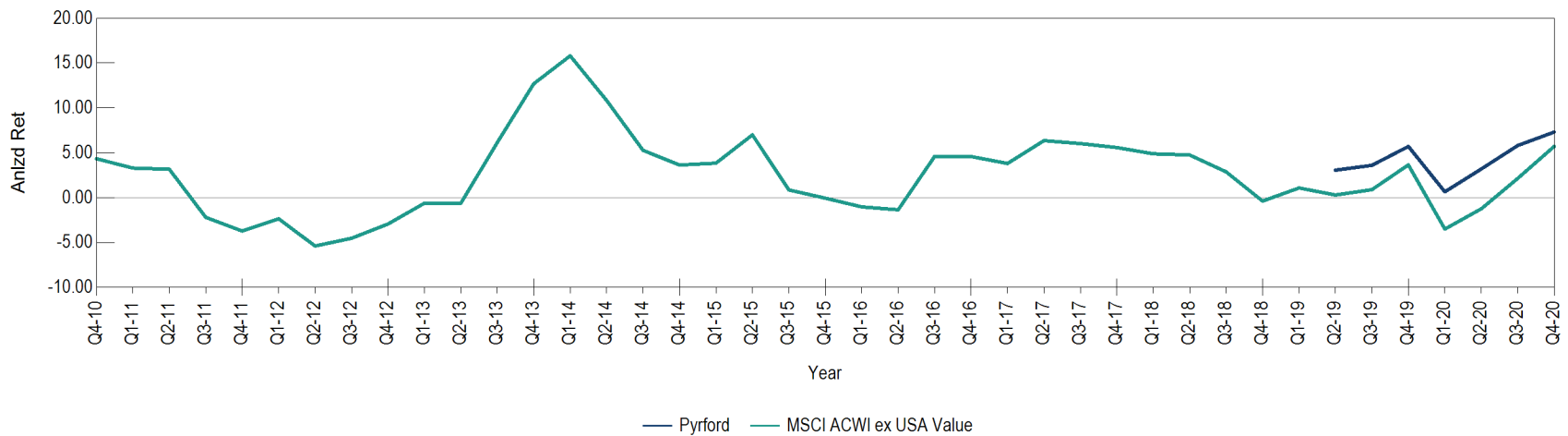


	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	26.8	18.8	9.9	13.1	7.8	18.8	29.6	-10.2	38.8	22.3
25th Percentile	21.8	6.2	2.7	8.2	5.4	6.2	24.0	-13.4	28.8	10.2
Median	19.6	2.1	1.2	7.2	4.9	2.1	19.5	-15.2	26.0	6.2
75th Percentile	15.4	-1.2	-1.0	5.9	4.0	-1.2	15.4	-17.9	23.0	3.3
95th Percentile	11.9	-3.5	-3.2	3.5	2.9	-3.5	10.8	-21.9	15.0	-0.1
# of Portfolios	49	49	47	46	29	49	52	54	56	55
● Pyrford	11.3 (97)	4.7 (33)	4.7 (16)	7.3 (48)	-- (--)	4.7 (33)	22.1 (35)	-10.1 (5)	19.8 (84)	3.4 (74)
▲ MSCI ACWI ex USA Value	20.4 (39)	-0.8 (73)	-0.4 (71)	5.7 (77)	2.8 (96)	-0.8 (73)	15.7 (74)	-14.0 (32)	22.7 (77)	8.9 (35)

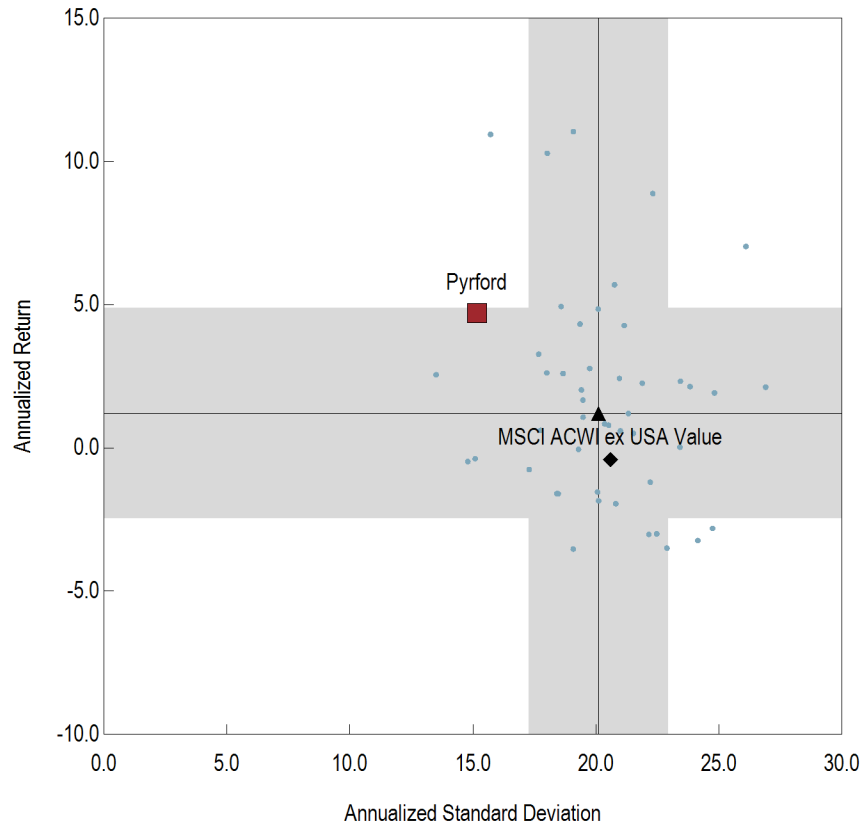
Rolling 3 Year Annualized Return (%)



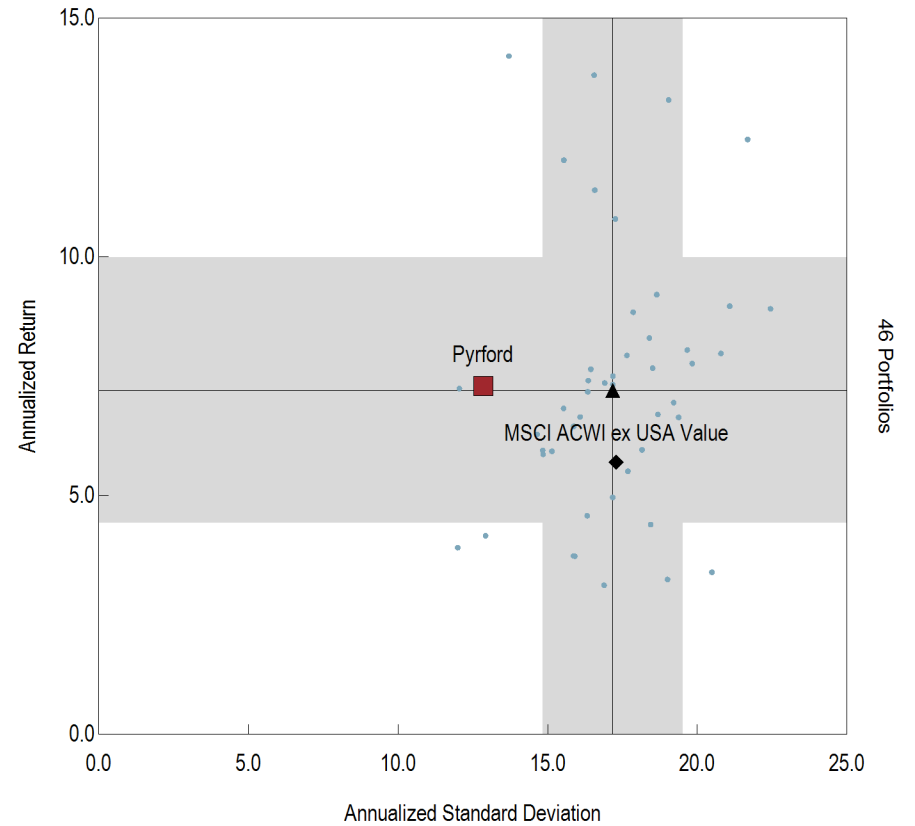
Rolling 5 Year Annualized Return (%)



3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Pyrford	4.7%	15.2%	0.2
MSCI ACWI ex USA Value	-0.4%	20.6%	-0.1
eV ACWI ex-US Value Equity Gross Median	1.2%	20.1%	0.0

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Pyrford	7.3%	12.8%	0.5
MSCI ACWI ex USA Value	5.7%	17.3%	0.3
eV ACWI ex-US Value Equity Gross Median	7.2%	17.2%	0.3

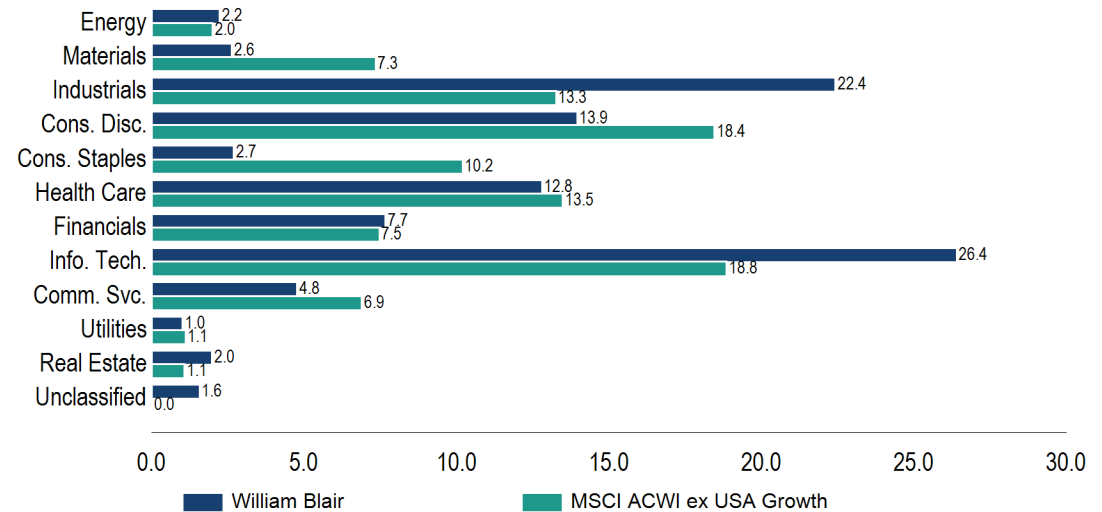


# William Blair Manager Portfolio Overview

Period Ending: December 31, 2020

International equity growth portfolio of non-US companies with high growth rates constructed from the security level. Primary personnel include Simon Fennell and Kenneth McAtamney.

	William Blair	MSCI ACWI Growth
Number of Holdings	181	1,011
Weighted Avg. Market Cap. (\$B)	80.08	140.56
Median Market Cap. (\$B)	13.17	10.35
Price To Earnings	41.80	32.34
Price To Book	6.41	4.23
Price To Sales	4.88	2.80
Return on Equity (%)	13.73	13.67
Yield (%)	0.77	1.22
Beta	1.17	1.00



## Country Allocation

	Manager Ending Allocation (USD)	Index Ending Allocation (USD)
<b>Totals</b>		
Developed	76.9%	68.3%
Emerging*	23.1%	31.7%
<b>Top 10 Largest Countries</b>		
Japan	12.5%	16.5%
China*	11.7%	12.5%
United Kingdom	8.9%	5.8%
France	7.8%	6.6%
Netherlands	6.7%	3.7%
Switzerland	6.2%	8.0%
Germany	5.9%	4.6%
Sweden	5.7%	3.1%
Denmark	4.9%	2.9%
Taiwan*	4.6%	4.6%
<b>Total-Top 10 Largest Countries</b>	<b>75.8%</b>	<b>68.2%</b>

## Top Contributors

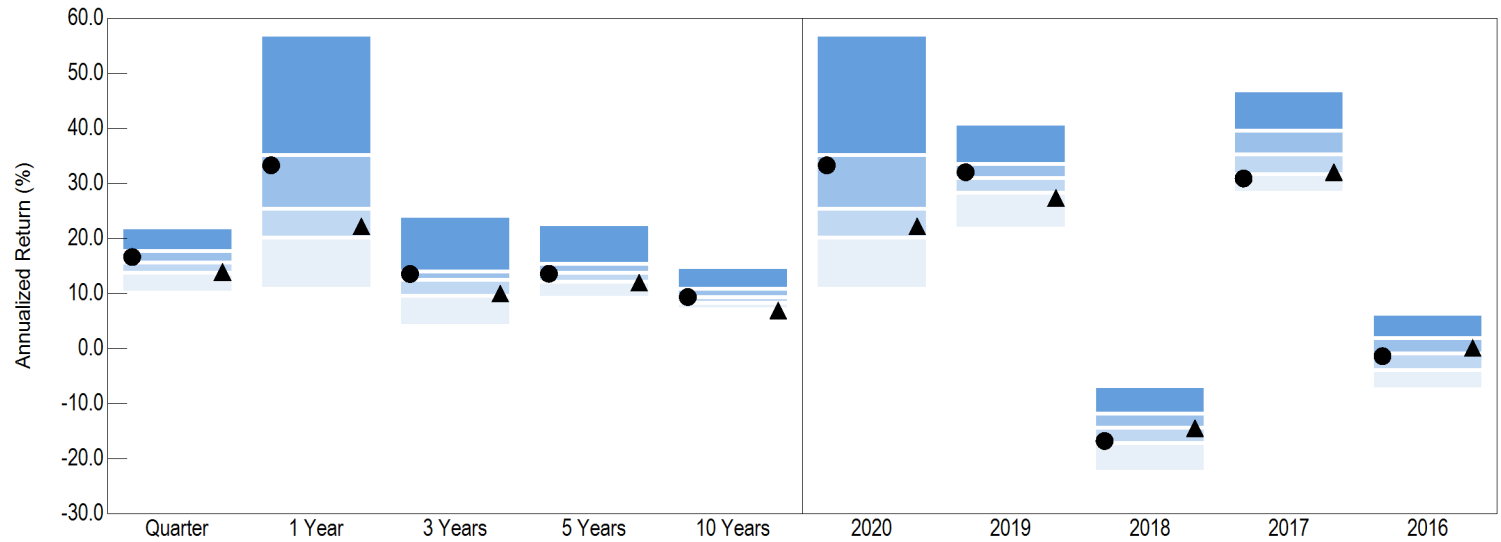
	Avg Wgt	Return	Contribution
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	2.05	35.07	0.72
ASML HOLDING NV	1.75	32.10	0.56
MTU AERO ENGINES AG	0.94	56.56	0.53
AIRBUS SE	1.04	50.68	0.53
INFINEON TECHNOLOGIES AG	1.25	35.60	0.45
SAFRAN SA	1.02	43.05	0.44
WUXI BIOLOGICS (CAYMAN) INC	0.68	63.45	0.43
LVMH MOET HENNESSY LOUIS VUITTON SE	1.27	33.79	0.43

## Bottom Contributors

	Avg Wgt	Return	Contribution
BABA-SW ORD	2.46	-15.64	-0.38
KINGSPAN GROUP PLC	0.88	-23.04	-0.20
SAP SE	1.03	-15.87	-0.16
RELIANCE INDUSTRIES LTD	1.29	-10.54	-0.14
TAL EDUCATION GROUP	1.12	-5.96	-0.07
AVEVA GROUP	0.31	-11.95	-0.04
AK MEDICAL ORD	0.10	-31.98	-0.03
EURONEXT NV	0.27	-12.15	-0.03
CHR.HANSEN HOLDINGS AS	0.41	-7.54	-0.03
INTERTEK GROUP PLC, LONDON	0.49	-5.86	-0.03

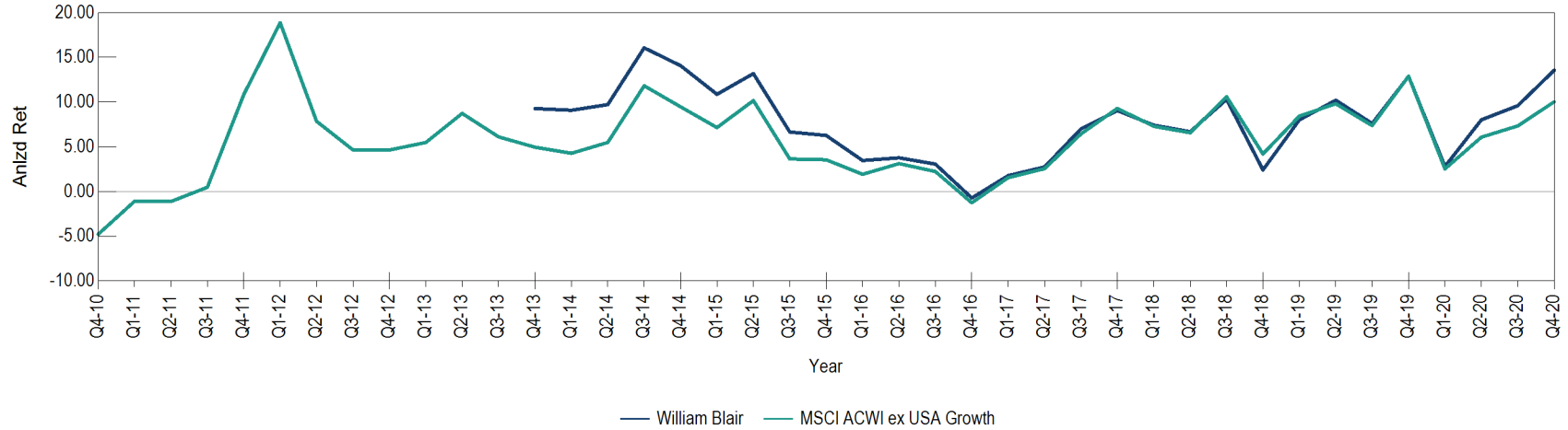
Unclassified sector allocation includes cash allocations.

William Blair vs. eV ACWI ex-US Growth Equity Gross Universe

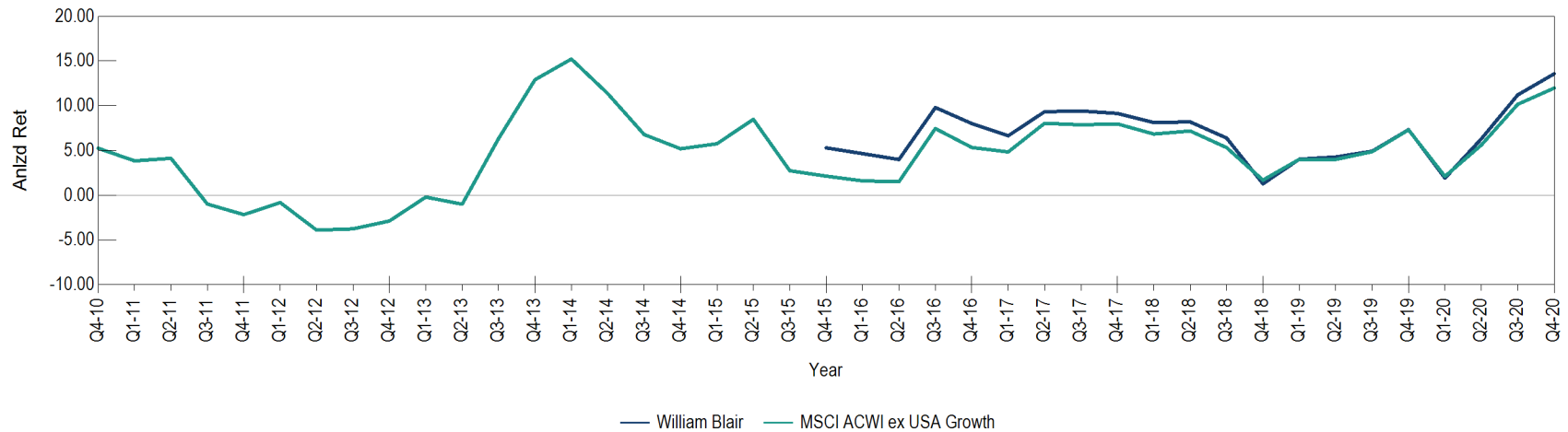


	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	22.0	57.0	24.0	22.5	14.8	57.0	40.8	-6.8	46.8	6.3
25th Percentile	17.8	35.2	14.0	15.4	10.9	35.2	33.6	-11.7	39.6	2.0
Median	15.6	25.5	12.6	13.8	9.4	25.5	31.0	-14.3	35.3	-0.9
75th Percentile	13.8	20.2	9.6	12.2	8.4	20.2	28.3	-17.2	31.8	-3.9
95th Percentile	10.2	10.9	4.1	9.2	7.2	10.9	21.8	-22.3	28.3	-7.4
# of Portfolios	95	94	89	85	55	94	93	82	94	90
● William Blair	16.6 (39)	33.3 (30)	13.5 (36)	13.6 (57)	9.4 (50)	33.3 (30)	32.0 (39)	-16.8 (69)	30.9 (81)	-1.4 (55)
▲ MSCI ACWI ex USA Growth	13.9 (74)	22.2 (64)	10.0 (72)	12.0 (77)	6.9 (96)	22.2 (64)	27.3 (80)	-14.4 (51)	32.0 (75)	0.1 (45)

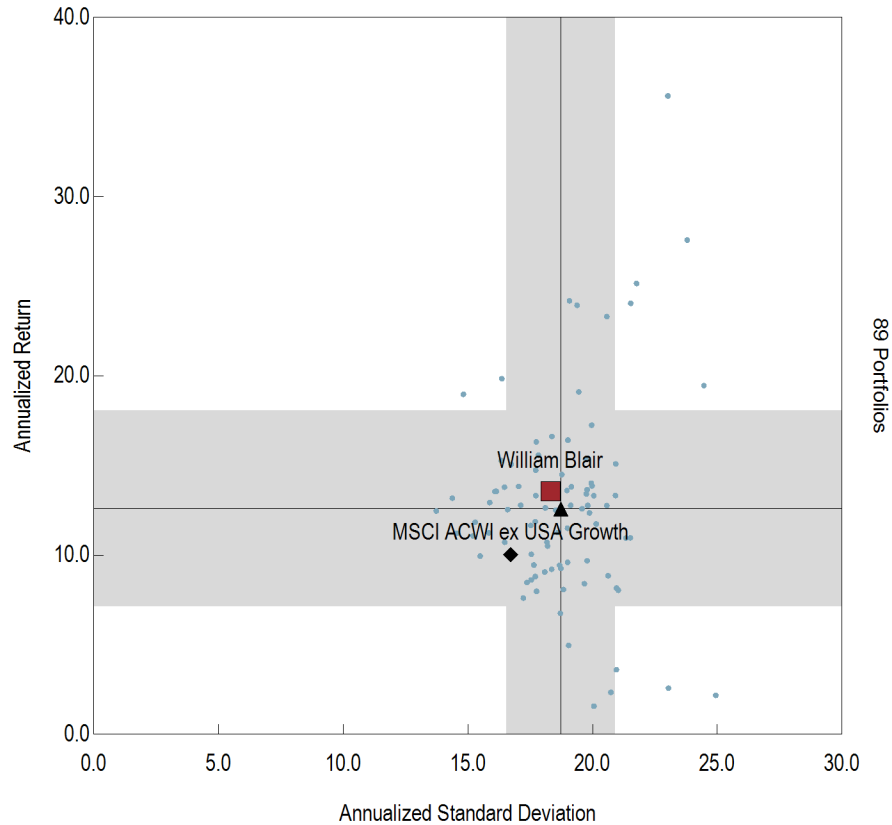
Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)



3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
William Blair	13.5%	18.3%	0.7
MSCI ACWI ex USA Growth	10.0%	16.7%	0.5
eV ACWI ex-US Growth Equity Gross Median	12.6%	18.7%	0.6

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
William Blair	13.6%	15.6%	0.8
MSCI ACWI ex USA Growth	12.0%	14.4%	0.8
eV ACWI ex-US Growth Equity Gross Median	13.8%	16.0%	0.8

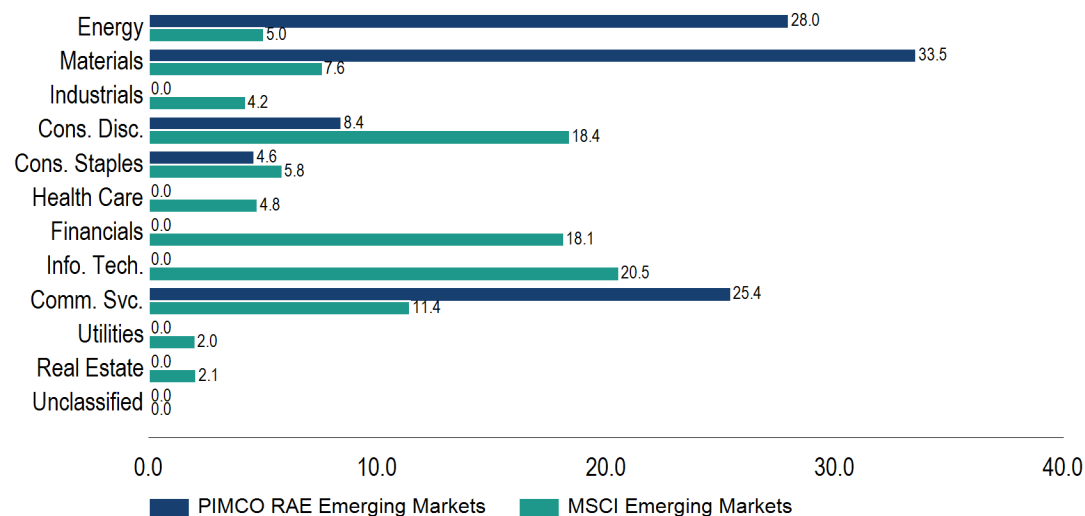
# PIMCO RAE Emerging Markets Manager Portfolio Overview

Period Ending: December 31, 2020

The PIMCO RAE Emerging Markets seeks to invest 80% of its assets in investments that are economically tied to emerging market countries. The portfolio is sub-advised by Research Affiliates, LLC.

	Portfolio	Emerging Markets
Number of Holdings	9	1,397
Weighted Avg. Market Cap. (\$B)	25.93	171.50
Median Market Cap. (\$B)	15.93	6.87
Price To Earnings	17.29	19.13
Price To Book	3.06	3.11
Price To Sales	0.45	1.36
Return on Equity (%)	6.82	11.11
Yield (%)	3.45	1.96
Beta	1.16	1.00

Sector Allocation (%) vs MSCI Emerging Markets



## Country Allocation

	Manager Ending Allocation (USD)	Index Ending Allocation (USD)
<b>Totals</b>		
Emerging*	100.0%	100.0%
<b>Top 10 Largest Countries</b>		
Russia*	43.5%	2.6%
Korea*	23.4%	13.5%
South Africa*	18.1%	3.5%
China*	10.5%	39.2%
Mexico*	4.6%	1.7%
<b>Total-Top 10 Largest Countries</b>	<b>100.0%</b>	<b>60.6%</b>

## Top Contributors

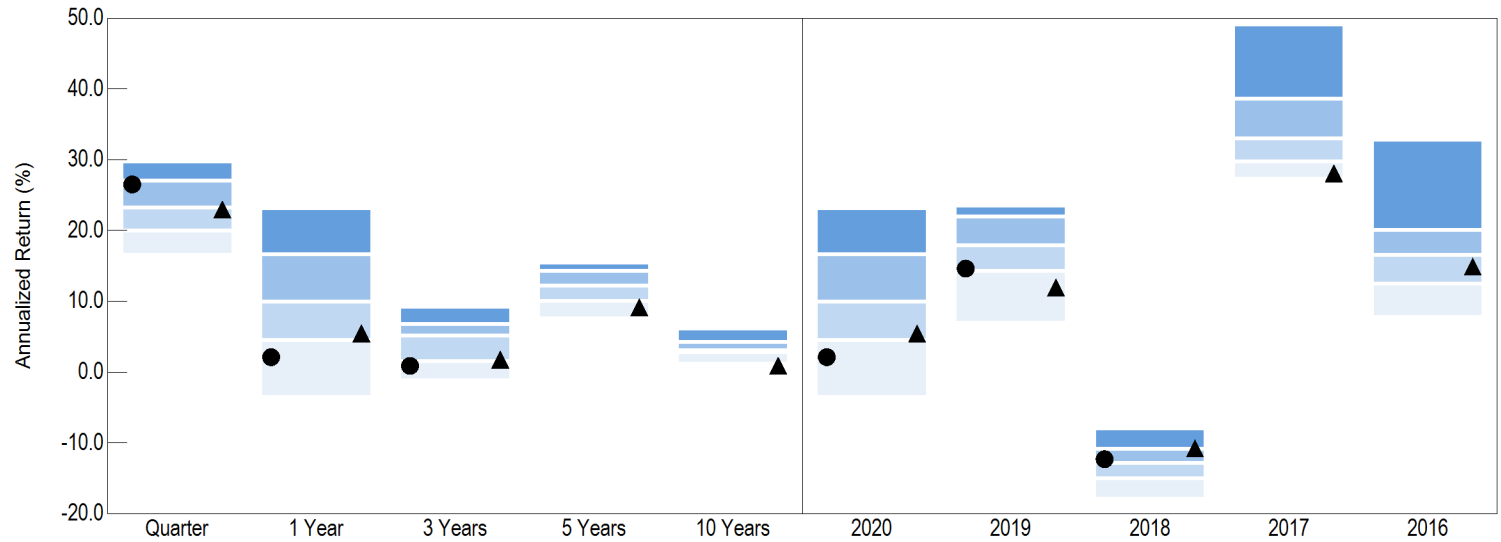
	End Weight	Return	Contribution
VIPSHOP HOLDINGS LIMITED	8.42	79.73	6.71
OIL CO LUKOIL PJSC	26.85	22.04	5.92
MINING AND METALLURGIAL CO NORILSK NICKEL PJSC	15.50	35.67	5.53
KT CORP	23.40	14.57	3.41
FOMENTO ECONOMICO MEXICAN SAB DE CV	2.06	36.74	0.76
COCA-COLA FEMSA SAB DE CV	2.55	16.75	0.43
GAZPROM NEFT PJSC	1.14	14.57	0.17
SOHU.COM LTD	2.04	-19.74	-0.40
GOLD FIELDS LTD	18.05	-24.57	-4.44

## Bottom Contributors

	End Weight	Return	Contribution
GOLD FIELDS LTD	18.05	-24.57	-4.44
SOHU.COM LTD	2.04	-19.74	-0.40
GAZPROM NEFT PJSC	1.14	14.57	0.17
COCA-COLA FEMSA SAB DE CV	2.55	16.75	0.43
FOMENTO ECONOMICO MEXICAN SAB DE CV	2.06	36.74	0.76
KT CORP	23.40	14.57	3.41
MINING AND METALLURGIAL CO NORILSK NICKEL PJSC	15.50	35.67	5.53
OIL CO LUKOIL PJSC	26.85	22.04	5.92
VIPSHOP HOLDINGS LIMITED	8.42	79.73	6.71

Unclassified sector allocation includes cash allocations.

PIMCO RAE Emerging Markets vs. eV Emg Mkts All Cap Value Equity Gross Universe



	Return (Rank)															
5th Percentile	29.7	23.1	9.2	15.4	6.2	23.1	23.5	-7.9	49.0	32.8						
25th Percentile	27.1	16.7	6.9	14.3	4.3	16.7	22.1	-10.8	38.6	20.1						
Median	23.3	10.0	5.2	12.2	3.2	10.0	18.0	-12.7	33.0	16.6						
75th Percentile	20.0	4.6	1.6	10.1	2.9	4.6	14.4	-14.9	29.8	12.6						
95th Percentile	16.6	-3.4	-1.1	7.7	1.3	-3.4	7.0	-17.8	27.4	7.8						
# of Portfolios	38	38	34	31	18	38	33	36	37	38						
● PIMCO RAE Emerging Markets	26.5 (29)	2.1 (85)	0.9 (79)	-- (--)	-- (--)	2.1 (85)	14.6 (72)	-12.3 (44)	-- (--)	-- (--)						
▲ MSCI Emerging Markets Value NR	23.0 (53)	5.5 (73)	1.8 (75)	9.2 (94)	0.9 (99)	5.5 (73)	12.0 (86)	-10.7 (25)	28.1 (90)	14.9 (59)						

# TT Emerging Markets Manager Portfolio Overview

Period Ending: December 31, 2020

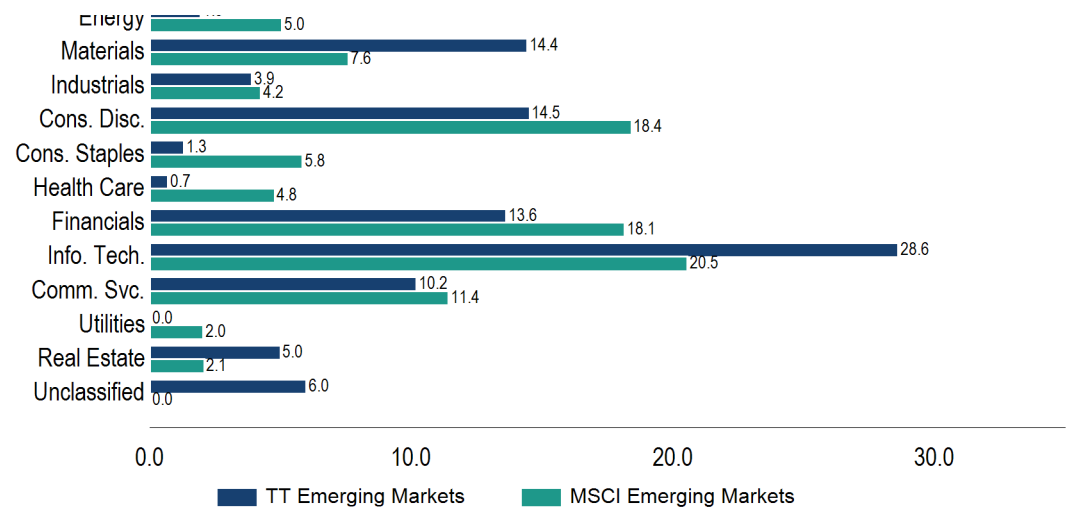
The Emerging Markets Unconstrained strategy aims to outperform its benchmark, MSCI Emerging Markets Index by 5% per annum over a three-year rolling period. It targets high returns and long term capital growth by investing in a focused portfolio of primarily equity and equity-related securities traded in the Emerging Markets.

	TT Emerging Markets	Emerging Markets
Number of Holdings	68	1,397
Weighted Avg. Market Cap. (\$B)	168.57	171.50
Median Market Cap. (\$B)	13.87	6.87
Price To Earnings	18.73	19.13
Price To Book	3.20	3.11
Price To Sales	1.07	1.36
Return on Equity (%)	7.90	11.11
Yield (%)	1.32	1.96
Beta	1.17	1.00

## Country Allocation

	Manager Ending Allocation (USD)	Index Ending Allocation (USD)
<b>Totals</b>		
Developed	15.0%	0.0%
Emerging*	84.4%	100.0%
Frontier**	0.6%	0.0%
<b>Top 10 Largest Countries</b>		
China*	20.4%	39.2%
Korea*	20.0%	13.5%
Taiwan*	12.5%	12.8%
Brazil*	11.1%	5.1%
India*	9.7%	9.3%
South Africa*	6.4%	3.5%
Netherlands	5.6%	0.0%
Hong Kong	4.1%	0.0%
United Kingdom	2.7%	0.0%
Mexico*	1.7%	1.7%
<b>Total-Top 10 Largest Countries</b>	<b>96.4%</b>	<b>85.1%</b>

Unclassified sector allocation includes cash allocations.



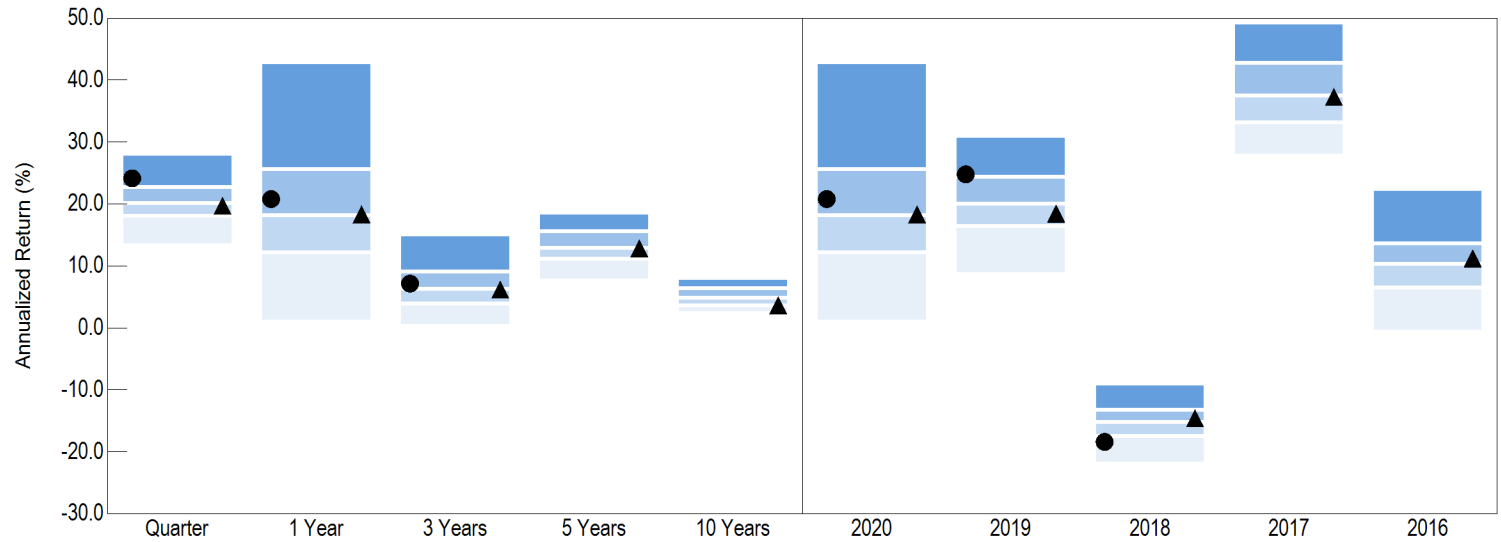
## Top Contributors

	End Weight	Return	Contribution
SAMSUNG ELECTRONICS CO LTD	5.21	56.68	2.95
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	7.84	26.77	2.10
SAMSUNG ELECTRONICS CO LTD	4.17	49.56	2.07
VALE SA	3.12	58.41	1.82
ICICI BANK	3.50	51.86	1.81
BANCO BRADESCO SA BRAD	2.97	56.16	1.67

## Bottom Contributors

	End Weight	Return	Contribution
ALIBABA GROUP HOLDING LTD	2.79	-20.83	-0.58
B2W COMPANHIA DIGITAL	2.13	-9.10	-0.19
A-LIVING ORD H	1.55	-12.29	-0.19
TIMES NEIGHBOR ORD	0.60	-29.13	-0.17
RELIANCE INDUSTRIES LTD	0.77	-16.26	-0.13
HUYA INC	0.73	-16.78	-0.12
SUNAC CHINA HOLDINGS LTD	1.91	-5.18	-0.10
DOUYU INTERNATIONAL HOLDINGS LTD	0.46	-16.28	-0.08
ONECONNECT FINANCIAL TECHNOLOGY CO LTD	0.78	-7.46	-0.06

TT Emerging Markets vs. eV Emg Mkts Equity Gross Universe



	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	28.1	42.8	15.0	18.6	8.0	42.8	30.9	-9.0	49.2	22.4
25th Percentile	22.7	25.7	9.2	15.7	6.4	25.7	24.4	-13.2	42.8	13.7
Median	20.2	18.2	6.3	13.0	4.9	18.2	20.1	-15.2	37.6	10.4
75th Percentile	18.1	12.2	4.0	11.2	3.7	12.2	16.5	-17.4	33.2	6.6
95th Percentile	13.3	1.1	0.3	7.7	2.5	1.1	8.8	-21.8	27.8	-0.6
# of Portfolios	381	381	349	317	182	381	386	355	343	337
● TT Emerging Markets	24.1 (18)	20.8 (39)	7.1 (42)	-- (--)	-- (--)	20.8 (39)	24.8 (24)	-18.4 (83)	-- (--)	-- (--)
▲ MSCI Emerging Markets	19.7 (56)	18.3 (50)	6.2 (54)	12.8 (57)	3.6 (79)	18.3 (50)	18.4 (63)	-14.6 (43)	37.3 (53)	11.2 (45)



## Global Equity Managers

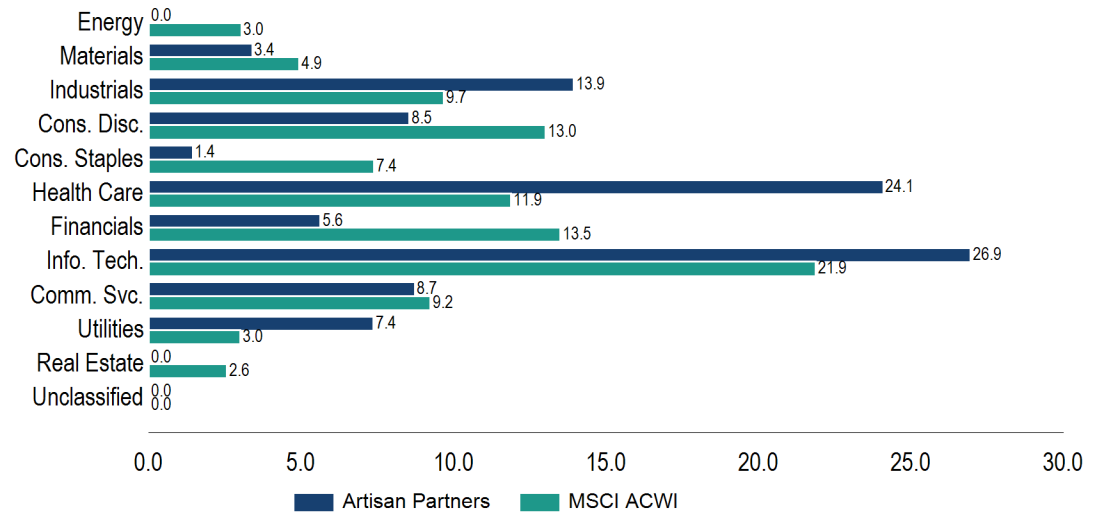
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# Artisan Partners Manager Portfolio Overview

Period Ending: December 31, 2020

Global equity portfolio of companies that is benchmark agnostic with accelerating profit cycles and a focus on capital allocation. Primary personnel include James Hamel, Craig Cepukenas, and Matthew Kamm.

Number of Holdings	46	2,982
Weighted Avg. Market Cap. (\$B)	141.49	306.44
Median Market Cap. (\$B)	53.02	12.22
Price To Earnings	41.12	25.54
Price To Book	5.89	3.68
Price To Sales	5.23	1.96
Return on Equity (%)	13.97	15.76
Yield (%)	0.85	1.81
Beta	0.99	1.00



## Country Allocation

	Manager Ending Allocation (USD)	Index Ending Allocation (USD)
<b>Totals</b>		
Developed	96.6%	86.7%
Emerging*	3.4%	13.3%
<b>Top 10 Largest Countries</b>		
United States	46.8%	57.3%
United Kingdom	13.4%	3.8%
Denmark	7.8%	0.7%
Hong Kong	6.5%	0.9%
Switzerland	4.7%	2.6%
Netherlands	4.7%	1.0%
Sweden	4.6%	0.9%
Japan	3.5%	6.8%
Spain	2.6%	0.7%
Australia	2.0%	1.9%
<b>Total-Top 10 Largest Countries</b>	<b>96.6%</b>	<b>76.4%</b>

## Top Contributors

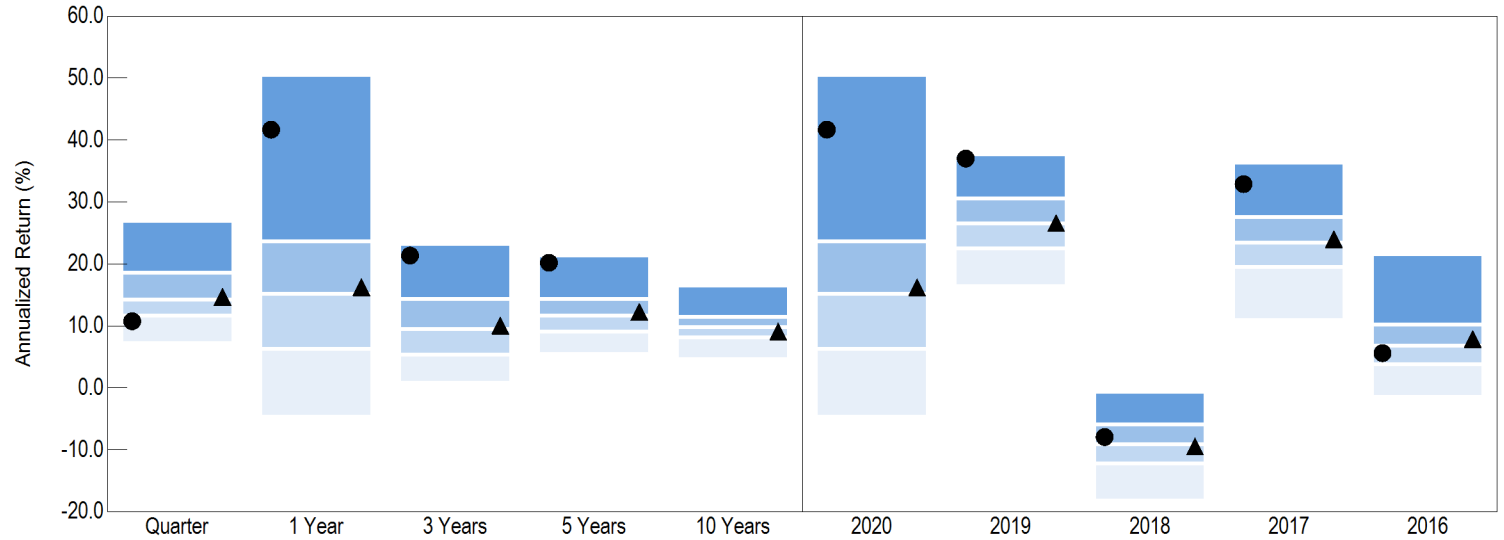
	Avg Wgt	Return	Contribution
VESTAS WIND SYSTEMS A/S	2.89	45.60	1.32
PAGSEGURO DIGITAL LTD	1.63	50.84	0.83
APTIV PLC	1.54	42.11	0.65
ARISTA NETWORKS INC	1.60	40.42	0.65
ORSTED A/S	1.29	47.98	0.62
ATLASSIAN CORP PLC	1.83	28.65	0.53
IHS MARKIT LTD	3.27	14.66	0.48
TECHTRONIC INDUSTRIES CO LTD	5.20	8.81	0.46
TJX COMPANIES INC (THE)	1.85	22.71	0.42

## Bottom Contributors

	Avg Wgt	Return	Contribution
ZOOM VIDEO COMMUNICATIONS INC	2.75	-28.25	-0.78
ASTRAZENECA PLC	4.18	-8.57	-0.36
FIDELITY NATIONAL INFORMATION SERVICES INC	4.18	-3.68	-0.15
LOWE'S COS INC	4.99	-2.90	-0.14
BOSTON SCIENTIFIC CORP	2.41	-5.91	-0.14
RECKITT BENCKISER GROUP PLC	1.16	-8.64	-0.10
VEEVA SYSTEMS INC	2.86	-3.18	-0.09
DANAHER CORP	2.97	3.25	0.10
NETFLIX INC	1.20	8.14	0.10

Unclassified sector allocation includes cash allocations.

Artisan Partners vs. eV All Global Equity Gross Universe

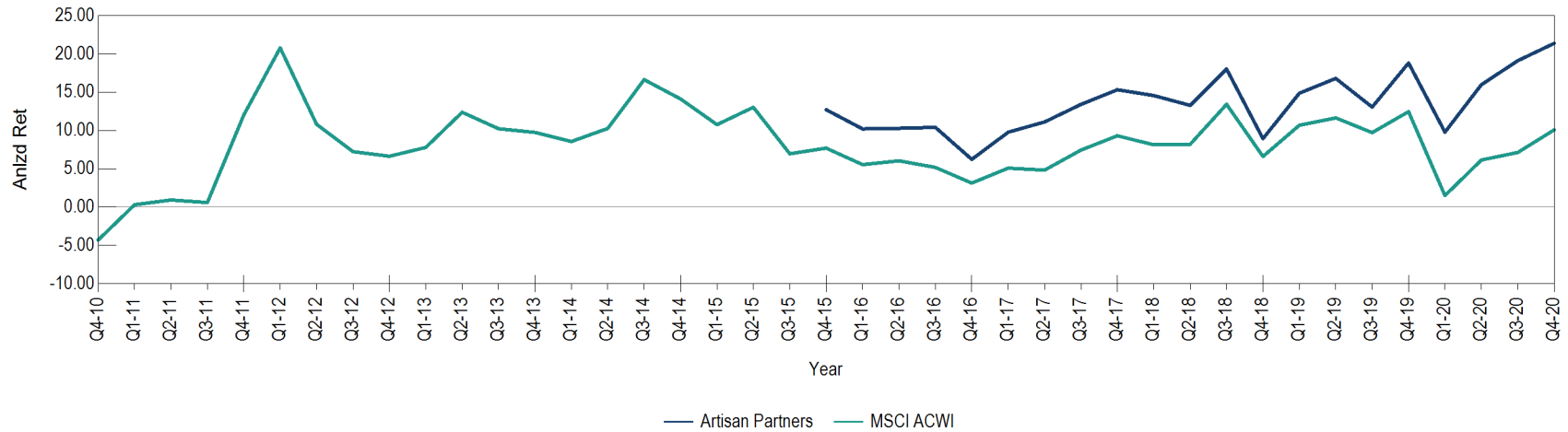


	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	26.9	50.5	23.2	21.3	16.5	50.5	37.6	-0.7	36.3	21.5
25th Percentile	18.6	23.7	14.4	14.4	11.6	23.7	30.7	-5.8	27.6	10.3
Median	14.3	15.3	9.5	11.7	9.9	15.3	26.6	-9.1	23.5	6.8
75th Percentile	11.7	6.3	5.4	9.1	8.2	6.3	22.6	-12.2	19.6	3.9
95th Percentile	7.3	-4.6	0.9	5.5	4.7	-4.6	16.5	-18.1	11.0	-1.4
# of Portfolios	1,040	1,040	952	846	531	1,040	989	920	880	842
● Artisan Partners	10.8 (82)	41.7 (8)	21.3 (7)	20.2 (6)	-- (--)	41.7 (8)	37.0 (7)	-7.9 (40)	32.9 (11)	5.6 (61)
▲ MSCI ACWI	14.7 (46)	16.3 (46)	10.1 (48)	12.3 (45)	9.1 (66)	16.3 (46)	26.6 (50)	-9.4 (53)	24.0 (47)	7.9 (42)

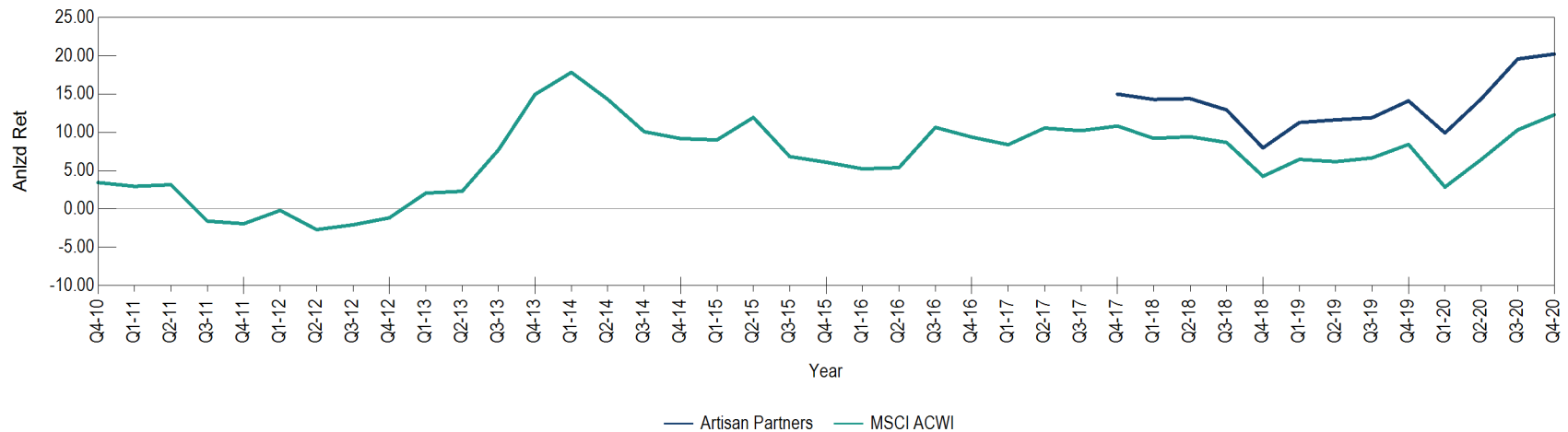
Artisan Partners  
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2020

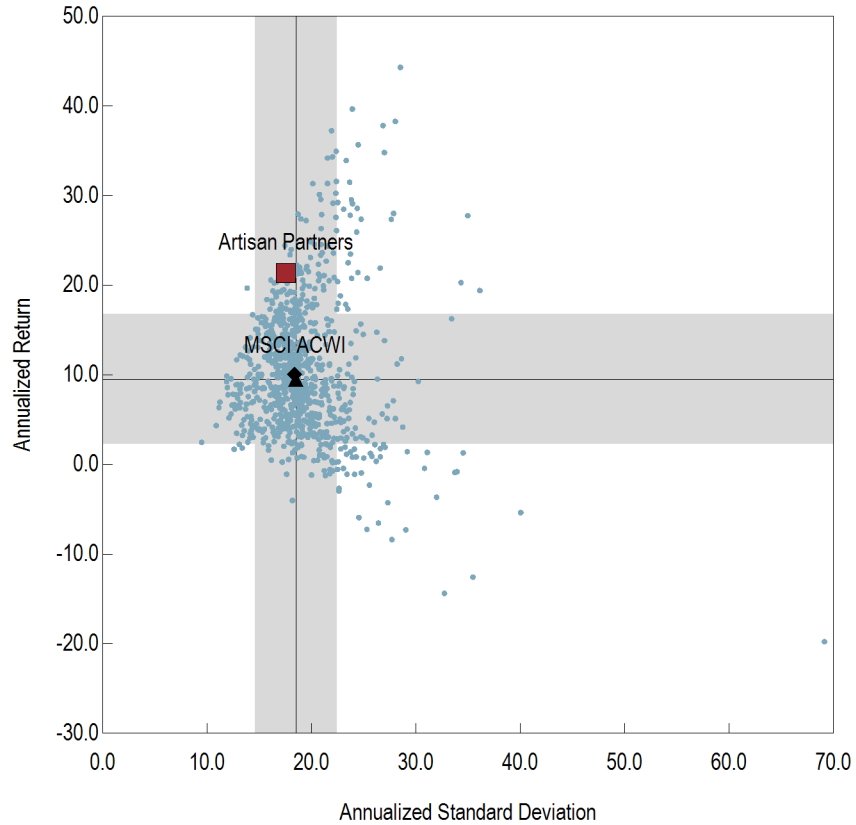
Rolling 3 Year Annualized Return (%)



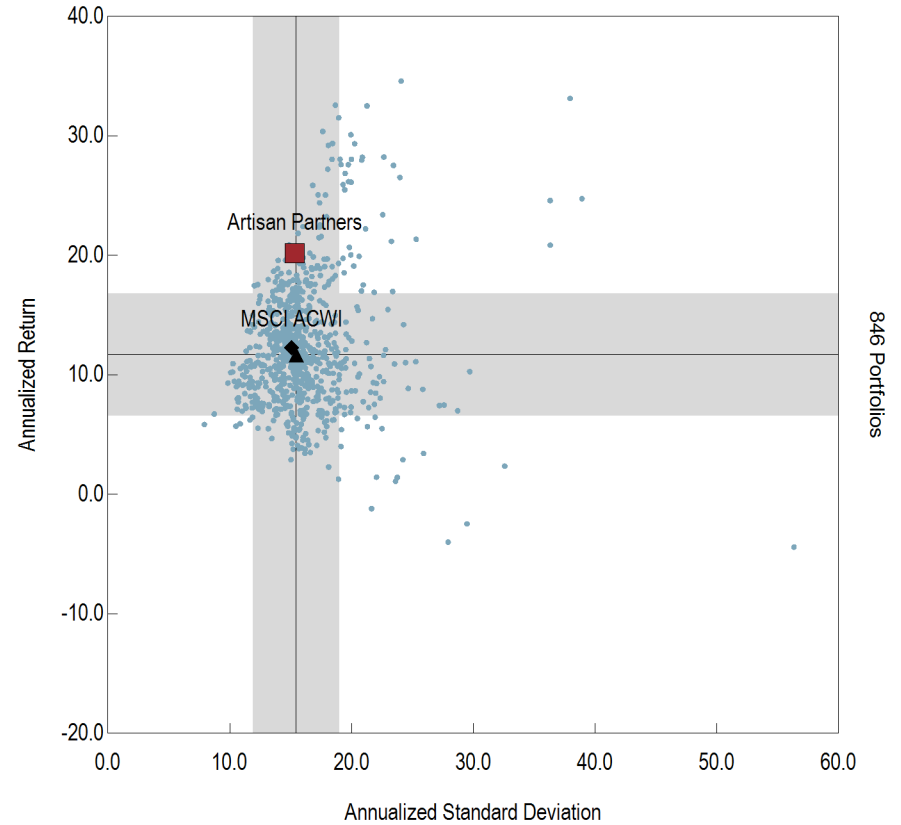
Rolling 5 Year Annualized Return (%)



3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Artisan Partners	21.3%	17.5%	1.1
MSCI ACWI	10.1%	18.4%	0.5
eV All Global Equity Gross Median	9.5%	18.5%	0.5

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Artisan Partners	20.2%	15.3%	1.2
MSCI ACWI	12.3%	15.1%	0.7
eV All Global Equity Gross Median	11.7%	15.5%	0.7

# First Eagle Manager Portfolio Overview

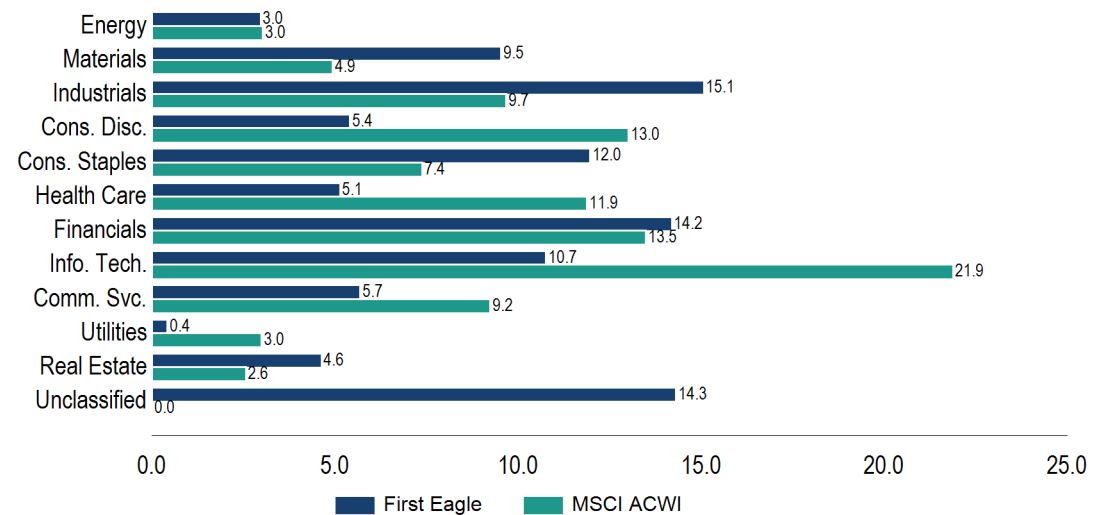
Period Ending: December 31, 2020

Global equity portfolio that is benchmark agnostic comprised of companies with low valuations. Primary personnel include Matt McLennan and Kimball Brooker.

## Characteristics

	Portfolio	MSCI ACWI
Number of Holdings	126	2,982
Weighted Avg. Market Cap. (\$B)	119.31	306.44
Median Market Cap. (\$B)	27.49	12.22
Price To Earnings	22.17	25.54
Price To Book	2.90	3.68
Price To Sales	1.76	1.96
Return on Equity (%)	13.64	15.76
Yield (%)	2.05	1.81
Beta	0.76	1.00

## Sector Allocation (%) vs MSCI ACWI



## Country Allocation

	Manager Ending Allocation (USD)	Index Ending Allocation (USD)
<b>Totals</b>		
Developed	93.7%	86.7%
Emerging*	6.3%	13.3%
<b>Top 10 Largest Countries</b>		
United States	56.6%	57.3%
Japan	11.5%	6.8%
United Kingdom	5.7%	3.8%
Canada	5.4%	2.7%
France	5.1%	3.0%
Korea*	2.6%	1.8%
Switzerland	2.3%	2.6%
Belgium	1.7%	0.3%
Sweden	1.3%	0.9%
Taiwan*	1.2%	1.7%
<b>Total-Top 10 Largest Countries</b>	<b>94.5%</b>	<b>80.7%</b>

## Top Contributors

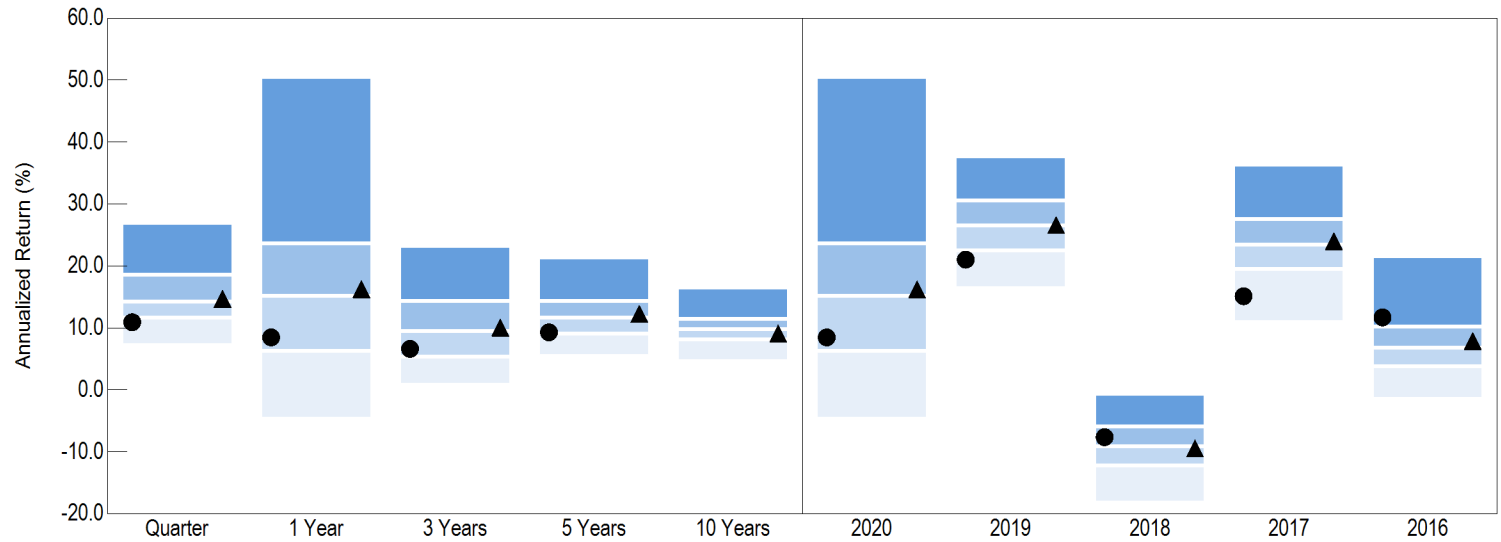
	End Weight	Return	Contribution
FANUC CORP	2.10	28.80	0.60
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	1.16	35.07	0.41
EXXON MOBIL CORP	1.67	22.90	0.38
CIE FINANCIERE RICHEMONT AG, ZUG	1.11	34.57	0.38
COMCAST CORP	2.76	13.86	0.38
SCHLUMBERGER LTD	0.90	41.13	0.37
DEERE & CO	1.66	21.74	0.36
BANK OF NEW YORK MELLON CORP (THE)	1.19	24.67	0.29
NUTRIEN LTD	1.23	23.93	0.29
ORACLE CORP	3.23	8.79	0.28

## Bottom Contributors

	End Weight	Return	Contribution
BARRICK GOLD CORP	0.99	-18.64	-0.18
WHEATON PRECIOUS METALS CORP	1.14	-14.67	-0.17
C.H. ROBINSON WORLDWIDE INC.	1.94	-7.64	-0.15
SALESFORCE.COM INC	0.79	-11.46	-0.09
NEWMONT CORPORATION	1.64	-4.97	-0.08
AGNICO EAGLE MINES LTD	0.71	-11.21	-0.08
NEWCREST MINING LTD	0.55	-11.19	-0.06
SANOFI	1.21	-3.92	-0.05
ROYAL GOLD INC	0.32	-11.29	-0.04
FRANCO-NEVADA CORP	0.28	-10.14	-0.03

Unclassified sector allocation includes cash allocations and Gold allocations (11.2% as of 12/31/2020).

First Eagle vs. eV All Global Equity Gross Universe

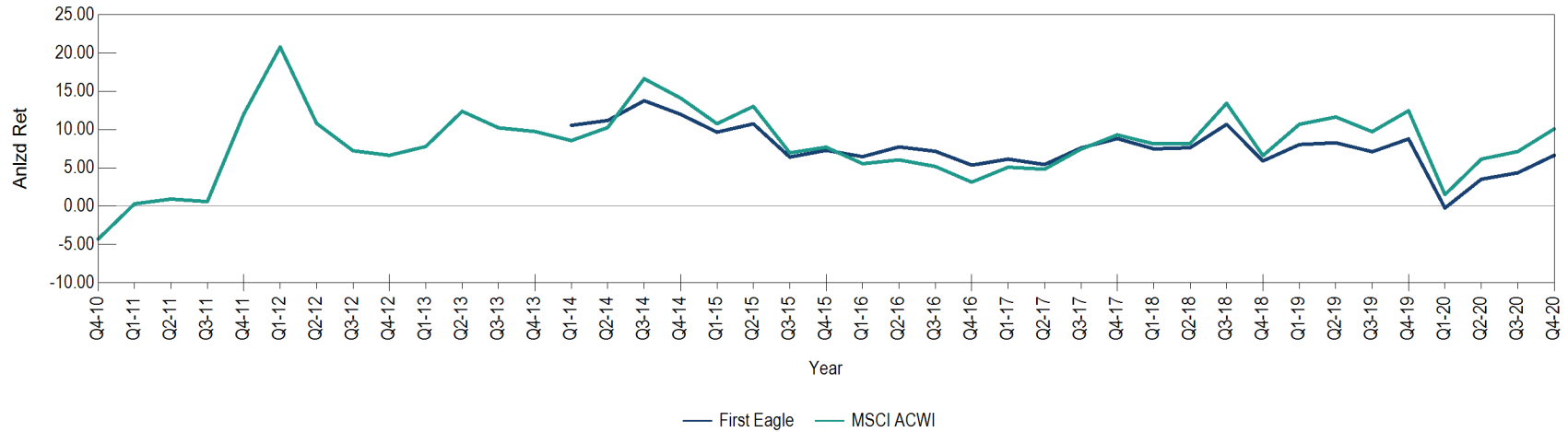


	Return (Rank)									
	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
5th Percentile	26.9	50.5	23.2	21.3	16.5	50.5	37.6	-0.7	36.3	21.5
25th Percentile	18.6	23.7	14.4	14.4	11.6	23.7	30.7	-5.8	27.6	10.3
Median	14.3	15.3	9.5	11.7	9.9	15.3	26.6	-9.1	23.5	6.8
75th Percentile	11.7	6.3	5.4	9.1	8.2	6.3	22.6	-12.2	19.6	3.9
95th Percentile	7.3	-4.6	0.9	5.5	4.7	-4.6	16.5	-18.1	11.0	-1.4
# of Portfolios	1,040	1,040	952	846	531	1,040	989	920	880	842
● First Eagle	10.9 (81)	8.5 (70)	6.6 (69)	9.3 (74)	-- (--)	8.5 (70)	21.0 (82)	-7.6 (38)	15.1 (89)	11.7 (19)
▲ MSCI ACWI	14.7 (46)	16.3 (46)	10.1 (48)	12.3 (45)	9.1 (66)	16.3 (46)	26.6 (50)	-9.4 (53)	24.0 (47)	7.9 (42)

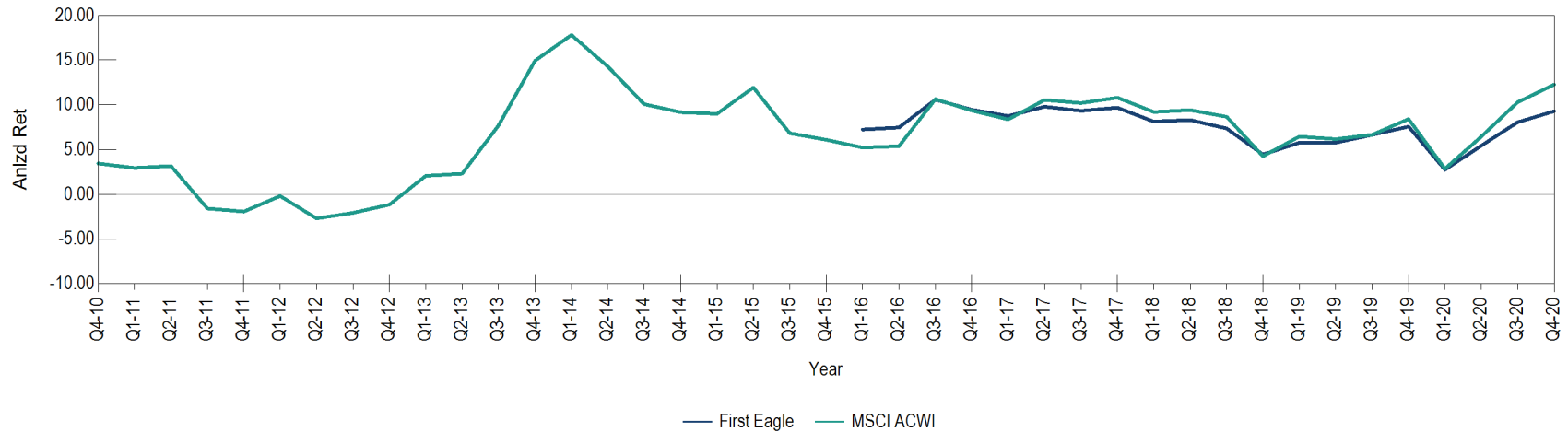
First Eagle  
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2020

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)

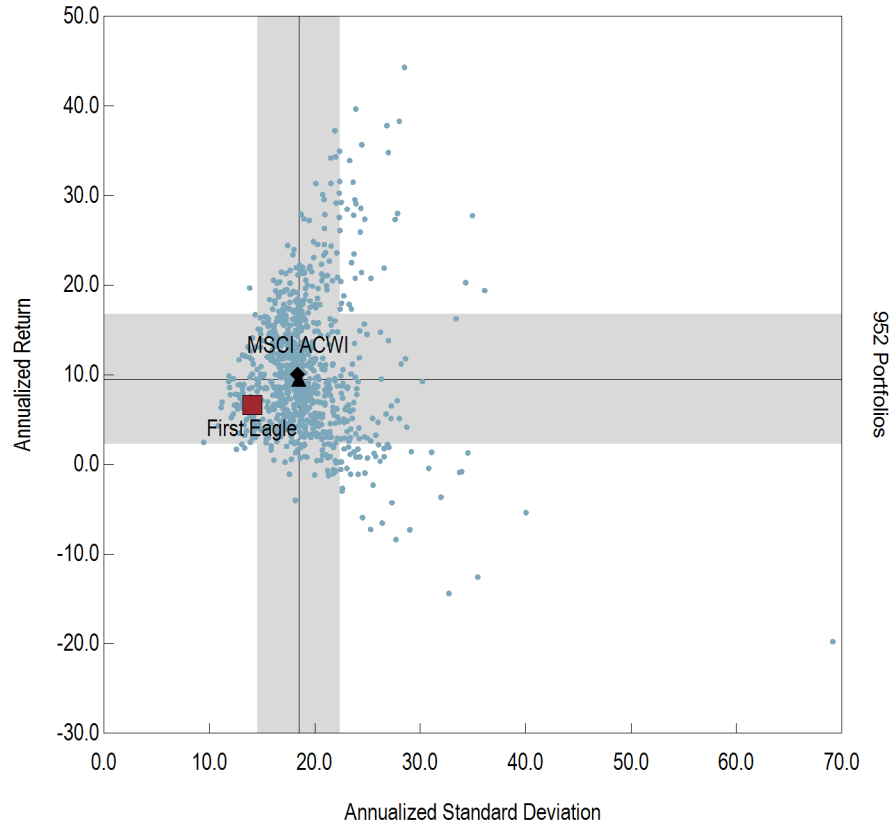




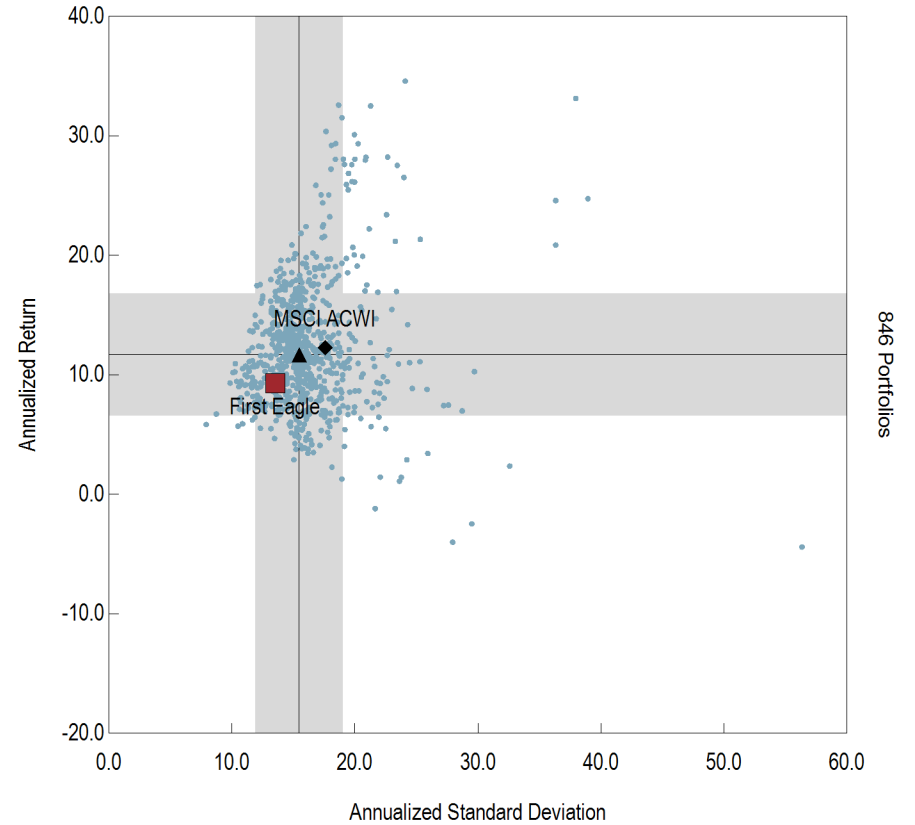
First Eagle  
Risk vs. Return 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2020

3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
First Eagle	6.6%	14.1%	0.4
MSCI ACWI	10.1%	18.4%	0.5
eV All Global Equity Gross Median	9.5%	18.5%	0.5

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
First Eagle	9.3%	11.5%	0.7
MSCI ACWI	12.3%	15.1%	0.7
eV All Global Equity Gross Median	11.7%	15.5%	0.7

## High Yield Managers

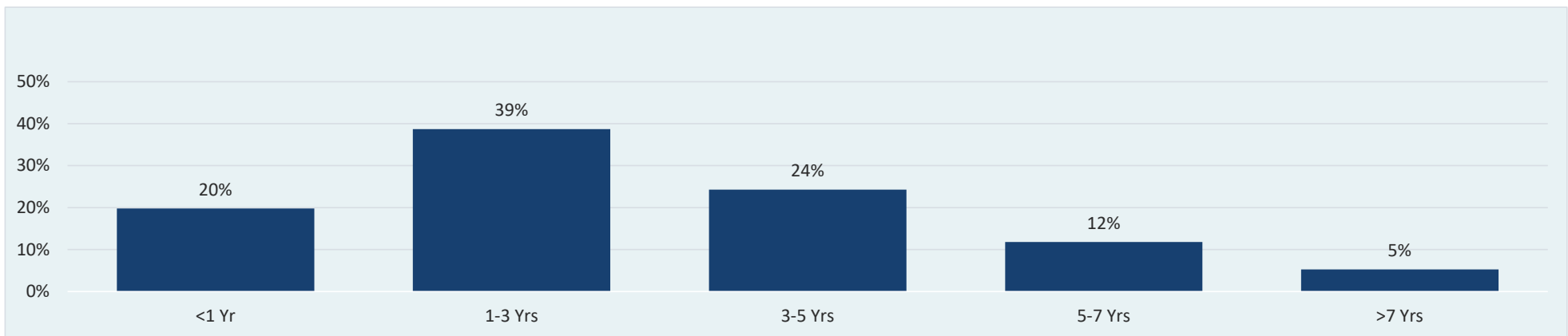
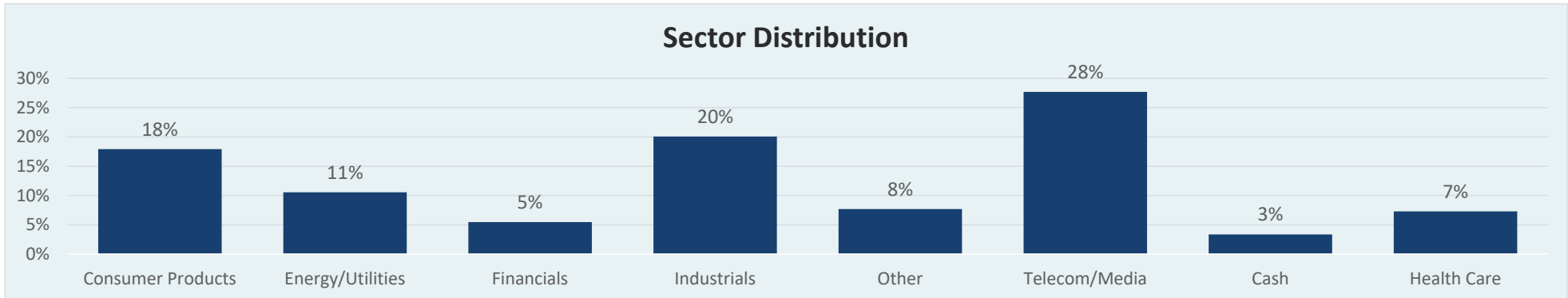
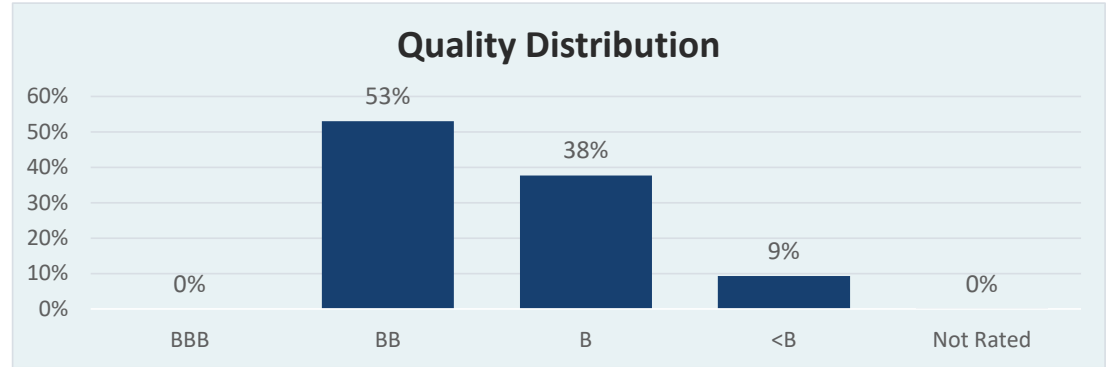
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# Allianz Global Investors Manager Portfolio Overview

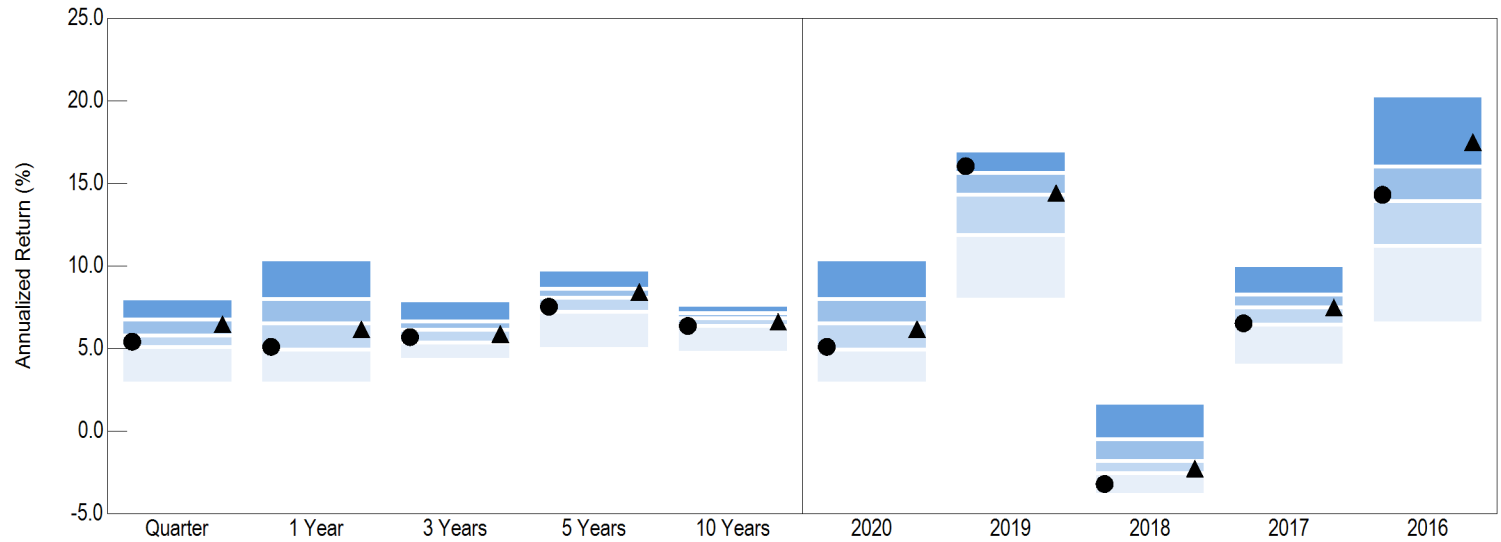
Period Ending: December 31, 2020

Domestic high yield fixed income portfolio with a focus on security selection. Primary personnel include Douglas Forsyth, Justin Kass, William Stickney, and Michael Yee.

	Allianz	ICE BofAML HY Master II
Effective Duration	2.90	3.70
Yield to Maturity	4.90	5.00
Average Quality	B1	B1
Average Coupon	6.5%	6.0%

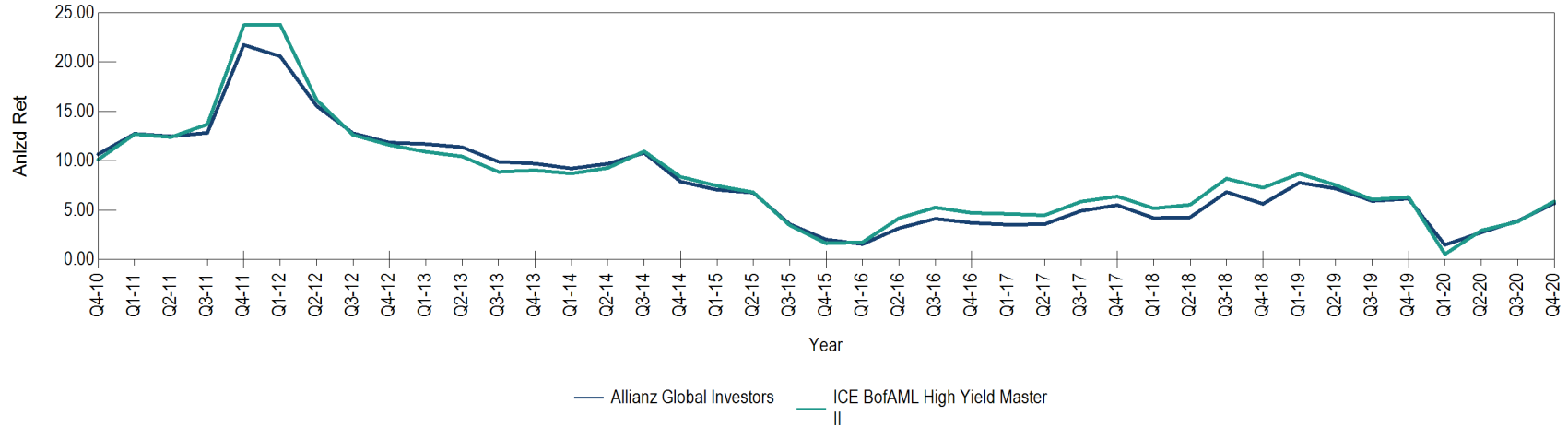


Allianz Global Investors vs. eV US High Yield Fixed Inc Gross Universe

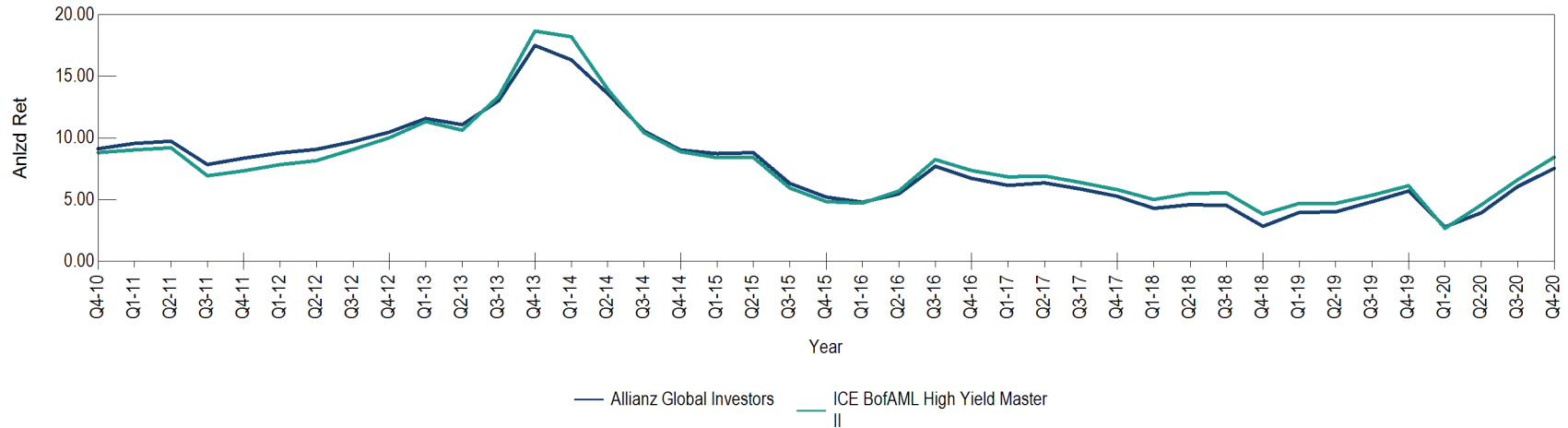


	Quarter	1 Year	3 Years	5 Years	10 Years	2020	2019	2018	2017	2016
<b>5th Percentile</b>	8.0	10.4	7.9	9.8	7.6	10.4	16.9	1.7	10.0	20.3
<b>25th Percentile</b>	6.8	8.0	6.6	8.6	7.1	8.0	15.6	-0.5	8.3	16.0
<b>Median</b>	5.8	6.5	6.1	8.1	6.8	6.5	14.3	-1.8	7.5	14.0
<b>75th Percentile</b>	5.1	5.0	5.4	7.2	6.4	5.0	11.9	-2.5	6.5	11.3
<b>95th Percentile</b>	2.9	2.9	4.3	5.0	4.8	2.9	8.0	-3.8	4.0	6.6
<b># of Portfolios</b>	197	197	193	177	131	197	226	210	198	183
<b>● Allianz Global Investors</b>	5.4 (65)	5.1 (75)	5.7 (69)	7.5 (64)	6.4 (76)	5.1 (75)	16.0 (15)	-3.2 (88)	6.5 (74)	14.3 (47)
<b>▲ ICE BofAML High Yield Master II</b>	6.5 (33)	6.2 (56)	5.9 (58)	8.4 (34)	6.6 (64)	6.2 (56)	14.4 (49)	-2.3 (69)	7.5 (53)	17.5 (14)

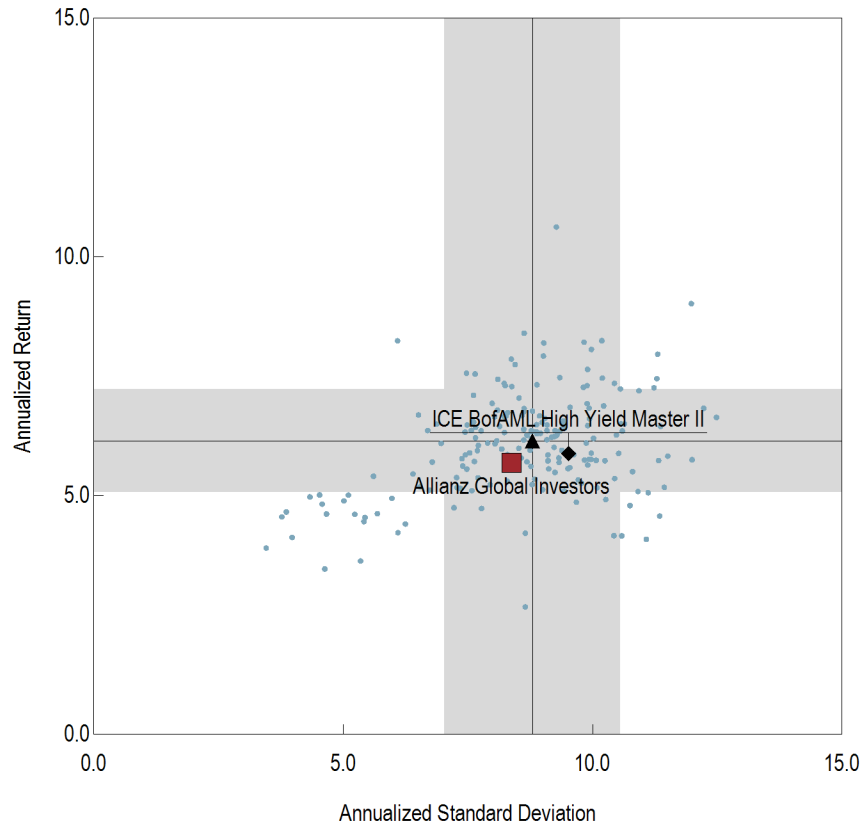
Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)

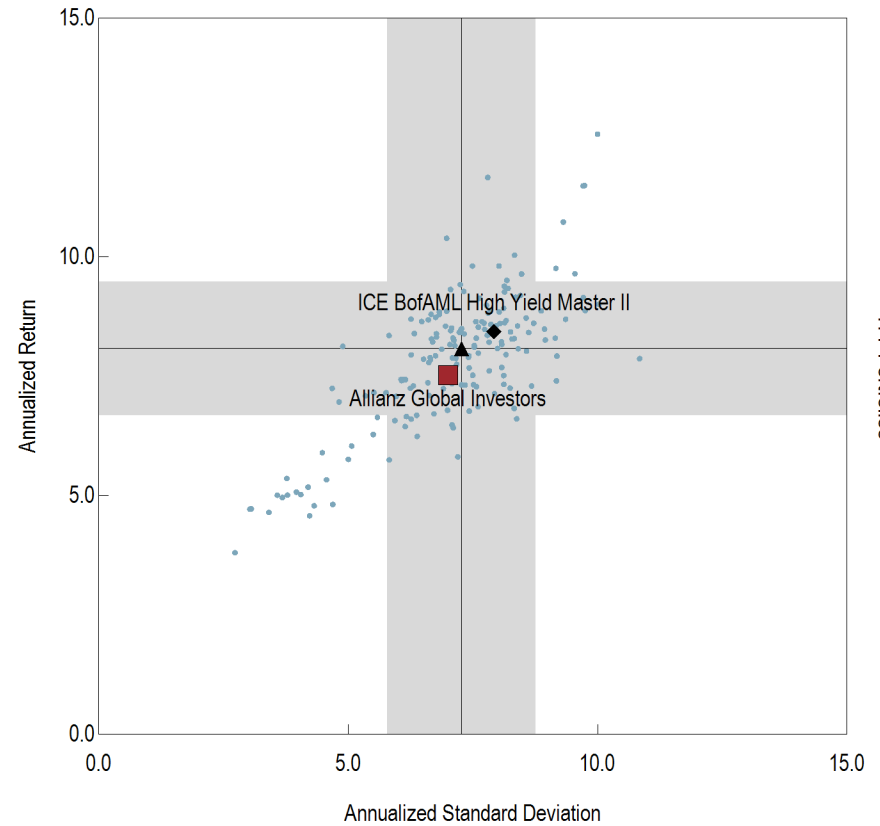


3 Years



193 Portfolios

5 Years



177 Portfolios

3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Allianz Global Investors	5.7%	8.4%	0.5
ICE BofAML High Yield Master II	5.9%	9.5%	0.5
eV US High Yield Fixed Inc Gross Median	6.1%	8.8%	0.5

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Allianz Global Investors	7.5%	7.0%	0.9
ICE BofAML High Yield Master II	8.4%	7.9%	0.9
eV US High Yield Fixed Inc Gross Median	8.1%	7.3%	1.0

## Real Estate Managers

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# Adelante Manager Portfolio Overview

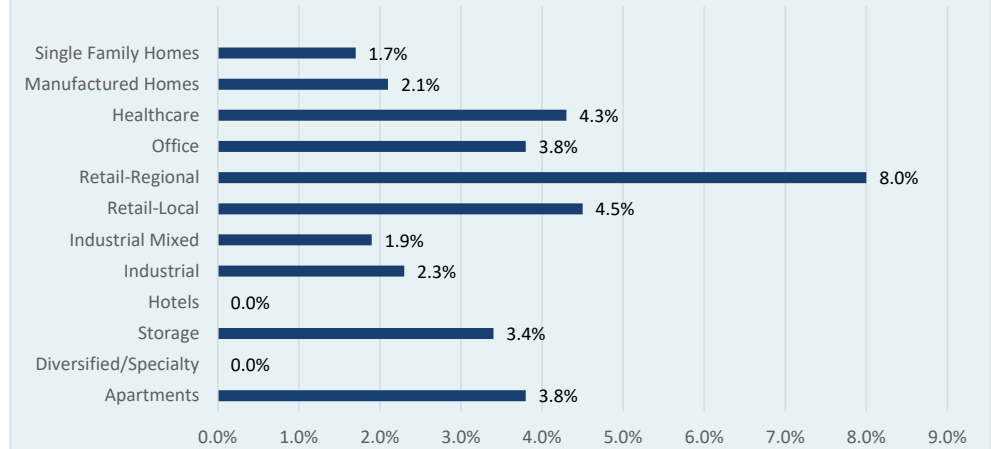
Period Ending: December 31, 2020

Diversified portfolio of U.S. REITs with a focus on the underlying real estate assets

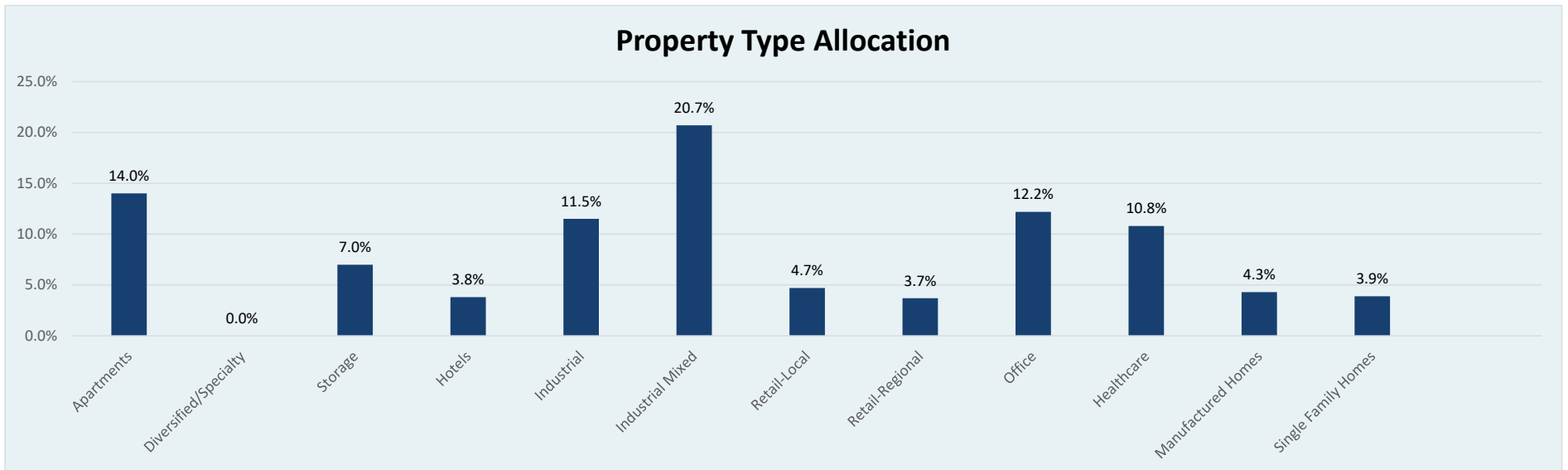
## Top Five Holdings

Company	Property Type	Allocation
Equinix Inc	Industrial Mixed	11.0%
ProLogis Inc.	Industrial	9.9%
Welltower, Inc.	Healthcare	5.5%
Equity Residential	Apartments	4.7%
Duke Realty Corporation	Industrial Mixed	4.6%

## Dividend Yield by Property Type



## Property Type Allocation





## Diversifying Fixed Income Managers

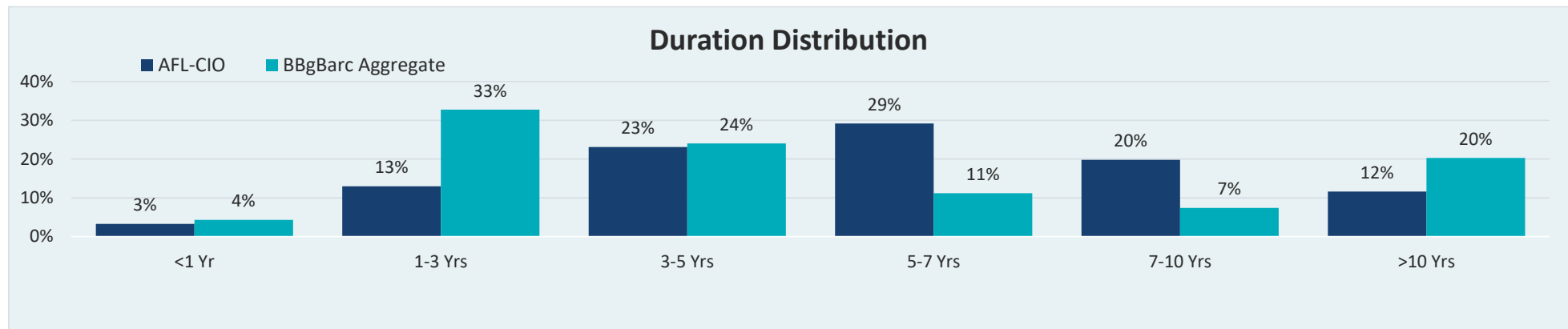
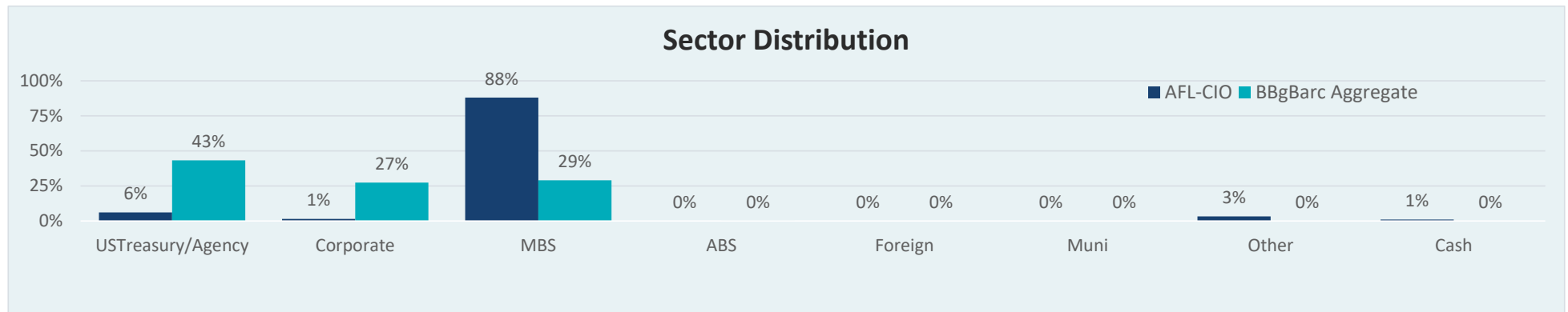
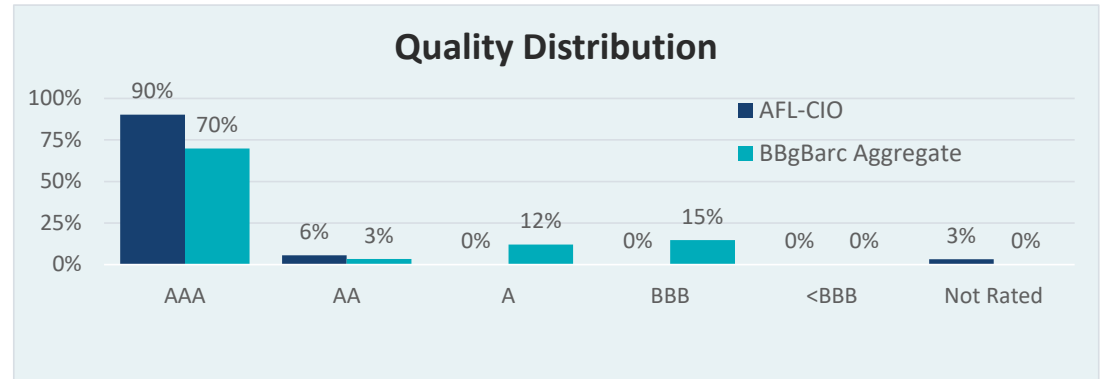
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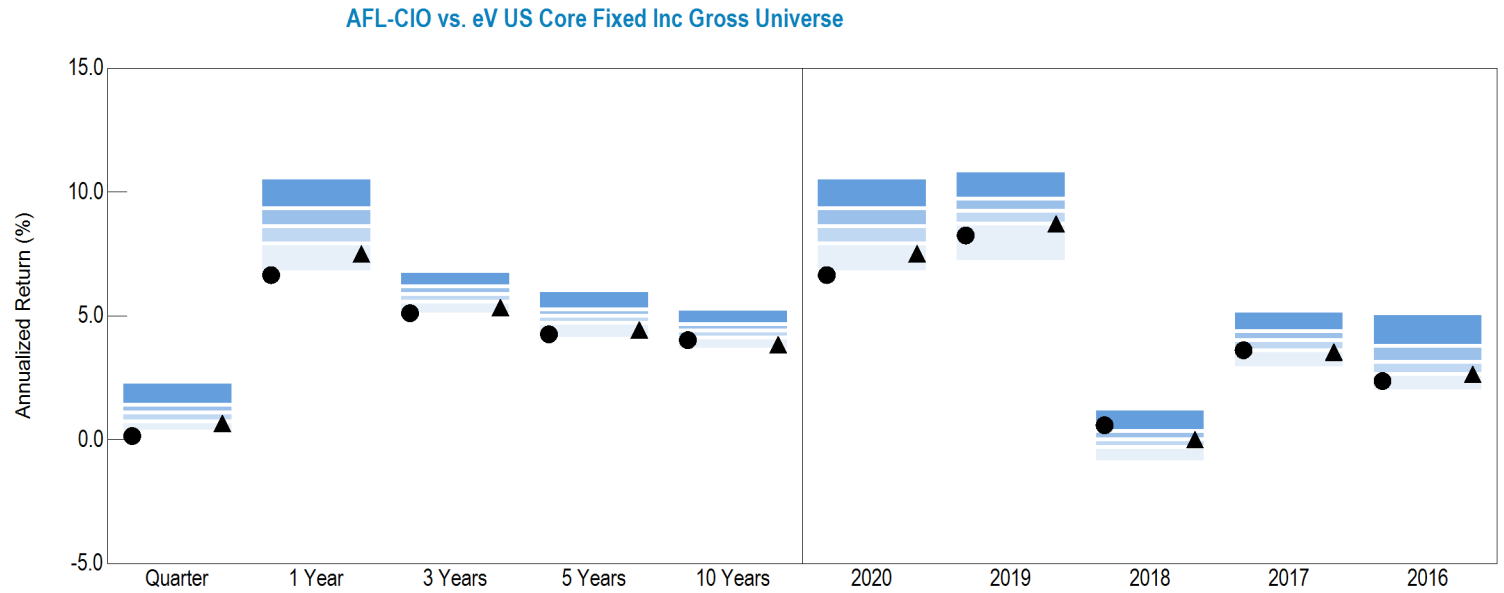
# AFL-CIO Manager Portfolio Overview

Period Ending: December 31, 2020

Domestic core fixed income portfolio with an exclusive focus on mortgage-related securities. Primary personnel include Stephen Coyle and Chang Su.

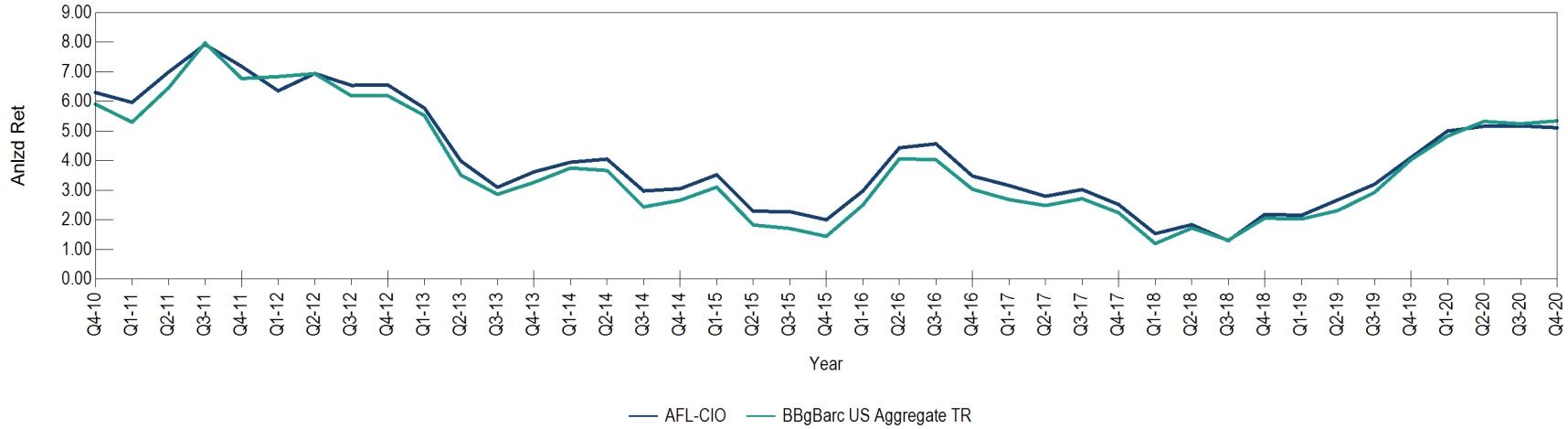
	AFL-CIO	BBgBarc Aggregate
<b>Effective Duration</b>	<b>5.83</b>	<b>6.22</b>
<b>Yield to Maturity</b>	<b>2.68</b>	<b>1.12</b>
<b>Average Quality</b>	<b>AAA</b>	<b>AA/AA+</b>
<b>Average Coupon</b>	<b>2.9%</b>	<b>2.8%</b>



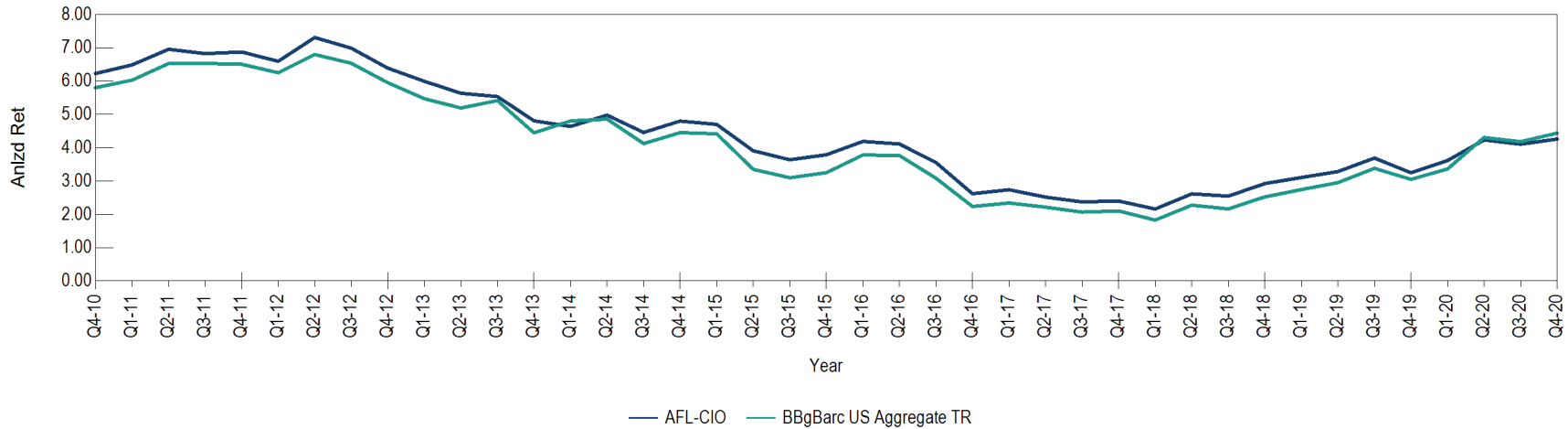


	Return (Rank)									
5th Percentile	2.3	10.6	6.8	6.0	5.3	10.6	10.9	1.2	5.2	5.1
25th Percentile	1.4	9.4	6.2	5.3	4.7	9.4	9.8	0.4	4.4	3.8
Median	1.1	8.6	5.9	5.0	4.4	8.6	9.3	0.0	4.0	3.2
75th Percentile	0.8	7.9	5.6	4.7	4.2	7.9	8.7	-0.3	3.6	2.7
95th Percentile	0.3	6.8	5.1	4.1	3.6	6.8	7.2	-0.9	2.9	2.0
# of Portfolios	214	214	211	208	198	214	228	240	233	223
● AFL-CIO	0.2 (97)	6.6 (96)	5.1 (95)	4.3 (93)	4.0 (86)	6.6 (96)	8.2 (88)	0.6 (16)	3.6 (76)	2.4 (87)
▲ BBgBarc US Aggregate TR	0.7 (81)	7.5 (86)	5.3 (90)	4.4 (91)	3.8 (93)	7.5 (86)	8.7 (77)	0.0 (54)	3.5 (79)	2.6 (77)

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)

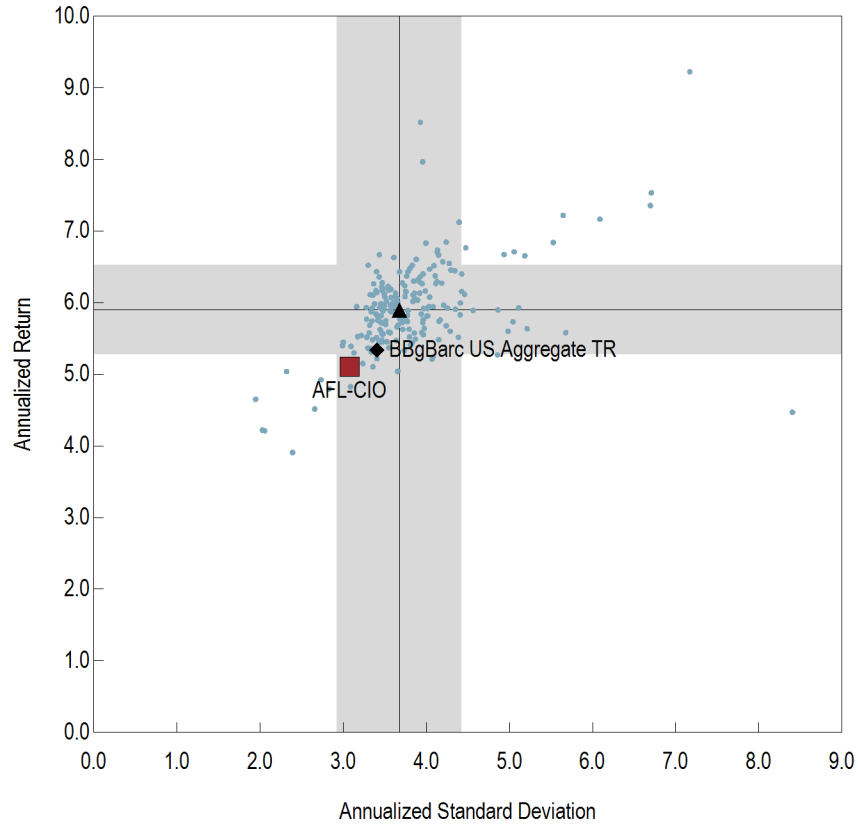


# AFL-CIO

## Risk vs. Return 3 & 5 Year (Gross of Fees)

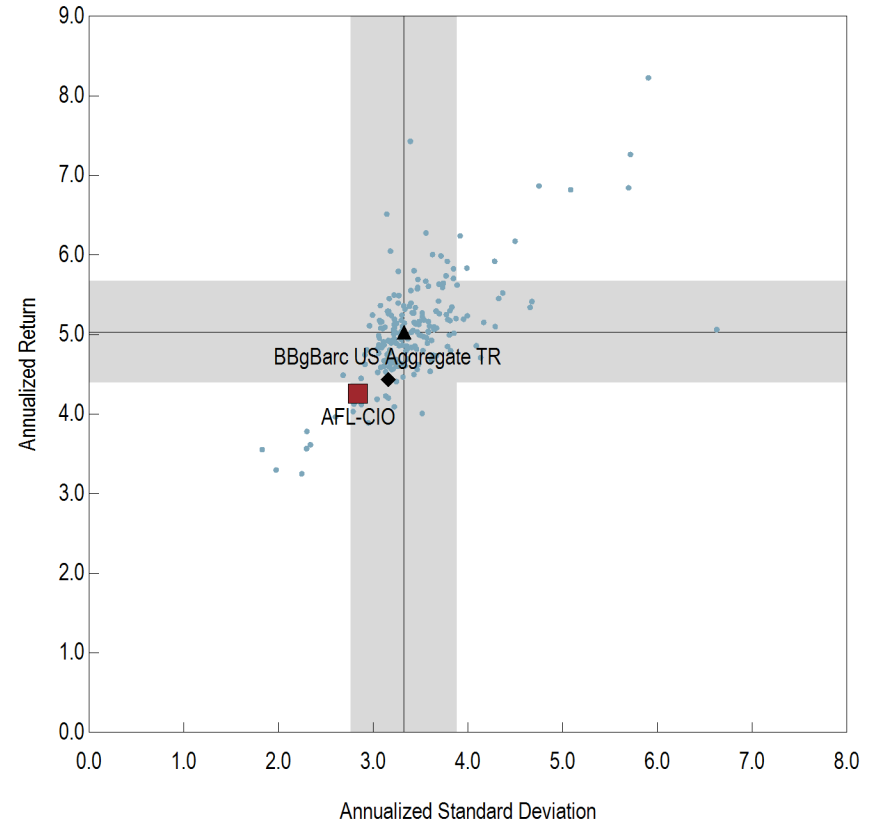
Period Ending: December 31, 2020

3 Years



211 Portfolios

5 Years



208 Portfolios

3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
AFL-CIO	5.1%	3.1%	1.2
BBgBarc US Aggregate TR	5.3%	3.4%	1.1
eV US Core Fixed Inc Gross Median	5.9%	3.7%	1.2

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
AFL-CIO	4.3%	2.8%	1.1
BBgBarc US Aggregate TR	4.4%	3.2%	1.0
eV US Core Fixed Inc Gross Median	5.0%	3.3%	1.1

## Liquidity Managers

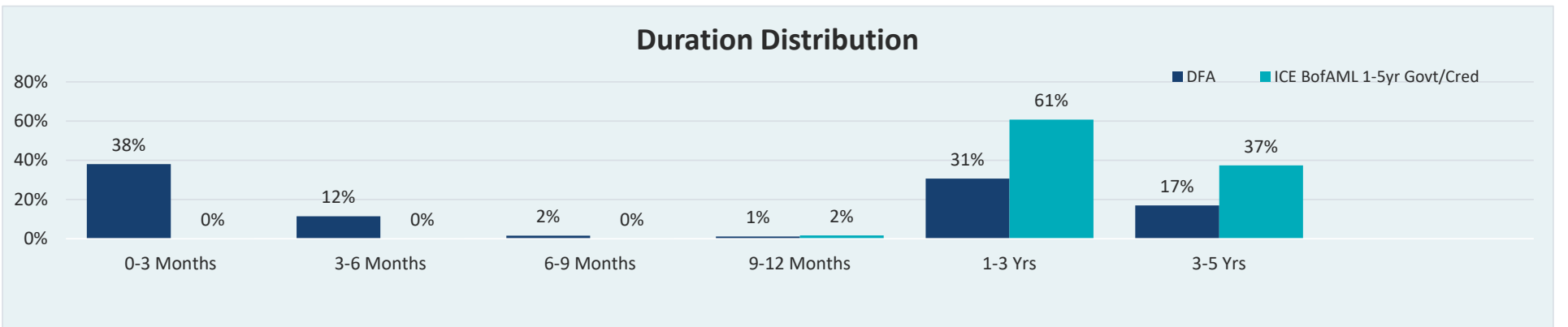
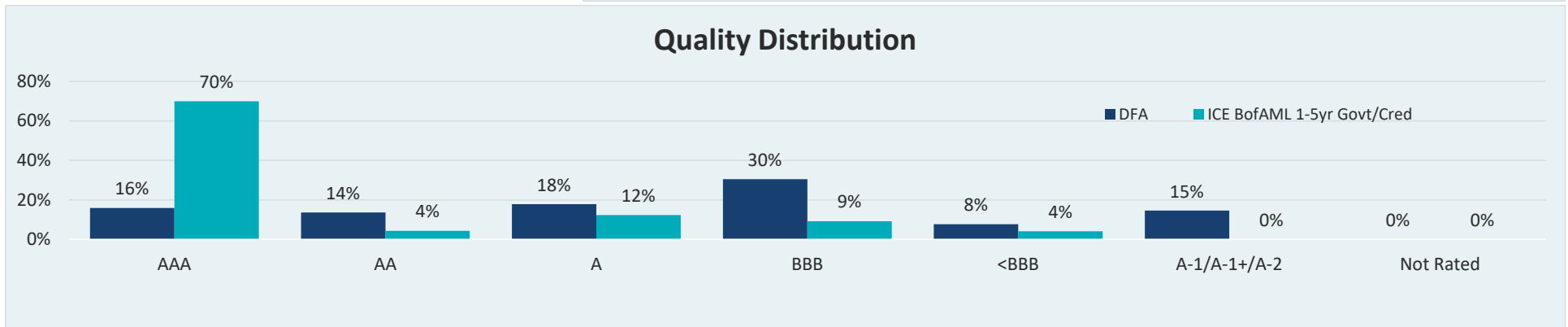
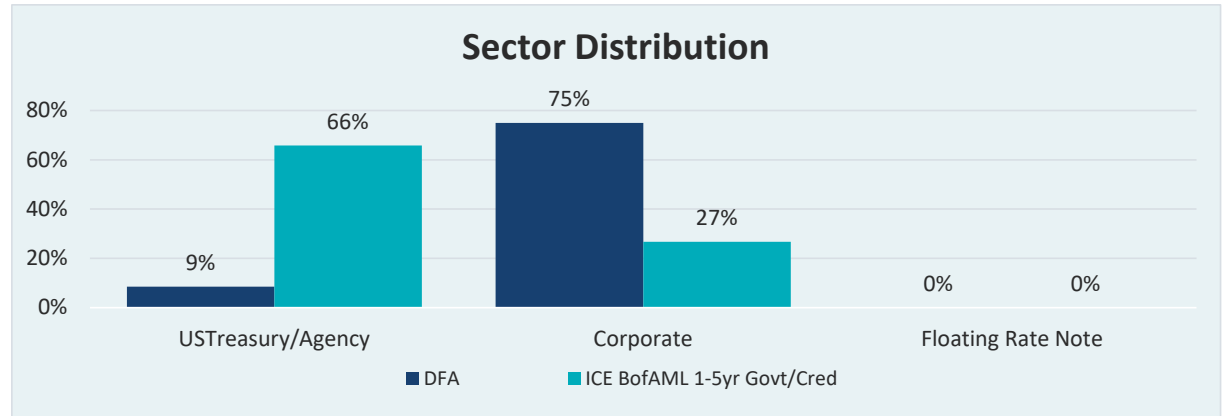
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# DFA Short Credit Manager Portfolio Overview

Period Ending: December 31, 2020

Domestic short term US credit fixed income portfolio that maximizes total return through income and capital appreciation. Primary personnel include Dave Plecha and Joseph Kolerich.

	DFA	ICE BofAML 1-5yr Govt/Cred
Effective Duration	1.28	2.68
Yield to Maturity	0.60	0.40
Average Quality	A	AA+
Average Coupon	2.06%	2.17%

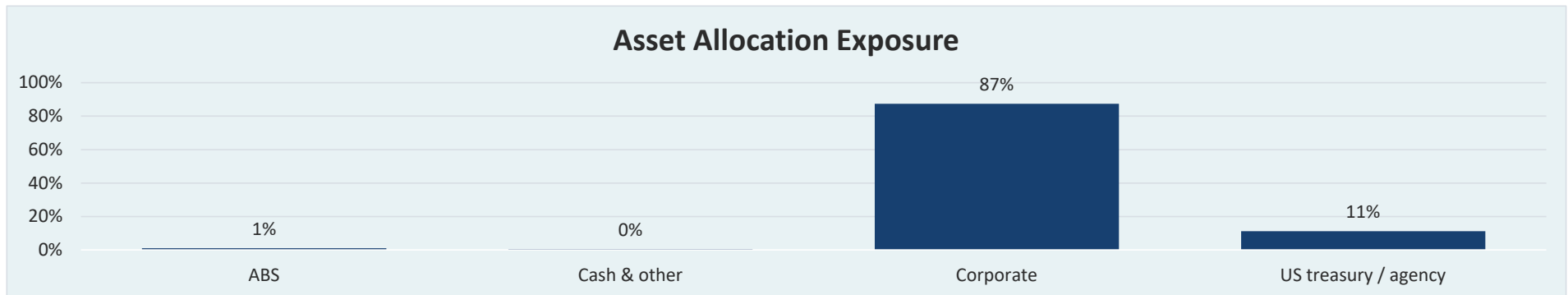
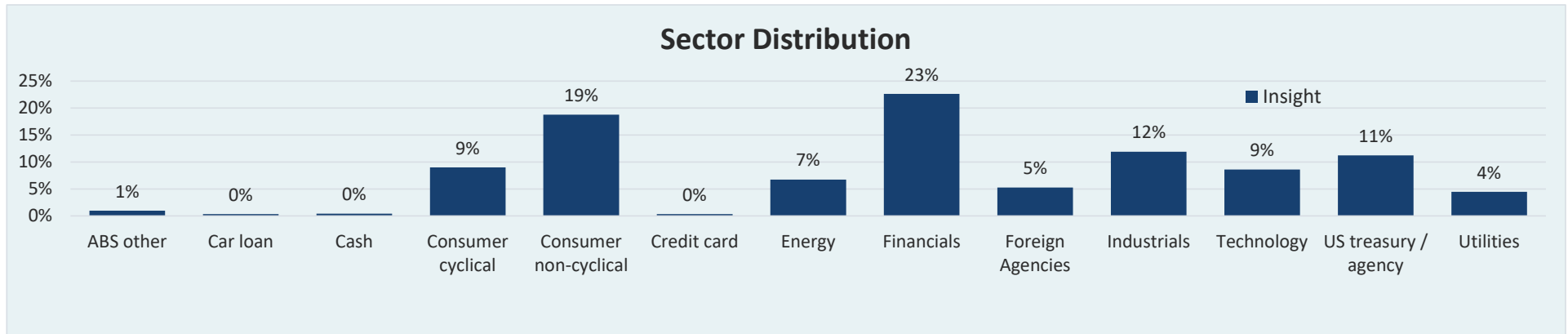
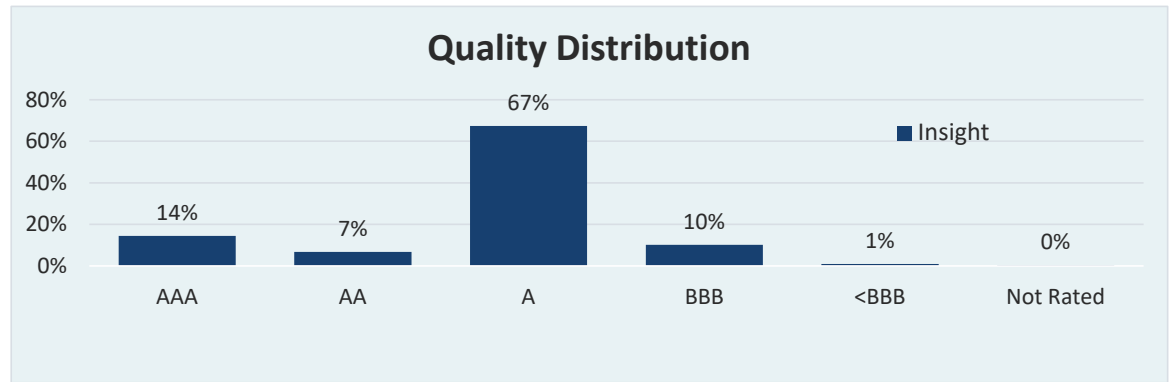


# Insight Short Duration Manager Portfolio Overview

Period Ending: December 31, 2020

High quality, short duration multi-sector fixed income portfolio comprised of Treasuries, Agencies, investment grade corporates, and ABS designed specifically to meet CCCERA's liabilities. Key personnel include Gerard Berrigan and Jesse Fogarty.

	Insight	BBgBarc 1-3yr Govt
Effective Duration	1.58	1.96
Yield to Maturity	0.60	0.13
Average Quality	A	AAA
Average Coupon	2.75%	1.45%



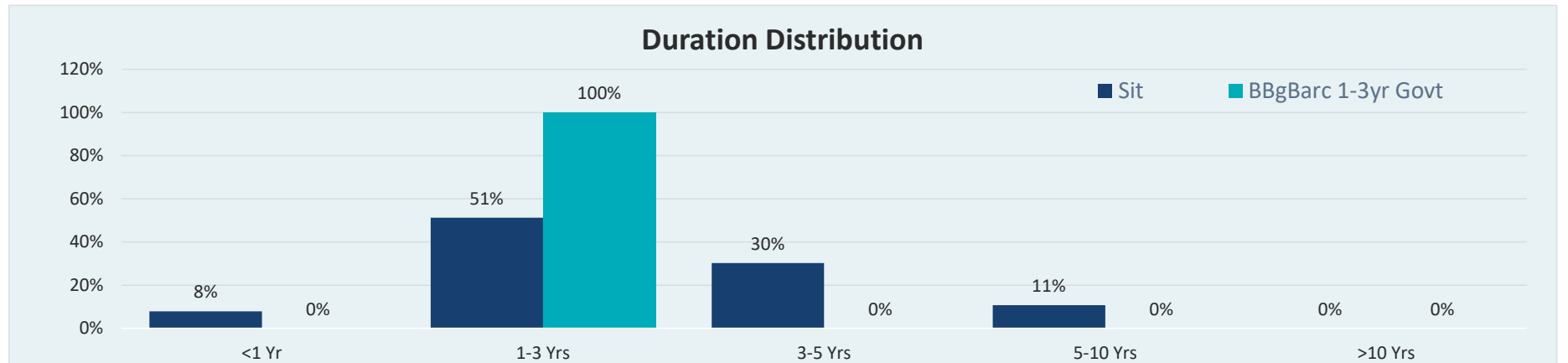
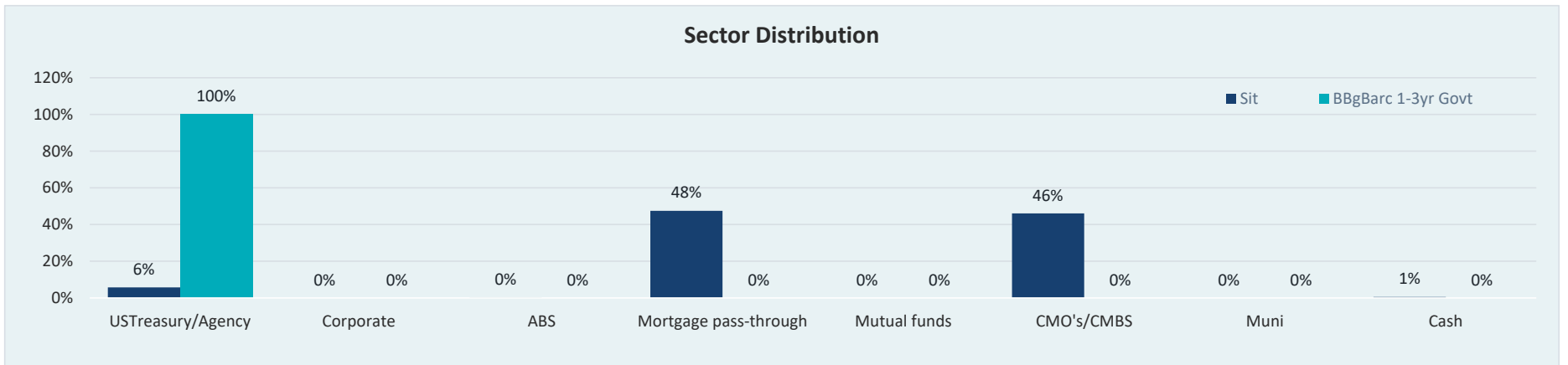


# Sit Short Duration Manager Portfolio Overview

Period Ending: December 31, 2020

Short duration fixed income portfolio with a focus on earning high levels of interest income. Primary personnel include Bryce Doty, Paul Jungquist and Michael Brilley.

	Sit	BBgBarc 1-3yr Govt
<b>Modified Duration</b>	<b>2.90</b>	<b>1.90</b>
<b>Yield to Maturity</b>	<b>1.50</b>	<b>0.10</b>
<b>Average Quality</b>	<b>AAA</b>	<b>AAA</b>
<b>Average Coupon</b>	<b>5.80%</b>	<b>1.40%</b>



**Performance Return Calculations**

Performance is calculated using Modified Dietz and for time periods with large cash flow (generally greater than 10% of portfolio value), Time Weighted Rates of Return (TWRR) methodologies. Monthly returns are geometrically linked and annualized for periods longer than one year.

**Data Source**

Verus is an independent third party consulting firm and calculates returns from best source book of record data. Returns calculated by Verus may deviate from those shown by the manager in part, but not limited to, differences in prices and market values reported by the custodian and manager, as well as significant cash flows into or out of an account. It is the responsibility of the manager and custodian to provide insight into the pricing methodologies and any difference in valuation.

**Illiquid Alternatives**

Due to the inability to receive final valuation prior to report production, closed end funds (including but are not limited to Real Estate, Hedge Funds, Private Equity, and Private Credit) performance is typically reported at a one-quarter lag. Valuation is reported at a one-quarter lag, adjusted for current quarter flow (cash flows are captured real time). Closed end fund performance is calculated using a time-weighted return methodology consistent with all portfolio and total fund performance calculations. For Private Markets, performance reports also include Verus-calculated multiples based on flows and valuations (e.g. DPI and TVPI) and manager-provided IRRs.

**Policy & Custom Index Composition**

Policy Index (7/1/2020 - present)	9% Russell 3000, 18% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 1.5% CPI + 4%, 11% S&P 500 +4% (Lagged), 7% ICE BofAML High Yield Master II +2%, 1.5% ICE BofAML High Yield Master II, 25% BBgBarc 1-3 Yr Gov/Credit, 3% BBgBarc US Aggregate, 2% BBgBarc Global Aggregate, 2% HFRI EH Equity Market Neutral.
Policy Index (7/1/2019 - 6/30/2020)	10% Russell 3000, 18% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 2% CPI + 4%, 11% S&P 500 +4% (Lagged), 5% ICE BofAML High Yield Master II +2%, 2% ICE BofAML High Yield Master II, 24% BBgBarc 1-3 Yr Gov/Credit, 3.5% BBgBarc US Aggregate, 2% BBgBarc Global Aggregate, 2.5% HFRI EH Equity Market Neutral.
Policy Index (7/1/2018 - 6/30/2019)	11% Russell 3000, 19% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 1% Wilshire REIT, 1.8% NCREIF Property Index, 7.2% NCREIF ODCE Index, 2% CPI + 4%, 10% S&P 500 +4% (Lagged), 4% ICE BofAML High Yield Master II +2%, 2% ICE BofAML High Yield Master II, 23% BBgBarc 1-3 Yr Gov/Credit, 3.5% BBgBarc US Aggregate, 2% BBgBarc Global Aggregate, 2.5% HFRI EH Equity Market Neutral.
Policy Index (10/1/2017 - 6/30/2018)	16.3% Russell 3000, 18.8% MSCI ACWI ex-US (Gross), 8.6% MSCI ACWI (Net), 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 2.5% CPI + 4%, 10.1% S&P 500 +4% (Lagged), 1.9% ICE BofAML High Yield Master II +2%, 4.3% ICE BofAML High Yield Master II, 25% BBgBarc 1-3 Yr Gov/Credit, 3.5% BBgBarc US Aggregate.
Policy Index (1/1/2017 - 9/30/2017)	22.9% Russell 3000, 11% MSCI ACWI ex-US (Gross), 10.9% MSCI ACWI (Net), 1% Wilshire REIT, 1.7% NCREIF Property Index, 6.8% NCREIF ODCE Index, 3.6% CPI + 4%, 8.1% S&P 500 +4% (Lagged), 1.7% ICE BofAML High Yield Master II +2%, 5.1% ICE BofAML High Yield Master II, 22.4% BBgBarc 1-3 Yr Gov/Credit, 3.2% BBgBarc US Aggregate, 1.6% 91-Day T-Bills.
Policy Index (4/1/2012-12/31/2016)	27.7% Russell 3000, 10.6% MSCI ACWI ex-US (Gross), 12.3% MSCI ACWI (Net), 19.6% BBgBarc U.S. Aggregate, 5% ICE BofAML High Yield Master II, 4% BBgBarc Global Aggregate, 13.5% Real Estate Benchmark, 6.8% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.
Policy Index (4/1/2011-3/31/2012)	31% Russell 3000, 10.4% MSCI EAFE (Gross), 9.6% MSCI ACWI (Net), 25% BBgBarc U.S. Aggregate, 3% ICE BofAML High Yield Master II, 4% BBgBarc Global Aggregate, 8.4% DJ Wilshire REIT, 3.1% NCREIF, 5% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.
Policy Index (4/1/2010-3/31/2011)	35.6% Russell 3000, 10.4% MSCI EAFE (Gross), 5% MSCI ACWI (Net), 25% BBgBarc U.S. Aggregate, 3% ICE BofAML High Yield Master II, 4% BBgBarc Global Aggregate, 8.4% DJ Wilshire REIT, 3.1% NCREIF, 5% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.
Policy Index (7/1/2009-3/31/2010)	40.6% Russell 3000, 10.4% MSCI EAFE (Gross), 25% BBgBarc U.S. Aggregate, 3% ICE BofAML High Yield Master II, 4% BBgBarc Global Aggregate, 8.4% DJ Wilshire REIT, 3.1% NCREIF, 5% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.
Custom Growth Benchmark (7/1/2020 - present)	13.14% Russell 3000, 26.28% MSCI ACWI ex-US (Gross), 16.06% MSCI ACWI (Net), 1.46% Wilshire REIT, 2.34% NCREIF Property Index, 9.33% NCREIF ODCE Index, 16.06% S&P 500 +4% (Lagged), 10.22% ICE BofAML High Yield Master II +2%, 2.19% ICE BofAML High Yield Master II, 2.92% BBgBarc Global Bond
Custom Growth Benchmark (7/1/2019 - 6/30/2020)	14.7% Russell 3000, 26.4% MSCI ACWI ex-US (Gross), 16.2% MSCI ACWI (Net), 1.5% Wilshire REIT, 2.4% NCREIF Property Index, 9.4% NCREIF ODCE Index, 16.2% S&P 500 +4% (Lagged), 7.4% ICE BofAML High Yield Master II +2%, 2.9% ICE BofAML High Yield Master II, 2.9% BBgBarc Global Bond
Custom Growth Benchmark (7/1/2018 - 6/30/2019)	16.0% Russell 3000, 27.5% MSCI ACWI ex-US (Gross), 15.9% MSCI ACWI (Net), 1.5% Wilshire REIT, 2.6% NCREIF Property Index, 10.4% NCREIF ODCE Index, 14.5% S&P 500 +4% (Lagged), 5.8% ICE BofAML High Yield Master II +2%, 2.9% ICE BofAML High Yield Master II, 2.9% BBgBarc Global Bond
Custom Growth Benchmark (9/30/2017-6/30/2018)	23.6% Russell 3000, 27.2% MSCI ACWI ex-US (Gross), 12.5% MSCI ACWI (Net), 1.5% Wilshire REIT, 2.3% NCREIF Property Index, 9.3% NCREIF ODCE Index, 14.6% S&P 500 +4% (Lagged), 2.8% ICE BofAML High Yield Master II +2%, 6.2% ICE BofAML High Yield Master II
Custom Growth Benchmark (1/1/2017-9/30/2017)	32.6% Russell 3000, 15.7% MSCI ACWI ex-US (Gross), 15.5% MSCI ACWI (Net), 1.4% Wilshire REIT, 2.4% NCREIF Property Index, 9.6% NCREIF ODCE Index, 1.6% CPI +4%, 11.5% S&P 500 +4% (Lagged), 2.4% ICE BofAML High Yield Master II +2%, 7.3% ICE BofAML High Yield Master II
Custom Growth Benchmark (Prior to 1/1/2017)	Weighted-average of the benchmarks of the sub-composites that make up the composite.
Custom Diversifying Benchmark (8/1/2020 - present)	46.15% BBgBarc US Aggregate, 30.77 FTSE 3-Month T-bill +4%, 23.08 FTSE 3-Month T-bill +5%.
Custom Diversifying Benchmark (7/1/2018 - 7/31/2020)	43.75% BBgBarc US Aggregate, 25% CPI + 4%, 31.25% HFRI EH Equity Market Neutral.
Custom Diversifying Benchmark (10/1/2017 - 6/30/2018)	58.33% BBgBarc US Aggregate, 41.67% CPI + 4%.
Custom Diversifying Benchmark (1/1/2017 - 9/30/2017)	56.1% BBgBarc US Aggregate, 43.9% CPI + 4%.
Custom Diversifying Benchmark (Prior to 1/1/2017)	Weighted-average of the benchmarks of the sub-composites that make up the composite.
Real Estate Benchmark (current)	11% Wilshire REIT, 18% NCREIF Property Index, 71% NCREIF ODCE Index.
Real Estate Benchmark (4/1/2012-11/30/2016)	40% Wilshire REIT, 50% NCREIF Property Index, 10% FTSE/EPRA NAREIT Developed ex-US.

Custom Diversifying Benchmark (1/1/2017 - 9/30/2017)

56.1% BBgBarc US Aggregate, 43.9% CPI + 4%.

Custom Diversifying Benchmark (Prior to 1/1/2017)

Weighted-average of the benchmarks of the sub-composites that make up the composite.

Real Estate Benchmark (current)

11% Wilshire REIT, 18% NCREIF Property Index, 71% NCREIF ODCE Index.

Real Estate Benchmark (4/1/2012-11/30/2016)

40% Wilshire REIT, 50% NCREIF Property Index, 10% FTSE/EPRA NAREIT Developed ex-US.

Manager Line Up					
Manager	Inception Date	Data Source	Manager	Inception Date	Data Source
BlackRock Russell 1000 Index	4/20/2017	BlackRock	Invesco Real Estate IV	6/30/2014	Invesco
Jackson Square Partners	5/1/2005	Northern Trust	Invesco Real Estate V	2/20/2019	Invesco
Boston Partners	6/1/1995	Northern Trust	Oaktree REOF V	12/31/2011	Oaktree
Emerald Advisors	4/7/2003	Northern Trust	Oaktree REOF VI	9/30/2013	Oaktree
Ceredex	11/6/2011	Northern Trust	Oaktree REOF VII	4/1/2015	Oaktree
Pyrford	4/25/2014	State Street	Siguler Guff DREOF	1/25/2012	Siguler Guff
William Blair	10/29/2010	William Blair	Siguler Guff DREOF II	8/31/2013	Siguler Guff
PIMCO RAE Emerging Markets	2/28/2017	State Street	Siguler Guff DREOF II Co-Inv	1/27/2016	Siguler Guff
TT Emerging Markets	7/27/2017	TT	Paulson Real Estate Fund II	11/10/2013	Paulson
Artisan Partners	10/1/2012	SEI Trust	AE Industrial Partners Fund II	4/8/2019	StepStone Group
First Eagle	1/18/2011	Northern Trust	Adams Street Partners	3/18/1996	StepStone Group
Allianz Global Investors	4/25/2000	Northern Trust	Adams Street Partners II	1/16/2009	StepStone Group
Adelante	9/30/2001	Northern Trust	Adams Street Partners Venture	4/28/2017	StepStone Group
AQR Global Risk Premium - EL	1/18/2019	AQR	Adams Street Partners - BFP	1/18/1996	StepStone Group
Panagora Risk Parity Multi Asset	3/15/2019	Panagora	Adams Street Partners - Fund 5	9/21/2012	StepStone Group
AFL-CIO	6/30/1991	AFL-CIO	Aether Real Assets IV	3/16/2016	StepStone Group
Wellington Real Total Return (in Liquidation)	2/26/2013	Wellington	Aether Real Assets III	11/27/2013	StepStone Group
Acadian Multi-Asset Absolute Return Fund	8/4/2020	Northern Trust	Aether Real Assets III Surplus	11/30/2013	StepStone Group
Parametric Defensive Equity	7/23/2018	Northern Trust	Bay Area Equity Fund	6/14/2004	StepStone Group
Sit Short Duration	11/2/2016	Northern Trust	Bay Area Equity Fund II	12/7/2009	StepStone Group
DFA Short Credit	11/21/2016	Northern Trust	Commonfund	6/28/2013	StepStone Group
Insight Short Duration	11/18/2016	Northern Trust	EIF US Power Fund II	8/16/2005	StepStone Group
Parametric Overlay	3/29/2017	Northern Trust	EIF US Power Fund III	5/30/2007	StepStone Group
Cash	-	Northern Trust	EIF US Power Fund IV	11/28/2011	StepStone Group
Angelo Gordon Energy Credit Opp	9/24/2015	StepStone Group	EIF US Power Fund V	11/28/2016	StepStone Group
StepStone CC Opportunities Fund	2/1/2018	StepStone Group	Genstar Capital Partners IX, L.P.	2/21/2019	StepStone Group
Torchlight II	9/30/2006	StepStone Group	Oaktree PIF 2009	2/28/2010	StepStone Group
Torchlight IV	7/1/2012	StepStone Group	Paladin III	11/30/2007	StepStone Group
Torchlight V	7/1/2012	StepStone Group	Ocean Avenue Fund II	6/11/2014	StepStone Group
Angelo Gordon Realty Fund VIII	1/23/2012	Angelo Gordon	Ocean Avenue Fund III	4/15/2016	StepStone Group
Angelo Gordon Realty Fund IX	12/8/2014	Angelo Gordon	Pathway 6	5/24/2011	StepStone Group
DLJ RECP III	6/23/2005	DLJ	Pathway 7	2/7/2013	StepStone Group
DLJ RECP IV	2/11/2008	DLJ	Pathway 8	11/23/2015	StepStone Group
DLJ RECP V	7/1/2014	DLJ	Pathway	11/9/1998	StepStone Group
DLJ RECP VI	3/19/2019	DLJ	Pathway 2008	12/26/2008	StepStone Group
LaSalle Income & Growth VI	7/16/2013	LaSalle	Siguler Guff CCCERA Opps	6/3/2014	StepStone Group
LaSalle Income & Growth VII	2/28/2017	LaSalle	Siguler Guff Secondary Opps	11/30/2016	StepStone Group
Hearthstone II	6/17/1998	Hearthstone	Siris Partners IV	3/15/2019	StepStone Group
Long Wharf Fund IV	7/3/2013	Long Wharf	TPG Healthcare Partners, L.P.	6/28/2019	StepStone Group
Long Wharf Fund V	9/30/2016	Long Wharf	Trident VIII, L.P.	5/24/2019	StepStone Group
Long Wharf Fund VI	2/5/2020	Long Wharf	Wastewater Opp. Fund	12/8/2015	StepStone Group
Invesco Real Estate III	6/30/2013	Invesco			

# Glossary

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**Allocation Effect:** An attribution effect that describes the amount attributable to the managers' asset allocation decisions, relative to the benchmark.

**Alpha:** The excess return of a portfolio after adjusting for market risk. This excess return is attributable to the selection skill of the portfolio manager. Alpha is calculated as:  $\text{Portfolio Return} - [\text{Risk-free Rate} + \text{Portfolio Beta} \times (\text{Market Return} - \text{Risk-free Rate})]$ .

**Benchmark R-squared:** Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R-squared, the more appropriate the benchmark is for the manager.

**Beta:** A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.

**Book-to-Market:** The ratio of book value per share to market price per share. Growth managers typically have low book-to-market ratios while value managers typically have high book-to-market ratios.

**Capture Ratio:** A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen (up market) or fallen (down market). The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.

**Correlation:** A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of -1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.

**Excess Return:** A measure of the difference in appreciation or depreciation in the price of an investment compared to its benchmark, over a given time period. This is usually expressed as a percentage and may be annualized over a number of years or represent a single period.

**Information Ratio:** A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: excess return divided by tracking error.

**Interaction Effect:** An attribution effect that describes the portion of active management that is contributable to the cross interaction between the allocation and selection effect. This can also be explained as an effect that cannot be easily traced to a source.

**Portfolio Turnover:** The percentage of a portfolio that is sold and replaced (turned over) during a given time period. Low portfolio turnover is indicative of a buy and hold strategy while high portfolio turnover implies a more active form of management.

**Price-to-Earnings Ratio (P/E):** Also called the earnings multiplier, it is calculated by dividing the price of a company's stock into earnings per share. Growth managers typically hold stocks with high price-to-earnings ratios whereas value managers hold stocks with low price-to-earnings ratios.

**R-Squared:** Also called the coefficient of determination, it measures the amount of variation in one variable explained by variations in another, i.e., the goodness of fit to a benchmark. In the case of investments, the term is used to explain the amount of variation in a security or portfolio explained by movements in the market or the portfolio's benchmark.

**Selection Effect:** An attribution effect that describes the amount attributable to the managers' stock selection decisions, relative to the benchmark.

**Sharpe Ratio:** A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as:  $\text{Portfolio Excess Return} / \text{Portfolio Standard Deviation}$ .

**Sortino Ratio:** Measures the risk-adjusted return of an investment, portfolio, or strategy. It is a modification of the Sharpe Ratio, but penalizes only those returns falling below a specified benchmark. The Sortino Ratio uses downside deviation in the denominator rather than standard deviation, like the Sharpe Ratio.

**Standard Deviation:** A measure of volatility, or risk, inherent in a security or portfolio. The standard deviation of a series is a measure of the extent to which observations in the series differ from the arithmetic mean of the series. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two-thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.

**Style Analysis:** A return based analysis designed to identify combinations of passive investments to closely replicate the performance of funds

**Style Map:** A specialized form or scatter plot chart typically used to show where a Manager lies in relation to a set of style indices on a two-dimensional plane. This is simply a way of viewing the asset loadings in a different context. The coordinates are calculated by rescaling the asset loadings to range from -1 to 1 on each axis and are dependent on the Style Indices comprising the Map.

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Meeting Date  
**02/24/2021**  
Agenda Item  
**#8b.**

**Memorandum**

Date: February 24, 2021  
To: CCCERA Board of Retirement  
From: Timothy Price, Chief Investment Officer  
Subject: Investment Staff Report – Q4 2020

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**Overview**

On a quarterly basis CCCERA’s Board receives a report which details critical elements of CCCERA’s Functionally Focused Portfolio’s sub-portfolios. The purpose of the report is to highlight elements of the sub-portfolios which are good indicators to the Board of the program’s efficient and effective operation.

**Summary**

CCCERA’s Total Fund is performing as expected, exhibiting returns above expectations for the amount of risk taken. This is measured by the Sharpe Ratio (risk-adjusted return), and a comparison to the Simple Target Index. The Simple Target Index is the most basic index which could replicate CCCERA’s Total Fund, and is made up of 68.5% MSCI ACWI, 25% Bloomberg 1-3 Year Gov/Credit, and 6.5% 3-Month Treasury Bills (please see the Total Fund pages in the appendix for additional details). CCCERA’s portfolio is much more complex, especially as it relates to allocations to private equity, private credit, and real estate.

CCCERA has been rewarded for implementing a more complex portfolio over the long-term though we have experienced some challenges more recently. The Total Fund has outperformed the Simple Target Index over the trailing ten years, while experiencing less risk (volatility). Details on performance relative to this index are included in the appendix. It is worth noting that CCCERA’s Total Fund return is an aggregate of the performance of the Liquidity, Growth, and Risk Diversifying sub-portfolios.

### **1) Liquidity**

The purpose of the liquidity program is to match four years of benefit payments with high credit quality, low duration assets. The liquidity sub-portfolio is made up of three fixed income managers, all of whom pursue a high quality, low duration investment approach. In the fourth quarter of 2020, all managers held high quality (as measured by credit ratings), low duration portfolios. The average credit quality for the entire liquidity program is A+ (AAA is the highest rating), and the duration is 1.9 years, which is considered short.

### **2) Growth**

The Growth portfolio is designed to take advantage of capital appreciation and income opportunities globally. To achieve this, the Growth portfolio includes a variety of assets, from stocks and growth-oriented bonds to private equity, real estate, and private credit.

For the trailing five-year period ending December 31, 2020, the Growth portfolio returned 10.2% relative to the index return of 12.3%, for a relative underperformance of 2.0%. During the fourth quarter of 2020, the public markets remained strong, with the MSCI ACWI Index returning 14.7% relative to CCCERA's Growth sub-portfolio return of 11.3%. The relative underperformance of CCCERA's sub-portfolio in 2020 (which contributed significantly to the underperformance over the trailing five years) is largely due to a lower risk profile, a significant allocation to private markets (in particular real estate) and the sharp underperformance of value strategies relative to growth and momentum strategies.

### **3) Risk Diversifying**

The Risk Diversifying mandate holds assets that are expected to diversify the growth portfolio's volatility while offering moderate growth. The mandate as a whole seeks to be highly liquid, have a low beta to the growth market, and produce positive real returns. In the first quarter, the Risk Diversifying mandate fulfilled two of these goals. The entire mandate can be liquidated within 90 days, meeting the requirement of high liquidity. The correlation of the mandate to growth markets is 0.7, which shows elevated, but not increasing, diversification compared to 0.7 correlation as of September 2020. However, trailing real (net of inflation) returns over the past five years is -0.8%, an improvement from -1.1% and -1.4% from the two previous quarters, but remains below expectations. We continue to actively underwrite a number of strategies to further build out this allocation.

The Liquidity and Growth sub-portfolios are largely functioning well and within expectations. We are in the midst of restructuring the Risk Diversifying sub-portfolio to address performance concerns. By and large, the product teams and asset managers across all managers are stable, and we have no significant organizational concerns with our investment managers. CCCERA's Total Fund in aggregate is performing in line with expectations, having a similar or higher risk-adjusted return but a lower level of volatility compared to the Simple Target Index. Enclosed are additional details on CCCERA's Total Fund, sub-portfolios, and individual investment strategies.



### CCCERA Portfolio Report Card

Below we have itemized those elements of each of CCCERA’s sub-portfolios and Total Fund which we believe the Board should pay particular attention to. Additional details on each of the sub-portfolios are available in the appendix. All CCCERA performance is stated on a net of fees basis.

#### Liquidity

Objective	Measurement	Current Period Data	Status
High Quality	Credit Quality	A+	Meeting Expectations
Low Risk	Duration	1.9 years	Meeting Expectations
Appropriately Sized	Months of Benefit Payments Invested	41 Months	Meeting Expectations

#### Growth

Objective	Measurement	Current Period Data	Status
Growth of Plan Assets	Absolute Returns	Trailing 5 yr return: 10.2%	Meeting Expectations
	Benchmark Relative Returns	-2.0% relative to ACWI over trailing 5 years	Below Expectations
Efficient Capital Deployment	Sharpe Ratio	CCCERA: 0.8 MSCI ACWI: 0.6 (over trailing 5 years)	Meeting Expectations

#### Risk Diversifying

Objective	Measurement	Current Period Data	Status
Offset Volatility in Growth Portfolio	Correlation	0.7 over trailing 5 years	Below Expectations
Positive Real Returns	Returns	Trailing 5 yr real return of -0.8%	Below Expectations
High Liquidity	% of Portfolio that can be liquidated within 90 days	100%	Meeting Expectations

#### Total Fund

Objective	Component/Measurement	Status
Store 4 Years of Benefit Payments	Liquidity Sub-portfolio	Meeting Expectations
Participate in Growth Opportunities	Growth Sub-portfolio	Meeting Expectations
Provide an offset to Growth volatility	Risk Diversifying Sub-portfolio	Below Expectations
Produce superior risk adjusted returns	Total Fund Sharpe Ratio	Meeting Expectations



**Appendix – Liquidity Sub-Portfolio**

Manager Reviews

**Organizational Stability**

	Portfolio Management Assessment	1 Year Product Asset Growth	1 Year Firm Asset Growth	Regulatory Action in Last Year?
Insight	Good	-5%	17%	N
Sit	Good	19%	9%	N
DFA	Good	-1%	-1%	N

**Performance**

	Portfolio Average Credit Quality	Portfolio Average Duration	Portfolio Average Yield	1 Year Total Return
Insight	A	1.6	0.6	3.4%
Sit	AAA	2.9	1.5	4.8%
DFA	A	1.3	0.6	2.5%

**Manager Notes:**

All three Liquidity managers performed in line with expectations over the prior year, with Sit in particular experiencing the benefit of a flight to quality in their portfolio of government-guaranteed mortgages.

**Manager Theses:**

The Liquidity Portfolio is a combination of three managers which work together to match four years of CCCERA’s liabilities. The portfolio is refreshed every year during the annual funding plan.

Insight: Insight plays a completion role in the liquidity program, matching out liabilities with short duration government and corporate fixed income securities.

DFA: Dimensional Fund Advisors runs a strategy that focuses on obtaining fixed income exposures via the most liquid securities available. DFA contributes to the Liquidity Program by selling securities at regular intervals to pay a portion of CCCERA’s monthly benefit payment.

Sit: Sit invests in high yielding government backed mortgages. The cash flow from these securities is harvested monthly to make up a portion of CCCERA’s monthly benefit payment.

## Appendix – Growth Sub-Portfolio

### Manager Reviews

#### Organizational Stability

	Portfolio Management Assessment	1 Year Product Asset Growth	1 Year Firm Asset Growth	Regulatory Action in Last Year?
Boston Partners	Good	-18%	-14%	N
Jackson Square	Good	18%	26%	N
BlackRock Index Fund	Good	15%	17%	N
Emerald Advisors	Good	27%	23%	N
Ceredex	Good	-8%	-23%	N
Pyrford (BMO)	Good	9%	4%	N
William Blair	Good	9%	19%	N
First Eagle	Good	-11%	13%	N
Artisan Global	Good	38%	30%	N
PIMCO/RAE EM	Good	-43%	15%	N
TT EM	Good	50%	27%	N
Adelante	Good	-39%	-27%	N
Allianz	Good	0%	13%	N
AQR	Good	4%	-25%	N
PanAgora	Good	23%	-12%	N
Private Equity	Good	--	--	N
Private Credit	Good	--	--	N
Real Estate	Good	--	--	N

### Performance

	Trailing 1 Year Return	Trailing 5 Year Return	Performance in Line with Expectations?
Boston Partners	2%	10%	Y
Jackson Square	44%	17%	Y
BlackRock Index Fund	21%	16%	Y
Emerald Advisors	37%	17%	Y
Ceredex	2%	9%	Y
Pyrford (BMO)	4%	7%	Y
William Blair	32%	13%	Y
First Eagle	8%	9%	Y
Artisan Global	40%	19%	Y
PIMCO/RAE EM	1%	12%	Y
TT EM	20%	16%	Y
Adelante	-5%	5%	N
Allianz	2%	6%	Y
AQR	6%	8%	Y
PanAgora	13%	10%	Y
	1Yr Premium	5 Year Premium	
Private Equity	-8%	-2%	N
Private Credit	-12%	-5%	N
Real Estate	-22%	-7%	N

#### Manager Notes:

The relative underperformance of small, non-US and value-oriented strategies that I have highlighted in the past two quarters began to reverse during the fourth quarter, though not nearly enough to overcome their earlier underperformance. Boston Partners (large cap value), Ceredex (small cap value), Pyrford (international value) and PIMCO (emerging market value), all suffered considerable short-term underperformance relative to the MSCI ACWI index during 2020. Both Ceredex and PIMCO had strong results in the fourth quarter and have begun to close the gap with their growth-oriented counterparts.

#### Manager Theses:

The growth portfolio includes all managers in public and private equity, real estate, and private credit. These managers grow CCCERA's assets for future benefit payments (beyond the four years already covered by the Liquidity program).

**Boston Partners:** Large cap domestic equity which follows a value discipline. Boston Partners will buy out of favor companies and sell them when their intrinsic values are reflected in the market. Expected to outperform in flat to falling markets.

**Jackson Square:** Domestic equity large cap growth portfolio concentrated in companies with sustainable long-term growth characteristics. This portfolio should outperform in rapidly rising markets.

**BlackRock Index Fund:** Large cap domestic equity portfolio which should follow the Russell 1000 Index.

**Emerald Advisors:** Small cap growth equity seeking companies with high growth rates. Expected to produce strong returns in rising markets, and weak returns in falling markets.

**Ceredex:** Domestic equity small cap value portfolio of companies with dividend yields and low valuations. This portfolio should outperform flat markets.

**Pyrford (BMO):** International equity value portfolio of non-US companies with low valuations at the country and stock level. This portfolio should outperform in flat markets.

**William Blair:** International equity growth portfolio of non-US companies with high growth rates constructed from the security level. This portfolio should outperform in rapidly rising markets.

**First Eagle:** Global equity portfolio that is benchmark agnostic comprised of companies with low valuations.

**Artisan Global Opportunities:** Global equity portfolio of companies that is benchmark agnostic with accelerating profit cycles and a focus on capital allocation.

**PIMCO/RAE Emerging Markets:** Quantitative equity with a value orientation. This portfolio follows the fundamental indexing approach (ranking companies by metrics other than market capitalization), resulting in a diversified, low turnover portfolio. This portfolio underperforms in momentum driven markets.

**TT International Emerging Markets:** Concentrated, growth oriented manager which invests in small and mid-cap emerging market companies. TT employs both a top-down and a bottom-up research approach, and seeks to outperform by identifying companies that have a catalyst to drive future growth.

**Adelante:** Diversified portfolio of U.S. REITs with a focus on the underlying real estate assets. Adelante is a public market proxy of the core real estate market.

**Allianz High Yield Fixed Income:** Domestic high yield fixed income portfolio with a focus on security selection. Allianz will focus on the higher quality segment of the high yield universe. Allianz should provide a steady income stream, and provide downside protection in falling markets.

**Private Equity:** CCCERA invests in private equity to generate returns above those available in the public equity markets.

**Private Credit:** CCCERA invests in private credit to generate cash flow streams above those available in the public debt markets.

**Real Estate:** CCCERA invests in value-add, distressed, and opportunistic real estate to generate returns from the capital appreciation and cash flow associated with commercial real estate investment.

**Risk Parity:** Multi-asset approach that strives for balanced contributions to total portfolio risk from multiple asset classes.

## Appendix – Risk Diversifying Sub-Portfolio

### Organizational Stability

	Portfolio Management Assessment	1 Year Product Asset Growth	1 Year Firm Asset Growth	Regulatory Action in Last Year?
AFL-CIO	Good	3%	3%	N
Parametric	Good	-47%	28%	N
Acadian	Good	190%	6%	N

### Performance

	Trailing 1 Year Correlation to Growth	Trailing 3 Year Correlation to Growth	1 Year Return	5 Year Return	% of Portfolio Liquid in 90 Days
AFL-CIO	-0.8	-0.3	6%	4%	100%
Parametric	0.9	---	-9%	N/A	100%
Acadian	-0.5	-0.4	-1%	N/A	100%

### Manager Notes:

Parametric is owned by Eaton Vance. During the fourth quarter, Eaton Vance announced that they are being acquired by Morgan Stanley. The firm also announced that Jay Strohmaier, Portfolio Manager of the strategy employed by CCCERA, would retire on March 31, 2021. He will be succeeded by Alex Zweber. Given the systematic nature of the investment process, we do not anticipate significant near-term changes as a result of Mr. Strohmaier's retirement.

### Manager Theses:

Managers in the risk diversifying allocation seek to have a low correlation with the growth portfolio, positive returns in flat and falling equity markets, and a high degree of liquidity. These managers work together to offset some of the risks in the growth portfolio.

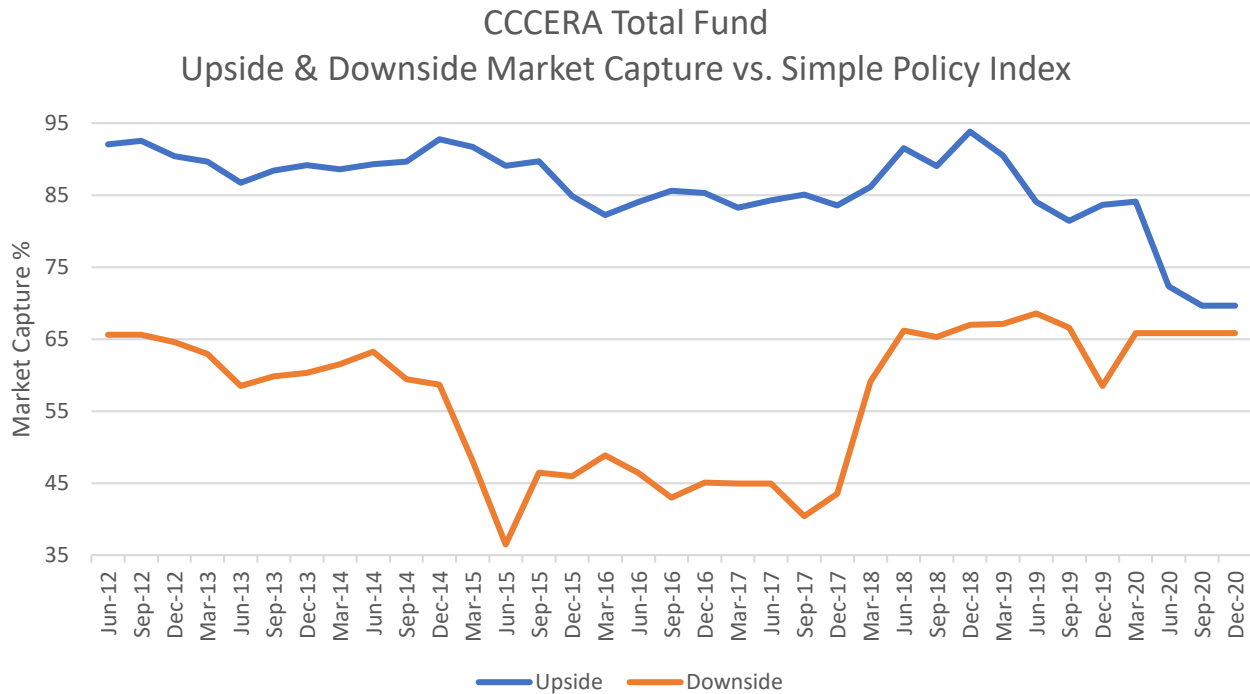
**AFL-CIO:** Portfolio of domestic, high quality fixed income securities which are backed by commercial and residential mortgages.

**Parametric:** Portfolio of paired options selling intended to collect insurance premiums by selling puts and calls on the S&P 500 with collateral invested in US Treasury portfolio.

**Acadian:** Quantitatively managed multi-asset absolute return strategy that uses various models to capture pricing dislocations.

**Appendix Data – Total Fund**

**Rolling 3-Year Total Fund Upside/Downside Market Capture**



\*The composition of the Simple Target Index has mirrored changes in CCCERA’s asset allocation over time: from 2008 to 2012 the benchmark was 73% MSCI ACWI, 23% Bloomberg 1-3 Year Gov/Credit, and 4% 3-Month Treasury Bills. From 2012 to 2016 the composition was 74% MSCI ACWI, 18% Bloomberg 1-3 Year Gov/Credit, and 9% 3-Month Treasury Bills. From 2016 to 2017 the composition was 63% MSCI ACWI, 25% Bloomberg 1-3 Year Gov/Credit, and 12% 3-Month Treasury Bills, from 2017 to September 2018 the composition was 61% MSCI ACWI, 27% Bloomberg 1-3 Year Gov/Credit, and 12% 3-Month Treasury Bills, from July 2018 to September 2019 the composition is 69% MSCI ACWI, 23% Bloomberg 1-3 Year Gov/Credit, and 8% 3-Month Treasury Bills, from July 2019 to September 2020 the composition is 68% MSCI ACWI, 24% Bloomberg 1-3 Year Gov/Credit, and 8% 3-Month Treasury Bills, and from July 2020 to the present the composition is 68.5% MSCI ACWI, 25% Bloomberg 1-3 Year Gov/Credit, and 6.5% 3-Month Treasury Bills.

## Total Fund Quarterly Attribution

	CCCERA Total Fund			Simple Target Index			Analysis		
	Allocation	Return	Contribution	Allocation	Return	Contribution	Allocation Difference	Return Difference	Total Effect
Liquidity	26.0%	0.4%	0.1%	25.0%	0.2%	0.1%	1.0%	0.2%	0.1%
Growth	68.7%	11.3%	7.8%	68.5%	14.7%	10.1%	0.2%	-3.3%	-2.3%
Risk Diversifying	5.3%	1.1%	0.1%	6.5%	0.0%	0.0%	-1.2%	1.1%	0.1%
Total Fund	100%		8.0%	100%		10.1%	-0.1%		-2.2%

## CCCERA Total Fund Performance vs. Simple Target Index

	One Year		Three Years		Five Years		Ten Years	
	CCCERA	STI	CCCERA	STI	CCCERA	STI	CCCERA	STI
Return	9.2	13.3	6.8	8.3	8.2	8.9	8.1	6.8
Volatility	16.4	24.6	10.2	15.4	8.0	11.9	7.7	10.8
<b>Sharpe</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.4</b>	<b>0.9</b>	<b>0.7</b>	<b>1.0</b>	<b>0.6</b>

The Simple Target Index is made up of 68.5% MSCI ACWI, 25% Bloomberg 1-3 Year Gov/Credit, and 6.5% 3-Month Treasury Bill. This purpose of this index is to examine whether CCCERA is being rewarded for pursuing a more nuanced portfolio versus a very simple representative portfolio.

CCCERA's Total Fund has produced strong risk adjusted and absolute returns over the trailing five and ten-year periods. Additionally, the CCCERA Portfolio has exceeded the STI over the trailing ten-year period, though it has lagged in more recent periods. This would indicate that CCCERA has been rewarded over time for engaging in more complex investments which target outperformance versus investing passively in the publicly traded market even though these more complex structures have lagged the public markets sharply in the past year which is a drag on medium-term performance.

The Sharpe ratio is a measure of risk adjusted returns which shows the amount of return a portfolio earns above the risk free rate per unit of volatility. The Total Fund has matched or exceeded the Sharpe ratio relative to the Simple Target Index over all trailing time periods, indicating that CCCERA is being favorably rewarded for the level of risk taken in the portfolio.

# Memorandum

**To:** Board of Trustees, Contra Costa County Employees' Retirement Association  
**From:** Scott J. Whalen, CFA, CAIA, Executive Managing Director | Senior Consultant  
**Date:** February 24, 2021  
**Re:** Benchmark Review

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## Introduction

Effective performance benchmarks provide useful information to investment decision makers and helps them assess whether their investment portfolio meets pre-established performance expectations. To realize their potential, however, benchmarks must be well designed. Fortunately, there is an established framework through which benchmark efficacy can be evaluated. We applied this framework to CCCERA's benchmarks and found them to be largely effective with the reasonable exception of the Plan's private markets investments.

Typically, tracking error is a useful metric for assessing the risk and reward derived from actively managing an investment portfolio (i.e., intentionally investing differently than the assigned benchmark). In the case of private markets investing, however, this is not the case. In fact, tracking error associated with private markets investments adds very little informational value to the performance reporting process and may even be misleading to investment decision makers.

This memo describes the framework for evaluating benchmark effectiveness, applies the framework to CCCERA's benchmarks, and addresses potential improvement opportunities with respect to benchmarking CCCERA's private markets portfolio as alternative benchmarking approaches have emerged over time.

## Benchmark Evaluation Framework

The primary objective of benchmarking investment performance is to provide investment decisionmakers with useful insights into whether an investment strategy is meeting the expectations set when the strategy was put in place. Public and private markets differ somewhat in the application of benchmarks for this purpose because of differences in the structure of how the investments are accessed, as well as the associated holding period. With public markets investments, investors can typically choose to eliminate the investment strategy and redeem



their funds within a calendar quarter. With private market investments, the investor has made a commitment for the pre-specified life of the fund, which may last up to a decade or even longer. Therefore, benchmarking private markets investments should focus on the success of the program over the long-term, helping the investor choose whether to continue with the program or wind it down, and if continue, help the investor decide whether to re-commit to the next fund with the same manager or abandon the current manager in favor of another. For this reason, private markets investments should be assessed less frequently but with arguably greater depth than public markets investments.

The CFA Institute advocates the use of a handy mnemonic device (“SAMURAI”<sup>1</sup>) to describe a set of desired benchmarking characteristics. These characteristics have been widely adopted as a framework to test the effectiveness of performance benchmarks and are defined as follows:

**Specified in advance.** The benchmark is specified prior to the start of the evaluation period.

**Appropriate.** The benchmark is consistent with the manager’s investment style or area of expertise.

**Measurable.** The benchmark’s return is readily calculable on a reasonably frequent basis.

**Unambiguous.** The identities and weights of securities are clearly defined.

**Reflective of current investment opinions.** The manager has current knowledge of the securities in the benchmark.

**Accountable.** The manager is aware of and accepts accountability for the constituents and performance of the benchmark.

**Investable.** It is possible to simply hold the benchmark.

For most public markets investments, benchmarks can be found that satisfy most, if not all, of the SAMURAI requirements. This is not the case for most alternative investments, however. Take private equity, for example. A typical approach would be to use a public market benchmark, such as the S&P500, add a premium reflective of the excess return expected for incurring additional risks associated with private equity (e.g., illiquidity, leverage), and lag it a quarter to reflect the fact that private equity funds are slow to report given valuation challenges. In this instance, the benchmark is clearly Specified in advance. It is also Measurable and Unambiguous. However, none of the other requirements are satisfied, which leads to significant shortcomings when applying traditional public markets benchmarks to private markets investments. Notably, while it is possible to improve the Appropriateness of a private markets benchmark, no benchmarks currently exist that satisfy all SAMURAI characteristics.

The table on the next page shows CCCERA’s investment policy index broken down into its component parts by asset class and evaluated using the SAMURAI framework:

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<sup>1</sup> Managing investment portfolios: A dynamic process (CFA institute investment Series), Third edition, John L. Maginn, Donald L. Tuttle, Jerald E. Pinto, Dennis W. McLeavey

Asset Class	Benchmark	S	A	M	U	R	A	I
Domestic Equity	Russell 3000	●	●	●	●	●	●	●
International Equity	ACWI ex US	●	●	●	●	●	●	●
Global Equity	ACWI	●	●	●	●	●	●	●
Private Equity	S&P 500 + 4%	●	○	●	●	○	○	○
High Yield Fixed Income	BofA Merrill HY Master II	●	●	●	●	●	●	◐
Real Estate	Custom (REIT, NPI, ODCE)	●	○	●	●	○	○	◐
Private Credit	BofA Merrill HY Master II + 2%	●	○	●	●	○	○	○
Risk Parity	60/40 ACWI/Global Agg	●	◐	●	●	○	◐	◐
Diversifying	Custom (Agg, HFRI, CPI+4%)	●	◐	●	○	◐	◐	◐
Liquidity	BBgBarc US Gov/Cred 1-3	●	●	●	●	●	●	◐

### Policy Index – Impact of Private Markets on Total Fund Index Comparisons

Two primary issues arise at the Total Fund level when applying the Plan’s current private markets benchmarking approach, and both are related to the tracking error problem identified above. The first is that the Policy Index does not account for the time lag between approval of the strategic asset allocation and final implementation. The second is the additional tracking error that comes from comparing private markets investments to public markets benchmarks.

#### Implementation Lag

The table below shows the Plan’s target allocation vs. the actual allocation at the end of February.

Asset Category	Target %	Current %
Public Markets	-3.0%	1.9%
Private Markets	-18.7%	21.7%

Currently, approximately 17% of total plan assets are allocated to illiquid investments in private equity, private credit, and private real estate, but which have not yet been invested. In the meantime, these assets are invested in public equity and fixed income as reasonable holding

places. Inevitably, these holding-place investments have different risk and return characteristics than the private market investments for which they are ultimately intended, which will likely result in more volatility and less return until they can be fully invested in line with policy targets.

This risk/return mismatch will add to higher tracking error and uncompensated and avoidable benchmark risk at the total fund level unless it is addressed. Fortunately, CCCERA mitigates this mismatch by re-stating the interim policy target allocation annually to better align the actual allocation with the target allocation weights used in the total fund benchmark.

#### Using Public Market Benchmarks for Private Market Investments

CCCERA, like many plans, has historically applied a time-weighted return calculation for private markets performance and compared it to a public-markets benchmark (e.g., S&P500 + 4%). The benchmark return is delayed one calendar quarter in consideration of the delayed reporting of private markets investments (caused by the time-consuming nature of establishing the value for illiquid investments).

There are at least two drawbacks to this commonly applied approach. The first is that the time-weighted calculation methodology is not appropriate for private markets investing because the timing of cash flows (a key element of the investment decision in private markets) is ignored in a public markets benchmark. The second and potentially bigger issue from a tracking error perspective comes from large return variances that can occur during periods of high market volatility.

The table below shows the return of CCCERA's private equity portfolio measured on a one-quarter lagged, time-weighted basis versus its public markets benchmark over the second and third quarters of 2020.

	2Q20	3Q20
CCCERA PE Program	-3.0%	1.9%
S&P500 + 4%	-18.7%	21.7%

As one might imagine, the return comparison above is of little informational value and could potentially lead to the erroneous conclusion that the private equity program is doing extraordinarily well one quarter and extraordinarily poorly the next. The tracking error implicit in these returns then rolls up to the total fund return, leading to aggregate over and under-performance and potentially causing unwarranted comfort or concern.

## Recommendation

To eliminate the unintended effects of the second benchmarking challenge identified above, we propose two related adjustments to the benchmarking/evaluation approach currently uses to assess CCCERA's private markets investment program.

First, in the quarterly investment report produced by Verus, we recommend removing the time-weighted, public market benchmark and instead using the actual time-weighted returns from the private markets investments themselves for the calculation of the Total Fund composite benchmark. This would eliminate the tracking error resulting from valuation timing differences and public markets volatility that is not reflected in private markets return streams.

Second, we recommend continuing to include traditional private markets performance metrics in a dedicated section of the Verus' quarterly performance report and also continuing to conduct a thorough annual private markets program assessment.

Currently, StepStone, CCCERA's private markets advisor, prepares an annual program review that includes a high-level performance comparison of CCCERA's private equity program's dollar-weighted return against a universe median dollar-weighted return and a public markets (S&P 500) time-weighted return. The informational value of these comparisons can be improved by including additional benchmarks and additional detail. We would advise inclusion of some or all of the following, based on data availability:

- Comparisons made at the Fund, Fund Type (e.g., Primary, Fund-of-Funds), and Program levels
- Benchmarks to include:
  - Best-fit comparative universe
  - IRR and Investment multiples (i.e., DPI, TVPI)
  - IRR-based PME return

We believe these recommended adjustments will increase the informational value of the private markets evaluation process and adds to the “Appropriateness” of the benchmarking exercise within the SAMURAI framework.

If the Board agrees with these recommendations, we will make the noted adjustments to our quarterly investment report beginning with the 1Q21 performance period. We will also reach out to StepStone directly or through CCCERA Investment Staff to effect the changes identified above.



Meeting Date  
**02/24/2021**  
Agenda Item  
**#10**

## MEMORANDUM

Date: February 24, 2021  
To: CCCERA Board of Retirement  
From: Timothy Price, Chief Investment Officer  
Subject: Annual Statement of Compliance with Board Resolutions

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### Overview

As part of the CCCERA investment procedures, staff is required to report annually on compliance with all Board Resolutions in effect for the prior year. These Board Resolutions can encompass a variety of topics, but in 2020 were limited to asset allocation targets and ranges related to the phased implementation of the new asset allocation program.

The Board adopted one investment-related resolution over the course of 2020 and one resolution from 2019 remained in effect at the beginning of 2020. These resolutions are noted below and included with the memo as Appendix 1.

RESOLUTION	CONTENT	DATE ADOPTED
2019-4	Asset Allocation Targets and Ranges	6/26/19
2020-2	Asset Allocation Targets and Ranges	7/22/20

### Compliance

CCCERA Investment staff provided a monthly report to the Board as part of the consent items showing month-end allocation for each sub-portfolio and investment manager. All allocations remained near their targets over the course of the year and the three sub-portfolios (liquidity, growth and diversifying) remained within their mandated ranges at all times. These reports are included with this memo as Appendix 2.

Please note that Resolutions 2019-4 and 2020-2 do not have specific cash allocation targets or ranges as this is overlaid (securitized) by Parametric and therefore has a similar economic exposure as the total fund.

**Asset Allocation Summary: Calendar Year 2020**

	Liquidity		Growth		Diversifying		Cash & Overlay
	Allocation	Range	Allocation	Range	Allocation	Range	Allocation
January	20.6%	16-28%	69.2%	60-80%	7.8%	0-10%	2.4%
February	21.0	16-28	68.6	60-80	8.0	0-10	2.4
March	21.8	16-28	67.8	60-80	7.1	0-10	3.3
April	21.4	16-28	70.0	60-80	6.8	0-10	1.8
May	20.7	16-28	71.3	60-80	5.1	0-10	3.0
June	20.2	16-28	72.0	60-80	5.1	0-10	2.7
July	19.3	16-28	67.8	60-80	4.8	0-10	8.1
August	23.7	16-28	68.5	60-80	5.8	0-10	2.1
September	23.3	16-28	68.7	60-80	5.3	0-10	2.6
October	23.1	16-28	68.9	60-80	5.3	0-10	2.7
November	21.7	16-28	70.4	60-80	5.1	0-10	2.8
December	20.6	16-28	71.1	60-80	5.0	0-10	3.3

# *Appendix 1*

**RESOLUTION OF THE BOARD OF RETIREMENT  
CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION**

**INVESTMENT ASSET ALLOCATION TARGETS AND RANGES**

WHEREAS, Article XVI, §17 of the Constitution of the State of California vests the Board of Retirement (Board) with "plenary authority and fiduciary responsibility for the investment of moneys and the administration of the system"; and

WHEREAS, the Board has exclusive control of the investment of CCCERA and may, in its discretion and subject to applicable law, invest, or delegate the authority to invest, the assets of the fund through the purchase, holding or sale or any form or type of investment, financial instrument, or financial transaction when prudent in the informed decision of the board, pursuant to the County Employees Retirement Law of 1937 (CERL), Government Code Section 31595; and

WHEREAS, the Board has adopted an Investment Policy Statement ("IPS"), pursuant to which the Board is to periodically set, review and revise its asset allocation targets.

NOW, THEREFORE BE IT RESOLVED that it shall be the policy of CCCERA to invest assets in the following manner:

**Asset Allocation**

Section 6.B of the Investment Policy Statement ("IPS"), adopted April 24, 2019, provides that "annually the Board shall review the relative size and composition of [the] sub-portfolios and revise them as necessary through Investment Resolutions." During this annual review, the CIO will recommend the targets, weightings, and the rationale for any deviation to an under-weight or over-weight across the asset allocation. The Board will consider and take action to adopt or revise asset allocation targets. Under the direction of the Board of Retirement, investment staff will administer the asset allocation per the Board's action.

As of 2019 the long-term asset allocation targets determined by the Board are as follows:

	Long Term	Current Target
Liquidity:	24%	24%
Growth:	66%	68%
Diversifying:	10%	8%

The current targets reflect the continued build out of the diversifying allocation. As additional strategies are identified and funded, we expect to make further progress towards funding this sub-portfolio to its full 10% allocation from its current allocation of 8%. On an interim basis, remaining 2% remains in the growth sub-portfolio.

The Liquidity sub-portfolio will have a target allocation of 24% once the annual funding has been completed. Over the course of the following 12 months, the Liquidity sub-portfolio will be used to pay benefits and expenses. As a result, and aside from market fluctuations, the funds in the Liquidity sub-portfolio will decline from the targeted allocation and, therefore, the relative allocations to the Growth and Diversifying sub-portfolios will increase proportionately.





**Current Targets**

<b>Sub-Portfolio Strategy</b>	<b>Current Target</b>	<b>Range</b>
<b>Growth</b>	<b>68.0%</b>	<b>60-80%</b>
Jackson Square	2.5%	
Boston Partners	2.5%	
Emerald	1.5%	
Ceredex	1.5%	
BlackRock Index Fund	2.0%	
Pyrford	5.0%	
William Blair	5.0%	
Artisan	4.0%	
First Eagle	4.0%	
TT Emerging Markets	4.0%	
PIMCO/RAE Emerging Markets	4.0%	
Adelante	1.0%	
Allianz	2.0%	
Private Real Estate	8.0%	
Private Equity	11.0%	
Private Credit	5.0%	
Risk Parity	5.0%	
<b>Liquidity</b>	<b>24.0%</b>	<b>16-28%</b>
Insight	12.0%	
DFA	6.0%	
Sit	6.0%	
<b>Risk Diversifying</b>	<b>8.0%</b>	<b>0-10%</b>
AFL-CIO HIT	3.5%	
Wellington Real Total Return	2.0%	
Parametric Defensive Equity	2.5%	
<b>Total</b>	<b>100.0%</b>	

THIS RESOLUTION WAS ADOPTED BY THE AFFIRMATIVE VOTE OF THE BOARD OF RETIREMENT OF THE CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION THIS 26<sup>th</sup> DAY OF JUNE, 2019.

AYES: Andersen, Gordon, Holcombe, Kroll, MacDonald, Phillips, and Smithey  
 NOES: None  
 ABSTAIN: None  
 ABSENT: Pigeon, Telles, and Watts

  
 \_\_\_\_\_  
 Todd Smithey  
 Chairperson of the Board of Retirement

  
 \_\_\_\_\_  
 Attest:  
 David J. MacDonald  
 Secretary of the Board of Retirement

**RESOLUTION OF THE BOARD OF RETIREMENT  
CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION**

**INVESTMENT ASSET ALLOCATION TARGETS AND RANGES**

WHEREAS, Article XVI, §17 of the Constitution of the State of California vests the Board of Retirement (Board) with "plenary authority and fiduciary responsibility for the investment of moneys and the administration of the system"; and

WHEREAS, the Board has exclusive control of the investment of CCCERA and may, in its discretion and subject to applicable law, invest, or delegate the authority to invest, the assets of the fund through the purchase, holding or sale or any form or type of investment, financial instrument, or financial transaction when prudent in the informed decision of the board, pursuant to the County Employees Retirement Law of 1937 (CERL), Government Code Section 31595; and

WHEREAS, the Board has adopted an Investment Policy Statement ("IPS"), pursuant to which the Board is to periodically set, review and revise its asset allocation targets.

NOW, THEREFORE BE IT RESOLVED that it shall be the policy of CCCERA to invest assets in the following manner:

**Asset Allocation**

Section 6.B of the Investment Policy Statement ("IPS"), adopted April 24, 2019, provides that "annually the Board shall review the relative size and composition of [the] sub-portfolios and revise them as necessary through Investment Resolutions." During this annual review, the CIO will recommend the targets, weightings, and the rationale for any deviation to an under-weight or over-weight across the asset allocation. The Board will consider and take action to adopt or revise asset allocation targets. Under the direction of the Board of Retirement, investment staff will administer the asset allocation per the Board's action.

As of 2020 the long-term asset allocation targets determined by the Board are as follows:

	Long Term	Current Target
Liquidity:	24%	25.0%
Growth:	66%	68.5%
Diversifying:	10%	6.5%

The Liquidity sub-portfolio will have a target allocation of 25% once the annual funding has been completed. Over the course of the following 12 months, the Liquidity sub-portfolio will be used to pay benefits and expenses. As a result, and aside from market fluctuations, the funds in the Liquidity sub-portfolio will decline from the targeted allocation and, therefore, the relative allocations to the Growth and Diversifying sub-portfolios will increase proportionately.

<b>Sub-Portfolio Strategy</b>	<b>Current Target</b>	<b>Range</b>
<b>Growth</b>	<b>68.5%</b>	<b>60-80%</b>
Jackson Square	2.0%	
Boston Partners	2.0%	
Emerald	1.5%	
Ceredex	1.5%	
BlackRock Index Fund	2.0%	
Pyrford	5.0%	
William Blair	5.0%	
Artisan	4.0%	
First Eagle	4.0%	
TT Emerging Markets	4.0%	
PIMCO/RAE Emerging Markets	4.0%	
Adelante	1.0%	
Allianz	1.5%	
Private Real Estate	8.0%	
Private Equity	11.0%	
Private Credit	7.0%	
Risk Parity	5.0%	
<b>Liquidity</b>	<b>25.0%</b>	<b>16-28%</b>
Insight	13.0%	
DFA	6.0%	
Sit	6.0%	
<b>Risk Diversifying</b>	<b>6.5%</b>	<b>0-10%</b>
AFL-CIO HIT	3.0%	
Parametric Defensive Equity	2.0%	
Acadian MAARS	1.5%	
<b>Total</b>	<b>100.0%</b>	

THIS RESOLUTION WAS ADOPTED BY THE AFFIRMATIVE VOTE OF THE BOARD OF RETIREMENT OF THE CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION THIS 22nd DAY OF JULY, 2020.

AYES: Anderson, Finley, Gordon, Holcombe, MacDonald, Phillips, Sloan, Smithey, Watts

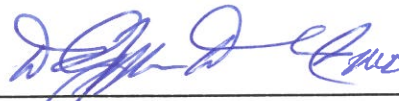
NOES: None

ABSTAIN: None

ABSENT: Kroll



Todd Smithey  
Chairperson of the Board of Retirement



Attest:  
David J. MacDonald  
Secretary of the Board of Retirement

# *Appendix 2*

**Contra Costa County Employees' Retirement Association**  
Asset Allocation as of January 31, 2020

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Insight	934,337,467	10.0%	12.0%	-2.0%		
Sit	543,502,653	5.8%	6.0%	-0.2%		
Dimensional Fund Advisors	448,461,459	4.8%	6.0%	-1.2%		
<b>Total Liquidity</b>	<b>1,926,301,580</b>	<b>20.6%</b>	<b>24.0%</b>	<b>-3.4%</b>	<b>24.0%</b>	<b>-3.4%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	241,873,732	2.6%	2.5%	0.1%		
Jackson Square	252,122,611	2.7%	2.5%	0.2%		
BlackRock Index Fund	204,818,445	2.2%	2.0%	0.2%		
Emerald Advisors	159,085,782	1.7%	1.5%	0.2%		
Ceredex	157,518,892	1.7%	1.5%	0.2%		
<b>Total Domestic Equity</b>	<b>1,015,419,462</b>	<b>10.9%</b>	<b>10.0%</b>	<b>0.9%</b>	<b>5.0%</b>	<b>5.9%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	477,562,481	5.1%	5.0%	0.1%		
William Blair	496,831,167	5.3%	5.0%	0.3%		
First Eagle	380,684,406	4.1%	4.0%	0.1%		
Artisan Global Opportunities	406,322,273	4.3%	4.0%	0.3%		
PIMCO/RAE Emerging Markets	369,299,185	4.0%	4.0%	-0.0%		
TT Emerging Markets	345,420,028	3.7%	4.0%	-0.3%		
<b>Total Global &amp; International Equity</b>	<b>2,476,119,541</b>	<b>26.5%</b>	<b>26.0%</b>	<b>0.5%</b>	<b>24.0%</b>	<b>2.5%</b>
<b>Private Equity</b>						
Private Credit	1,054,495,048	11.3%	11.0%	0.3%	11.0%	0.3%
Real Estate - Value Add	543,788,584	5.8%	5.0%	0.8%	12.0%	-6.2%
Real Estate - Opportunistic & Distress	157,620,045	1.7%	4.0%	-2.3%	4.0%	-2.3%
Real Estate - REIT (Adelante)	463,439,167	5.0%	4.0%	1.0%	4.0%	1.0%
High Yield (Allianz)	81,005,374	0.9%	1.0%	-0.1%	1.0%	-0.1%
Risk Parity	208,444,020	2.2%	2.0%	0.2%	0.0%	2.2%
AQR GRP EL	237,984,724	2.5%	5.0%	-0.0%	5.0%	-0.0%
PanAgora	226,659,492	2.4%				
<b>Total Other Growth Assets</b>	<b>2,973,436,454</b>	<b>31.8%</b>	<b>32.0%</b>	<b>-0.2%</b>	<b>37.0%</b>	<b>-5.2%</b>
<b>Total Growth Assets</b>	<b>6,464,975,457</b>	<b>69.2%</b>	<b>68.0%</b>	<b>1.2%</b>	<b>66.0%</b>	<b>3.2%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	340,783,264	3.6%	3.5%	0.1%	3.0%	0.6%
Parametric Defensive Equity	204,706,320	2.2%	2.5%	-0.3%	3.5%	-1.3%
Wellington Real Total Return	187,519,447	2.0%	2.0%	0.0%	3.5%	-1.5%
<b>Total Risk Diversifying</b>	<b>733,009,031</b>	<b>7.8%</b>	<b>8.0%</b>	<b>-0.2%</b>	<b>10.0%</b>	<b>-2.2%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	33,974,665	0.4%		0.4%		
Cash	185,774,211	2.0%		2.0%		
<b>Total Cash and Overlay</b>	<b>219,748,876</b>	<b>2.4%</b>	<b>0.0%</b>	<b>2.4%</b>	<b>0.0%</b>	<b>2.4%</b>
<b>Total Fund</b>	<b>9,344,034,943.55</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on June 26, 2019 (BOR Resolution 2019-4)

**Contra Costa County Employees' Retirement Association**  
Asset Allocation as of February 28, 2020

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	550,944,412	6.1%	6.0%	0.1%		
Dimensional Fund Advisors	435,726,781	4.8%	6.0%	-1.2%		
Insight	912,339,956	10.1%	12.0%	-1.9%		
<b>Total Liquidity</b>	<b>1,899,011,149</b>	<b>21.0%</b>	<b>24.0%</b>	<b>-3.0%</b>	<b>24.0%</b>	<b>-3.0%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	218,350,454	2.4%	2.5%	-0.1%		
Jackson Square	237,435,823	2.6%	2.5%	0.1%		
BlackRock Index Fund	188,078,042	2.1%	2.0%	0.1%		
Emerald Advisors	148,284,562	1.6%	1.5%	0.1%		
Ceredex	141,654,609	1.6%	1.5%	0.1%		
<b>Total Domestic Equity</b>	<b>933,803,490</b>	<b>10.3%</b>	<b>10.0%</b>	<b>0.3%</b>	<b>5.0%</b>	<b>5.3%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	438,306,986	4.9%	5.0%	-0.1%		
William Blair	464,205,410	5.1%	5.0%	0.1%		
First Eagle	356,306,380	3.9%	4.0%	-0.1%		
Artisan Global Opportunities	383,961,530	4.3%	4.0%	0.3%		
PIMCO/RAE Emerging Markets	314,653,665	3.5%	4.0%	-0.5%		
TT Emerging Markets	328,965,345	3.6%	4.0%	-0.4%		
<b>Total Global &amp; International Equity</b>	<b>2,286,399,315</b>	<b>25.3%</b>	<b>26.0%</b>	<b>-0.7%</b>	<b>24.0%</b>	<b>1.3%</b>
<b>Private Equity</b>						
Private Credit	1,057,420,154	11.7%	11.0%	0.7%	11.0%	0.7%
Real Estate - Value Add	552,469,984	6.1%	5.0%	1.1%	12.0%	-5.9%
Real Estate - Opportunistic & Distress	169,364,998	1.9%	4.0%	-2.1%	4.0%	-2.1%
Real Estate - REIT (Adelante)	459,728,753	5.1%	4.0%	1.1%	4.0%	1.1%
High Yield (Allianz)	74,920,702	0.8%	1.0%	-0.2%	1.0%	-0.2%
Risk Parity	205,602,544	2.3%	2.0%	0.3%	0.0%	2.3%
AQR GRP EL	232,021,268	2.6%	5.0%	0.0%	5.0%	0.0%
PanAgora	221,590,438	2.5%				
<b>Total Other Growth Assets</b>	<b>2,973,118,841</b>	<b>32.9%</b>	<b>32.0%</b>	<b>0.9%</b>	<b>37.0%</b>	<b>-4.1%</b>
<b>Total Growth Assets</b>	<b>6,193,321,646</b>	<b>68.6%</b>	<b>68.0%</b>	<b>0.6%</b>	<b>66.0%</b>	<b>2.6%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	345,204,418	3.8%	3.5%	0.3%	3.0%	0.8%
Parametric Defensive Equity	195,005,902	2.2%	2.5%	-0.3%	3.5%	-1.3%
Wellington Real Total Return	183,655,674	2.0%	2.0%	0.0%	3.5%	-1.5%
<b>Total Risk Diversifying</b>	<b>723,865,994</b>	<b>8.0%</b>	<b>8.0%</b>	<b>0.0%</b>	<b>10.0%</b>	<b>-2.0%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	42,093,540	0.5%		0.5%		
Cash	175,618,704	1.9%		1.9%		
<b>Total Cash and Overlay</b>	<b>217,712,244</b>	<b>2.4%</b>	<b>0.0%</b>	<b>2.4%</b>	<b>0.0%</b>	<b>2.4%</b>
<b>Total Fund</b>	<b>9,033,911,032.87</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on June 26, 2019 (BOR Resolution 2019-4)

**Contra Costa County Employees' Retirement Association**  
Asset Allocation as of March 31, 2020

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	552,669,526	6.6%	6.0%	0.6%		
Dimensional Fund Advisors	413,652,257	4.9%	6.0%	-1.1%		
Insight	865,823,667	10.3%	12.0%	-1.7%		
<b>Total Liquidity</b>	<b>1,832,145,450</b>	<b>21.8%</b>	<b>24.0%</b>	<b>-2.2%</b>	<b>24.0%</b>	<b>-2.2%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	179,037,451	2.1%	2.5%	-0.4%		
Jackson Square	213,837,026	2.5%	2.5%	0.0%		
BlackRock Index Fund	163,246,783	1.9%	2.0%	-0.1%		
Emerald Advisors	120,381,318	1.4%	1.5%	-0.1%		
Ceredex	107,312,686	1.3%	1.5%	-0.2%		
<b>Total Domestic Equity</b>	<b>783,815,264</b>	<b>9.3%</b>	<b>10.0%</b>	<b>-0.7%</b>	<b>5.0%</b>	<b>4.3%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	392,588,559	4.7%	5.0%	-0.3%		
William Blair	405,741,804	4.8%	5.0%	-0.2%		
First Eagle	317,958,422	3.8%	4.0%	-0.2%		
Artisan Global Opportunities	352,105,128	4.2%	4.0%	0.2%		
PIMCO/RAE Emerging Markets	246,810,121	2.9%	4.0%	-1.1%		
TT Emerging Markets	262,473,033	3.1%	4.0%	-0.9%		
<b>Total Global &amp; International Equity</b>	<b>1,977,677,067</b>	<b>23.6%</b>	<b>26.0%</b>	<b>-2.4%</b>	<b>24.0%</b>	<b>-0.4%</b>
<b>Private Equity</b>						
Private Credit	1,070,485,342	12.8%	11.0%	1.8%	11.0%	1.8%
Real Estate - Value Add	568,997,177	6.8%	5.0%	1.8%	12.0%	-5.2%
Real Estate - Opportunistic & Distress	173,472,206	2.1%	4.0%	-1.9%	4.0%	-1.9%
Real Estate - REIT (Adelante)	454,113,478	5.4%	4.0%	1.4%	4.0%	1.4%
High Yield (Allianz)	61,404,863	0.7%	1.0%	-0.3%	1.0%	-0.3%
Risk Parity	186,258,968	2.2%	2.0%	0.2%	0.0%	2.2%
AQR GRP EL	212,979,688	2.5%	5.0%	-0.1%	5.0%	-0.1%
PanAgora	201,563,058	2.4%				
<b>Total Other Growth Assets</b>	<b>2,929,274,780</b>	<b>34.9%</b>	<b>32.0%</b>	<b>2.9%</b>	<b>37.0%</b>	<b>-2.1%</b>
<b>Total Growth Assets</b>	<b>5,690,767,111</b>	<b>67.8%</b>	<b>68.0%</b>	<b>-0.2%</b>	<b>66.0%</b>	<b>1.8%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	343,783,680	4.1%	3.5%	0.6%	3.0%	1.1%
Parametric Defensive Equity	177,951,621	2.1%	2.5%	-0.4%	3.5%	-1.4%
Wellington Real Total Return	70,067,599	0.8%	2.0%	-1.2%	3.5%	-2.7%
<b>Total Risk Diversifying</b>	<b>591,802,900</b>	<b>7.1%</b>	<b>8.0%</b>	<b>-0.9%</b>	<b>10.0%</b>	<b>-2.9%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	37,443,825	0.4%		0.4%		
Cash	242,040,035	2.9%		2.9%		
<b>Total Cash and Overlay</b>	<b>279,483,860</b>	<b>3.3%</b>	<b>0.0%</b>	<b>3.3%</b>	<b>0.0%</b>	<b>3.3%</b>
<b>Total Fund</b>	<b>8,394,199,321</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on June 26, 2019 (BOR Resolution 2019-4)

**Contra Costa County Employees' Retirement Association**  
Asset Allocation as of April 30, 2020

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	602,921,519	6.9%	6.0%	0.9%		
Dimensional Fund Advisors	405,589,452	4.6%	6.0%	-1.4%		
Insight	858,089,834	9.8%	12.0%	-2.2%		
<b>Total Liquidity</b>	<b>1,866,600,804</b>	<b>21.4%</b>	<b>24.0%</b>	<b>-2.6%</b>	<b>24.0%</b>	<b>-2.6%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	201,010,177	2.3%	2.5%	-0.2%		
Jackson Square	244,951,312	2.8%	2.5%	0.3%		
BlackRock Index Fund	184,809,846	2.1%	2.0%	0.1%		
Emerald Advisors	139,091,467	1.6%	1.5%	0.1%		
Ceredex	119,585,730	1.4%	1.5%	-0.1%		
<b>Total Domestic Equity</b>	<b>889,448,531</b>	<b>10.2%</b>	<b>10.0%</b>	<b>0.2%</b>	<b>5.0%</b>	<b>5.2%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	420,396,713	4.8%	5.0%	-0.2%		
William Blair	440,338,245	5.0%	5.0%	0.0%		
First Eagle	347,590,727	4.0%	4.0%	-0.0%		
Artisan Global Opportunities	444,412,562	5.1%	4.0%	1.1%		
PIMCO/RAE Emerging Markets	269,511,275	3.1%	4.0%	-0.9%		
TT Emerging Markets	292,110,706	3.3%	4.0%	-0.7%		
<b>Total Global &amp; International Equity</b>	<b>2,214,360,228</b>	<b>25.4%</b>	<b>26.0%</b>	<b>-0.6%</b>	<b>24.0%</b>	<b>1.4%</b>
<b>Private Equity</b>						
Private Credit	1,074,785,721	12.3%	11.0%	1.3%	11.0%	1.3%
Real Estate - Value Add	604,587,020	6.9%	5.0%	1.9%	12.0%	-5.1%
Real Estate - Opportunistic & Distress	182,422,108	2.1%	4.0%	-1.9%	4.0%	-1.9%
Real Estate - REIT (Adelante)	459,601,485	5.3%	4.0%	1.3%	4.0%	1.3%
High Yield (Allianz)	66,164,917	0.8%	1.0%	-0.2%	1.0%	-0.2%
Risk Parity	190,262,311	2.2%	2.0%	0.2%	0.0%	2.2%
AQR GRP EL	216,224,259	2.5%	5.0%	-0.1%	5.0%	-0.1%
PanAgora	210,296,530	2.4%				
<b>Total Other Growth Assets</b>	<b>3,004,344,351</b>	<b>34.4%</b>	<b>32.0%</b>	<b>2.4%</b>	<b>37.0%</b>	<b>-2.6%</b>
<b>Total Growth Assets</b>	<b>6,108,153,110</b>	<b>70.0%</b>	<b>68.0%</b>	<b>2.0%</b>	<b>66.0%</b>	<b>4.0%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	346,458,519	4.0%	3.5%	0.5%	3.0%	1.0%
Parametric Defensive Equity	175,872,761	2.0%	2.5%	-0.5%	3.5%	-1.5%
Wellington Real Total Return	71,603,011	0.8%	2.0%	-1.2%	3.5%	-2.7%
<b>Total Risk Diversifying</b>	<b>593,934,291</b>	<b>6.8%</b>	<b>8.0%</b>	<b>-1.2%</b>	<b>10.0%</b>	<b>-3.2%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	43,544,435	0.5%		0.5%		
Cash	112,694,667	1.3%		1.3%		
<b>Total Cash and Overlay</b>	<b>156,239,102</b>	<b>1.8%</b>	<b>0.0%</b>	<b>1.8%</b>	<b>0.0%</b>	<b>1.8%</b>
<b>Total Fund</b>	<b>8,724,927,307</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on June 26, 2019 (BOR Resolution 2019-4)



**Contra Costa County Employees' Retirement Association**  
Asset Allocation as of May 31, 2020

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	603,437,327	6.8%	6.0%	0.8%		
Dimensional Fund Advisors	394,272,069	4.4%	6.0%	-1.6%		
Insight	837,664,209	9.4%	12.0%	-2.6%		
<b>Total Liquidity</b>	<b>1,835,373,606</b>	<b>20.7%</b>	<b>24.0%</b>	<b>-3.3%</b>	<b>24.0%</b>	<b>-3.3%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	208,422,805	2.3%	2.5%	-0.2%		
Jackson Square	269,768,239	3.0%	2.5%	0.5%		
BlackRock Index Fund	194,554,649	2.2%	2.0%	0.2%		
Emerald Advisors	154,949,451	1.7%	1.5%	0.2%		
Ceredex	123,405,557	1.4%	1.5%	-0.1%		
<b>Total Domestic Equity</b>	<b>951,100,702</b>	<b>10.7%</b>	<b>10.0%</b>	<b>0.7%</b>	<b>5.0%</b>	<b>5.7%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	430,996,518	4.9%	5.0%	-0.1%		
William Blair	475,372,615	5.4%	5.0%	0.4%		
First Eagle	407,790,061	4.6%	4.0%	0.6%		
Artisan Global Opportunities	486,870,144	5.5%	4.0%	1.5%		
PIMCO/RAE Emerging Markets	273,727,786	3.1%	4.0%	-0.9%		
TT Emerging Markets	290,122,031	3.3%	4.0%	-0.7%		
<b>Total Global &amp; International Equity</b>	<b>2,364,879,155</b>	<b>26.6%</b>	<b>26.0%</b>	<b>0.6%</b>	<b>24.0%</b>	<b>2.6%</b>
<b>Private Equity</b>						
Private Credit	1,048,980,777	11.8%	11.0%	0.8%	11.0%	0.8%
Real Estate - Value Add	620,039,973	7.0%	5.0%	2.0%	12.0%	-5.0%
Real Estate - Opportunistic & Distress	182,263,360	2.1%	4.0%	-1.9%	4.0%	-1.9%
Real Estate - REIT (Adelante)	461,382,405	5.2%	4.0%	1.2%	4.0%	1.2%
High Yield (Allianz)	66,297,287	0.7%	1.0%	-0.3%	1.0%	-0.3%
Risk Parity	198,178,359	2.2%	2.0%	0.2%	0.0%	2.2%
AQR GRP EL	219,880,916	2.5%	5.0%	-0.1%	5.0%	-0.1%
PanAgora	215,466,238	2.4%				
<b>Total Other Growth Assets</b>	<b>3,012,489,315</b>	<b>33.9%</b>	<b>32.0%</b>	<b>1.9%</b>	<b>37.0%</b>	<b>-3.1%</b>
<b>Total Growth Assets</b>	<b>6,328,469,172</b>	<b>71.3%</b>	<b>68.0%</b>	<b>3.3%</b>	<b>66.0%</b>	<b>5.3%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	271,547,925	3.1%	3.5%	-0.4%	3.0%	0.1%
Parametric Defensive Equity	177,255,796	2.0%	2.5%	-0.5%	3.5%	-1.5%
Wellington Real Total Return	1,119,580	0.0%	2.0%	-2.0%	3.5%	-3.5%
<b>Total Risk Diversifying</b>	<b>449,923,301</b>	<b>5.1%</b>	<b>8.0%</b>	<b>-2.9%</b>	<b>10.0%</b>	<b>-4.9%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	46,947,057	0.5%		0.5%		
Cash	221,121,182	2.5%		2.5%		
<b>Total Cash and Overlay</b>	<b>268,068,238</b>	<b>3.0%</b>	<b>0.0%</b>	<b>3.0%</b>	<b>0.0%</b>	<b>3.0%</b>
<b>Total Fund</b>	<b>8,881,834,317</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on June 26, 2019 (BOR Resolution 2019-4)

**Contra Costa County Employees' Retirement Association**  
Asset Allocation as of June 30, 2020

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	603,382,248	6.8%	6.0%	0.8%		
Dimensional Fund Advisors	381,344,231	4.3%	6.0%	-1.7%		
Insight	814,518,772	9.1%	12.0%	-2.9%		
<b>Total Liquidity</b>	<b>1,799,245,251</b>	<b>20.2%</b>	<b>24.0%</b>	<b>-3.8%</b>	<b>24.0%</b>	<b>-3.8%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	209,106,725	2.3%	2.5%	-0.2%		
Jackson Square	277,961,088	3.1%	2.5%	0.6%		
BlackRock Index Fund	198,853,668	2.2%	2.0%	0.2%		
Emerald Advisors	159,569,780	1.8%	1.5%	0.3%		
Ceredex	126,136,312	1.4%	1.5%	-0.1%		
<b>Total Domestic Equity</b>	<b>971,627,572</b>	<b>10.9%</b>	<b>10.0%</b>	<b>0.9%</b>	<b>5.0%</b>	<b>5.9%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	442,003,290	5.0%	5.0%	-0.0%		
William Blair	504,713,901	5.7%	5.0%	0.7%		
First Eagle	414,027,367	4.6%	4.0%	0.6%		
Artisan Global Opportunities	511,057,045	5.7%	4.0%	1.7%		
PIMCO/RAE Emerging Markets	287,988,049	3.2%	4.0%	-0.8%		
TT Emerging Markets	314,723,866	3.5%	4.0%	-0.5%		
<b>Total Global &amp; International Equity</b>	<b>2,474,513,518</b>	<b>27.8%</b>	<b>26.0%</b>	<b>1.8%</b>	<b>24.0%</b>	<b>3.8%</b>
<b>Private Equity</b>						
Private Credit	1,017,093,034	11.4%	11.0%	0.4%	11.0%	0.4%
Real Estate - Value Add	615,483,685	6.9%	5.0%	1.9%	12.0%	-5.1%
Real Estate - Opportunistic & Distress	182,377,987	2.0%	4.0%	-2.0%	4.0%	-2.0%
Real Estate - REIT (Adelante)	444,521,758	5.0%	4.0%	1.0%	4.0%	1.0%
High Yield (Allianz)	68,077,283	0.8%	1.0%	-0.2%	1.0%	-0.2%
Risk Parity	197,837,624	2.2%	2.0%	0.2%	0.0%	2.2%
AQR GRP EL	223,929,256	2.5%	5.0%	-0.0%	5.0%	-0.0%
PanAgora	220,521,020	2.5%				
<b>Total Other Growth Assets</b>	<b>2,969,841,648</b>	<b>33.3%</b>	<b>32.0%</b>	<b>1.3%</b>	<b>37.0%</b>	<b>-3.7%</b>
<b>Total Growth Assets</b>	<b>6,415,982,738</b>	<b>72.0%</b>	<b>68.0%</b>	<b>4.0%</b>	<b>66.0%</b>	<b>6.0%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	272,314,036	3.1%	3.5%	-0.4%	3.0%	0.1%
Parametric Defensive Equity	178,669,547	2.0%	2.5%	-0.5%	3.5%	-1.5%
Wellington Real Total Return	921,688	0.0%	2.0%	-2.0%	3.5%	-3.5%
<b>Total Risk Diversifying</b>	<b>451,905,270</b>	<b>5.1%</b>	<b>8.0%</b>	<b>-2.9%</b>	<b>10.0%</b>	<b>-4.9%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	50,091,075	0.6%		0.6%		
Cash	192,006,578	2.2%		2.2%		
<b>Total Cash and Overlay</b>	<b>242,097,653</b>	<b>2.7%</b>	<b>0.0%</b>	<b>2.7%</b>	<b>0.0%</b>	<b>2.7%</b>
<b>Total Fund</b>	<b>8,909,230,911</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on June 26, 2019 (BOR Resolution 2019-4)

**Contra Costa County Employees' Retirement Association**  
**Asset Allocation as of July 31, 2020**

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	603,491,739	6.4%	6.0%	0.4%		
Dimensional Fund Advisors	427,963,397	4.5%	6.0%	-1.5%		
Insight	790,117,322	8.4%	12.0%	-3.6%		
<b>Total Liquidity</b>	<b>1,821,572,457</b>	<b>19.3%</b>	<b>24.0%</b>	<b>-4.7%</b>	<b>24.0%</b>	<b>-4.7%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	198,052,946	2.1%	2.5%	-0.4%		
Jackson Square	203,223,387	2.2%	2.5%	-0.3%		
BlackRock Index Fund	195,440,508	2.1%	2.0%	0.1%		
Emerald Advisors	149,939,432	1.6%	1.5%	0.1%		
Ceredex	130,206,971	1.4%	1.5%	-0.1%		
<b>Total Domestic Equity</b>	<b>876,863,245</b>	<b>9.3%</b>	<b>10.0%</b>	<b>-0.7%</b>	<b>5.0%</b>	<b>4.3%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	459,122,031	4.9%	5.0%	-0.1%		
William Blair	508,082,279	5.4%	5.0%	0.4%		
First Eagle	432,518,579	4.6%	4.0%	0.6%		
Artisan Global Opportunities	514,795,722	5.5%	4.0%	1.5%		
PIMCO/RAE Emerging Markets	300,899,713	3.2%	4.0%	-0.8%		
TT Emerging Markets	349,140,775	3.7%	4.0%	-0.3%		
<b>Total Global &amp; International Equity</b>	<b>2,564,559,098</b>	<b>27.2%</b>	<b>26.0%</b>	<b>1.2%</b>	<b>24.0%</b>	<b>3.2%</b>
<b>Private Equity</b>						
Private Credit	983,728,594	10.4%	11.0%	-0.6%	11.0%	-0.6%
Real Estate - Value Add	636,286,942	6.7%	5.0%	1.7%	12.0%	-5.3%
Real Estate - Opportunistic & Distress	186,015,180	2.0%	4.0%	-2.0%	4.0%	-2.0%
Real Estate - REIT (Adelante)	448,271,334	4.7%	4.0%	0.7%	4.0%	0.7%
High Yield (Allianz)	71,229,244	0.8%	1.0%	-0.2%	1.0%	-0.2%
Risk Parity	167,690,722	1.8%	2.0%	-0.2%	0.0%	1.8%
AQR GRP EL	231,638,915	2.5%	5.0%	-0.1%	5.0%	-0.1%
PanAgora	230,512,434	2.4%				
<b>Total Other Growth Assets</b>	<b>2,955,373,365</b>	<b>31.3%</b>	<b>32.0%</b>	<b>-0.7%</b>	<b>37.0%</b>	<b>-5.7%</b>
<b>Total Growth Assets</b>	<b>6,396,795,708</b>	<b>67.8%</b>	<b>68.0%</b>	<b>-0.2%</b>	<b>66.0%</b>	<b>1.8%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	274,032,117	2.9%	3.5%	-0.6%	3.0%	-0.1%
Parametric Defensive Equity	181,019,871	1.9%	2.5%	-0.6%	3.5%	-1.6%
Wellington Real Total Return	418,450	0.0%	2.0%	-2.0%	3.5%	-3.5%
<b>Total Risk Diversifying</b>	<b>455,470,438</b>	<b>4.8%</b>	<b>8.0%</b>	<b>-3.2%</b>	<b>10.0%</b>	<b>-5.2%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	54,838,009	0.6%		0.6%		
Cash	711,933,778	7.5%		7.5%		
<b>Total Cash and Overlay</b>	<b>766,771,787</b>	<b>8.1%</b>	<b>0.0%</b>	<b>8.1%</b>	<b>0.0%</b>	<b>8.1%</b>
<b>Total Fund</b>	<b>9,440,610,390</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on June 26, 2019 (BOR Resolution 2019-4)

**Contra Costa County Employees' Retirement Association  
Asset Allocation as of August 31, 2020**

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	603,451,423	6.3%	6.0%	0.3%		
Dimensional Fund Advisors	483,768,582	5.1%	6.0%	-0.9%		
Insight	1,173,657,892	12.3%	13.0%	-0.7%		
<b>Total Liquidity</b>	<b>2,260,877,897</b>	<b>23.7%</b>	<b>25.0%</b>	<b>-1.3%</b>	<b>24.0%</b>	<b>-0.3%</b>
		<b>Range 16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	203,973,317	2.1%	2.0%	0.1%		
Jackson Square	218,155,669	2.3%	2.0%	0.3%		
BlackRock Index Fund	209,780,499	2.2%	2.0%	0.2%		
Emerald Advisors	157,577,174	1.6%	1.5%	0.1%		
Ceredex	132,859,376	1.4%	1.5%	-0.1%		
<b>Total Domestic Equity</b>	<b>922,346,034</b>	<b>9.6%</b>	<b>9.0%</b>	<b>0.6%</b>	<b>5.0%</b>	<b>4.6%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	471,364,638	4.9%	5.0%	-0.1%		
William Blair	540,068,088	5.7%	5.0%	0.7%		
First Eagle	447,540,252	4.7%	4.0%	0.7%		
Artisan Global Opportunities	543,871,100	5.7%	4.0%	1.7%		
PIMCO/RAE Emerging Markets	303,119,904	3.2%	4.0%	-0.8%		
TT Emerging Markets	358,955,848	3.8%	4.0%	-0.2%		
<b>Total Global &amp; International Equity</b>	<b>2,664,919,831</b>	<b>27.9%</b>	<b>26.0%</b>	<b>1.9%</b>	<b>24.0%</b>	<b>3.9%</b>
<b>Private Equity</b>	985,568,340	10.3%	11.0%	-0.7%	11.0%	-0.7%
<b>Private Credit</b>	636,283,099	6.7%	7.0%	-0.3%	12.0%	-5.3%
<b>Real Estate - Value Add</b>	180,713,611	1.9%	4.0%	-2.1%	4.0%	-2.1%
<b>Real Estate - Opportunistic &amp; Distress</b>	444,560,070	4.7%	4.0%	0.7%	4.0%	0.7%
<b>Real Estate - REIT (Adelante)</b>	71,710,152	0.8%	1.0%	-0.2%	1.0%	-0.2%
<b>High Yield (Allianz)</b>	169,582,234	1.8%	1.5%	0.3%	0.0%	1.8%
<b>Risk Parity</b>			5.0%	-0.1%	5.0%	-0.1%
AQR GRP EL	235,129,433	2.5%				
PanAgora	233,841,178	2.4%				
<b>Total Other Growth Assets</b>	<b>2,957,388,117</b>	<b>30.9%</b>	<b>33.5%</b>	<b>-2.6%</b>	<b>37.0%</b>	<b>-6.1%</b>
<b>Total Growth Assets</b>	<b>6,544,653,982</b>	<b>68.5%</b>	<b>68.5%</b>	<b>-0.0%</b>	<b>66.0%</b>	<b>2.5%</b>
		<b>Range 60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	273,024,343	2.9%	3.0%	-0.1%	3.0%	-0.1%
Parametric Defensive Equity	179,500,148	1.9%	2.0%	-0.1%	3.5%	-1.6%
Acadian MAARS	99,834,109	1.0%	1.5%			
Wellington Real Total Return	268,649	0.0%	0.0%	0.0%	3.5%	-3.5%
<b>Total Risk Diversifying</b>	<b>552,627,249</b>	<b>5.8%</b>	<b>6.5%</b>	<b>-0.7%</b>	<b>10.0%</b>	<b>-4.2%</b>
		<b>Range 0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	59,857,668	0.6%		0.6%		
Cash	140,533,737	1.5%		1.5%		
<b>Total Cash and Overlay</b>	<b>200,391,405</b>	<b>2.1%</b>	<b>0.0%</b>	<b>2.1%</b>	<b>0.0%</b>	<b>2.1%</b>
<b>Total Fund</b>	<b>9,558,550,532</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on July 22, 2020 (BOR Resolution 2020-2).

**Contra Costa County Employees' Retirement Association**  
**Asset Allocation as of September 30, 2020**

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	603,096,275	6.4%	6.0%	0.4%		
Dimensional Fund Advisors	469,043,159	4.9%	6.0%	-1.1%		
Insight	1,145,047,708	12.1%	13.0%	-0.9%		
<b>Total Liquidity</b>	<b>2,217,187,141</b>	<b>23.3%</b>	<b>25.0%</b>	<b>-1.7%</b>	<b>24.0%</b>	<b>-0.7%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	197,682,430	2.1%	2.0%	0.1%		
Jackson Square	209,673,177	2.2%	2.0%	0.2%		
BlackRock Index Fund	202,103,346	2.1%	2.0%	0.1%		
Emerald Advisors	154,524,877	1.6%	1.5%	0.1%		
Ceredex	129,144,563	1.4%	1.5%	-0.1%		
<b>Total Domestic Equity</b>	<b>893,128,393</b>	<b>9.4%</b>	<b>9.0%</b>	<b>0.4%</b>	<b>5.0%</b>	<b>4.4%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	456,590,623	4.8%	5.0%	-0.2%		
William Blair	535,352,232	5.6%	5.0%	0.6%		
First Eagle	437,391,104	4.6%	4.0%	0.6%		
Artisan Global Opportunities	541,609,682	5.7%	4.0%	1.7%		
PIMCO/RAE Emerging Markets	296,888,358	3.1%	4.0%	-0.9%		
TT Emerging Markets	349,493,604	3.7%	4.0%	-0.3%		
<b>Total Global &amp; International Equity</b>	<b>2,617,325,603</b>	<b>27.6%</b>	<b>26.0%</b>	<b>1.6%</b>	<b>24.0%</b>	<b>3.6%</b>
<b>Private Equity</b>						
<b>Private Credit</b>						
<b>Real Estate - Value Add</b>						
<b>Real Estate - Opportunistic &amp; Distress</b>						
<b>Real Estate - REIT (Adelante)</b>						
<b>High Yield (Allianz)</b>						
<b>Risk Parity</b>						
AQR GRP EL	1,037,446,201	10.9%	11.0%	-0.1%	11.0%	-0.1%
PanAgora	679,401,095	7.2%	7.0%	0.2%	12.0%	-4.8%
	182,795,666	1.9%	4.0%	-2.1%	4.0%	-2.1%
	416,723,769	4.4%	4.0%	0.4%	4.0%	0.4%
	68,911,573	0.7%	1.0%	-0.3%	1.0%	-0.3%
	167,943,516	1.8%	1.5%	0.3%	0.0%	1.8%
	233,024,231	2.5%	5.0%	-0.1%	5.0%	-0.1%
<b>Total Other Growth Assets</b>	<b>3,017,522,613</b>	<b>31.8%</b>	<b>33.5%</b>	<b>-1.7%</b>	<b>37.0%</b>	<b>-5.2%</b>
<b>Total Growth Assets</b>	<b>6,527,976,608</b>	<b>68.7%</b>	<b>68.5%</b>	<b>0.2%</b>	<b>66.0%</b>	<b>2.7%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	272,920,161	2.9%	3.0%	-0.1%	3.0%	-0.1%
Parametric Defensive Equity	105,472,202	1.1%	2.0%	-0.9%	3.5%	-2.4%
Acadian MAARS	124,455,662	1.3%	1.5%			
Wellington Real Total Return	268,649	0.0%	0.0%	0.0%	3.5%	-3.5%
<b>Total Risk Diversifying</b>	<b>503,116,674</b>	<b>5.3%</b>	<b>6.5%</b>	<b>-1.2%</b>	<b>10.0%</b>	<b>-4.7%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	107,050,594	1.1%		1.1%		
Cash	141,312,387	1.5%		1.5%		
<b>Total Cash and Overlay</b>	<b>248,362,982</b>	<b>2.6%</b>	<b>0.0%</b>	<b>2.6%</b>	<b>0.0%</b>	<b>2.6%</b>
<b>Total Fund</b>	<b>9,496,643,405</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on July 22, 2020 (BOR Resolution 2020-2).

**Contra Costa County Employees' Retirement Association**  
**Asset Allocation as of October 31, 2020**

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	600,860,016	6.4%	6.0%	0.4%		
Dimensional Fund Advisors	454,563,604	4.8%	6.0%	-1.2%		
Insight	1,118,559,556	11.9%	13.0%	-1.1%		
<b>Total Liquidity</b>	<b>2,173,983,175</b>	<b>23.1%</b>	<b>25.0%</b>	<b>-1.9%</b>	<b>24.0%</b>	<b>-0.9%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	196,804,662	2.1%	2.0%	0.1%		
Jackson Square	205,227,147	2.2%	2.0%	0.2%		
BlackRock Index Fund	197,239,730	2.1%	2.0%	0.1%		
Emerald Advisors	157,605,076	1.7%	1.5%	0.2%		
Ceredex	134,552,297	1.4%	1.5%	-0.1%		
<b>Total Domestic Equity</b>	<b>891,428,911</b>	<b>9.5%</b>	<b>9.0%</b>	<b>0.5%</b>	<b>5.0%</b>	<b>4.5%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	437,097,286	4.6%	5.0%	-0.4%		
William Blair	529,201,115	5.6%	5.0%	0.6%		
First Eagle	429,383,341	4.6%	4.0%	0.6%		
Artisan Global Opportunities	528,848,821	5.6%	4.0%	1.6%		
PIMCO/RAE Emerging Markets	296,040,622	3.1%	4.0%	-0.9%		
TT Emerging Markets	352,669,069	3.7%	4.0%	-0.3%		
<b>Total Global &amp; International Equity</b>	<b>2,573,240,255</b>	<b>27.3%</b>	<b>26.0%</b>	<b>1.3%</b>	<b>24.0%</b>	<b>3.3%</b>
<b>Private Equity</b>						
Private Credit	1,057,387,279	11.2%	11.0%	0.2%	11.0%	0.2%
Real Estate - Value Add	684,928,818	7.3%	7.0%	0.3%	12.0%	-4.7%
Real Estate - Opportunistic & Distress	183,244,487	1.9%	4.0%	-2.1%	4.0%	-2.1%
Real Estate - REIT (Adelante)	413,080,993	4.4%	4.0%	0.4%	4.0%	0.4%
High Yield (Allianz)	67,476,228	0.7%	1.0%	-0.3%	1.0%	-0.3%
Risk Parity	168,774,831	1.8%	1.5%	0.3%	0.0%	1.8%
AQR GRP EL	230,277,309	2.4%	5.0%	-0.1%	5.0%	-0.1%
PanAgora	227,747,686	2.4%				
<b>Total Other Growth Assets</b>	<b>3,032,917,630</b>	<b>32.2%</b>	<b>33.5%</b>	<b>-1.3%</b>	<b>37.0%</b>	<b>-4.8%</b>
<b>Total Growth Assets</b>	<b>6,497,586,796</b>	<b>68.9%</b>	<b>68.5%</b>	<b>0.4%</b>	<b>66.0%</b>	<b>2.9%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	270,919,028	2.9%	3.0%	-0.1%	3.0%	-0.1%
Parametric Defensive Equity	105,238,517	1.1%	2.0%	-0.9%	3.5%	-2.4%
Acadian MAARS	123,865,092	1.3%	1.5%			
Wellington Real Total Return	168,040	0.0%	0.0%	0.0%	3.5%	-3.5%
<b>Total Risk Diversifying</b>	<b>500,190,678</b>	<b>5.3%</b>	<b>6.5%</b>	<b>-1.2%</b>	<b>10.0%</b>	<b>-4.7%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	103,738,535	1.1%		1.1%		
Cash	151,363,545	1.6%		1.6%		
<b>Total Cash and Overlay</b>	<b>255,102,080</b>	<b>2.7%</b>	<b>0.0%</b>	<b>2.7%</b>	<b>0.0%</b>	<b>2.7%</b>
<b>Total Fund</b>	<b>9,426,862,729</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on July 22, 2020 (BOR Resolution 2020-2).

**Contra Costa County Employees' Retirement Association**  
**Asset Allocation as of November 30, 2020**

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	600,695,060	6.1%	6.0%	0.1%		
Dimensional Fund Advisors	440,832,236	4.5%	6.0%	-1.5%		
Insight	1,094,889,911	11.1%	13.0%	-1.9%		
<b>Total Liquidity</b>	<b>2,136,417,207</b>	<b>21.7%</b>	<b>25.0%</b>	<b>-3.3%</b>	<b>24.0%</b>	<b>-2.3%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	225,719,809	2.3%	2.0%	0.3%		
Jackson Square	232,118,825	2.4%	2.0%	0.4%		
BlackRock Index Fund	220,456,252	2.2%	2.0%	0.2%		
Emerald Advisors	177,661,130	1.8%	1.5%	0.3%		
Ceredex	153,838,553	1.6%	1.5%	0.1%		
<b>Total Domestic Equity</b>	<b>1,009,794,568</b>	<b>10.2%</b>	<b>9.0%</b>	<b>1.2%</b>	<b>5.0%</b>	<b>5.2%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	488,397,506	5.0%	5.0%	-0.0%		
William Blair	585,791,393	5.9%	5.0%	0.9%		
First Eagle	467,220,232	4.7%	4.0%	0.7%		
Artisan Global Opportunities	576,823,195	5.8%	4.0%	1.8%		
PIMCO/RAE Emerging Markets	340,785,094	3.5%	4.0%	-0.5%		
TT Emerging Markets	391,993,515	4.0%	4.0%	-0.0%		
<b>Total Global &amp; International Equity</b>	<b>2,851,010,934</b>	<b>28.9%</b>	<b>26.0%</b>	<b>2.9%</b>	<b>24.0%</b>	<b>4.9%</b>
<b>Private Equity</b>						
<b>Private Credit</b>						
<b>Real Estate - Value Add</b>						
<b>Real Estate - Opportunistic &amp; Distress</b>						
<b>Real Estate - REIT (Adelante)</b>						
<b>High Yield (Allianz)</b>						
<b>Risk Parity</b>						
AQR GRP EL	242,585,542	2.5%	5.0%	-0.1%	5.0%	-0.1%
PanAgora	245,010,988	2.5%				
<b>Total Other Growth Assets</b>	<b>3,085,180,443</b>	<b>31.3%</b>	<b>33.5%</b>	<b>-2.2%</b>	<b>37.0%</b>	<b>-5.7%</b>
<b>Total Growth Assets</b>	<b>6,945,985,946</b>	<b>70.4%</b>	<b>68.5%</b>	<b>1.9%</b>	<b>66.0%</b>	<b>4.4%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	271,789,245	2.8%	3.0%	-0.2%	3.0%	-0.2%
Parametric Defensive Equity	106,885,266	1.1%	2.0%	-0.9%	3.5%	-2.4%
Acadian MAARS	123,732,299	1.3%	1.5%			
Wellington Real Total Return	168,040	0.0%	0.0%	0.0%	3.5%	-3.5%
<b>Total Risk Diversifying</b>	<b>502,574,851</b>	<b>5.1%</b>	<b>6.5%</b>	<b>-1.4%</b>	<b>10.0%</b>	<b>-4.9%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	119,398,413	1.2%		1.2%		
Cash	159,084,811	1.6%		1.6%		
<b>Total Cash and Overlay</b>	<b>278,483,224</b>	<b>2.8%</b>	<b>0.0%</b>	<b>2.8%</b>	<b>0.0%</b>	<b>2.8%</b>
<b>Total Fund</b>	<b>9,863,461,227</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on July 22, 2020 (BOR Resolution 2020-2).

**Contra Costa County Employees' Retirement Association**  
**Asset Allocation as of December 31, 2020**

	Market Value	Percentage of Total Fund	Current Target Percentage	Current Target Over/(Under)	Long Term Target	Long Term Over/(Under)
<b>Liquidity</b>						
Sit	599,181,635	5.9%	6.0%	-0.1%		
Dimensional Fund Advisors	426,576,384	4.2%	6.0%	-1.8%		
Insight	1,069,317,369	10.5%	13.0%	-2.5%		
<b>Total Liquidity</b>	<b>2,095,075,389</b>	<b>20.6%</b>	<b>25.0%</b>	<b>-4.4%</b>	<b>24.0%</b>	<b>-3.4%</b>
		<b>Range</b>				
		<b>16% - 28%</b>				
<b>Growth</b>						
<b>Domestic Equity</b>						
Boston Partners	234,795,447	2.3%	2.0%	0.3%		
Jackson Square	243,346,164	2.4%	2.0%	0.4%		
BlackRock Index Fund	229,775,570	2.3%	2.0%	0.3%		
Emerald Advisors	194,942,957	1.9%	1.5%	0.4%		
Ceredex	164,252,512	1.6%	1.5%	0.1%		
<b>Total Domestic Equity</b>	<b>1,067,112,649</b>	<b>10.5%</b>	<b>9.0%</b>	<b>1.5%</b>	<b>5.0%</b>	<b>5.5%</b>
<b>Global &amp; International Equity</b>						
Pyrford (BMO)	508,279,141	5.0%	5.0%	0.0%		
William Blair	624,338,394	6.1%	5.0%	1.1%		
First Eagle	485,083,633	4.8%	4.0%	0.8%		
Artisan Global Opportunities	598,791,258	5.9%	4.0%	1.9%		
PIMCO/RAE Emerging Markets	375,063,168	3.7%	4.0%	-0.3%		
TT Emerging Markets	433,114,183	4.3%	4.0%	0.3%		
<b>Total Global &amp; International Equity</b>	<b>3,024,669,777</b>	<b>29.8%</b>	<b>26.0%</b>	<b>3.8%</b>	<b>24.0%</b>	<b>5.8%</b>
<b>Private Equity</b>						
<b>Private Credit</b>						
<b>Real Estate - Value Add</b>						
<b>Real Estate - Opportunistic &amp; Distress</b>						
<b>Real Estate - REIT (Adelante)</b>						
<b>High Yield (Allianz)</b>						
<b>Risk Parity</b>						
AQR GRP EL	1,037,482,181	10.2%	11.0%	-0.8%	11.0%	-0.8%
PanAgora	739,239,382	7.3%	7.0%	0.3%	12.0%	-4.7%
	182,040,043	1.8%	4.0%	-2.2%	4.0%	-2.2%
	408,166,722	4.0%	4.0%	0.0%	4.0%	0.0%
	76,519,958	0.8%	1.0%	-0.2%	1.0%	-0.2%
	177,037,759	1.7%	1.5%	0.2%	0.0%	1.7%
	250,241,057	2.5%	5.0%	-0.0%	5.0%	-0.0%
	253,536,148	2.5%				
<b>Total Other Growth Assets</b>	<b>3,124,263,250</b>	<b>30.8%</b>	<b>33.5%</b>	<b>-2.7%</b>	<b>37.0%</b>	<b>-6.2%</b>
<b>Total Growth Assets</b>	<b>7,216,045,676</b>	<b>71.1%</b>	<b>68.5%</b>	<b>2.6%</b>	<b>66.0%</b>	<b>5.1%</b>
		<b>Range</b>				
		<b>60% - 80%</b>				
<b>Risk Diversifying</b>						
AFL-CIO	270,681,038	2.7%	3.0%	-0.3%	3.0%	-0.3%
Parametric Defensive Equity	108,277,204	1.1%	2.0%	-0.9%	3.5%	-2.4%
Acadian MAARS	127,591,071	1.3%	1.5%	-0.2%	3.5%	-2.2%
Wellington Real Total Return	168,040	0.0%	0.0%			
<b>Total Risk Diversifying</b>	<b>506,717,353</b>	<b>5.0%</b>	<b>6.5%</b>	<b>-1.5%</b>	<b>10.0%</b>	<b>-5.0%</b>
		<b>Range</b>				
		<b>0% - 10%</b>				
<b>Cash and Overlay</b>						
Overlay (Parametric)	128,870,875	1.3%		1.3%		
Cash	208,073,614	2.0%		2.0%		
<b>Total Cash and Overlay</b>	<b>336,944,489</b>	<b>3.3%</b>	<b>0.0%</b>	<b>3.3%</b>	<b>0.0%</b>	<b>3.3%</b>
<b>Total Fund</b>	<b>10,154,782,907</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	

\*Current targets and ranges reflect asset allocation targets accepted by the Board on July 22, 2020 (BOR Resolution 2020-2).



Meeting Date  
**02/24/2021**  
Agenda Item  
**#11a.**



**SAVE THE DATE**  
Siguler Guff's 2021 Virtual Annual Conference  
**Wednesday, April 28 – Thursday, April 29, 2021**

Siguler Guff will once again hold its Annual Conference virtually. Please save the following dates:

**April 28**  
Advisory Board Meetings  
Scheduling details will be provided to Advisory Board Members

**April 29**  
Portfolio Reviews

Invitation and agenda to follow  
Please direct questions to [conference@sigulerguff.com](mailto:conference@sigulerguff.com)