



AGENDA

RETIREMENT BOARD MEETING

SECOND MONTHLY MEETING

February 27, 2019

9:00 a.m.

Retirement Board Conference Room

The Willows Office Park

1355 Willow Way, Suite 221

Concord, California

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

1. Pledge of Allegiance.
2. Accept comments from the public.
3. Approve minutes from the January 23, 2019 meeting.

CLOSED SESSION

4. The Board will go into closed session pursuant to Govt. Code Section 54957 to evaluate the performance of the following public employee:

Title: Chief Executive Officer

5. The Board will continue in closed session pursuant to Govt. Code Section 54956.9(d)(1) to confer with legal counsel regarding pending litigation:

- a. *Fernandez v. CCCERA, et al.*, Contra Costa County Superior Court, Case No. CIVMSN17-036
- b. *Contra Costa County Deputy Sheriffs Association, et al., v. Board of Retirement of CCCERA, et al.*, Supreme Court of the State of California, Case No. S247095

6. The Board will continue in closed session pursuant to Govt. Code Section 54956.9(d)(4) to confer with legal counsel regarding the initiation of litigation (one case).

OPEN SESSION

7. Consider and take possible action to adopt the actuarial valuation report of Other Post-Employment Benefits as of December 31, 2018.
8. Review of total portfolio performance for period ending December 31, 2018.
 - a. Presentation from Verus
 - b. Presentation from staff

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.

9. Information session on retirement process.
10. Information regarding fire standby pay for Contra Costa County Fire Protection District.
11. Annual Statement of Compliance with Board Resolutions.
12. Consider authorizing the attendance of Board:
 - a. CRCEA Spring 2019 Conference, April 14-17, 2019, San Diego, CA.
 - b. Advanced Investments Management, IFEBP, April 29-May 2, 2019, Philadelphia, PA. (Note: Conflict with Meeting)
 - c. SACRS 2019 Spring Conference, May 7-10, 2019, Lake Tahoe, CA.
 - d. Annual Conference and Exhibition, NCPERS, May 18-22, 2019, Austin, TX. (Note: Conflict with Meeting)
13. 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.



Meeting Date
02/27/19
Agenda Item
#3

MINUTES

RETIREMENT BOARD MEETING MINUTES

REGULAR MEETING
January 23, 2019
9:00 a.m.

Retirement Board Conference Room
The Willows Office Park
1355 Willow Way, Suite 221
Concord, California

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

Absent: William Pigeon

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 Colin Bishop, Member Services Manager

Outside Professional Support: Christopher Boucher Representing: Wiley Price & Radulovich LLP

1. Pledge of Allegiance

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

Telles was present for subsequent discussion and voting.

2. Accept comments from the public

No member of the public offered comment.

3. Approval of Minutes

It was **M/S/C** to approve the minutes from the November 28 and December 12, 2018 meetings. (Yes: Andersen, Gordon, Holcombe, MacDonald, Phillips, Smithey, Telles and Watts)

Kwon was present for subsequent discussion and voting.

CLOSED SESSION

The Board moved into closed session pursuant to Govt. Code Section 54957.6 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 54956.9(d)(1).

6. **Consider and take possible action to adopt a cost-of-living increase for retirees as of April 1, 2019**

Dunn reviewed how the cost-of-living (COLA) increase is determined noting the actual amount is dependent on the tier of the retiree. She noted a letter from Segal is attached with recommendations.

It was **M/S/C** to adopt a cost-of-living increase for retirees as of April 1, 2019. (Yes: Andersen, Gordon, Holcombe, MacDonald, Phillips, Smithey, Telles and Watts)

7. **Consider and take possible action to issue a Request for Proposal for IRC 457(b) Deferred Compensation Plan Services**

Dunn reported CCCERA recently became aware that Contra Costa County has issued an RFP for a deferred compensation provider and since CCCERA is a subset of Contra Costa County's provider, this would be a good time to issue an RFP for a deferred compensation provider to see what options are available to CCCERA.

It was **M/S/C** to issue a Request for Proposal for IRC 457(b) Deferred Compensation Plan Services. (Yes; Andersen, Gordon, Holcombe, MacDonald, Phillips, Smithey, Telles and Watts)

8. **Consider and take possible action to adopt Board of Retirement Resolution 2019-1, Funding of I.R.C. Section 115 Trust for Other Post-Employment Benefits**

Strohl reviewed the background on the IRC Section 115 Trust for Other Post-Employment Benefits and asked the Board to adopt the resolution indicating that the intention is that the trust will be prefunded over a 30-year period.

It was **M/S/C** to adopt Board of Retirement Resolution 2019-1, Funding of IRC Section 115 Trust for Other Post-Employment Benefits. (Yes: Andersen, Gordon, Holcombe, MacDonald, Phillips, Smithey, Telles and Watts)

9. **Consider authorizing the attendance of Board:**

- a. There was no action taken on this item. CII Spring Conference, Council of Institutional Investors, March 4-6, 2019, Washington, DC.

10. **Miscellaneous**

- (a) Staff Report –

Strohl reported that the CIO Quarterly Performance Report has been added alongside the Quarterly Performance Review on CCCERA's website.

- (b) Outside Professionals' Report -

None

- (c) Trustees' comments –

None

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

Todd Smithey, Chairman

David MacDonald, Secretary



MEMORANDUM

Date: February 27, 2019

To: CCCERA Board of Retirement

From: Christina Dunn, Deputy Chief Executive Officer

Subject: Consider and take possible action to adopt the Actuarial Valuation Report of Post-Employment Benefits as of December 31, 2018.

Background

On January 1, 2015, CCCERA became an independent employer separate from Contra Costa County. The financial liability for retiree health benefit payments for County employees who worked at CCCERA and retired prior to this date are included in the Contra Costa County's Irrevocable Trust for Other Post-Employment Benefits (OPEB) funding. CCCERA currently provides payments to Contra Costa County for those retired employees.

For CCCERA employees who retired on or after January 1, 2015, CCCERA assumes the liability of providing retiree health benefits. For the retiree health benefits provided those employees, Milliman has prepared an actuarial valuation report of post-employment benefits for those benefits in accordance with GASB 74 and 75 to determine the liability, annual actuarially determined contribution (ADC) and required financial disclosures.

On November 28, 2018, CCCERA established an irrevocable IRC 115 Trust to fund benefits. On January 23, 2019, the CCCERA Board of Retirement adopted Resolution 2019-1 resolving to complete a biennial actuarial valuation and to annually fund the ADC on an amortization schedule designed to achieve full funding over a 30 year period. The attached Actuarial Valuation Report of Post-Employment Benefits other than Pensions assists with determining the ADC for funding the irrevocable IRC 115 Trust.

Recommendation

Consider and take possible action to adopt the Actuarial Valuation Report of Post-Employment Benefits as of December 31, 2018.



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February 18, 2019

Ms. Christina Dunn
Deputy Chief Executive Officer
Contra Costa County Employees' Retirement Association
1355 Willow Way, Suite 221
Concord, CA 94520

Actuarial Valuation of Other Post Employment Benefits for Staff Employees and Retirees as of January 1, 2018 and GASB 74/75 Disclosures as of December 31, 2018

Dear Christina:

I am pleased to enclose above titled report for the Contra Costa County Employees' Retirement Association ("CCCERA"). In this report, we have prepared certain disclosures required by GASB Statements No. 74 / 75 for the Contra Costa County Employee's Retirement Association's OPEB Plan for staff employees and retirees for the fiscal year ending December 31, 2018.

If you have any questions or would like to review the report, please call me at (415) 394-3740.

Sincerely,

A handwritten signature in black ink that reads "John R. Botsford". The signature is stylized and cursive.

John R. Botsford, FSA, MAAA

enc.

Contra Costa County Employees' Retirement Association

Actuarial Valuation of Other Post Employment Benefits for Staff Employees and Retirees
as of January 1, 2018 and GASB 74/75 Disclosures as of December 31, 2018

Prepared by:

John R. Botsford
FSA, MAAA

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February 18, 2019



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Contra Costa County Employees' Retirement Association
1355 Willow Way, Suite 221
Concord, CA 94520

Actuarial Valuation of Other Post Employment Benefits for Staff Employees and Retirees as of January 1, 2018 and GASB 74/75 Disclosures as of December 31, 2018

At the request of the Contra Costa County Employees' Retirement Association ("CCCERA"), we have prepared an actuarial valuation of Other Post Employment Benefits as of January 1, 2018 for CCCERA's staff employees and retirees, and GASB 74 and 75 disclosures for the fiscal year ending December 31, 2018, to comply with Statements No. 74 and 75 of the Governmental Accounting Standards Board (GASB).

In preparing this report, we relied, without audit, on information supplied by CCCERA's staff. This information includes but is not limited to employee census data, financial information and plan provisions. While Milliman has not audited the financial and census data, they have been reviewed for reasonableness and are, in our opinion, sufficient and reliable for the purposes of our calculations. If any of this information as summarized in this report is inaccurate or incomplete, the results shown could be materially affected and this report may need to be revised.

All costs, liabilities, rates of interest, and other factors for CCCERA have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of CCCERA and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting CCCERA. Further, in our opinion, each actuarial assumption used is reasonably related to the experience of the Plan and to reasonable expectations which, in combination, represent our best estimate of anticipated experience for CCCERA.

This valuation report is only an estimate of the Plan's financial condition as of a single date. It can neither predict the Plan's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of Plan benefits, only the timing of CCCERA's contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. CCCERA has the final decision regarding the appropriateness of the assumptions.

Actuarial computations presented in this report under GASB Statements No. 74 and 75 are for purposes of assisting CCCERA in fulfilling its financial accounting requirements. The computations prepared for this purpose may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of CCCERA's funding policy and goals. The calculations in this report have been made on a basis consistent with our understanding of the OPEB plan provisions described in Appendix A of this report, and of GASB Statements No. 74 and 75. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

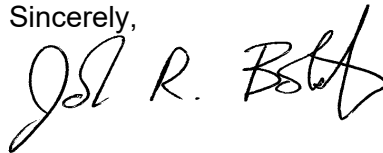
Milliman's work is prepared solely for the internal business use of CCCERA. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

- a) CCCERA may provide a copy of Milliman's work, in its entirety, to CCCERA's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit CCCERA.
- b) CCCERA may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs. The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel. The signing actuary is independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, the report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the applicable Actuarial Standards of Practice of the American Academy of Actuaries. The undersigned is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely,



John R. Botsford, FSA, MAAA
Principal and Consulting Actuary

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Introduction

Milliman, Inc. (Milliman) has been retained by Contra Costa County Employees' Retirement Association ("CCCERA") to provide an actuarial valuation of Other Post Employment Benefit (OPEB) Liabilities as of January 1, 2018 for its staff employees and retirees, and disclosures required by GASB Statements No. 74 and 75 for CCCERA's Staff OPEB Plan for the fiscal year ending December 31, 2018.

GASB 74 applies to financial reporting for public OPEB plans. Even if the plan does not issue standalone financial statements, but rather is considered a trust fund of a government, it is subject to GASB 74.

GASB 75 governs the specifics of accounting for public OPEB plan obligations for employers. GASB 75 requires a liability for OPEB obligations, known as the Net OPEB Liability, to be recognized on the balance sheets of employers. Changes in the Net OPEB Liability will be immediately recognized as OPEB Expense on the income statement or reported as deferred inflows/outflows of resources depending on the nature of the change.

Background

Staff employees who retire directly from CCCERA may receive certain retiree health benefits if they meet certain eligibility requirements. CCCERA contracts with CalPERS for health benefits. CCCERA will contribute an amount toward the cost of retiree health benefits for staff retirees consistent with the bargaining agreements between CCCERA and various bargaining units. Appendix A provides a more detailed summary of benefits.

Key Results

The following table summarizes key results. Exhibits 1 – 5 contain the information needed for the preparation of accounting disclosures under GASB 74 and 75.

| | December 31, 2018 |
|--|-------------------|
| Net OPEB Liability | |
| Total OPEB Liability | \$ 4,710,000 |
| Fiduciary Net Position | <u>2,542,000</u> |
| Net OPEB Liability | \$ 2,168,000 |
| Fiduciary Net Position as % of Total OPEB Liability | 54.0% |
| Annual OPEB Expense for 2018 | \$ 479,000 |
| Actuarially Determined Contribution for 2018 | |
| Service Cost as of January 1, 2018 | \$ 180,000 |
| Amortization of Net OPEB Liability as of January 1, 2018 | 322,000 |
| Interest to December 31, 2018 | <u>34,000</u> |
| ADC as of December 31, 2018 | \$ 536,000 |

Actuarially Determined Contribution

CCCERA has adopted a funding policy to contribute to a Section 115 trust, the actuarially determined contribution (ADC) each year. For this valuation, the ADC is defined as the annual service cost, plus an amount to amortize the NOL over 30 years from 2018 on a level dollar basis, plus interest to account for the timing of contributions during the year.

Rationale for Significant Assumptions

With any valuation of future benefits, assumptions of anticipated future events are required. If actual events differ from the assumptions made, the actual cost of the plan will vary as well. A complete list and description of the actuarial assumptions is presented in Appendix B.

Investment Rate of Return. We have assumed an investment rate of return of 6.75%, net of investment expenses. This is based on the investment policy set by CCCERA for its Staff Plan OPEB trust and managed by the Public Agency Retirement Services (PARS). Please see Appendix B for additional details supporting the assumed investment return.

Discount Rate. Under GASB 74 & 75, the discount rate should be the single rate that reflects the long-term rate of return on OPEB plan investments that are expected to be used to finance the payment of benefits. To the extent that OPEB plan assets along with expected future investment returns and expected future contributions are sufficient to finance all OPEB benefits, the discount rate should be based on the assumed investment on assets. CCCERA's current funding policy is to fund the Actuarially Determined Contribution each fiscal year. Based on CCCERA's funding policy, plan assets are projected to be sufficient to fund OPEB liabilities. Therefore, a discount rate of 6.75% was assumed.

Health Cost Trend. We have assumed health costs will increase according to the health cost inflation trend derived by using the "Getzen" model developed by the Society of Actuaries. A margin to reflect the impact of the excise tax in future years is reflected in the assumed trend.

The CalPERS minimum contribution is assumed to increase by 3.25% per year. The minimum contribution is indexed to the medical component of CPI. Over the past 10 years, medical CPI has averaged approximately 3.1% per year.

Demographic Rates. The assumptions for mortality, turnover, retirement and disability used in this valuation are based on the December 31, 2017 pension actuarial report from the Contra Costa County Employees' Retirement Association (CCCERA). Since CCCERA became a separate employer on January 1, 2015, there is insufficient experience data on mortality, turnover, disability and retirement rates for CCCERA staff employees. We have therefore used the rates developed for the CCCERA pension plan. These assumptions can be reviewed and modified in the future as experience emerges for CCCERA staff employees.

Coverage Election Rates and Spouse Age Difference. Since CCCERA became a separate employer on January 1, 2015, there is insufficient experience data on health benefit election, spouse coverage, and spouse age differences to develop assumptions for CCCERA staff retirees. We have reviewed the current active enrollment information and have based our coverage and election assumptions on this information and actuarial judgment of future experience. For employees eligible for the premium subsidy, we assumed 100% of new retirees will elect medical and dental coverage at retirement and 70% of the new retirees will elect spouse coverage. New retirees electing medical coverage are assumed to elect the Kaiser Plan for medical coverage. For all other employees, we have assumed 50% of new retirees will elect medical and dental coverage at retirement and 70% of the new retirees electing coverage will also elect spouse coverage.

Female spouses are assumed to be three years younger than male spouses. We have assumed that 50% of retirees with spouse coverage will elect coverage for a dependent child until age 65.

A complete summary of the actuarial assumptions is presented in Appendix B.

Variability of Results

The results contained in this report represent our best estimates. However, variation from these or any other estimates of future retiree medical costs is not only possible but probable. Actual future costs may vary significantly from estimates in this report.

Exhibit 1. Net OPEB Liabilities

The Valuation Date is January 1, 2018. This is the date as of which the actuarial valuation is performed. The Measurement Date is December 31, 2018, which is also the GASB 74 and 75 Reporting Date, for the fiscal year ending December 31, 2018. The Total OPEB Liability is projected to December 31, 2018, using standard actuarial techniques as permitted by GASB 74 and 75. The Fiduciary Net Position is the market value of assets as of the fiscal year ending December 31, 2018.

| | For the Fiscal Year Ending | |
|---|----------------------------|-------------------|
| | December 31, 2018 | December 31, 2017 |
| Total OPEB Liability | \$ 4,710,000 | \$ 4,281,000 |
| Fiduciary Net Position | <u>2,542,000</u> | <u>0</u> |
| Net OPEB Liability | \$ 2,168,000 | \$ 4,281,000 |
| Fiduciary Net Position as a % of Total OPEB Liability | 54.0% | 0.0% |
| Valuation Date | 01/01/2018 | 01/01/2018 |
| Measurement date | 12/31/2018 | 12/31/2017 |
| GASB 74/75 Reporting date | 12/31/2018 | N/A |
| Discount Rate | 6.75% | 6.75% |

Exhibit 2. Sensitivity of Net OPEB Liabilities

GASB 74/75 requires disclosure of the sensitivity of the Net OPEB Liability (NOL) to changes in the discount rate and health care cost trend rates. The liabilities shown below are based on a measurement date of December 31, 2018, and are applicable for the fiscal year ending December 31, 2018.

Sensitivity of the Net OPEB Liability to changes in the discount rate

The following table shows what CCCERA's Net OPEB Liability (NOL) would be if it were calculated using a discount rate that is 1 percentage point lower or 1 percentage point higher than the current discount rate.

| Sensitivity Analysis | 1% Decrease in Discount Rate 5.75% | Current Discount Rate 6.75% | 1% Increase in Discount Rate 7.75% |
|--|--|-----------------------------------|--|
| Net OPEB Liability as of December 31, 2018 | \$ 2,851,000 | \$ 2,168,000 | \$ 1,611,000 |

Sensitivity of the Net OPEB Liability to changes in the Healthcare Cost Trend Rates

The following table shows what CCCERA's Net OPEB Liability (NOL) would be if it were calculated using a Healthcare cost trend that is 1 percentage point lower or 1 percentage point higher than the current Healthcare cost trend rates.

| Sensitivity Analysis | 1% Decrease in Healthcare Costs Trend Rate | Current Healthcare Costs Trend Rate | 1% Increase in Healthcare Costs Trend Rate |
|--|--|---|--|
| Net OPEB Liability as of December 31, 2018 | \$ 1,538,000 | \$ 2,168,000 | \$ 2,962,000 |

Exhibit 3. Changes in Net OPEB Liability

The following exhibit shows a reconciliation of the Net OPEB Liability from the measurement date December 31, 2017, to December 31, 2018, to be reported for the fiscal year ending December 31, 2018.

| | Increase / (Decrease) | | |
|---|-------------------------|--------------------------------|-----------------------|
| | Total OPEB Liability | Plan Fiduciary Net Position | Net OPEB Liability |
| Balance as of December 31, 2017 | \$ 4,281,000 | \$ 0 | \$ 4,281,000 |
| Service cost | \$ 180,000 | \$ 0 | \$ 180,000 |
| Interest on the total OPEB liability | 299,000 | 0 | 299,000 |
| Changes of benefit terms | 0 | 0 | 0 |
| Differences between actual and expected experience with regard to economic or demographic factors | 0 | 0 | 0 |
| Changes of assumptions | 0 | 0 | 0 |
| Benefit payments ¹ | (50,000) | (50,000) | 0 |
| Contributions from employer | 0 | 2,592,000 ² | (2,592,000) |
| Net investment income | 0 | 0 | 0 |
| Administrative expense | 0 | 0 | 0 |
| Other changes | <u>0</u> | <u>0</u> | <u>0</u> |
| Total changes | \$ 429,000 | \$ 2,542,000 | \$ (2,113,000) |
| Balance as of December 31, 2018 | \$ 4,710,000 | \$ 2,542,000 | \$ 2,168,000 |

1. The benefit payment shown is equal to the annual pay-as-you-go cost of \$42,000 estimated from the census information reported by CCCERA for the fiscal year ending December 31, 2018, increased by \$8,000 to reflect the estimated implicit subsidy.
2. The amount shown above includes both the contributions of \$2,542,000 made to the trust plus the pay-as-you-go benefit payment cost of \$42,000 plus \$8,000 to reflect the estimated implicit subsidy.

Exhibit 4. Calculation of OPEB Expense and Deferred Inflows/Outflows

The following tables shows the development of the OPEB expense and deferred inflows/outflows of resources.

| OPEB Expense | For the Fiscal Year Ending | |
|---|----------------------------|-------------------|
| | December 31, 2018 | December 31, 2017 |
| Service cost | \$ 180,000 | N/A |
| Interest on the total OPEB liability | 299,000 | N/A |
| Effect of plan changes | 0 | N/A |
| Administrative expense | 0 | N/A |
| Member contributions | 0 | N/A |
| Expected investment return, net of investment expenses | 0 | N/A |
| Recognition of Deferred (Inflows)/Outflows of Resources | | |
| Economic/demographic (gains) or losses | 0 | N/A |
| Assumption changes or inputs | 0 | N/A |
| Investment (gains) or losses | <u>0</u> | <u>N/A</u> |
| Total Recognition | 0 | N/A |
| OPEB expense | \$ 479,000 | N/A |

| Deferred (Inflows) / Outflows of Resources | Deferred Inflows of Resources | Deferred Outflows of Resources |
|--|-------------------------------|--------------------------------|
| Differences between expected and actual experience | \$ 0 | \$ 0 |
| Changes of assumptions | 0 | 0 |
| Net difference between projected and actual earnings | 0 | 0 |
| Contributions made subsequent to measurement date | <u>0</u> | <u>0</u> |
| Total | \$ 0 | \$ 0 |

Amounts currently reported as deferred inflows of resources and outflows of resources related to OPEB will be recognized in OPEB expense as follows:

| Fiscal Year Ending December 31 | Recognized Deferred (Inflows) and Outflows of Resources |
|--------------------------------|---|
| 2019 | \$ 0 |
| 2020 | 0 |
| 2021 | 0 |
| 2022 | 0 |
| 2023 | 0 |
| Thereafter | 0 |

Exhibit 5. Schedule of Deferred Inflows and Outflows of Resources

Investment (gains)/losses are recognized in OPEB expense over a period of five years. Economic/demographic (gains)/losses and assumption changes or inputs are recognized over the average remaining service life for all active and inactive members. Since there is no expected future service for inactives, their remaining service is equal to zero for purposes of computing the average remaining service life.

| Date Established (Fiscal Year Ending) | Original Amount | Original Recognition Period | Balance of Deferred (Inflows)/Outflows 12/31/2018 | Remaining Recognition Period | Amount Recognized in Expense 12/31/2018 |
|--|-----------------|-----------------------------|---|------------------------------|---|
| Investment (gains) or losses | | | | | |
| 12/31/2018 | \$ 0 | 5.00 | \$ 0 | 4.00 | \$ 0 |
| Economic / Demographic and Assumption changes | | | | | |
| 12/31/2018 | \$ 0 | 9.47 | \$ 0 | 8.47 | \$ 0 |

Appendix A. Summary of Plan Benefits

The following description of retiree health benefits is intended to be only a brief summary and is not complete information.

Eligibility

Eligible for the Premium Subsidy

Unrepresented CCCERA staff employees who are hired prior to January 1, 2007 and retire with a CCCERA pension benefit. Unrepresented CCCERA staff employees who are hired on January 1, 2007 to December 31, 2008 with completion of 15 years of service and retire with a CCCERA pension benefit. AFSCME CCCERA staff employees who are hired prior to January 1, 2007 and retire with a CCCERA pension benefit. AFSCME CCCERA staff employees who are hired on January 1, 2007 to December 31, 2009 with completion of 15 years of service and retire with a CCCERA pension benefit.

PEMHCA Minimum Contribution

Unrepresented CCCERA staff employees who are hired on or after January 1, 2009 with completion of 15 years of service and retire with a CCCERA pension benefit. AFSCME CCCERA staff employees who are hired on or after January 1, 2010 with completion of 15 years of service and retire with a CCCERA pension benefit.

Health Benefits (Retirement date on or after January 1, 2015)

Eligible CCCERA staff retirees and their dependents may elect coverage under the health plans sponsored by CalPERS. For retirees who meet the eligibility requirements to receive the premium subsidy, CCCERA will pay the monthly premium subject to maximum subsidies shown in the table below by rate tier for 2017.

| Medical Coverage | 2017 |
|------------------|-----------|
| Retiree Only | \$ 746.47 |
| Retiree + 1 | 1,492.94 |
| Retiree + Family | 1,940.82 |

For 2018 and beyond, if there is an increase in the monthly premium charged by a medical plan, CCCERA and the employee will each pay fifty percent (50%) of the monthly increase that is above the amount of the 2017 plan premium. The fifty percent (50%) share of the monthly medical plan increase paid by CCCERA is in addition to the amount paid by CCCERA for the 2017 plan year.

For dental coverage, CCCERA's monthly premium subsidy is a set dollar amount as shown in the table below.

| Dental Coverage | 2018 |
|---------------------|----------|
| Employee Only | \$ 46.21 |
| Employee and Spouse | 103.72 |
| Employee and Child | 103.41 |
| Family | 169.38 |

For employees who meet the eligibility to receive the PEMHCA minimum contribution the benefit is (\$133 per month for 2018), subject to an annual increase based on the medical Consumer Price Index).

Health Insurance Premium Rates

Retirees may choose among the following PEMHCA plans.

| | Monthly Premium Rates – Effective January 1, 2018 | | | | | |
|--------------------------|---|-----------|-------------|-----------|-------------|-------------|
| | Single | | 2-Party | | Family | |
| | Under 65 | Over 65 | Under 65 | Over 65 | Under 65 | Over 65 |
| Anthem HMO Select | \$ 856.41 | \$ 370.34 | \$ 1,712.82 | \$ 740.68 | \$ 2,226.67 | \$ 1,111.02 |
| Anthem HMO Traditional | 925.47 | 370.34 | 1,850.94 | 740.68 | 2,406.22 | 1,111.02 |
| BSC Access+ | 889.02 | N/A | 1,778.04 | N/A | 2,311.45 | N/A |
| HealthNet SmartCare | 863.48 | N/A | 1,726.96 | N/A | 2,245.05 | N/A |
| Kaiser Permanente | 779.86 | 316.34 | 1,559.72 | 632.68 | 2,027.64 | 949.02 |
| PERS Choice | 800.27 | 345.97 | 1,600.54 | 691.94 | 2,080.70 | 1,037.91 |
| PERS Select | 717.50 | 345.97 | 1,435.00 | 691.94 | 1,865.50 | 1,037.91 |
| PERSCare | 882.45 | 382.30 | 1,764.90 | 764.60 | 2,294.37 | 1,146.90 |
| United Healthcare | 1,371.84 | 330.76 | 2,743.68 | 661.52 | 3,566.78 | 992.28 |
| Western Health Advantage | 792.56 | N/A | 1,585.12 | N/A | 2,060.66 | N/A |

Dental Plan Premiums

The following table shows monthly retiree dental insurance premiums for the 2018 calendar year.

| Coverage | Monthly Rate |
|---------------------|--------------|
| Employee Only | \$ 57.76 |
| Employee and Spouse | 129.65 |
| Employee and Child | 129.26 |
| Family | 211.73 |

Appendix B. Actuarial Cost Method and Assumptions

Actuarial Cost Method

The actuarial cost method used for determining the benefit obligations is the individual Entry Age Normal Cost Method. Under the principles of this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of expected salary for each year of employment between entry age (defined as age at hire) and assumed exit.

The portion of this actuarial present value allocated to a valuation year is called the service cost. The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets (market value of Fiduciary Net Position), and (b) the actuarial present value of future service costs is called the Net OPEB Liability (NOL).

The Actuarial Value of Assets is equal to the market value of assets as of the measurement date. The actuarial assumptions are summarized below.

Economic Assumptions

| | |
|------------------------------------|-------|
| <i>Discount Rate (Liabilities)</i> | 6.75% |
| <i>General Inflation</i> | 2.75% |

We have used a discount rate of 6.75% in this valuation to reflect CCCERA's current policy of funding its OPEB liabilities. This rate is derived based on the fund's investment policy, annual funding equal to the ADC, and assumes a 2.75% long-term inflation. CCCERA OPEB Irrevocable Trust assets are managed by the Public Agency Retirement Services. Based on the portfolio's target allocation (shown below), the expected annual return of Trust assets over the next 50 years is expected to be 6.82%.

| Asset Class | Expected 1-Year Nominal Return | Targeted Asset Allocation |
|--|--------------------------------|---------------------------|
| Domestic Equity Large Cap | 7.48% | 20.0% |
| Domestic Equity Small Cap | 8.75% | 5.0% |
| International Developed Equity | 8.99% | 20.0% |
| International Emerging Market Equity | 11.11% | 15.0% |
| Real Estate | 8.12% | 2.0% |
| U.S. Treasuries | 4.59% | 8.0% |
| Intermediate – Term Fixed Income | 4.94% | 15.0% |
| Short – Term Fixed Income | 4.28% | 15.0% |
| Expected Geometric Median Annual Return (50 years) | | 6.82% |

Assumed Salary Increases (Applied to Individual Entry Age Normal Cost Method)

The assumed annual rates of compensation increases used for the EAN actuarial cost method are the same as the assumption used in the December 31, 2017 CCCERA Actuarial Valuation.

| Years of Service | General |
|------------------|---------|
| Less than 1 | 13.25% |
| 1 | 10.50% |
| 2 | 8.50% |
| 3 | 7.00% |
| 4 | 6.00% |
| 5 | 5.50% |
| 10 | 4.40% |
| 15 or more | 4.00% |

Demographic Assumptions

Below is a summary of the assumed rates for mortality, retirement, disability and withdrawal, which are consistent with assumptions used in the December 31, 2017 CCCERA Actuarial Valuation.

Pre / Post Retirement Mortality

Healthy: For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table, projected generationally with the two-dimensional MP-2015 projection scale.

Disabled: For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set forward eight years, projected generationally with the two-dimensional MP-2015 projection scale.

Beneficiaries: Beneficiaries are assumed to have the same mortality as a General Member of the opposite sex who had taken a service (non-disability) retirement.

Withdrawal – Sample probabilities of terminating employment from CCCERA are shown below for selected years of CCCERA service.

| Years of Service | General |
|------------------|---------|
| Less than 1 | 13.50% |
| 1 | 9.25% |
| 2 | 9.00% |
| 3 | 6.00% |
| 4 | 4.50% |
| 5 | 4.25% |
| 10 | 2.75% |
| 15 | 2.10% |
| 20 or more | 1.50% |

Disability

| Age | Non-PEPRA | PEPRA |
|---------|-----------|-------|
| 20 | 0.01% | 0.01% |
| 25 | 0.02% | 0.02% |
| 30 | 0.04% | 0.03% |
| 35 | 0.08% | 0.05% |
| 40 | 0.22% | 0.08% |
| 45 | 0.36% | 0.13% |
| 50 | 0.52% | 0.16% |
| 55 | 0.60% | 0.20% |
| 60 | 0.60% | 0.28% |
| 65 – 70 | 0.60% | 0.32% |

Retirement

| Non-PEPRA | | PEPRA | |
|-----------|-------|---------|-------|
| Age | Rates | Age | Rates |
| 50 | 5% | 50 – 51 | 0% |
| 51 | 4% | 52 | 2% |
| 52 – 53 | 5% | 53 – 54 | 3% |
| 54 | 14% | 55 – 56 | 5% |
| 55 – 58 | 20% | 57 | 6% |
| 59 | 25% | 58 | 8% |
| 60 | 28% | 59 | 9% |
| 61 – 62 | 35% | 60 | 10% |
| 63 – 64 | 30% | 61 | 14% |
| 65 | 35% | 62 – 64 | 20% |
| 66 – 69 | 40% | 65 | 25% |
| 70 – 74 | 50% | 66 – 69 | 30% |
| 75 | 100% | 70 – 74 | 50% |
| | | 75 | 100% |

Coverage Election Assumptions

Retiree and Spouse Coverage – For employees eligible for the premium subsidy, we have assumed 100% of new retirees will elect medical and dental coverage at retirement and 70% of the new retirees will elect spouse coverage. For all other employees, we have assumed 50% of new retirees will elect medical and dental coverage at retirement and 70% of the new retirees will elect spouse coverage.

Spouse Age – Female spouses are assumed to be three years younger than male spouses.

Dependent Coverage – We have assumed 30% of retirees with no spouse coverage will elect coverage for a dependent child until age 65 and 50% of retirees with spouse coverage will elect coverage for a dependent child until age 65.

Health Plan Election – We have assumed that all new retirees electing medical coverage will elect the Kaiser plan for medical coverage.

Valuation of Retiree Premium Subsidy Due to Active Health Costs

The California PERS (PEMHCA) health plans charge the same premiums for retirees who are not yet eligible for Medicare as for active employees. Therefore, the retiree premium rates are being subsidized by the inclusion of active lives in setting rates. (Premiums calculated only based on retiree health claims experience would have resulted in higher retiree premiums.) GASB 74/75 requires that the value of this subsidy be recognized as a liability in valuations of OPEB costs. To account for the fact that per member health costs vary depending on age (higher health costs at older ages), we calculated equivalent per member per month (PMPM) costs that vary by age based on the age distribution of covered members, and based on relative cost factors by age.

The relative cost factors were developed from the Milliman Health Cost Guidelines™. Based on the carrier premium rates and relative age cost factors assumptions, we developed age adjusted monthly PMPM health costs for 2018 to be used in valuing the implicit rate subsidy.

| Age Adjusted Medical PMPM Costs for 2018 | | | | |
|--|----------|--------|---------|--------|
| Age | Retirees | | Spouses | |
| | Male | Female | Male | Female |
| 50 | \$ 756 | \$ 937 | \$ 672 | \$ 829 |
| 55 | 927 | 1,020 | 851 | 952 |
| 60 | 1,167 | 1,172 | 1,081 | 1,100 |
| 64 | 1,465 | 1,343 | 1,361 | 1,255 |

Since premiums for retirees with Medicare are determined without regard to active life experience, no such subsidy exists for this group.

Medical Cost Inflation Assumption

The assumed future increases to the health costs and premiums are based on the “Getzen” model published by the Society of Actuaries for purposes of evaluating long term medical trend. A margin to reflect the impact of the excise tax in future years is reflected in the assumed trend. The following table shows the assumed rate increases in future years for Medical premiums.

| Calendar Year | Pre 65 | Post 65 |
|---------------|--------|---------|
| 2019 | 6.00% | 5.75% |
| 2020 | 5.50% | 5.50% |
| 2021 | 5.50% | 5.50% |
| 2022 | 5.50% | 5.50% |
| 2023 | 5.50% | 5.50% |
| 2028 | 6.25% | 5.50% |
| 2033 | 6.25% | 5.50% |
| 2038 | 6.25% | 5.50% |
| 2043 | 6.00% | 5.25% |
| 2048 | 5.75% | 5.25% |
| 2058 | 5.50% | 5.50% |
| 2068 | 5.00% | 5.00% |
| 2078 | 4.75% | 4.75% |

For CCCERA staff plan employees who retire on or after January 1, 2015 and are eligible for the CCCERA premium subsidy shown in Appendix A, we assumed that the subsidy will increase each year at the same rate as medical inflation.

CCCERA Portion of Dental Cost

We have assumed CCCERA’s portion of retiree dental costs will remain the same as in 2018.

Medical CPI

We assumed the PEMHCA minimum will increase 3.25% annually.

Appendix C. Summary of Participant Data

The following census of participants was used in the staff plan actuarial valuation and provided by Contra Costa County Employees' Retirement Association as of January 1, 2018.

Active Employees

| Non-PEPRA Hired before 1/1/2013 | PEPRA – Hired on or after 1/1/2013 | Total |
|------------------------------------|------------------------------------|-------|
| 29 | 23 | 52 |
| Average Age at Valuation Date: | | 47.00 |
| Average Service at Valuation Date: | | 9.98 |

Current Retirees

| Retired after 1/1/2015 | |
|--------------------------------|-------|
| 4 | |
| Average Age on Valuation Date: | 61.88 |

Appendix D. Glossary of Key Terms

Actuarially Determined Contribution. A target or recommended contribution to an OPEB plan for the reporting period, determined based on the funding policy and most recent measurement available when the contribution for the reporting period was adopted.

Deferred Inflows/Outflows of Resources. Portion of changes in net OPEB liability that is not immediately recognized in OPEB Expense. These changes include differences between expected and actual experience, changes in assumptions, and differences between expected and actual earnings on plan investments.

Discount Rate. Single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the sum of:

- 1) The actuarial present value of benefit payments projected to be made in future periods where the plan assets are projected to be sufficient to meet benefit payments, calculated using the Long-Term Expected Rate of Return.
- 2) The actuarial present value of projected benefit payments not included in (1), calculated using the Municipal Bond Rate.

Long-Term Expected Rate of Return. Long-term expected rate of return on OPEB plan investments expected to be used to finance the payment of benefits, net of investment expenses.

Money-Weighted Rate of Return. The internal rate of return on OPEB plan investments, net of investment expenses.

Municipal Bond Rate. Yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher.

Total OPEB Liability. The portion of actuarial present value of projected benefit payments that is attributable to past periods of member service using the Entry Age Normal cost method based on the requirements of GASB 74 and 75 (formerly Actuarial Accrued Liability).

Fiduciary Net Position. Equal to market value of assets.

Net OPEB Liability. Total OPEB Liability minus the Plan's Fiduciary Net Position (formerly unfunded accrued liability).

Service Cost. The portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



Meeting Date
02/27/19
Agenda Item
#8a.

PERIOD ENDING: DECEMBER 31, 2018
Investment Performance Review for

Contra Costa County Employees' Retirement Association

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**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**

1ST QUARTER 2019
Investment Landscape

Recent Verus research

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Sound thinking

PRIORITIES FOR 2019

The start of the year is a good time to consider some of the likely key issues that investors may have to deal with over the next 12 months. Our CIO, Ian Toner, identifies eight topics that are likely to be important during 2019. He also outlines ways that investors might approach each of these topics, and identifies some of the ways they might impact portfolios over the year.

Topics of interest

BUILDING EFFECTIVE PRIVATE MARKET PORTFOLIOS

Institutional sponsors often invest in private asset classes to boost the return profile of their overall plan portfolios. Yet, many fall short of achieving the desired returns. We believe that effective portfolio construction is an important component of achieving attractive return targets in private markets. Drawing on our experience over the last 20 years, we highlight the key considerations for any investor seeking to build a private markets portfolio.

PRIVATE MARKETS COMMITMENT PACING AND CASH FLOW MODELING

Private markets investors are faced with the difficulty of estimating future exposures within their portfolios over a longer time horizon. An effective pacing model designed to manage investor target allocations is a key process for managing exposures accurately. We provide an overview to commitment strategies, maintaining allocations over the long-term and monitoring liquidity risk.

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4th quarter summary

THE ECONOMIC CLIMATE

- U.S. real GDP growth reached 3.0% in Q3, supported by fiscal stimulus which is more or less expected to fade in 2019. Growth is forecast to moderate in the U.S., in-line with the rest of the developed world. [p. 9](#)
- The U.S. and China ended their most recent round of trade negotiations during the first week of January. China indicated willingness to purchase more American agricultural goods, energy, and other manufactured goods, but little progress is evident overall. [p. 15](#)

PORTFOLIO IMPACTS

- The Federal Reserve raised the fed funds rate by 0.25% to a range of 2.25%-2.50%. Market expectations for future rate hikes changed dramatically in December. As of year-end, the fed funds futures market is pricing in zero hikes for 2019, and a rate cut for 2020. [p. 19](#)
- Emerging markets were the top equity performer in Q4, as these markets (MSCI EM -7.5%) experienced much less pain than developed markets (S&P 500 -13.5%, MSCI EAFE -12.5%) during the equity sell-off. Currencies stabilized in Q4 (JPMorgan EM Currency Index +0.2%) and emerging market crises concerns faded from the news headlines. [p. 34](#)

THE INVESTMENT CLIMATE

- The U.S. equity market experienced a fairly significant peak-to-trough drawdown in Q4 (S&P 500 -19.8%, Russell 1000 -20.1%), along with global equity markets. Equity corrections of this size have historically occurred roughly once per cycle. [p. 29](#)
- After reaching a cyclical high of 3.2% in November, the 10-year U.S. Treasury yield fell sharply to end the year at 2.7%. Much of this drop was due to falling inflation expectations as energy prices trended down. [p. 19](#)
- The House of Commons in British Parliament overwhelmingly rejected Theresa May's Brexit deal that had been approved by the European Union. The details surrounding the terms of Great Britain's exit remain uncertain ahead of the March 30th deadline. [p. 17](#)

ASSET ALLOCATION ISSUES

- Diversification has been particularly painful in recent years as most asset classes failed to keep up with a domestic 60/40 portfolio. U.S. performance exceptionalism reversed in Q4 as U.S. equities underperformed. [p. 6](#)
- Economic conditions around the world have weakened. This trend has been broad-based, from industrial production, to business sentiment, to corporate earnings expectations. [p. 16](#)

Economic conditions displayed a weaker trend in Q4

A neutral risk stance may be appropriate in today's environment

What drove the market in Q4?

“Stocks continue to fall on global growth concerns”

| GLOBAL MANUFACTURING PMI | | | | | |
|--------------------------|-------|-------|-------|-------|-------|
| Q3 17 | Q4 17 | Q1 18 | Q2 18 | Q3 18 | Q4 18 |
| 53.2 | 54.5 | 53.3 | 53.0 | 52.2 | 51.5 |

Article Source: Yahoo Finance, December 14th, 2018

“Fed seen slowing, or even stopping, rate hikes next year”

| YEAR-END 2020 MARKET IMPLIED FED FUNDS RATE | | | | | |
|---|-------|-------|-------|-------|-------|
| Jul | Aug | Sep | Oct | Nov | Dec |
| 2.72% | 2.62% | 2.82% | 2.86% | 2.71% | 2.38% |

Article Source: Reuters, December 10th, 2018

“The great cheapening of 2018: global stock valuations now at five-year lows”

| MSCI ACWI FORWARD P/E RATIO | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|
| Jul | Aug | Sep | Oct | Nov | Dec |
| 14.9x | 14.9x | 14.8x | 13.7x | 13.9x | 13.0x |

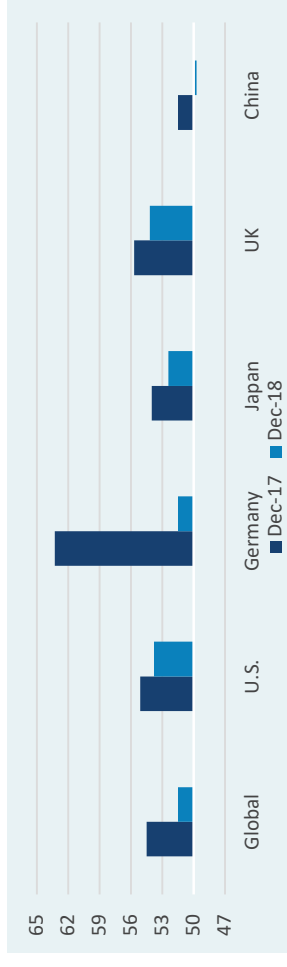
Article Source: Wall Street Journal, December 10th, 2018

“Market volatility is surging”

| DAILY AVERAGE OF S&P 500 INDEX IMPLIED VOLATILITY (VIX) | | | | | |
|---|------|------|------|------|------|
| Jul | Aug | Sep | Oct | Nov | Dec |
| 13.1 | 12.5 | 12.9 | 19.4 | 19.4 | 25.0 |

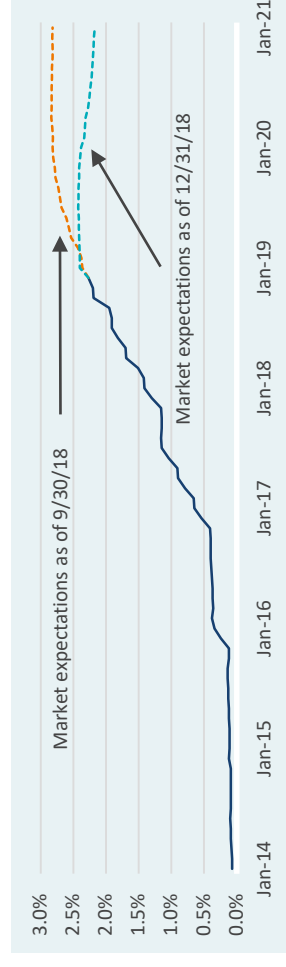
Article Source: Forbes, October 11th, 2018

GLOBAL MANUFACTURING PMIs



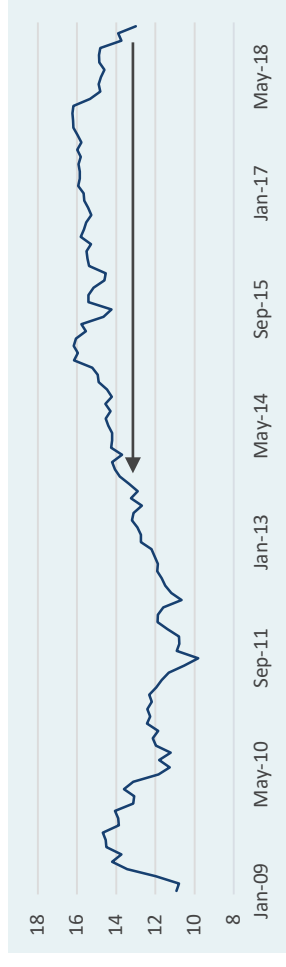
Source: Bloomberg, JPMorgan, Market, as of 12/31/18, 50 indicates a neutral level

MARKET PRICING OF FUTURE FED FUNDS RATE



Source: Bloomberg, as of 12/31/18

MSCI ACWI FORWARD P/E RATIO



Source: Bloomberg, as of 12/31/18, blended 12-month forward earnings

Tough years for diversification

Individual asset classes relative to a domestic 60/40

| RELATIVE TO DOMESTIC 60/40 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|--|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|-------|--------|--------|
| US Large | 8.6 | (7.8) | (8.0) | (12.1) | 9.5 | 2.3 | 0.8 | 4.4 | (0.5) | (14.0) | 6.9 | 2.7 | (2.4) | 4.1 | 14.5 | 3.3 | 0.2 | 3.2 | 7.4 | (1.9) |
| US Small | 8.9 | (1.7) | 6.4 | (10.5) | 28.1 | 9.7 | 0.5 | 7.0 | (7.6) | (10.8) | 7.6 | 14.5 | (8.7) | 4.4 | 20.9 | (5.5) | (5.6) | 12.5 | 0.2 | (8.5) |
| International Developed | 14.6 | (12.9) | (17.5) | (5.9) | 19.4 | 11.6 | 9.4 | 14.9 | 5.2 | (20.4) | 12.2 | (4.6) | (16.6) | 5.4 | 4.9 | (15.3) | (2.0) | (7.8) | 10.6 | (11.3) |
| Emerging Markets | (12.4) | 1.3 | 1.3 | 3.8 | 36.6 | 17.0 | 29.9 | 20.7 | 33.4 | (30.3) | 58.9 | 6.5 | (22.9) | 6.3 | (20.5) | (12.6) | (16.1) | 2.4 | 22.9 | (12.1) |
| US TIPS | (10.0) | 14.5 | 11.8 | 26.6 | (10.8) | (0.1) | (1.3) | (11.0) | 5.6 | 20.6 | (8.2) | (6.1) | 9.1 | (4.9) | (26.5) | (6.8) | (2.6) | (4.1) | (11.4) | 1.2 |
| US Treasury | (17.7) | 16.0 | 10.7 | 24.5 | (17.3) | (4.2) | (1.7) | (8.7) | 4.2 | 41.0 | (25.6) | (3.0) | 11.1 | (7.7) | (23.9) | (1.4) | 0.4 | (7.7) | (11.8) | 3.4 |
| Global Sovereign ex-US | (18.9) | (1.5) | - | 31.9 | (1.0) | 3.5 | (12.9) | (4.1) | 4.9 | 32.4 | (15.3) | (6.3) | 0.7 | (10.1) | (22.8) | (13.2) | (6.0) | (6.9) | (5.1) | 1.6 |
| Core Fixed Income | (13.2) | 12.9 | 12.3 | 20.3 | (15.1) | (4.3) | (1.7) | (7.1) | 1.0 | 28.2 | (13.7) | (5.9) | 3.3 | (7.7) | (19.9) | (4.4) | (0.7) | (6.2) | (10.9) | 2.5 |
| High Yield Corp. Credit | (10.0) | (4.6) | 9.2 | 8.6 | 9.8 | 2.5 | (1.4) | 0.4 | (4.1) | (3.2) | 38.6 | 2.7 | 0.5 | 3.9 | (10.5) | (7.9) | (5.7) | 8.3 | (6.9) | 0.4 |
| Bank Loans. | (12.4) | 1.3 | 3.9 | 10.0 | (19.2) | (3.4) | 1.0 | (4.7) | (3.9) | (6.1) | 32.0 | (2.3) | (3.0) | (2.2) | (12.6) | (8.8) | (1.9) | 1.4 | (10.3) | 3.6 |
| Global Credit | (12.4) | 1.3 | 7.1 | 23.6 | (2.8) | 1.4 | (6.1) | (3.1) | 0.6 | 13.5 | 1.4 | (5.7) | (0.1) | 0.2 | (16.8) | (8.0) | (4.6) | (3.4) | (5.2) | (0.8) |
| Emerging Market Debt (Hard) | 7.2 | 14.0 | 13.6 | 23.7 | 3.0 | 3.0 | 6.1 | (1.5) | 0.2 | 11.0 | 10.2 | (0.2) | 2.8 | 5.5 | (23.2) | (3.0) | - | 1.4 | (4.1) | (1.8) |
| Emerging Market Debt (Local) | (12.4) | 1.3 | 3.9 | 10.0 | (19.2) | (8.6) | 2.2 | 3.8 | 12.1 | 17.8 | 2.4 | 3.3 | (6.3) | 4.9 | (26.9) | (16.1) | (16.1) | 1.1 | 0.8 | (3.7) |
| Commodities | 11.9 | 33.1 | (15.6) | 35.9 | 4.7 | 0.5 | 17.3 | (9.3) | 10.2 | (12.6) | (0.7) | 4.4 | (17.8) | (13.0) | (27.4) | (27.4) | (25.9) | 3.0 | (12.7) | (8.8) |
| Hedge Fund | 14.1 | 5.4 | 6.7 | 11.0 | (7.6) | (1.7) | 3.4 | (1.0) | 4.3 | 1.6 | (8.1) | (6.7) | (10.2) | (7.1) | (8.9) | (7.0) | (1.5) | (8.3) | (6.6) | (1.0) |
| REITs | (15.0) | 32.3 | 16.2 | 13.6 | 17.0 | 24.6 | 9.7 | 24.6 | (23.6) | (16.2) | 9.0 | 16.2 | 4.7 | 5.7 | (16.0) | 21.4 | 3.0 | (1.6) | (10.2) | (2.3) |
| Risk Parity (HFR Vol 10) | (12.4) | 1.3 | 3.9 | 10.0 | (19.2) | 9.1 | 11.4 | (9.1) | 4.7 | 6.6 | (3.6) | 5.7 | 4.7 | 1.1 | (18.4) | (2.3) | (6.3) | 1.2 | (0.9) | 6.4 |
| Core Real Estate (NCREIF ODCE) | 0.8 | 15.6 | 9.5 | 15.5 | (9.9) | 4.5 | 17.3 | 4.9 | 10.0 | 13.0 | (49.4) | 4.0 | 11.5 | (1.0) | (4.0) | 2.1 | 13.8 | - | (6.8) | 7.8 |
| Domestic 60/40 (S&P 500, BC Universal) | 12.4 | (1.3) | (3.9) | (10.0) | 19.2 | 8.6 | 4.1 | 11.4 | 6.0 | (23.0) | 19.6 | 12.4 | 4.5 | 11.9 | 17.9 | 10.4 | 1.2 | 8.8 | 14.4 | (2.5) |

| | | | | | | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| % of Assets Outperforming Domestic 60/40 | 39% | 72% | 78% | 83% | 44% | 67% | 67% | 44% | 72% | 56% | 56% | 50% | 50% | 56% | 17% | 17% | 22% | 50% | 28% | 44% |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

Performance as of 12/31/18, NCREIF Property Index performance data as of 9/30/18

Economic environment

U.S. economics summary

- Real GDP growth reached 3.0% YoY (3.4% quarterly annualized rate) in the third quarter, the fastest pace of growth in more than three years. Consumers drove growth after bouncing back from a spending slowdown in Q1.
- The U.S. and China ended the recent round of trade negotiations during the first week of January. The U.S. noted China's willingness to purchase more American agricultural goods, energy, and other manufactured goods, but little progress is evident overall.
- U.S. inflation remained near the Federal Reserve's 2.0% target. Headline U.S. inflation fell from 2.3% to 1.9% over the quarter, driven by lower oil prices. U.S. core CPI remained at 2.2%. Moderate inflation has likely contributed to the willingness of the Fed to keep on course with rate hikes.
- The labor market remained a bright spot in the U.S. economy. On average, nonfarm payrolls increased by 254,000 per month during the quarter, well above the expansion average of 201,000.
- The headline U-3 unemployment rate rose from 3.7% to 3.9%, in part due to an increase in labor force participation.
- Fiscal stimulus continued to support growth, although the impacts will likely subside in the first half of 2019. Stimulus may be masking a slowdown in the economy, which would be directionally in line with the rest of the developed world.
- The Federal Reserve hiked the target range for its benchmark interest rate by 25 basis points to a new range of 2.25% - 2.50%. Consistent with expectations for a "dovish hike", central bank officials re-rated hike expectations in 2019 from three to two.

| | Most Recent | 12 Months Prior |
|---|--------------------------|--------------------------|
| GDP (YoY) | 3.0% 9/30/18 | 2.3% 9/30/17 |
| Inflation (CPI YoY, Core) | 2.2% 12/31/18 | 1.8% 12/31/17 |
| Expected Inflation (5yr-5yr forward) | 1.8% 12/31/18 | 2.0% 12/31/17 |
| Fed Funds Target Range | 2.25 – 2.50% 12/31/18 | 1.25 – 1.50% 12/31/17 |
| 10 Year Rate | 2.7% 12/31/18 | 2.4% 12/31/17 |
| U-3 Unemployment | 3.9% 12/31/18 | 4.1% 12/31/17 |
| U-6 Unemployment | 7.6% 12/31/18 | 8.1% 12/31/17 |

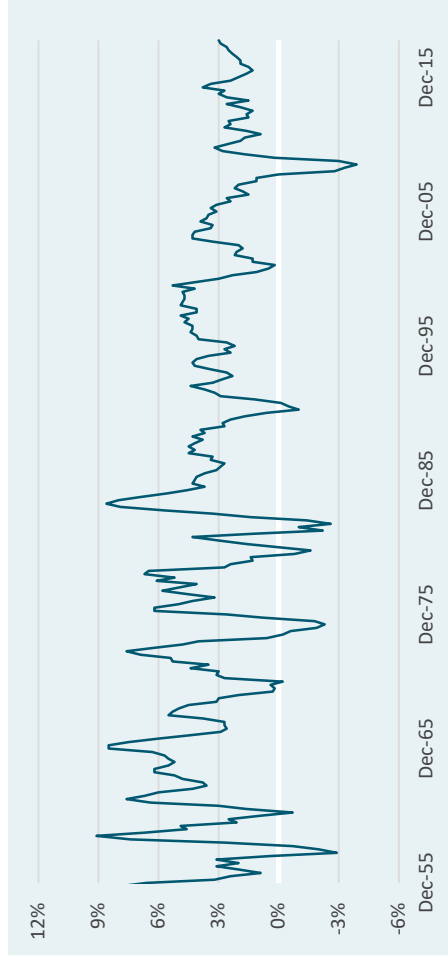
GDP growth

Real GDP growth reached 3.0% YoY (3.4% quarterly annualized rate) in the third quarter, the fastest pace in more than three years. Consumer spending was a core driver for the second straight quarter after bouncing back from a spending slowdown earlier in the year. A tight labor market, firming wage growth, and low inflation created a strong backdrop for spending, which added 2.4% to the quarterly growth rate. A build in inventories was the second biggest contributor to growth, which could be the result of pulling future growth into the current quarter as inventory builds are typically drawn down in subsequent quarters.

Fiscal stimulus continued to support growth, although its impact will likely subside in the first half of 2019. This support may be masking a slowdown in the U.S. economy, which has already started to appear in other parts of the world. More current metrics of the economy, such as PMIs, are indeed indicating that activity is slowing from recent high levels, but growth remains positive. However, fading fiscal stimulus and monetary tightening (that impacts the economy with a lag) present unique challenges to the economic outlook and increase the possibility of a more significant slowdown.

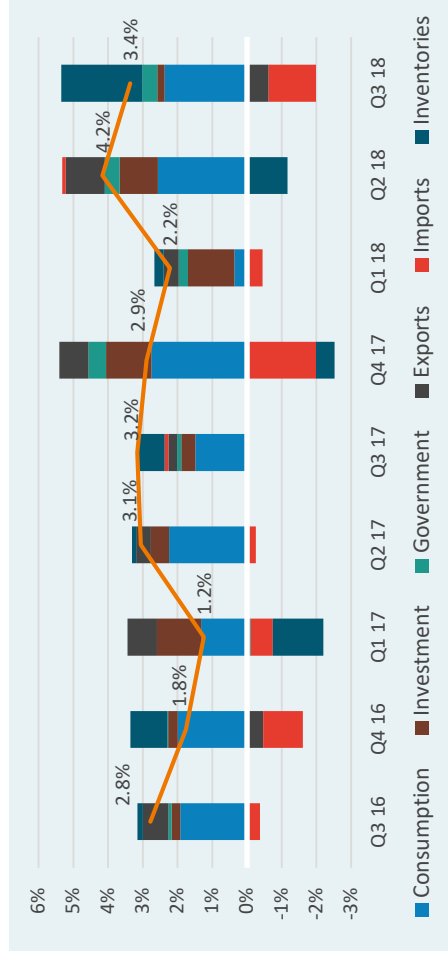
The economy appears to be slowing after a period of strong growth

U.S. REAL GDP GROWTH (YOY)



Source: Bloomberg, as of 9/30/18

U.S. GDP GROWTH ATTRIBUTION



Source: BEA, annualized quarterly rate, as of 9/30/18

Inflation

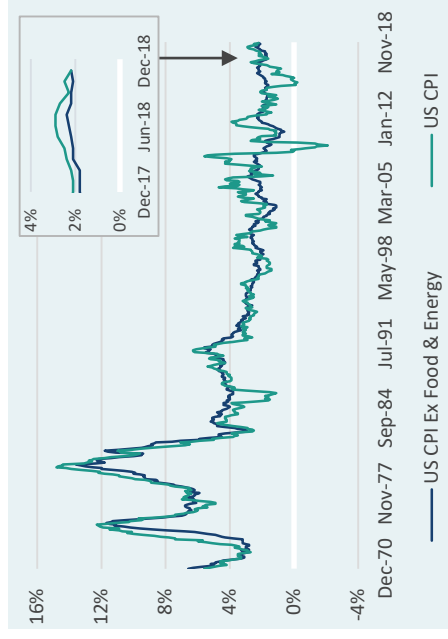
U.S. inflation remained near the Federal Reserve's 2.0% target. Headline U.S. inflation fell from 2.3% to 1.9% over the quarter, driven by lower oil prices. U.S. core CPI remained at 2.2%. Moderate inflation has likely contributed to the willingness of the Fed to keep on course with rate hikes.

Inflation fears remained muted as indicated by consumer expectations and market pricing. Breakeven inflation rates implied by U.S. 10-year Treasury pricing fell by a net 0.4% to 1.7% in the fourth quarter alongside a significant drop in

energy prices. Consumer inflation expectations moderated by a net 0.3% during that time, according to the University of Michigan consumer survey.

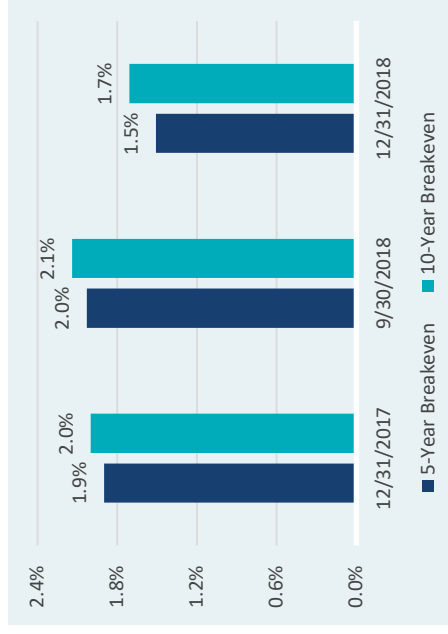
U.S.-China tariffs have recently been cited as a potential source of inflation risk. However, flow-through effects from import prices to consumer prices are complex, and the outcome may be more nuanced. We do not expect a material increase in inflation due to the tariffs that have been implemented.

U.S. CPI (YOY)



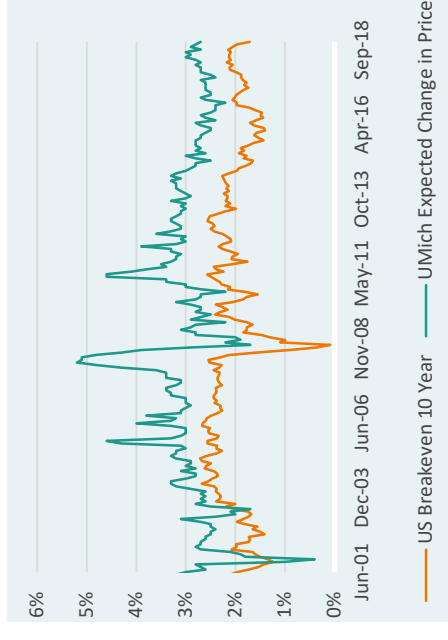
Source: Bloomberg, as of 12/31/18

BREAKEVEN INFLATION RATES



Source: FRED, as of 12/31/18

INFLATION EXPECTATIONS



Source: Bloomberg, as of 12/31/18

Labor market

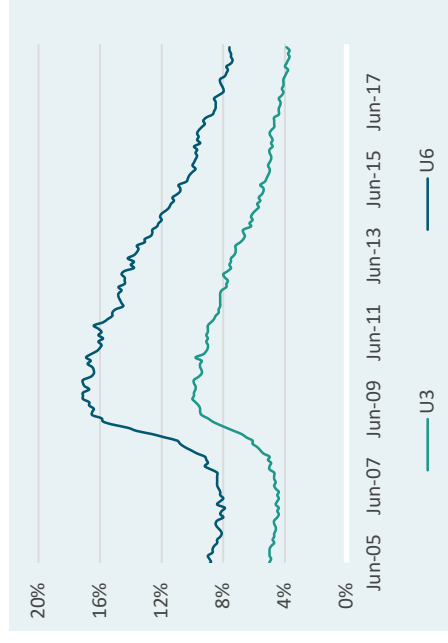
The labor market remained a bright spot in the U.S. economy, although this strength may reflect where the economy has been rather than where it is headed. Labor market conditions tend to lag the broader economy.

On average, nonfarm payrolls increased by 254,000 per month during the quarter, well above the expansion average of 201,000. The headline U-3 unemployment rate ticked up from 3.7% to 3.9%, in part due to an increase in labor force participation. Rising wages and ease of obtaining

employment may have played a role in enticing people to come back to work. Core age participation (ages 25-54) rose from 81.8% to 82.3% in the fourth quarter. This measure is up a net 1.7% (this increase roughly equates to 3.5 million more employed persons, all else equal) since hitting a secular low in late 2015.

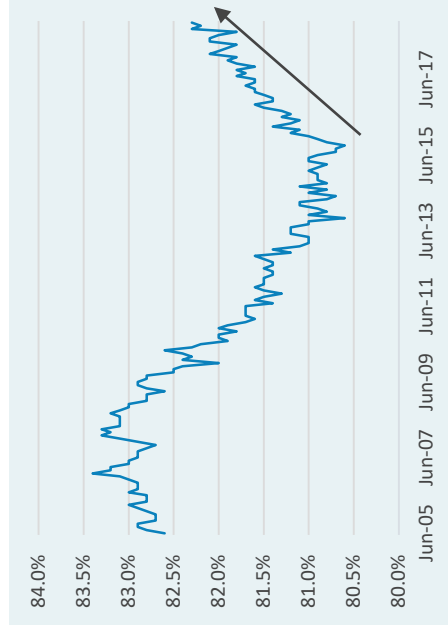
The tightness in the labor market appears to be translating to above average wage gains. In December, wage growth hit a cycle high of 3.3% from the previous year.

UNEMPLOYMENT RATE



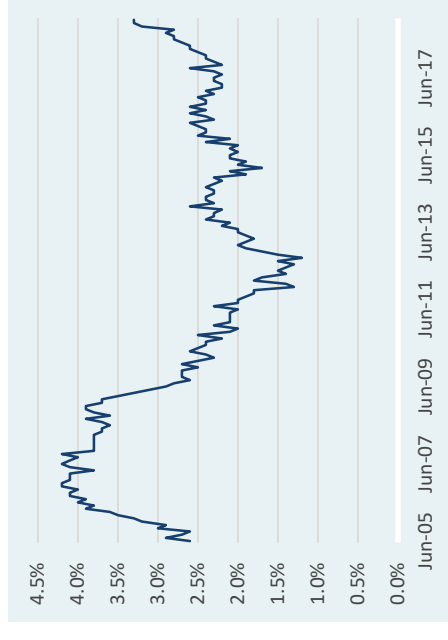
Source: FRED, as of 12/31/18

CORE AGE PARTICIPATION RATE



Source: Bloomberg, as 12/31/18

WAGE GROWTH (YOY)



Source: Bloomberg, as of 12/31/18

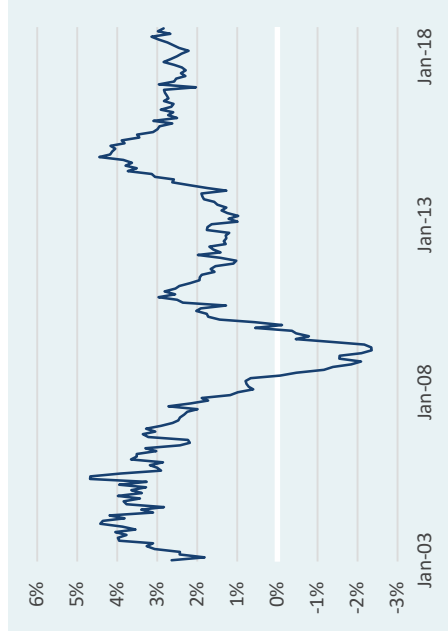
The consumer

Real consumer spending rose 2.8% year-over-year, and remains a core driver of recent economic growth.

A strong job market, decent wage gains, and low interest rates have provided continued support to spending. Although conditions and sentiment are strong relative to history, U.S. consumers appear to be behaving conservatively. Overall, spending growth and debt usage has been more moderate than seen in recent expansions, perhaps partly due to memories of the 2008-2009 recession.

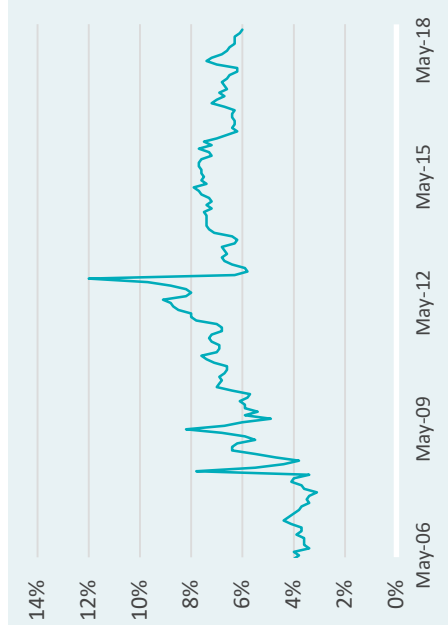
The 30-year fixed mortgage rate approached 5% towards the end of the year but tapered off as interest rates fell in December. Credit card interest rates have also risen materially. We believe further rate increases from this point will most likely be minimal, but that recent rate rises will act as a headwind to the consumer in many areas. For example, higher home values post-2009 were possible because low interest rates helped keep monthly payments within budgets. Now the reversal in interest rates, paired with additional home price appreciation, has squeezed the budget for new homeowners and contributed to a slowdown in the U.S. housing market.

REAL CONSUMER SPENDING (YOY)



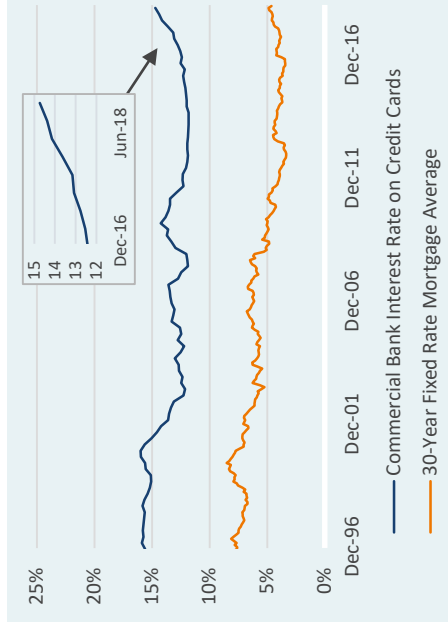
Source: Bloomberg, as of 11/30/18

PERSONAL SAVINGS RATE



Source: FRED, as of 11/30/18

CONSUMER INTEREST RATES



Source: FRED, as of 12/31/18

Sentiment

Both consumer and business sentiment indicators were resilient in the fourth quarter, holding at above average levels.

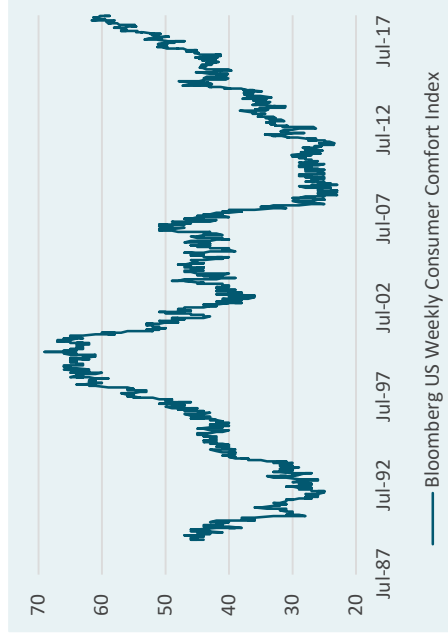
The University of Michigan Index of Consumer Sentiment fell modestly during the quarter from 100.1 to 98.3, but is still elevated relative to its own history (87th percentile since index inception in 1978). The recent plunge in stock prices was only reported by 12% of respondents as a primary economic concern. Consumers were instead

focused on positive perceptions of employment and income prospects, according to the survey administrators.

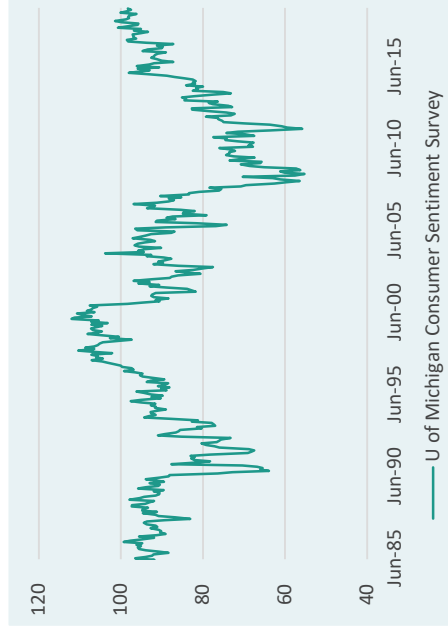
Small business sentiment drifted lower, but remained near record highs. At 104.4, the December reading for the NFIB Small Business Optimism Index was in the 92nd percentile of its own history going back to 1985.

Consumers and business are confident about the future

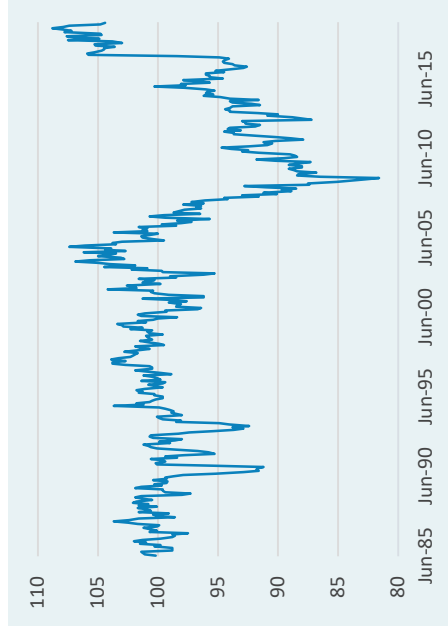
CONSUMER COMFORT INDEX



CONSUMER SENTIMENT



NFIB SMALL BUSINESS OPTIMISM INDEX



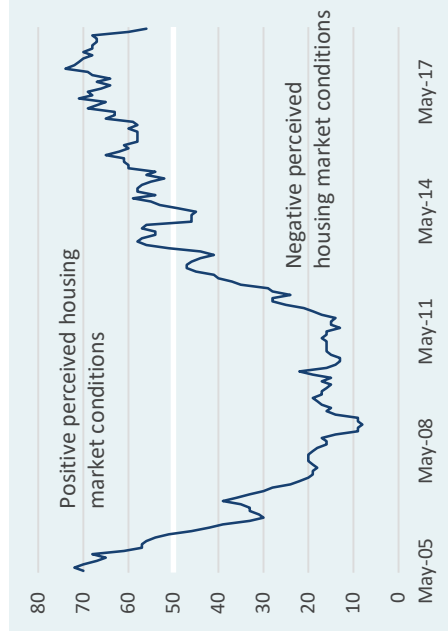
Housing

Housing market data that was released in the fourth quarter consistently came in below expectations. Monetary tightening has led to higher interest rates and likely begun to weigh on sales activity and home price appreciation. The National Association of Homebuilders (NAHB) Housing Market Index, based on a monthly survey of NAHB members designed to take the pulse of the single-family housing market, fell sharply from 67 to 56. However, the survey suggests conditions remain favorable overall, as 50 represents the neutral point for the index.

Less favorable buying conditions have flowed through to a slower pace of home sales despite a slowdown in price increases. Existing home sales, which make up the majority of national sales, fell to an annualized rate of 5.3 million in November, the slowest pace since early 2016. Home prices continue to march upward, but at a more moderate pace. In the most recent October print, the Case-Shiller National Home Price Index rose 5.5% year-over-year.

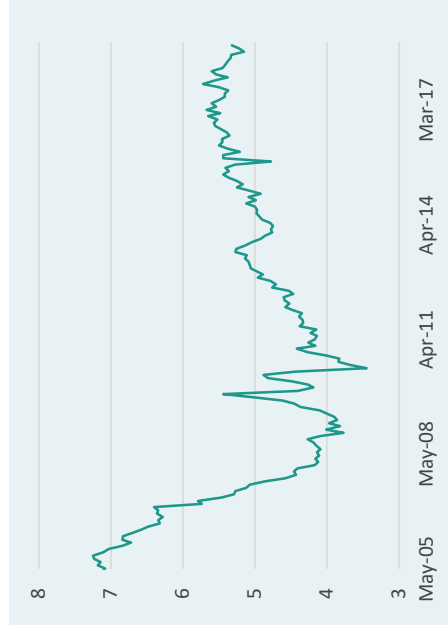
The U.S. housing market appears to be cooling off

NAHB HOUSING MARKET INDEX



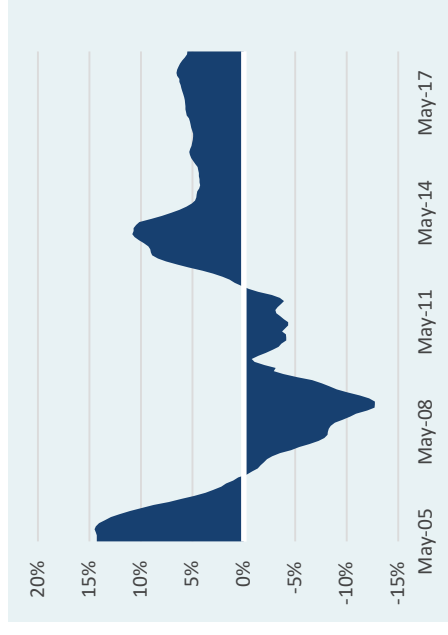
Source: Bloomberg, NAHB, as of 12/31/18 (see appendix)

EXISTING HOME SALES (MILLIONS)



Source: Bloomberg, SAAR, as of 11/30/18

NATIONAL HOME PRICE INDEX (YOY)



Source: Bloomberg, S&P/Case-Shiller, as of 10/31/18

International economics summary

- Outside of the U.S., economic growth has slowed in recent quarters, most notably in Europe and Japan. Developed real GDP growth is expected to slow from 2.2% in 2018 to 2.0% in 2019, according to the World Bank.
- The U.S. and China ended the recent round of trade negotiations during the first week of January. Officials continue to work towards an agreement, though little progress is been demonstrated thus far. On March 2nd, U.S. tariffs are scheduled to increase from 10% to 25% on \$200 billion of Chinese imports.
- China's Purchasing Managers' Index (PMI) fell to 49.7 in December. An index reading of 50 indicates economic expansion while a reading below 50 indicates contraction. This reading is in line with a string of weak economic data coming out of China.
- The House of Commons in British Parliament overwhelmingly rejected Theresa May's Brexit deal that had been approved by the European Union. The details surrounding the terms of Great Britain's exit remain uncertain ahead of the March 30th deadline. Potential resolutions include renegotiating a deal with the EU, leaving without a deal, or delaying the exit deadline.
- The U.S. dollar appreciated by 1.9% during the quarter on a trade-weighted basis. A slowing U.S. economy would likely put downside pressure on the dollar, which has been boosted recently by U.S. economic exceptionalism.

| Area | GDP (Real, YoY) | Inflation (CPI, YoY) | Unemployment |
|------------------|--------------------|-------------------------|-------------------|
| United States | 3.0% 9/30/18 | 2.2% 11/30/18 | 3.9% 12/31/18 |
| Eurozone | 1.6% 9/30/18 | 1.8% 11/30/18 | 8.1% 10/31/18 |
| Japan | 0.0% 9/30/18 | 0.8% 11/30/18 | 2.5% 11/30/18 |
| BRICS Nations | 5.6% 9/30/18 | 2.4% 12/31/18 | 5.4% 9/30/18 |
| Brazil | 1.3% 9/30/18 | 4.1% 11/30/18 | 11.7% 12/31/18 |
| Russia | 1.5% 9/30/18 | 4.3% 12/31/18 | 4.8% 11/30/18 |
| India | 7.1% 9/30/18 | 2.3% 11/30/18 | 8.8% 12/31/17 |
| China | 6.5% 9/30/18 | 2.2% 11/30/18 | 3.8% 9/30/18 |

International economics

Outside of the U.S., economic growth slowed in recent quarters, most notably in Europe and Japan. Inflation turned lower in Q4 alongside falling energy prices. Low inflation provides greater flexibility for central banks to remain accommodative as needed.

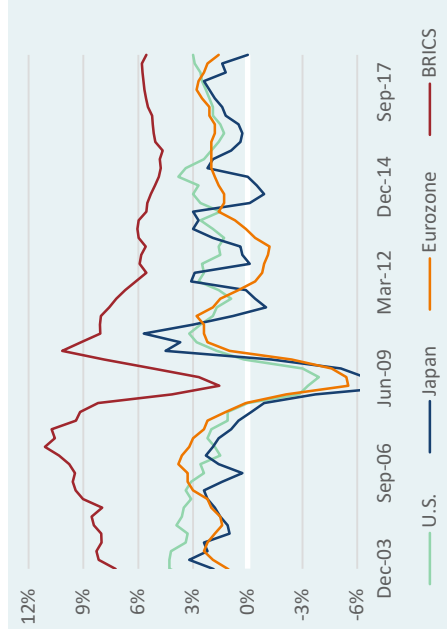
In the Eurozone, real GDP decelerated to 1.6% YoY as many economies struggled with stagnation and social unrest. European Union rules restrict the ability of member nations to fully implement fiscal and monetary stimulus to their economies, which may have contributed to Europe's uneven

economic recovery. It is possible that certain laggards of the Eurozone will eventually push for greater sovereign control of their economies if stagnation continues. This may result in standoffs such as seen recently between Italy and the EU.

The House of Commons in British Parliament overwhelmingly rejected Theresa May's Brexit deal that had been approved by the European Union. The details surrounding the terms of Great Britain's exit remain uncertain ahead of the March 30th deadline. Potential resolutions include renegotiating a deal with the EU, leaving without a deal, or delaying the exit deadline.

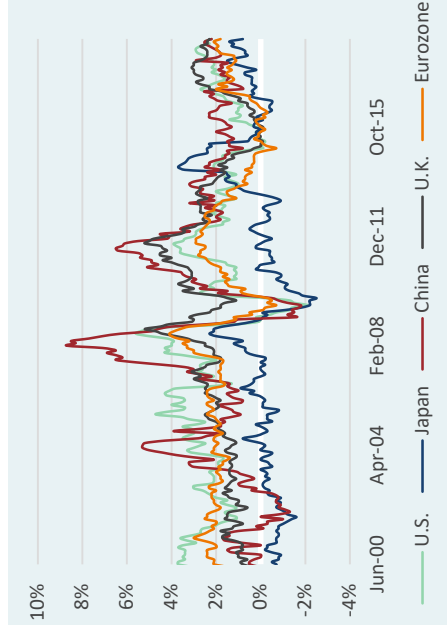
Global economic growth appears to be decelerating

REAL GDP GROWTH (YOY)



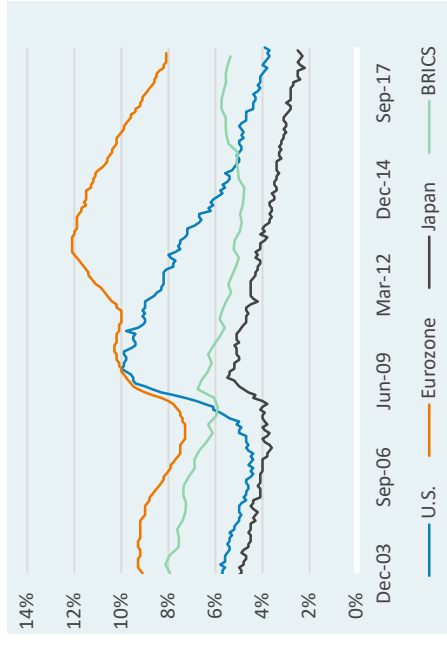
Source: Bloomberg, as of 9/30/18

INFLATION (CPI YOY)



Source: Bloomberg, as of 11/30/18

UNEMPLOYMENT RATE



Source: Bloomberg, as of 11/30/18 or most recent release

Brexit

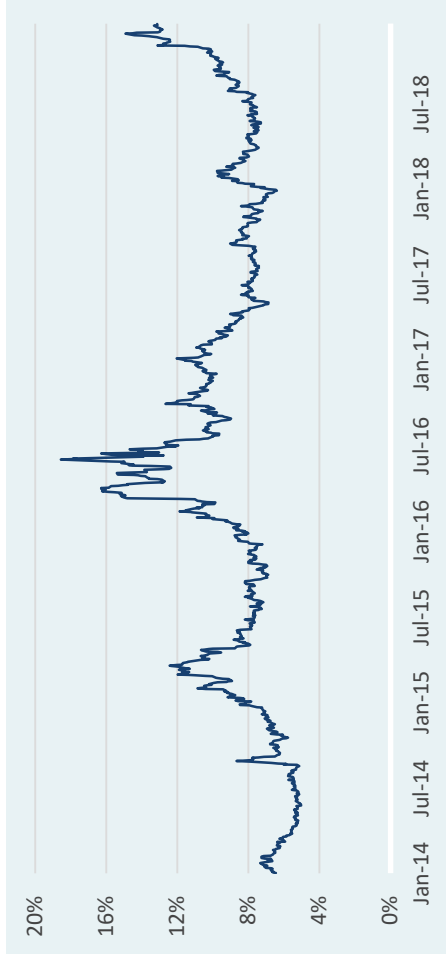
The chaos surrounding Brexit negotiations has not yet had a large impact on markets (outside of higher volatility in the British pound), but it will likely become an increasing area of focus for global investors the closer we get to the March 2019 deadline. While most political and market commentators remain anti-Brexit, when we take a step back and think more dispassionately about the issue, a different picture emerges. Less immigration from Europe will likely be balanced by easier movement from other countries, including the U.S., India, Australia and others with historically strong links to the UK. Some businesses will likely shift to

accommodate the UK being outside of the protectionist area of the EU, but for most UK firms, much of their business is either done domestically or with non-EU countries.

There will be both gains and losses from Brexit, and yet current market pricing behavior seems to be putting little focus on the good and exaggerating the bad, which may present investment opportunity, particularly for non-consensus active managers. In the short-term, however, investors should brace for higher volatility.

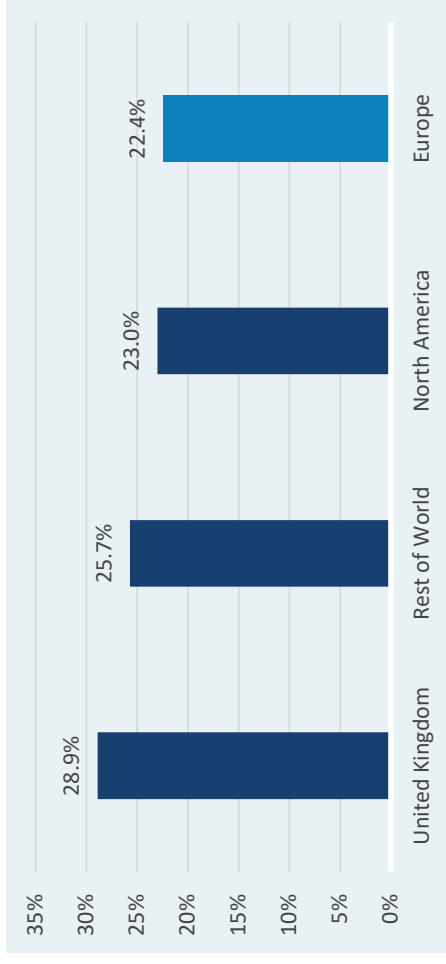
There will be both gains and losses from Brexit

3-MONTH IMPLIED VOLATILITY OF GBP/USD



Source: Bloomberg, as of 12/31/18

FTSE 100 COMPANY REVENUES BY REGION (2017)



Source: FTSE, 2017

Fixed income rates & credit

Interest rate environment

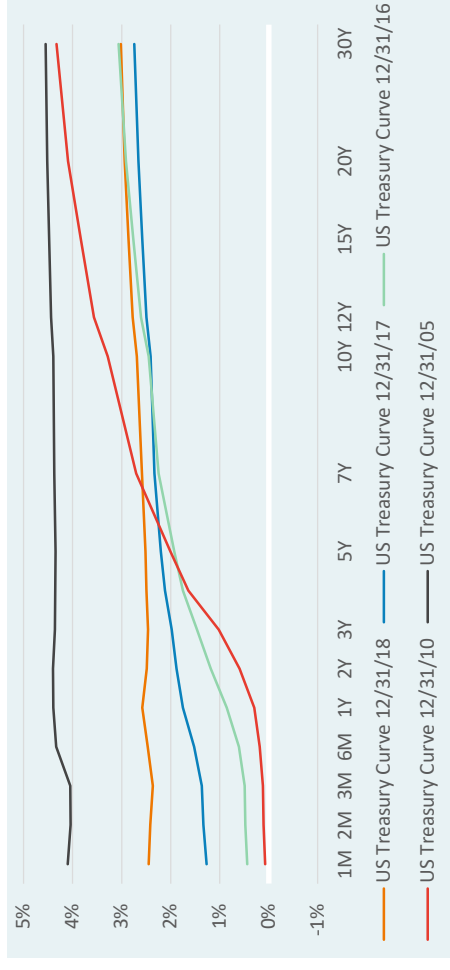
- The Federal Reserve raised the target for the fed funds rate by 0.25% in December, to a range of 2.25%-2.50%. Despite the hike, Fed officials indicated a more patient approach to future tightening, and lowered expectations for hikes in 2019 from three to two.
- The market's expectation for future rate hikes changed dramatically in December. As of year-end, the fed fund futures market is pricing zero hikes in 2019 and a rate cut priced in 2020.
- After reaching a cycle high of 3.2% in November, the 10-year Treasury yield fell sharply to end the year at 2.7%. Much of this drop was due to falling breakeven inflation as oil prices plunged. The 10-year breakeven inflation rate fell from 2.1% to 1.7% over the quarter.
- Although certain parts of the U.S. Treasury yield curve have inverted, there remains a 15 bps gap between the 10- and 2-year yields, which is the most widely cited measure of yield curve shape.
- Developed sovereign yields fell alongside U.S. Treasuries. The 10-year German bund yield was cut in half over the quarter to 0.24%.
- As expected, the European Central Bank officially announced the end of its asset purchase program. Beginning in January of 2019, monthly purchases will fall from €30 billion to €0. Central bank officials have said that they will fully reinvest maturing securities for the foreseeable future and keep interest rates unchanged until at least the second half of 2019.

| Area | Short Term (3M) | 10-Year |
|---------------|-----------------|---------|
| United States | 2.36% | 2.69% |
| Germany | (0.77%) | 0.24% |
| France | (0.86%) | 0.71% |
| Spain | (0.42%) | 1.42% |
| Italy | (0.06%) | 2.74% |
| Greece | 1.30% | 4.40% |
| U.K. | 0.73% | 1.28% |
| Japan | (0.15%) | 0.00% |
| Australia | 2.01% | 2.32% |
| China | 2.83% | 3.31% |
| Brazil | 6.48% | 9.24% |
| Russia | 7.12% | 8.78% |

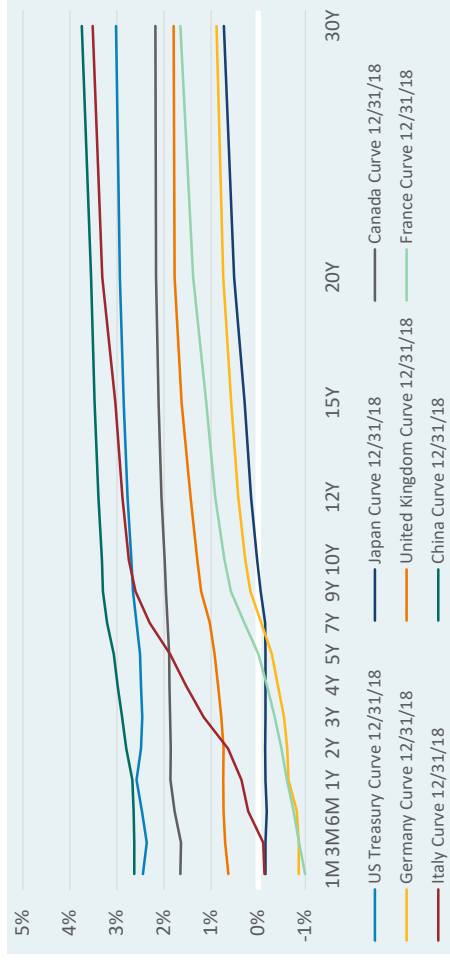
Source: Bloomberg, as of 12/31/18

Yield environment

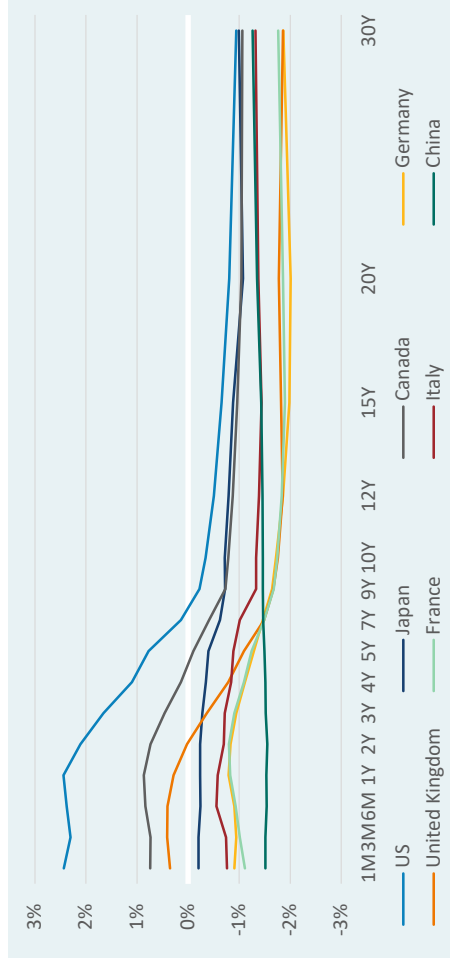
U.S. YIELD CURVE



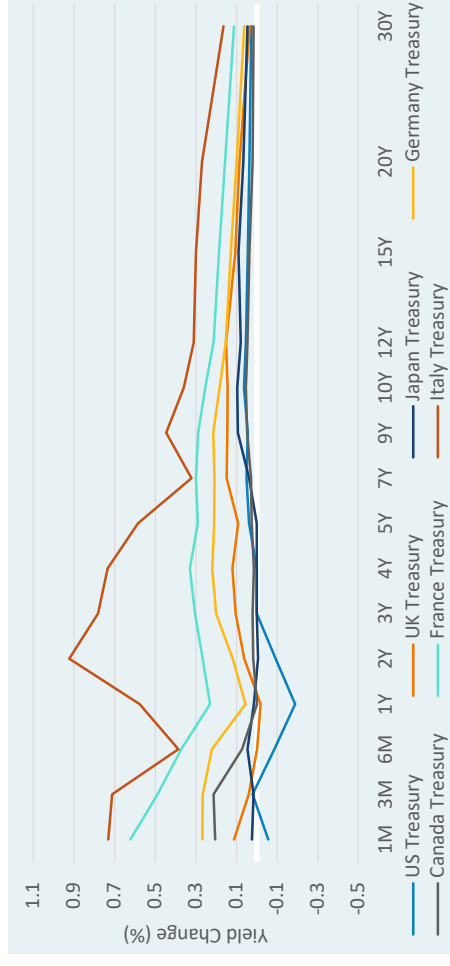
GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 12/31/18

Fed pricing

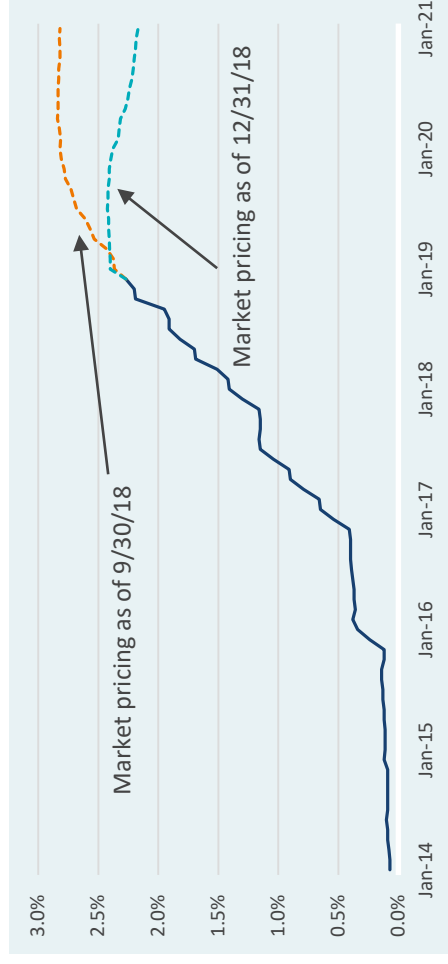
The Fed raised rates by another 25 bps in December to a target range of 2.25% to 2.50% on the fed funds rate, the fourth such hike of 2018. More important than what the Fed did, however, is what Fed officials said, and how the market reacted and adjusted its expectations for future monetary tightening. Leading up to the December meeting, Fed officials began to take a more a dovish tone amid market volatility and economic data misses, and they stressed the importance of future policy being data dependent. The Fed then acknowledged these concerns by lowering expectations for rate hikes in 2019 from three to two. Meanwhile, market expectations for future rate hikes plummeted as equity

markets sold off and volatility spiked. As of the end of the year, not only were markets priced for a Fed pause in 2019, but they were also priced for a rate cut in 2020. With such dovish market pricing, it is important to note that in order for the Fed to provide any stimulus at this point, it will likely need to cut rates or halt the balance sheet unwind.

As of December, the Fed balance sheet had been reduced by around \$500 billion without any immediate issues. To this point, officials have been adamant that the balance sheet is not an active tool for tightening monetary policy, and that there are no plans to adjust the current rate of unwind.

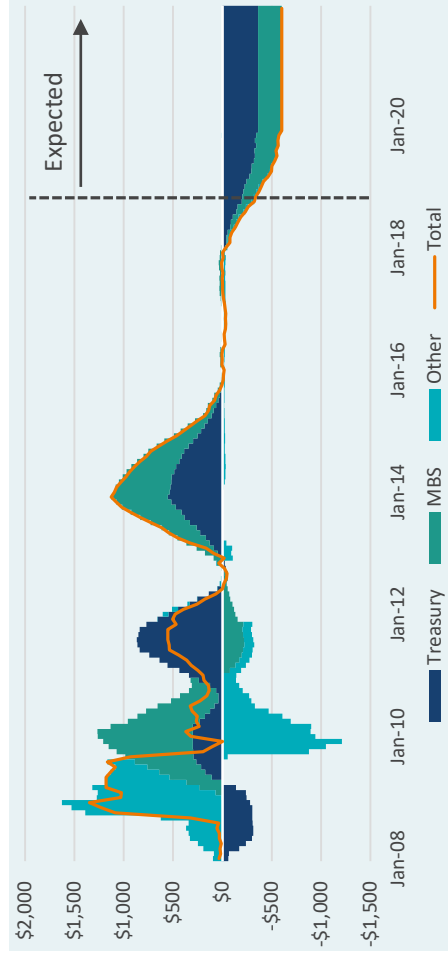
Market pricing of future Fed policy is extremely dovish

MARKET PRICING OF THE FED FUNDS RATE



Source: Bloomberg, as of 12/31/18, dotted lines are based on futures market pricing

NET CHANGE IN FED BALANCE SHEET (YOY, \$BILLIONS)



Source: Bloomberg, Federal Reserve, as of 12/31/18

Credit environment

High yield and bank loans delivered losses during the quarter on slowing growth expectations, energy price volatility, investor outflows, and broad risk-off market sentiment (BbgBarc US Corp High Yield -4.5%, CS Leveraged Loans -3.1%).

High yield bonds returned -2.1% for 2018, which is the second lowest annual return for the asset class in the last ten years after 2015. Yields and spreads in high yield credit are at their highest since 2016, increasing to 8.0% and 526 bps, respectively.

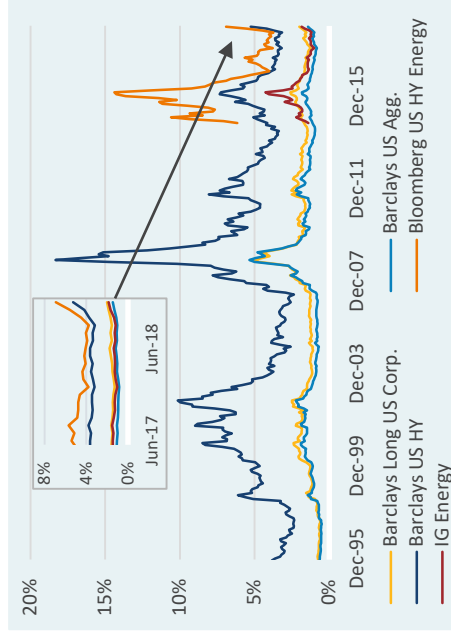
Loans were also under pressure in December as the asset class

dealt with accelerated outflows and negative press – spreads on loans increased to 505 bps from 374 bps the prior quarter. The credit quality of bank loans has deteriorated throughout the cycle as covenant-lite loans dominated new issuance.

Based on the recent behavior and heightened volatility in credit, we do not believe investors are being adequately compensated for credit risk and believe an underweight to U.S. investment grade, high yield credit, and bank loans is warranted. Within credit, we have a bias toward owning higher quality and more liquid assets.

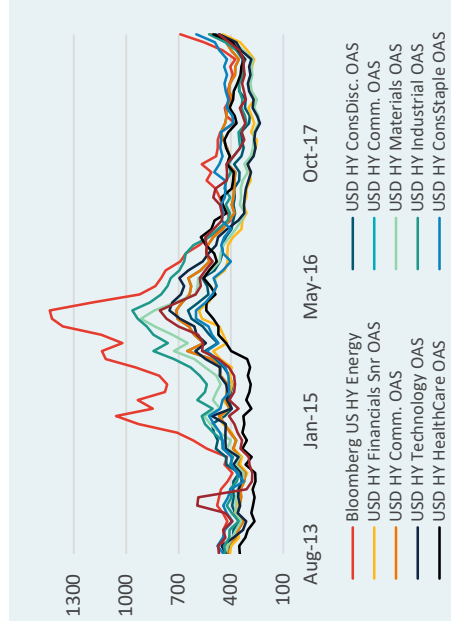
Credit spreads widened due to concerns over slowing global growth and broader risk-off behavior

SPREADS



Source: Barclays, Bloomberg, as of 12/31/18

HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 12/31/18

| Market | Credit Spread (OAS 12/31/18) | Credit Spread (1 Year Ago) |
|-------------------|------------------------------|----------------------------|
| Long US Corporate | 2.0% | 1.4% |
| US Aggregate | 1.4% | 0.9% |
| US High Yield | 5.3% | 3.4% |
| US Bank Loans* | 5.1% | 4.0% |

Source: Barclays, Credit Suisse, Bloomberg, as of 12/31/18

*Discount margin 4-year life

Issuance and default

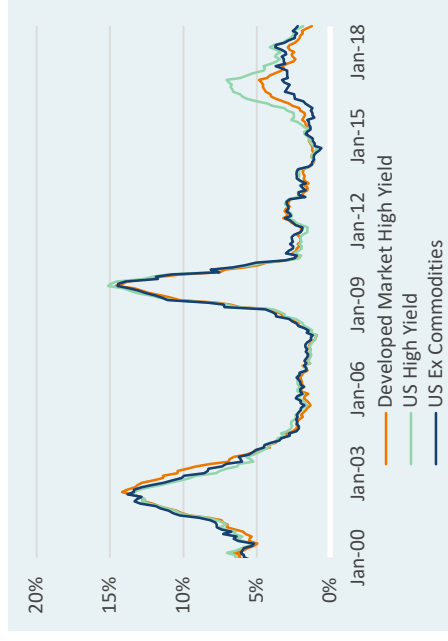
Default activity has been low and stable in the U.S. credit market, despite wider spreads. The par-weighted default rate of 1.9% remains below its long-term average of 3.0-3.5%. There were 29 defaults in 2018, affecting \$40.9 billion in bonds. iHeartRadio accounted for 40% of default volume (\$16 billion). The loan par-weighted default rate finished the year at 1.6%.

Senior loan and high yield markets have essentially recovered from a wave of defaults seen in 2015-2016 that were generated from the energy and metals/mining sectors.

Recovery rates for high yield bonds have vastly improved since that time.

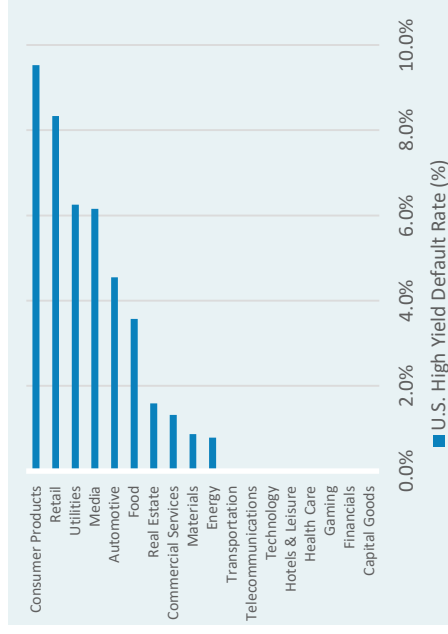
There were no high yield bonds issued in December due to market volatility – the first time this has happened since November 2008. Loan market issuance also slowed, with only \$8 billion in institutional loan volume. Gross new high yield and loan issue activity totaled \$187 billion and \$704 billion for 2018, respectively.

HY DEFAULT RATE (ROLLING 1-YEAR)



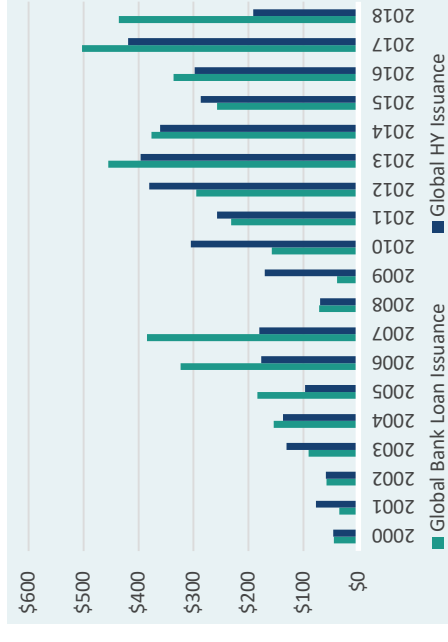
Source: BofA Merrill Lynch, as of 12/31/18

HY SECTOR DEFAULTS (LAST 12 MONTHS)



Source: BofA Merrill Lynch, as of 12/31/18 – par weighted

GLOBAL ISSUANCE (\$ BILLIONS)

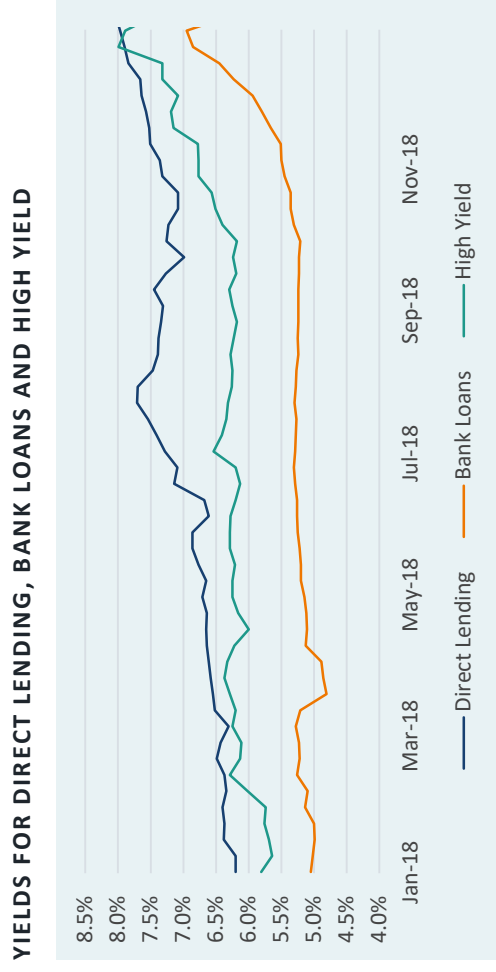


Source: Bloomberg, BofA Merrill Lynch, as of 12/31/18

Private credit

Fundraising in Private Credit slowed in 2018. 163 funds closed on \$110 billion in 2018, which was down from 189 funds and \$129 billion in 2017. Direct lending, mezzanine and distressed debt were the most active strategies raising \$45 billion, \$31 billion, and \$21 billion, respectively. Even with the slower fundraising, dry powder in private credit is at record levels. Private debt dry powder at the end of 2018 was \$280 billion, which eclipsed the 2017 record of \$246 billion.

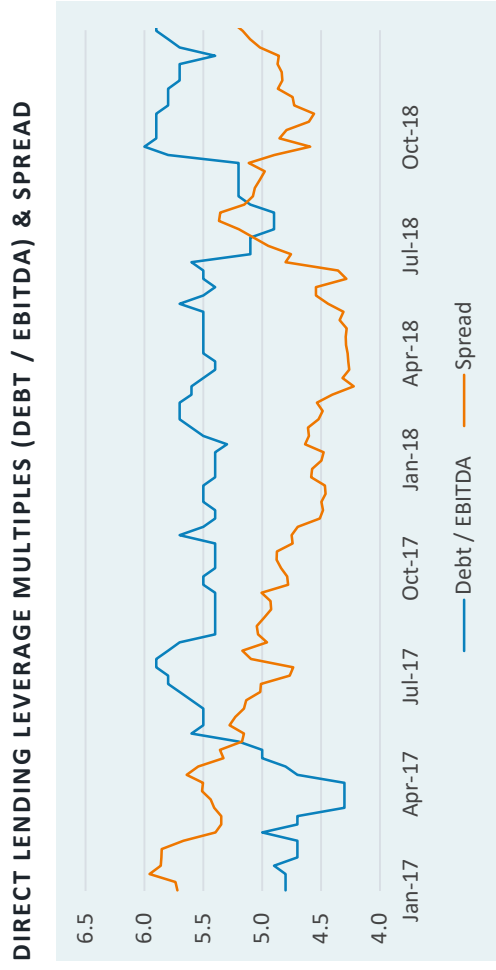
Yields for loans made by direct lending funds finished the year above 8% (8.04%). While yields have been aided by higher LIBOR rates,



Source: The Lead Left, Middle Market, EBITDA < \$50MM; S&P LSTA US Leveraged Loan Index; ICE BofAML US High Yield Master II, as of 12/31/18

which grew from 1.7% to 2.8% during 2018, spreads increased from 4.5% to 5.35% during the year.

While credit spreads expanded in 2018, so too did the debt multiples for borrowers. Borrowers now average debt totaling 5.9x EBITDA, a 0.5x increase from January 2018-levels.



Source: The Lead Left, Middle Market Credit Stats, as of 12/31/18

Equity

Equity environment

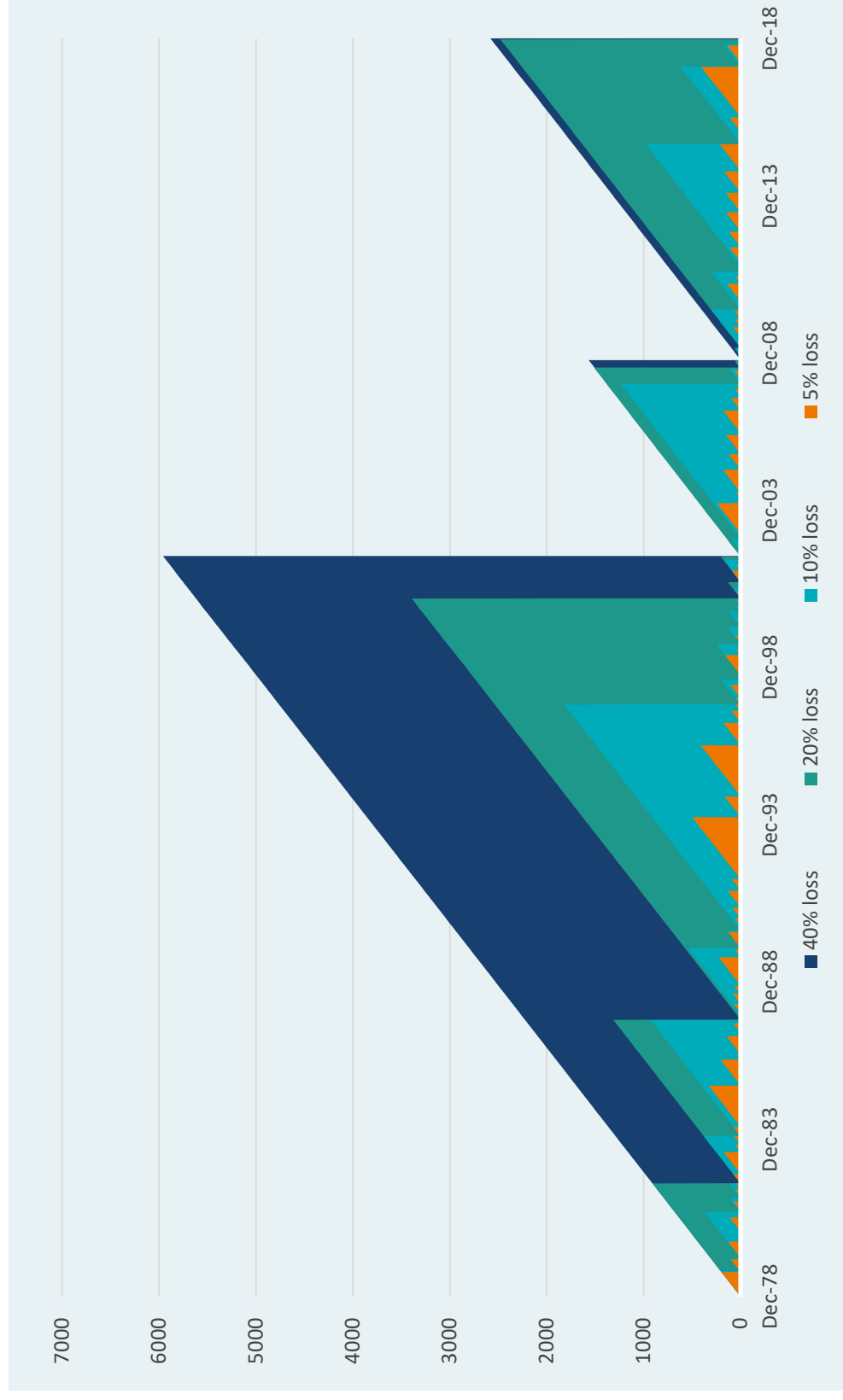
- U.S. equities experienced their worst quarter since 2008 – the S&P 500 Index returned -13.5%. The sell-off was due in part to concerns over a slowdown in global growth, and was exacerbated by low liquidity toward the end of the year.
- The drawdown from peak on the S&P 500 Index stopped just shy of 20% before equities rebounded during the last week of the year. Historically, equity drawdowns of more than 20% have been associated with an economic recession.
- Although absolute performance was also poor, international equities outperformed U.S. equities, particularly in emerging markets.
- Global equities saw a sharp drop in valuations as price declines overwhelmed small downward adjustments to earnings expectations. The 12-month forward P/E multiple for the MSCI ACWI fell by 12.1% during the quarter, falling from 14.8x to 13.0x.
- The risk-off environment hit small cap equities especially hard. The Russell 2000 Index posted a -20.2% return in the fourth quarter, compared to a decline of 13.8% on the Russell 1000 Index.
- Value equities outperformed growth equities over the quarter for the time since Q4 2016. The Russell 1000 Value Index and Russell 1000 Growth Index returned -11.7% and -15.9%, respectively.
- Equity volatility surged in what may be the beginning of a transition to a higher volatility regime. The VIX Index averaged 21 in Q4, and hit a high of 36 on December 24th.

| | QTD TOTAL RETURN | | 1 YEAR TOTAL RETURN | |
|---|------------------|----------|---------------------|----------|
| | (unhedged) | (hedged) | (unhedged) | (hedged) |
| US Large Cap (Russell 1000) | (13.8%) | | (4.8%) | |
| US Small Cap (Russell 2000) | (20.2%) | | (11.0%) | |
| US Large Value (Russell 1000 Value) | (11.7%) | | (8.3%) | |
| US Large Growth (Russell 1000 Growth) | (15.9%) | | (1.5%) | |
| International Large (MSCI EAFE) | (12.5%) | (11.6%) | (13.8%) | (9.0%) |
| Eurozone (Euro Stoxx 50) | (14.1%) | (10.7%) | (16.2%) | (9.3%) |
| U.K. (FTSE 100) | (11.7%) | (9.1%) | (14.0%) | (7.3%) |
| Japan (NIKKEI 225) | (14.6%) | (16.6%) | (8.6%) | (9.6%) |
| Emerging Markets (MSCI Emerging Markets) | (7.5%) | (7.4%) | (14.6%) | (10.3%) |

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 12/31/18

Corrections are normal

RUSSELL 1000 INDEX – CUMULATIVE TRADING DAYS SINCE LOSS OF GIVEN MAGNITUDE



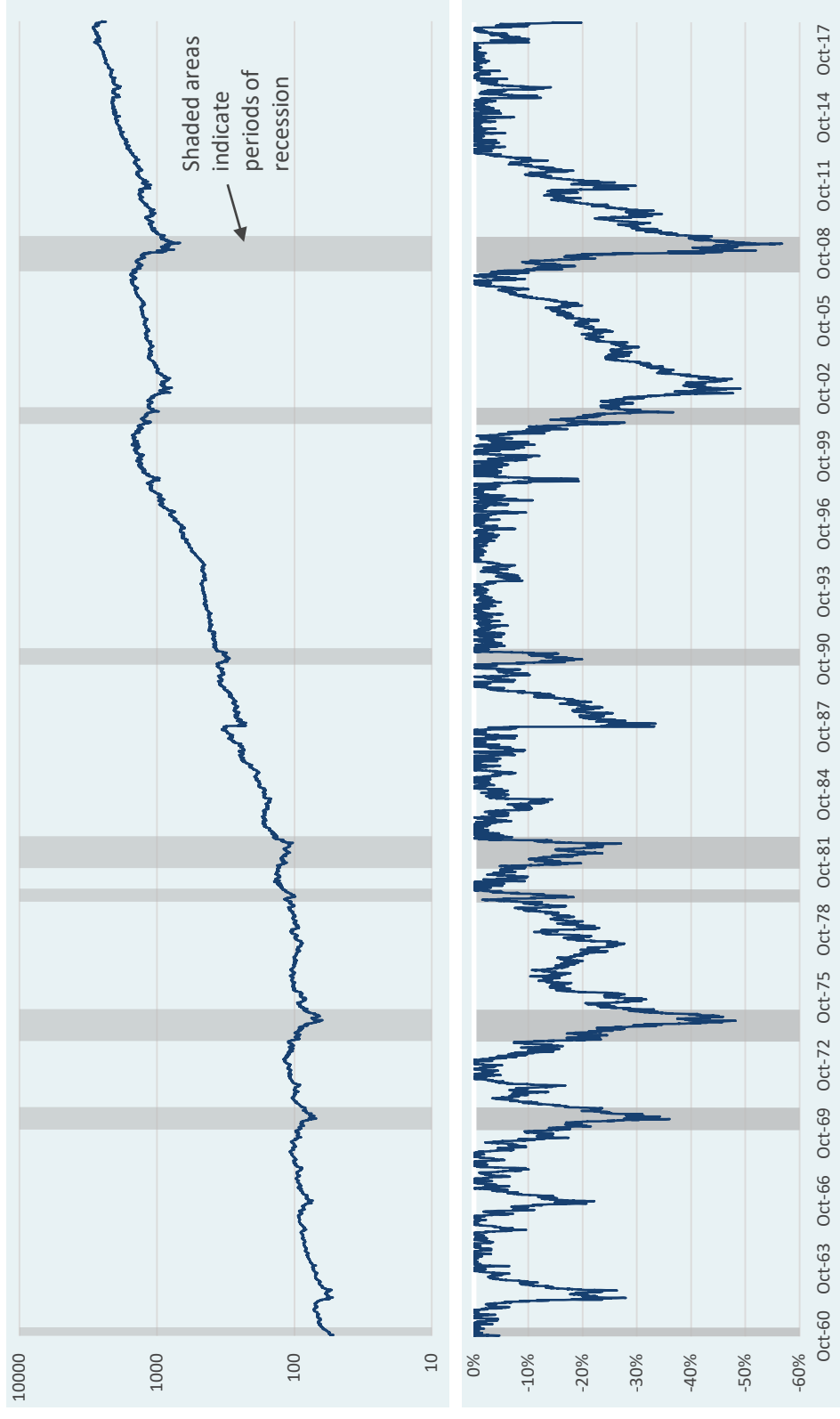
5% and 10% corrections occur regularly

The recent 20% drawdown is more notable, as equity drops of this size have happened once per cycle, on average

Source: Verus, FTSE Russell, as of 12/31/18

Drawdowns of greater than 20% occur less frequently

S&P 500 INDEX (UPPER PANEL) AND DRAWDOWN FROM PEAK (LOWER PANEL)



Drawdowns of greater than 20% have typically been associated with economic recessions

The recent drawdown appears overdone based on economic conditions

Source: Bloomberg, Verus, as of 12/31/18, recession start and end dates are from the NBER

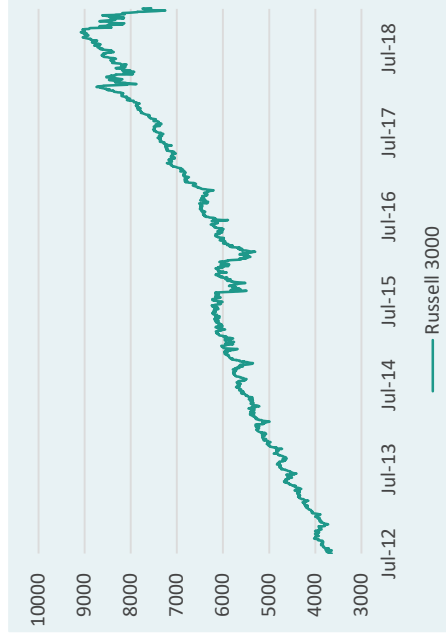
Domestic equity

U.S. equities experienced their worst quarter since 2008 as the S&P 500 Index returned -13.5%. For much of 2018, strong realized and expected earnings growth more than offset rising risk premiums (i.e. February sell-off) and discount rates as shown below in the middle chart. However, when cracks appeared in the growth story, influenced by poor economic data as well as profit warnings from companies, this support quickly vanished. The sharp drawdown, particularly in December, was also influenced by pockets of illiquidity in the market that exacerbated the move lower.

The question for investors now becomes whether the recent drawdown was a healthy reset of the pricing of earnings and risk premia, or whether it was a more urgent warning signal of a deterioration in the growth and profit cycle. We believe it to be more of the former rather than the latter, and that the market priced in an overly pessimistic view of macro conditions. However, we also recognize the growing headwinds to equities, including slowing global growth, further potential monetary tightening, and high debt levels. These conditions will likely result in sustained higher volatility, consistent with previous late cycle experiences.

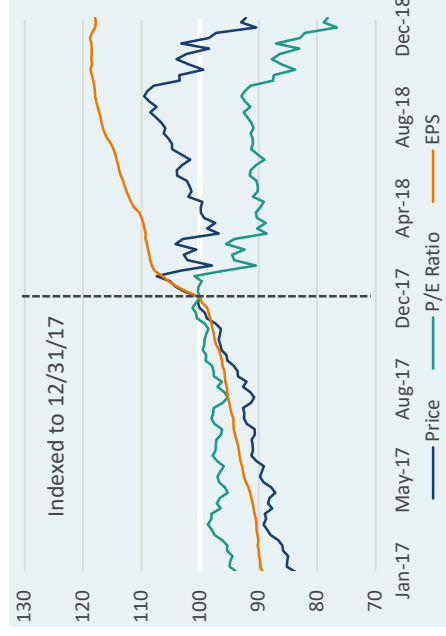
We maintain a neutral view on U.S. equities

U.S. EQUITIES



Source: Russell Investments, as of 12/31/18

S&P 500 PRICE MOVEMENT ATTRIBUTION



Source: Bloomberg, as of 12/31/18

CYCLICALS-DEFENSIVES RETURN SPREAD



Source: Bloomberg, MSCI, as of 12/31/18

Domestic equity size & style

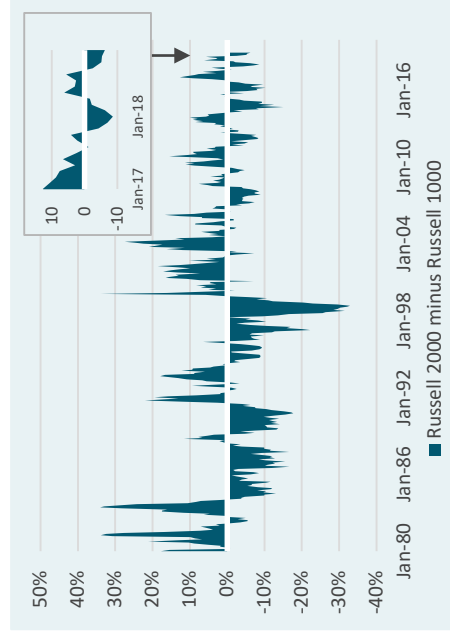
Large cap equities (Russell 1000 -13.8%) significantly outperformed small cap equities (Russell 2000 -20.2%) during the quarter. It may not be surprising that small cap equities underperformed, given the broad risk-off moves during this period. Growth stocks underperformed value stocks during the quarter (Russell 1000 Growth -15.9% vs. Russell 1000 Value -11.7%) for the first time since Q4 2016.

The sector weights in large-cap style benchmarks explain most of the recent value underperformance. Over the past

year, Energy, Materials, and Financials returned -18.1%, -14.7%, and -13.0%, respectively. These sectors are heavily weighted with value stocks, which resulted in a large drag to value. Information technology was an outperforming sector with a return of -0.3% during the period.

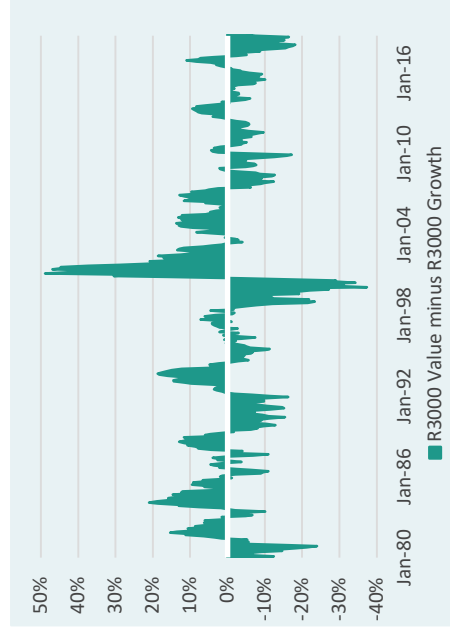
Long spans of style (size, value) underperformance is, and will always be, discouraging for investors. Similar to an investment in the broader equity market, we should expect to see rough patches of performance through time.

SMALL CAP VS LARGE CAP (YOY)



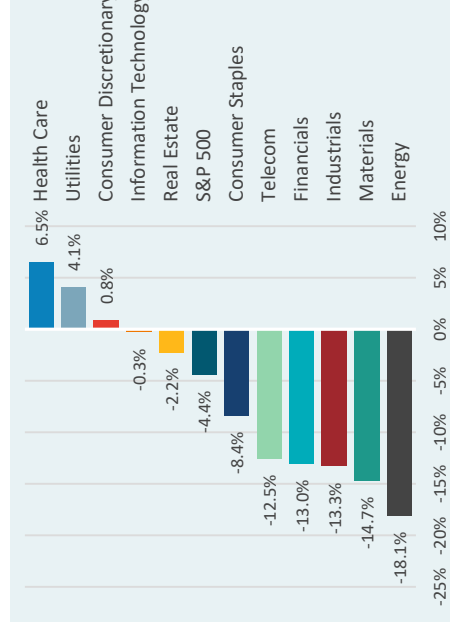
Source: FTSE, as of 12/31/18

VALUE VS GROWTH (YOY)



Source: FTSE, as of 12/31/18

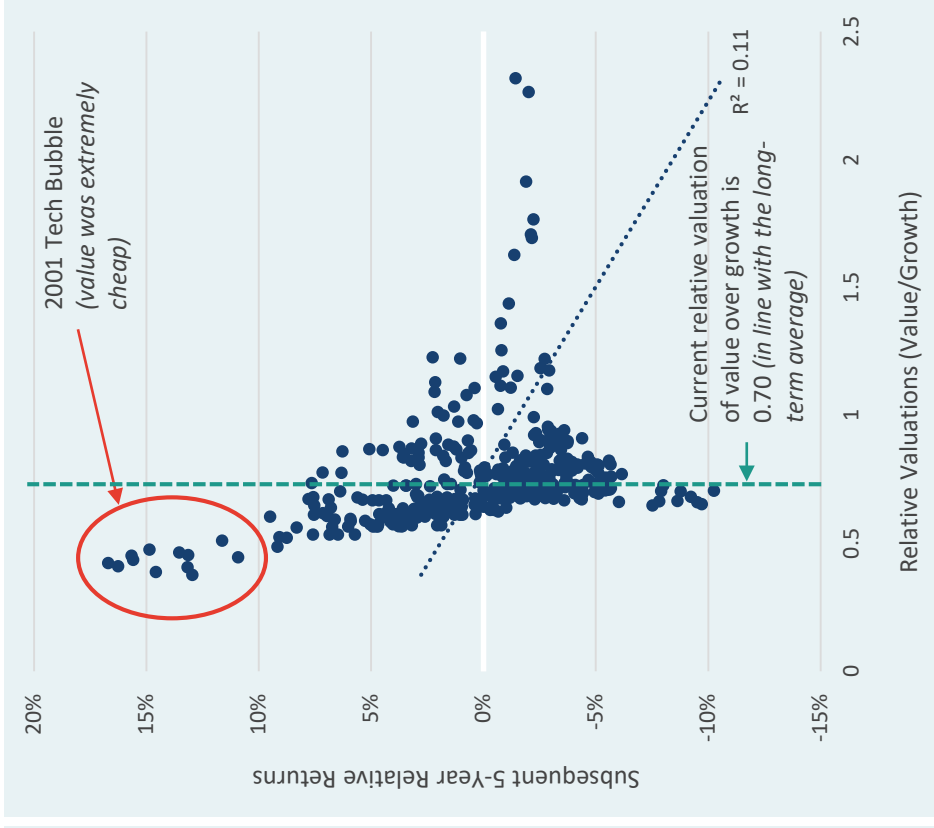
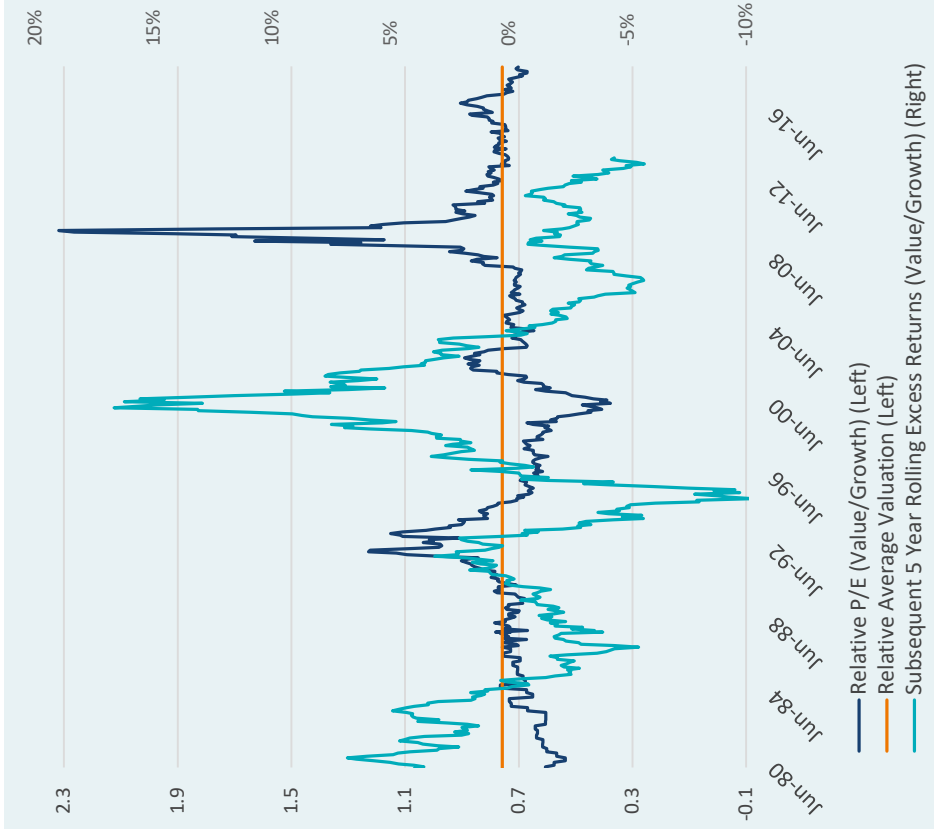
1-YEAR S&P 500 SECTOR RETURNS



Source: Morningstar, as of 12/31/18

Value – extreme prices indicate opportunity

But the price of value stocks is in-line with the long-term average



Although value has delivered an extended period of poor performance, value stocks are not cheap

Source: Verus, FTSE Russell, as of 12/31/18

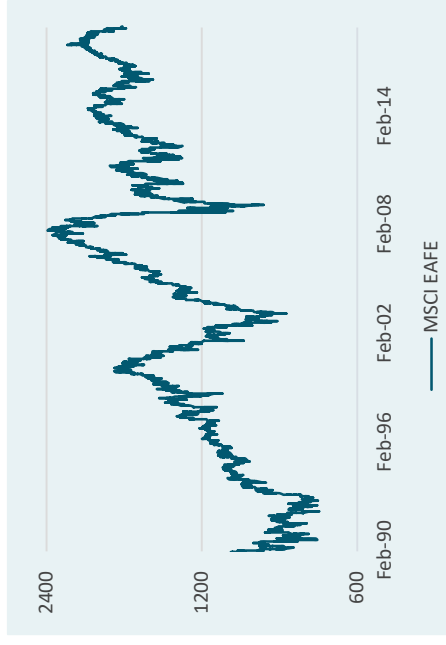
International developed equity

International developed equities sold off alongside U.S. equities. On an unhedged basis, the MSCI EAFE Index returned -12.5% in Q4 (-11.6% on a currency hedged basis). The three major equity markets in the EAFE Index – Japan, the Eurozone, and the UK – were all down more than 10%. The key factors that may have driven U.S. equities lower, most notably concerns over slowing global growth and central bank tightening, likely played an important role in non-U.S. developed markets. These concerns were particularly acute in the Eurozone where economic data routinely missed expectations, while the ECB officially

announced the end to its asset purchase program in December.

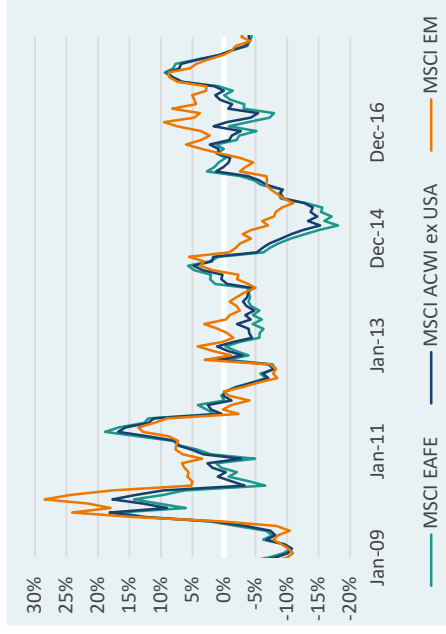
International developed equity markets are still cheap on both an absolute and relative basis at 11.9x forward earnings, but we believe there are good reasons for this pricing in certain markets. Within equity allocations, we are pessimistic on EAFE equities due to a negative view on the Eurozone. We believe slowing economic growth at the same time political risks are increasing and the ECB is unable to meaningfully ease policy present material headwinds to equity performance.

INTERNATIONAL DEVELOPED EQUITIES



Source: MSCI, as of 12/31/18

EFFECT OF CURRENCY (1-YEAR ROLLING)



Source: MSCI, as of 12/31/18

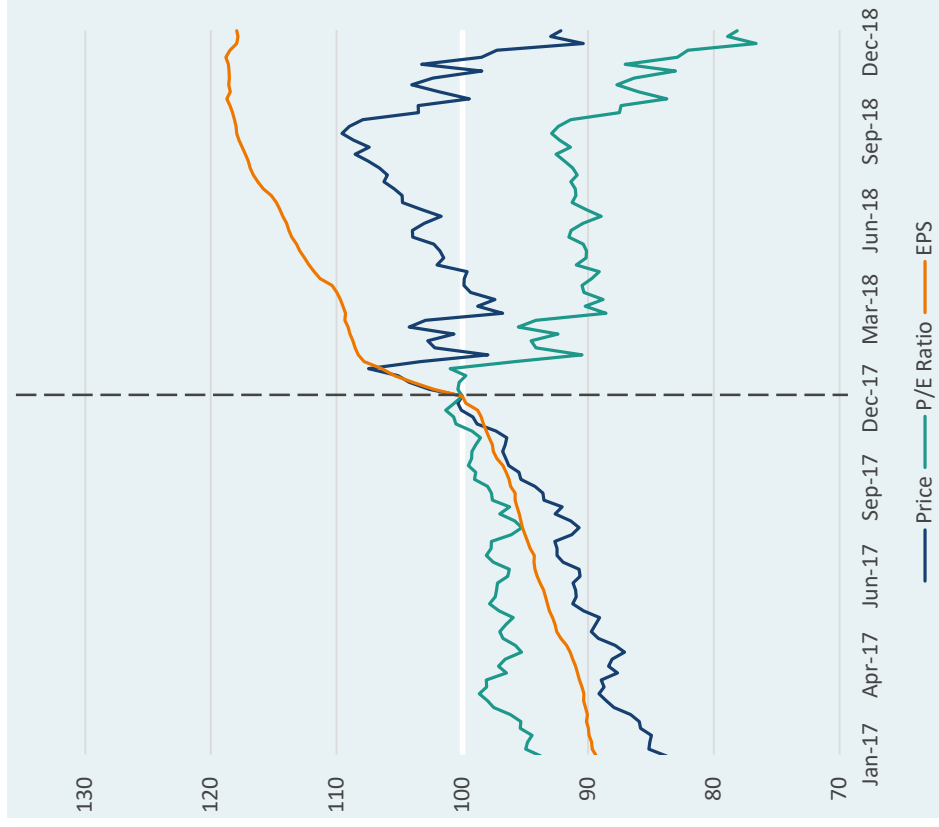
EARNINGS PER SHARE



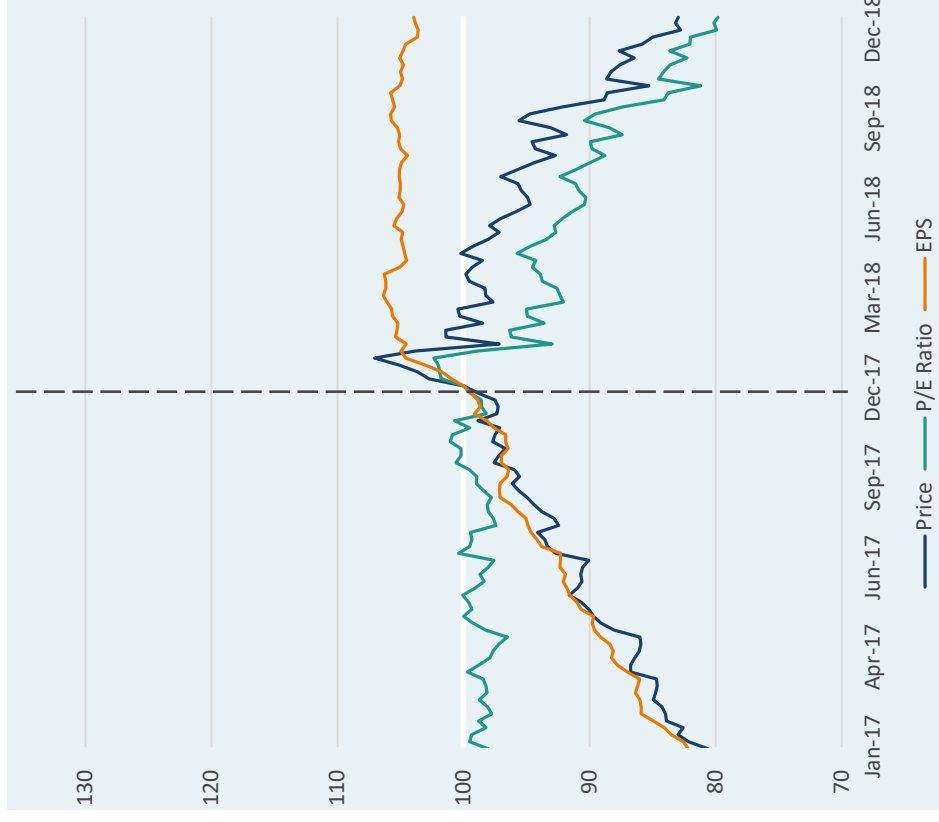
Source: Bloomberg, as of 12/31/18, indexed to earnings trough

Equity return behavior

U.S. (INDEXED TO START OF 2018)



EX U.S. (INDEXED TO START OF 2018)



U.S. and international equity prices failed to keep up with earnings growth during 2018. This has resulted in much cheaper equity valuations.

Source: Bloomberg, as of 12/31/18, the U.S. and ex-U.S. equity markets are represented by the S&P 500 Index and MSCI ACWI ex U.S. Index, respectively

Emerging market equity

Emerging market equities were the top performer in Q4, as these markets (MSCI EM -7.5%) experienced much less pain than developed (S&P 500 -13.5%, MSCI EAFE -12.5%) during the equity sell-off. Currency depreciation stabilized in Q4 (JP Morgan EM Currency Index +0.2%) and emerging market crises concerns faded from the news headlines.

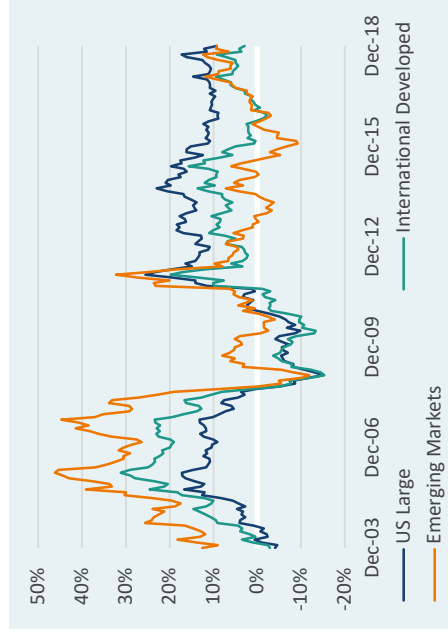
Valuations are near their long-term average, but remain much cheaper than developed market equities. Sentiment around emerging markets seems to be improving as the extreme negativity of 2018 dissipates, which creates possible

upside surprise if investors decide these fears were overblown. Very depressed currencies may also provide a performance tailwind in the event of mean reversion. Overall, we maintain our preference for the asset class.

Decelerating global growth and rising probability of recession do present unique risks to emerging markets, however, as these market typically exhibit a higher beta during market downside and upside moves. We will be watching global developments closely and will update our emerging market views as appropriate.

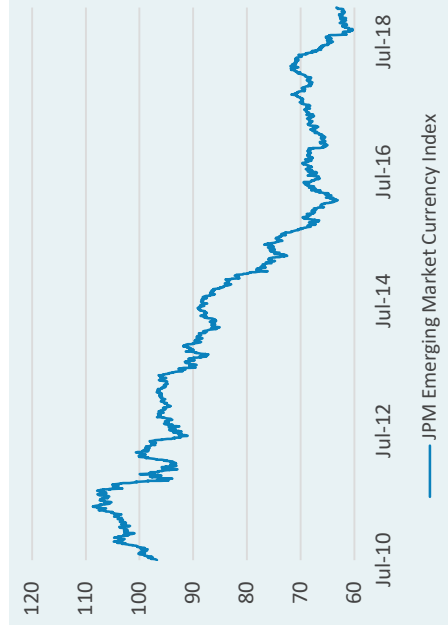
EM equities were the top performer in Q4

EQUITY PERFORMANCE (3-YR ROLLING)



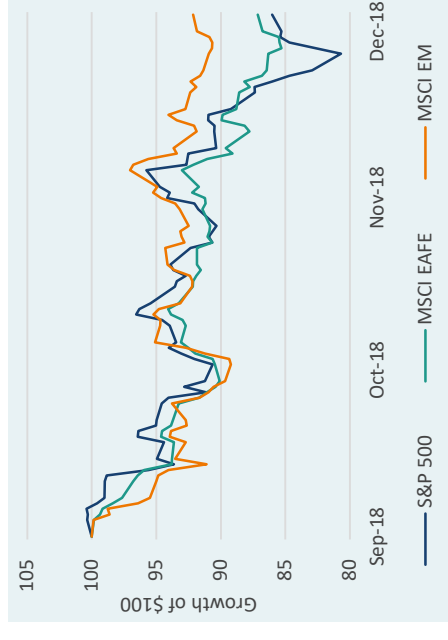
Source: Standard & Poor's, MSCI, as of 12/31/18

EMERGING MARKET CURRENCY MOVEMENT



Source: JP Morgan, as of 12/31/18

Q4 CUMULATIVE PERFORMANCE



Source: Standard & Poor's, MSCI, as of 12/31/18

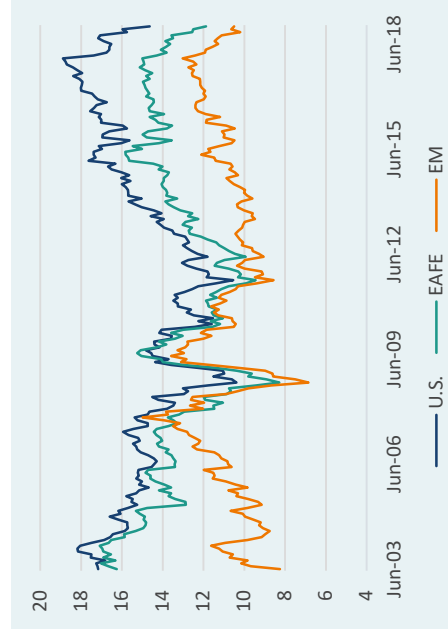
Equity valuations

The sharp drop in global equity prices overwhelmed small downward adjustments to earnings expectations, resulting in materially lower forward P/E multiples. In the U.S., EAFE, and EM regions, forward P/E ratios declined by 13.1%, 12.4%, and 5.5%, respectively in Q4. Depending on the period of analysis, many equity markets could now be considered fairly valued relative to their own history (U.S., EM) and others could be considered outright cheap (EAFE). In the U.S., the 12-month forward P/E ratio was 14.6x at the end of December, placing it below the median value of the past 15 years.

Assessing whether or not an equity market is cheap or

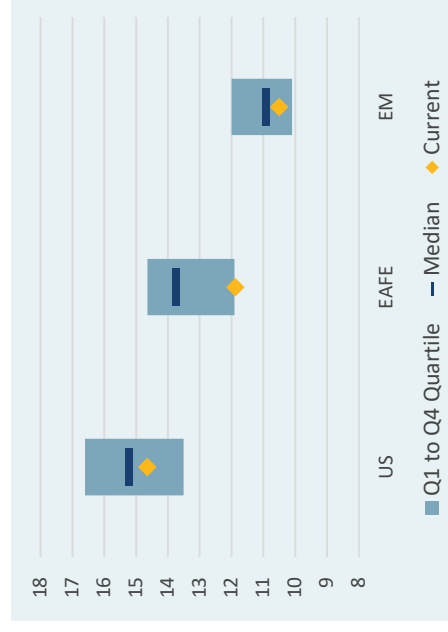
expensive is not a straightforward exercise. For one, as we have noted in the past, the broader macro environment (namely real interest rates and inflation) can strongly influence value. Higher (lower) real interest rates and inflation demand (higher) lower equity valuations, all else equal. Further, conclusions on the cheapness/richness of equities at any point in time depend on this metric. For example, trailing earnings may suffer from being backward-looking, while forward earnings are subject to forecast error and analyst bias. Particularly when looking at the forward P/E ratio, we caution against naively extrapolating recent earnings growth into the future.

FORWARD P/E RATIOS



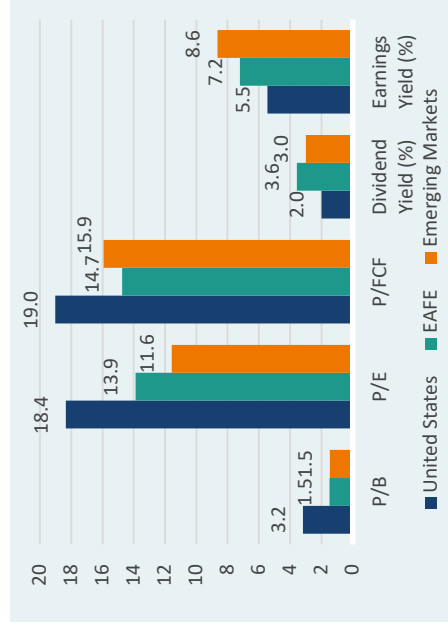
Source: MSCI, as of 12/31/18

FORWARD P/E RATIO DISTRIBUTION (15-YR)



Source: Verus, MSCI, as of 12/31/18

VALUATION METRICS (3-MONTH AVERAGE)



Source: Bloomberg, as of 12/31/18 - trailing P/E

Equity volatility

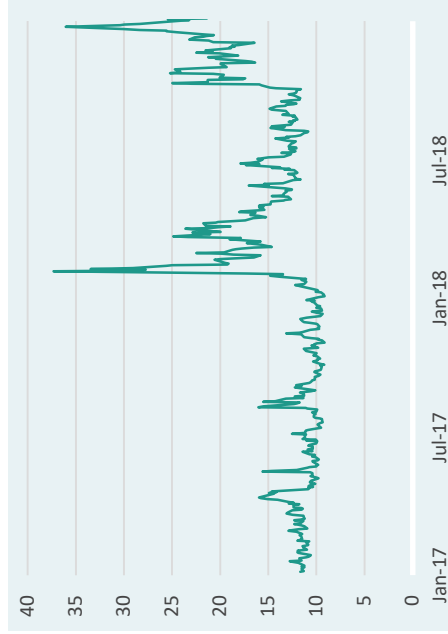
Equity volatility jumped in October, and remained elevated throughout the rest of the year. The VIX Index of implied volatility for the S&P 500 Index averaged 21 in the fourth quarter, above its long-term average of around 18, and hit a high of 36 on December 24th. Equities also experienced frequent large intra-day swings, particularly in December, that are not captured by daily volatility measures. Extremely low liquidity during the end of the year likely exacerbated market movements and augmented volatility. The increase in volatility was more acute in the U.S. than other equity markets – the trailing

one-year volatility for the S&P 500 Index was higher than both the MSCI EAFE and EM Indices for the first time since 2008.

While volatility has certainly been extreme relative to the recent past, it has been much more normal when compared to a longer history. We believe investors should expect higher volatility moving forward as we continue to progress into the later stages of the cycle.

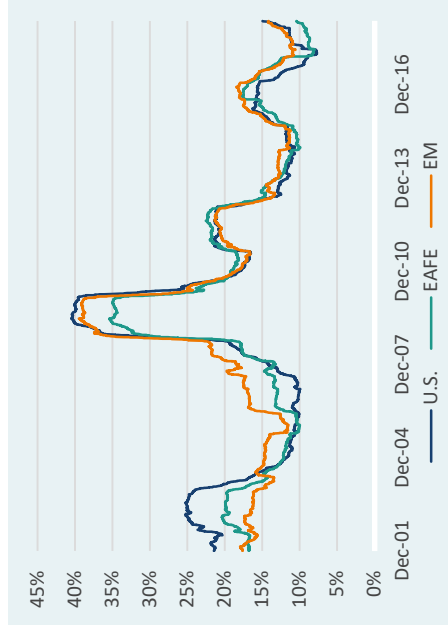
Equity volatility rose in Q4

U.S. IMPLIED VOLATILITY (VIX)



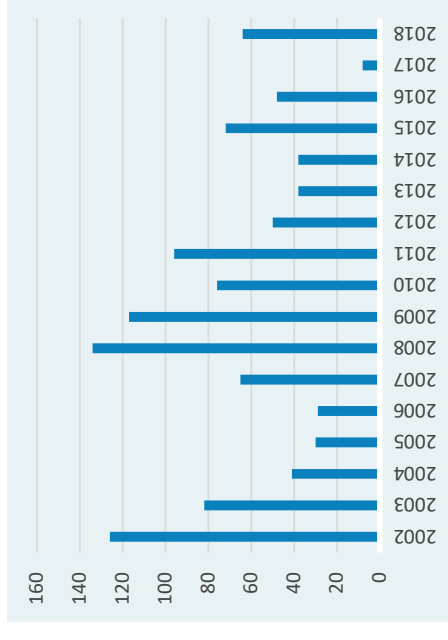
Source: CBOE, as of 12/31/18

REALIZED 1-YEAR ROLLING VOLATILITY



Source: Bloomberg, as of 12/31/18

S&P 500 – NUMBER OF >1% DAILY MOVES



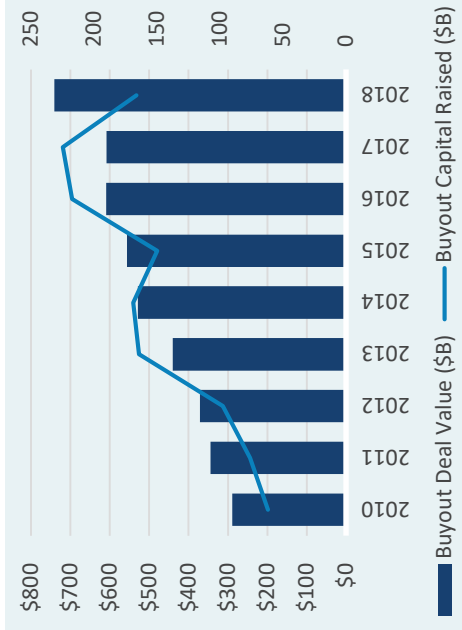
Source: Bloomberg, as of 12/31/18, includes down and up moves

Private equity

Deals increased in buyouts and venture; multiples are steady; buyout fundraising has slowed

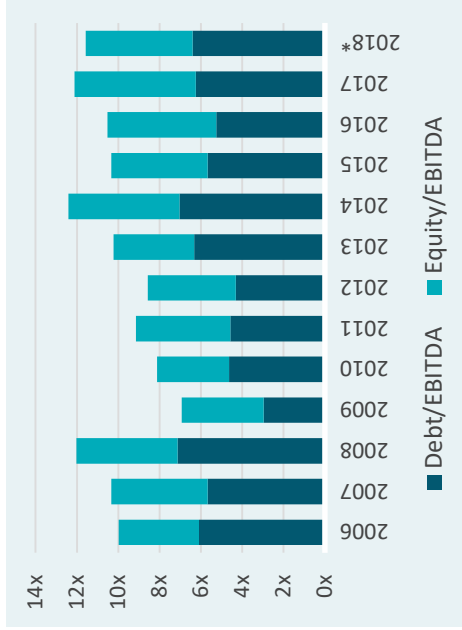
- Buyout activity has continued to increase in 2018. Through the fourth quarter buyouts are up 21.8% and 4.7% when measured by dollar value and number of transactions, respectively. The size of the average buyout, \$155.43, has increased from 2017, \$133.63. Unlike deal flow, fund capital raising has slowed from the peaks of 2017. Only 186 buyout funds representing \$166 billion closed so far this year, down from 235 funds representing a record \$225 billion in 2017.
- Buyout multiples slightly decreased from 2017. Average EV/EBITDA is 11.6x through December 31, 2018 (down from 11.9x in 2017) with debt multiples averaging 6.2x through the third quarter. Debt as a percentage of transaction value hovers around 54%.
- Venture capital fundraising and deal volumes continue to set records. \$55 billion of venture capital has been raised in the U.S. in 2018, an increase of 63% over the same period last year. Similarly, the amount of venture deals are up 57.8%. In fact, 2018 venture deal volume (\$131 billion) exceeds the record of \$82 billion that was set in 2017.
- Balancing high deal multiples and a growing number of deals against a slowdown in fundraising, we advocate selectivity in fund investments.

BUYOUTS DEAL VOLUME & CAPITAL RAISED



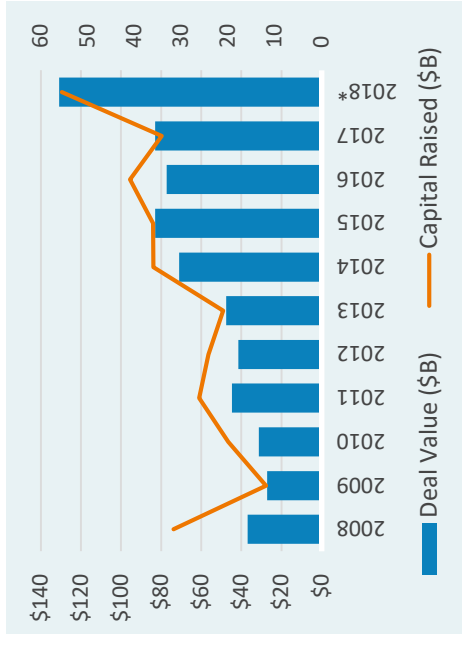
Source: PitchBook

TRANSACTION MULTIPLES



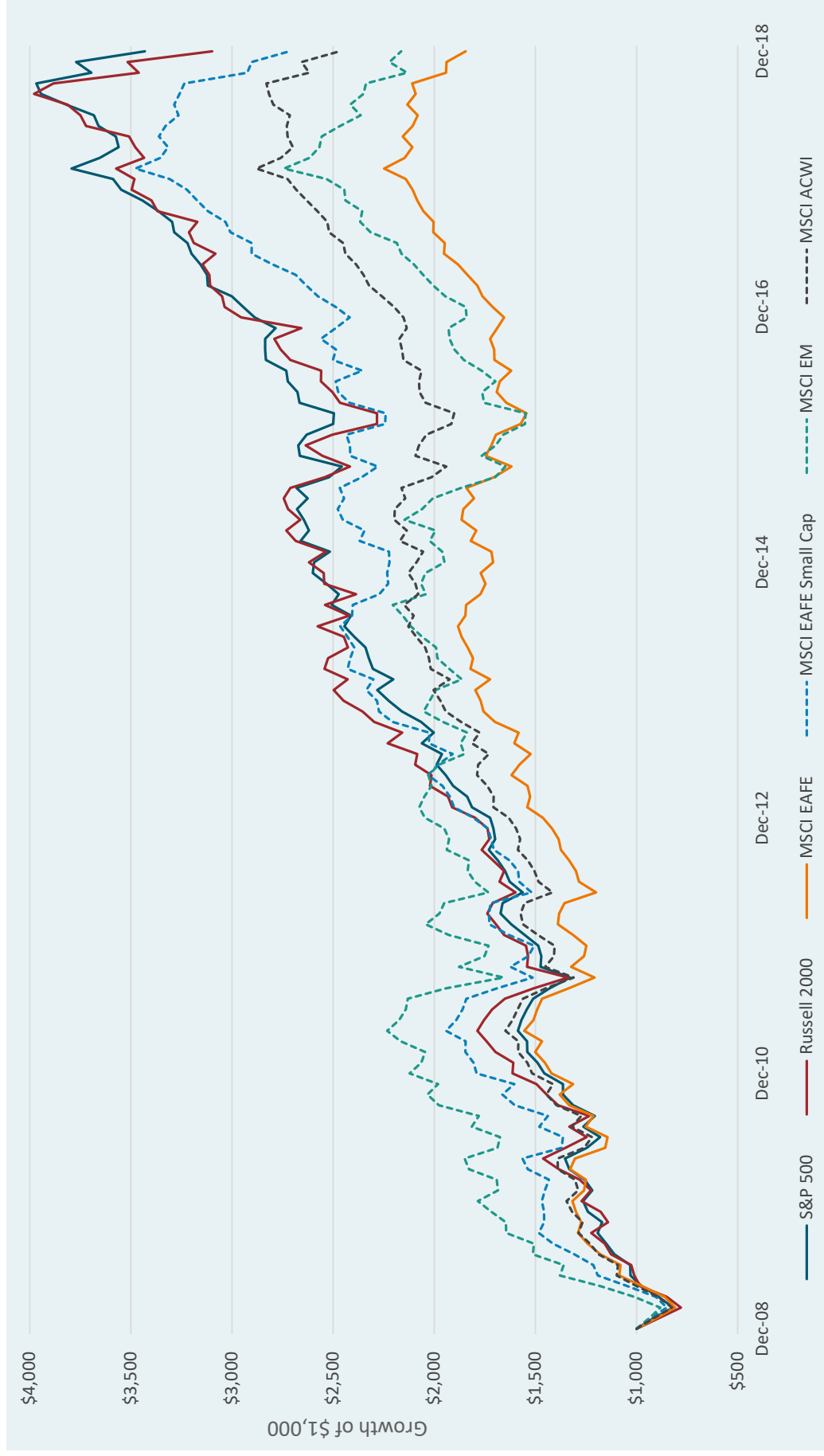
Source: PitchBook

VENTURE DEAL VOLUME & FUNDRAISING



Source: PitchBook

Long-term equity performance



Source: Morningstar, as of 12/31/18

Other assets

Currency

The U.S. dollar appreciated by 1.8% during the quarter, and 7.2% in 2018 based on the Broad Trade Weighted Dollar Index. The strong appreciation of the dollar last year was influenced by a number of factors, including stronger relative U.S. economic growth, higher relative interest rates, and weakness in other currencies such as the euro and British pound. The recent dollar strength in Q4 was due in part to safe haven demand amid equity market turbulence as these moves came despite the market pricing considerably less tightening from the Fed.

Emerging market currencies stabilized over the quarter, and recovered slightly from the recent drawdown in Q3. The JPMorgan Emerging Market Currency Index appreciated by 0.2% in Q4.

From a value perspective (based on purchasing power parity), the U.S. dollar remains expensive, particularly versus the euro, yen, and British pound.

The U.S. dollar appreciated to a cycle high

U.S. DOLLAR TRADE WEIGHTED INDEX



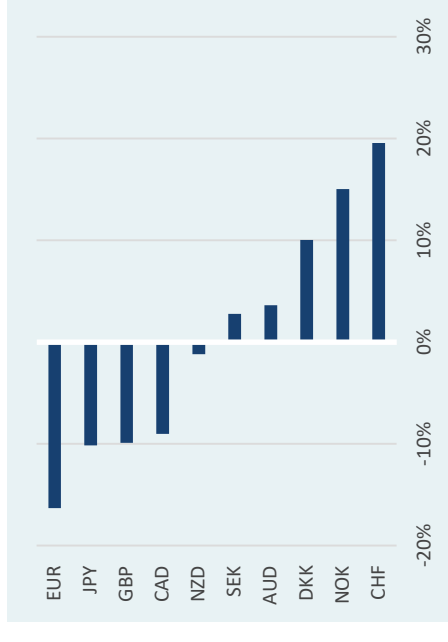
Source: Federal Reserve, as of 12/26/18

JPM EMERGING MARKET CURRENCY INDEX



Source: Bloomberg, JPMorgan, as of 12/31/18

U.S. DOLLAR VALUE (PPP)



Source: Bloomberg, OECD, as of 12/31/18

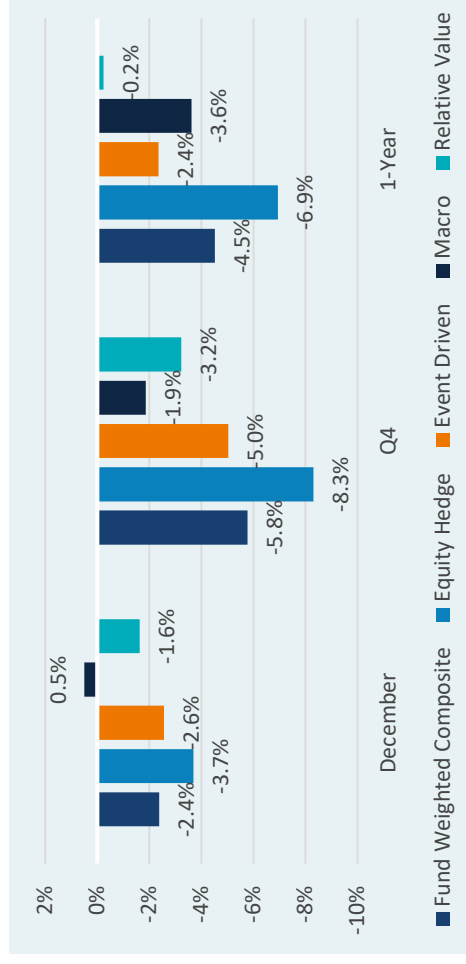
Hedge funds

Hedge funds Q4 losses pushed full-year 2018 results into negative territory (HFRI Fund Weighted Composite -5.8% in Q4; -4.5% in 2018). Most hedge funds stumbled in October as equity markets experienced a painful reversal ranging from -5% to -10%. The industry fared relatively better in December with hedge funds down -2.4% while the S&P 500 Index lost -9.0%. The approximate 6.6% performance differential was the largest observed since February 2009. As a group, macro strategies performed best in December and for the quarter. Defensively oriented discretionary macro strategies and currency strategies stood out with strong

relative performance. Equity hedge strategies lagged the universe, and products with higher beta and value exposures were hit the hardest as equity markets fell.

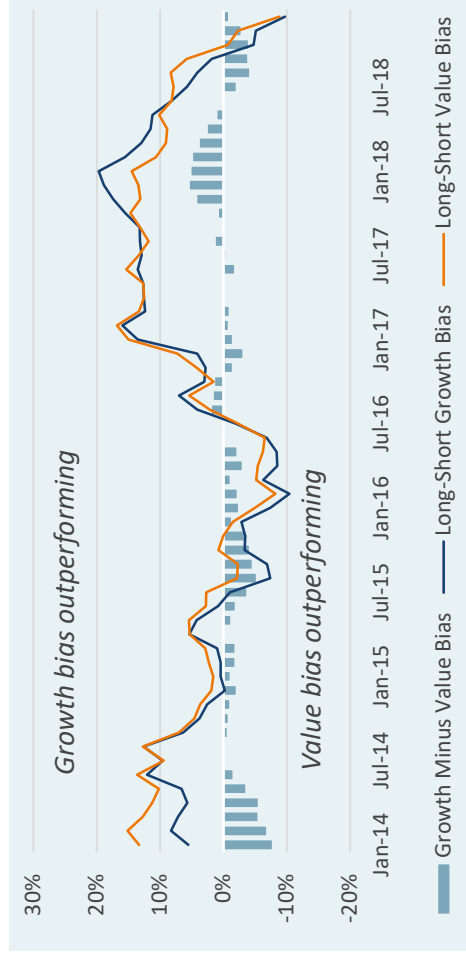
For managers trading fixed income securities, strategies focused on sovereign (-1.2%) and asset backed bonds (-1.7%) preserved capital relatively well during the market turbulence. Convertible arbitrage managers fared worse (-5.1%) due in part to greater relative sensitivity to equity market volatility.

HFRI HEDGE FUND STYLE PERFORMANCE



Source: HFRI, as of 12/31/18

GROWTH VS VALUE BIAS IN LONG-SHORT EQUITY MANAGERS (1-YR ROLLING PERFORMANCE)



Source: HFRI, as of 12/31/2018

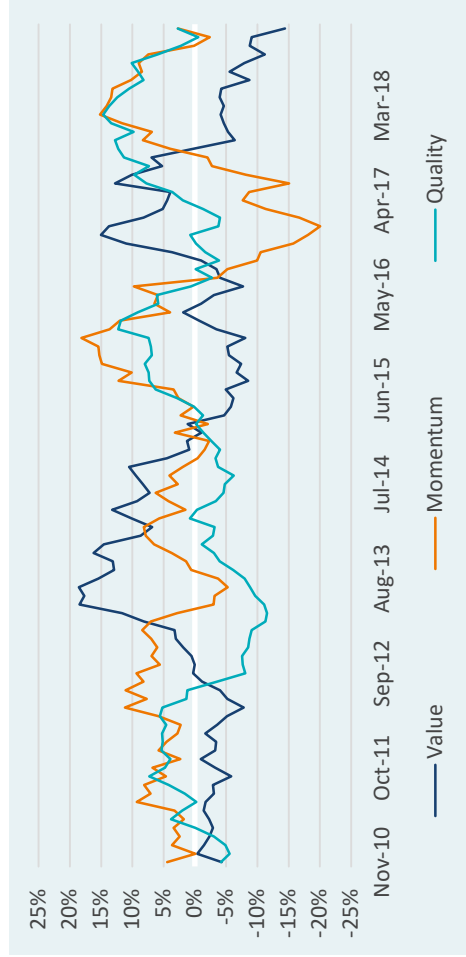
Alternative beta

Alternative beta strategy investors endured a difficult year, with many strategies performing one or two standard deviations below their historical average. While the median strategy we follow delivered negative returns during the fourth quarter, we noted dispersion across the space as a few products posted positive results. Factor exposures, particularly in the equity markets, continue to account for a meaningful portion of poor outcomes. While traditional value factors earned modestly positive results

during the quarter, this performance was offset by losses in momentum and size-related factors.

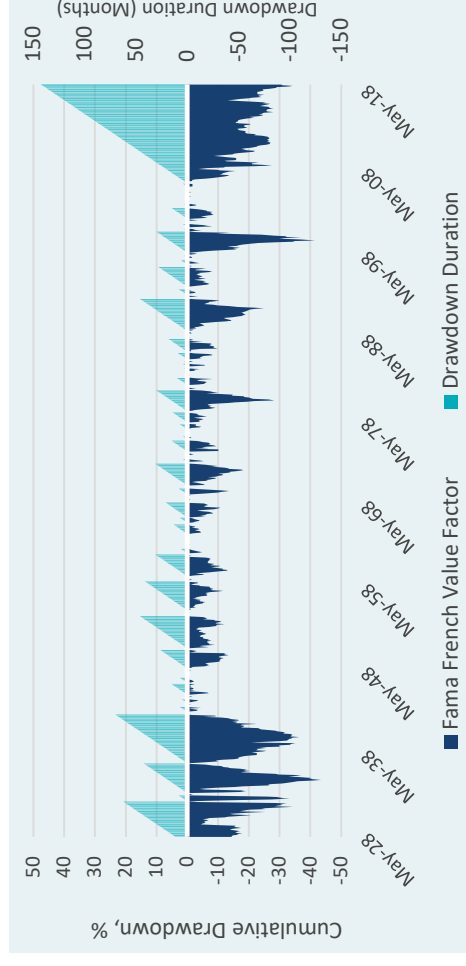
We continue to believe that alternative beta strategies are not “broken” per se, but instead have reflected extreme drawdowns in some factors and muted returns in others. We will continue to closely monitor these strategies and discuss the situation with managers in 2019.

U.S. MARKET NEUTRAL FACTOR PERFORMANCE (12-MONTH ROLLING)



Source: S&P Dow Jones, Thematic Market Neutral Indices, as of 12/31/18

VALUE FACTOR DRAWDOWN MAGNITUDE AND DURATION



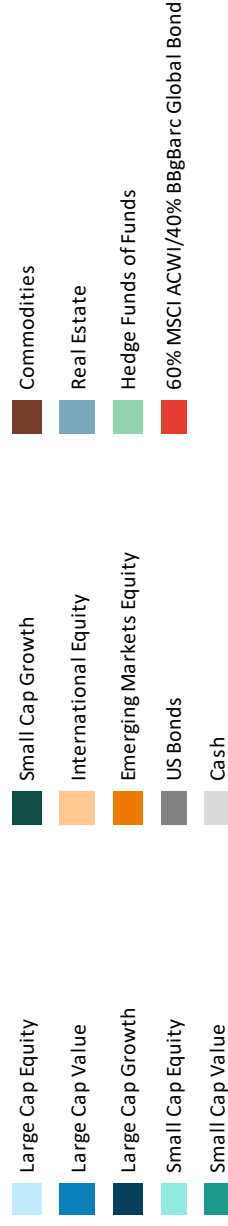
Source: Kenneth French Data Library, as of 11/30/18

Appendix

Periodic table of returns

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 5-Year 10-Year |
|-------------------------|-------|------|-------|-------|-------|------|------|------|------|------|-------|-------|------|-------|------|------|-------|-------|------|------|-------|------|----------------|
| Real Estate | 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 | 5.3 | 10.4 | 15.3 |
| Cash | 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 | 9.0 | 13.5 |
| US Bonds | 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 | 8.2 | 13.3 |
| Large Cap Growth | 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 | 5.9 | 12.0 |
| Hedge Funds of Funds | 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 | 5.1 | 11.2 |
| Large Cap Equity | 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 | 4.4 | 10.4 |
| 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 | 3.6 | 8.0 |
| Large Cap Value | 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 | 3.1 | 7.3 |
| Small Cap Growth | 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 | 2.5 | 6.8 |
| Small Cap Equity | -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 | 1.6 | 6.3 |
| Commodities | -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 | 1.5 | 3.5 |
| Small Cap Value | -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 | 0.6 | 3.2 |
| International Equity | -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 | 0.5 | 0.4 |
| Emerging Markets Equity | -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 | -8.8 | -3.8 |

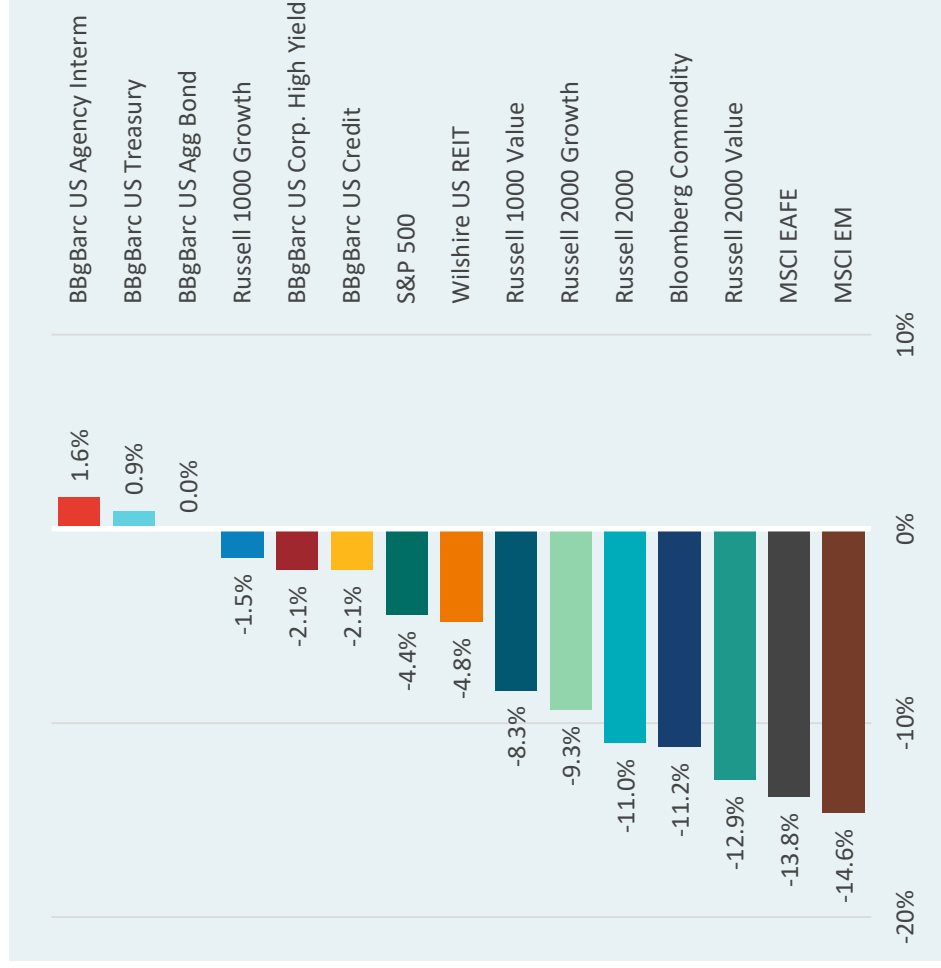
WORST



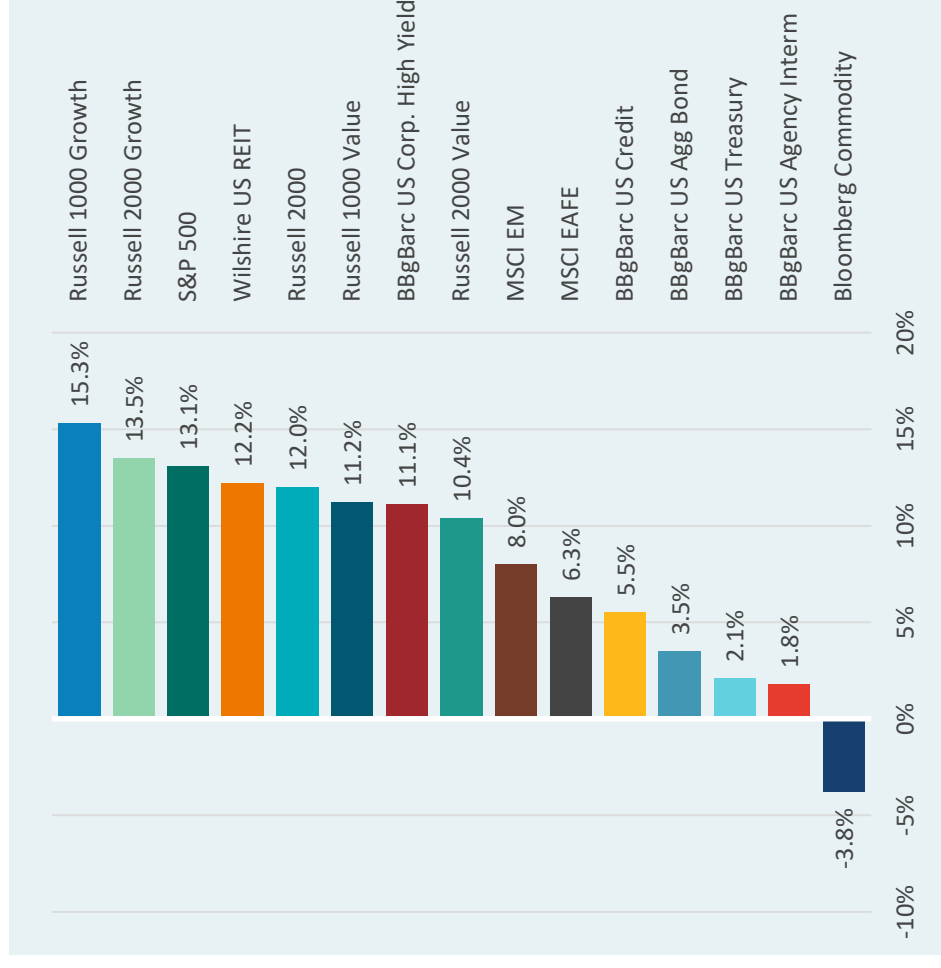
Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, BbgBarc US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFR FOF, MSCI ACWI, BbgBarc Global Bond. NCREIF Property Index performance data as of 9/30/18.

Major asset class returns

ONE YEAR ENDING DECEMBER



TEN YEARS ENDING DECEMBER

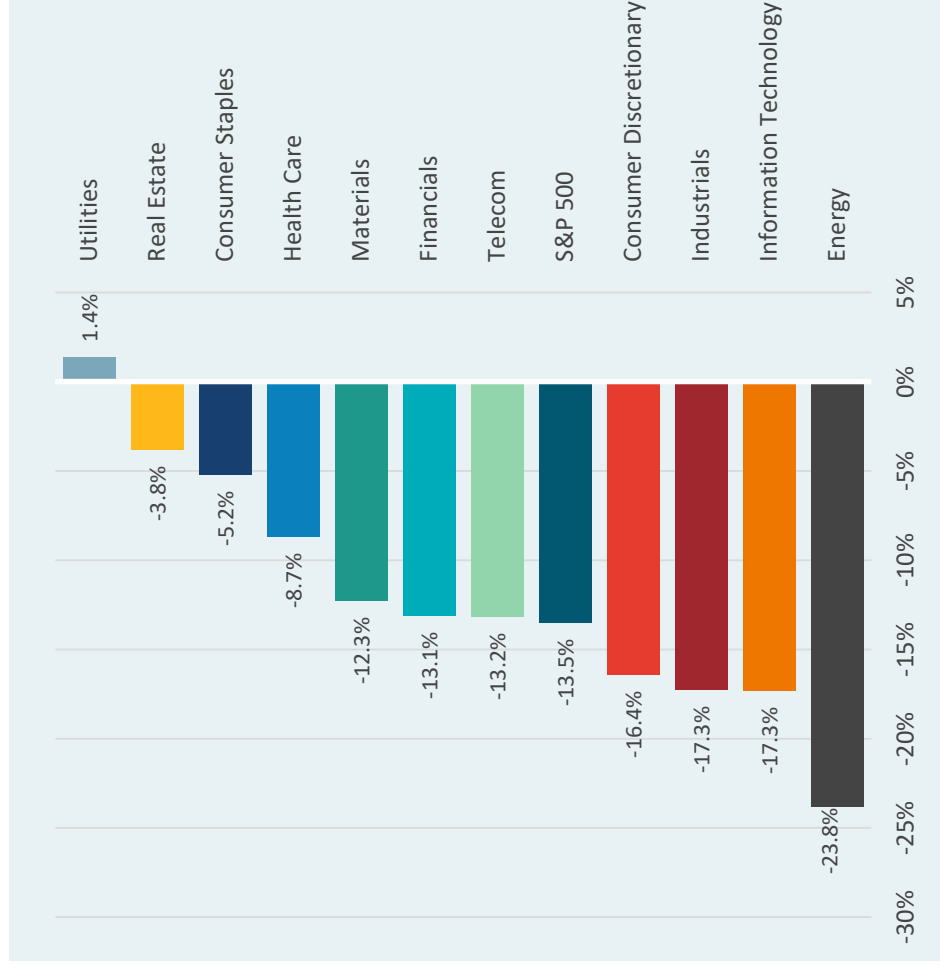


Source: Morningstar, as of 12/31/18

Source: Morningstar, as of 12/31/18

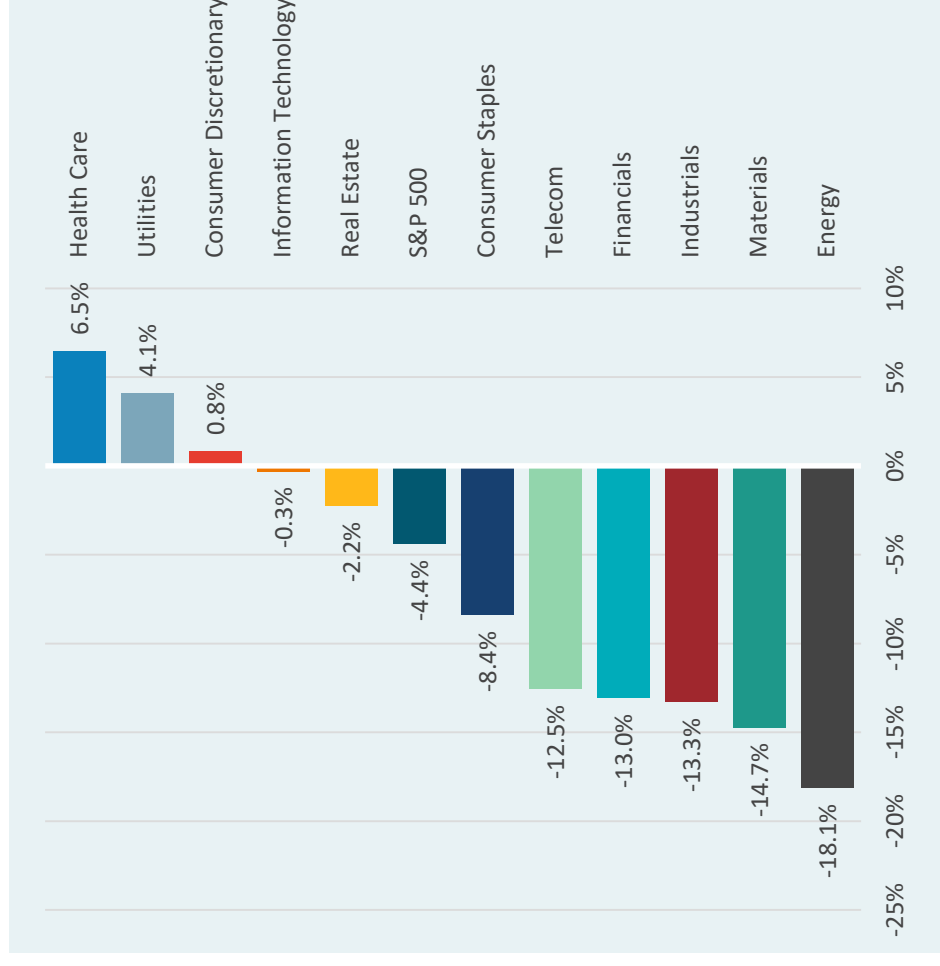
S&P 500 sector returns

Q4



Source: Morningstar, as of 12/31/18

ONE YEAR ENDING DECEMBER



Source: Morningstar, as of 12/31/18

Detailed index returns

DOMESTIC EQUITY

| | Month | QTD | YTD | 1 Year | 3 Year | 5 Year | 10 Year |
|------------------------|--------|--------|--------|--------|--------|--------|---------|
| Core Index | | | | | | | |
| S&P 500 | (9.0) | (13.5) | (4.4) | (4.4) | 9.3 | 8.5 | 13.1 |
| S&P 500 Equal Weighted | (9.7) | (13.9) | (7.6) | (7.6) | 8.0 | 7.1 | 15.0 |
| DJ Industrial Average | (8.6) | (11.3) | (3.5) | (3.5) | 12.9 | 9.7 | 13.2 |
| Russell Top 200 | (8.8) | (13.2) | (3.1) | (3.1) | 9.9 | 9.0 | 13.0 |
| Russell 1000 | (9.1) | (13.8) | (4.8) | (4.8) | 9.1 | 8.2 | 13.3 |
| Russell 2000 | (11.9) | (20.2) | (11.0) | (11.0) | 7.4 | 4.4 | 12.0 |
| Russell 3000 | (9.3) | (14.3) | (5.2) | (5.2) | 9.0 | 7.9 | 13.2 |
| Russell Mid Cap | (9.9) | (15.4) | (9.1) | (9.1) | 7.0 | 6.3 | 14.0 |
| Style Index | | | | | | | |
| Russell 1000 Growth | (8.6) | (15.9) | (1.5) | (1.5) | 11.1 | 10.4 | 15.3 |
| Russell 1000 Value | (9.6) | (11.7) | (8.3) | (8.3) | 7.0 | 5.9 | 11.2 |
| Russell 2000 Growth | (11.7) | (21.7) | (9.3) | (9.3) | 7.2 | 5.1 | 13.5 |
| Russell 2000 Value | (12.1) | (18.7) | (12.9) | (12.9) | 7.4 | 3.6 | 10.4 |

FIXED INCOME

| | Month | QTD | YTD | 1 Year | 3 Year | 5 Year | 10 Year |
|-----------------------------|-------|-------|-------|--------|--------|--------|---------|
| Broad Index | | | | | | | |
| BbgBarc US TIPS | 0.5 | (0.4) | (1.3) | (1.3) | 2.1 | 1.7 | 3.6 |
| BbgBarc US Treasury Bills | 0.2 | 0.6 | 1.9 | 1.9 | 1.0 | 0.6 | 0.4 |
| BbgBarc US Agg Bond | 1.8 | 1.6 | 0.0 | 0.0 | 2.1 | 2.5 | 3.5 |
| Duration | | | | | | | |
| BbgBarc US Treasury 1-3 Yr | 0.8 | 1.3 | 1.6 | 1.6 | 0.9 | 0.8 | 1.0 |
| BbgBarc US Treasury Long | 5.5 | 4.2 | (1.8) | (1.8) | 2.6 | 5.9 | 4.1 |
| BbgBarc US Treasury | 2.2 | 2.6 | 0.9 | 0.9 | 1.4 | 2.0 | 2.1 |
| Issuer | | | | | | | |
| BbgBarc US MBS | 1.8 | 2.1 | 1.0 | 1.0 | 1.7 | 2.5 | 3.1 |
| BbgBarc US Corp. High Yield | (2.1) | (4.5) | (2.1) | (2.1) | 7.2 | 3.8 | 11.1 |
| BbgBarc US Agency Interm | 1.0 | 1.6 | 1.6 | 1.6 | 1.3 | 1.4 | 1.8 |
| BbgBarc US Credit | 1.5 | 0.0 | (2.1) | (2.1) | 3.2 | 3.2 | 5.5 |

INTERNATIONAL EQUITY

| | Month | QTD | YTD | 1 Year | 3 Year | 5 Year | 10 Year |
|------------------------|-------|--------|--------|--------|--------|--------|---------|
| Broad Index | | | | | | | |
| MSCI ACWI | (7.0) | (12.8) | (9.4) | (9.4) | 6.6 | 4.3 | 9.5 |
| MSCI ACWI ex US | (4.5) | (11.5) | (14.2) | (14.2) | 4.5 | 0.7 | 6.6 |
| MSCI EAFE | (4.9) | (12.5) | (13.8) | (13.8) | 2.9 | 0.5 | 6.3 |
| MSCI EM | (2.7) | (7.5) | (14.6) | (14.6) | 9.2 | 1.6 | 8.0 |
| MSCI EAFE Small Cap | (6.4) | (16.0) | (17.9) | (17.9) | 3.7 | 3.1 | 10.5 |
| Style Index | | | | | | | |
| MSCI EAFE Growth | (4.8) | (13.3) | (12.8) | (12.8) | 2.9 | 1.6 | 7.1 |
| MSCI EAFE Value | (4.9) | (11.7) | (14.8) | (14.8) | 2.8 | (0.6) | 5.5 |
| Regional Index | | | | | | | |
| MSCI UK | (3.8) | (11.8) | (14.2) | (14.2) | 1.6 | (1.7) | 6.8 |
| MSCI Japan | (6.7) | (14.2) | (12.9) | (12.9) | 3.4 | 3.1 | 5.3 |
| MSCI Euro | (4.8) | (13.2) | (16.4) | (16.4) | 2.4 | (0.9) | 4.4 |
| MSCI EM Asia | (3.2) | (9.3) | (15.5) | (15.5) | 8.6 | 3.9 | 9.8 |
| MSCI EM Latin American | (0.8) | 0.4 | (6.6) | (6.6) | 14.9 | (1.7) | 5.0 |

OTHER

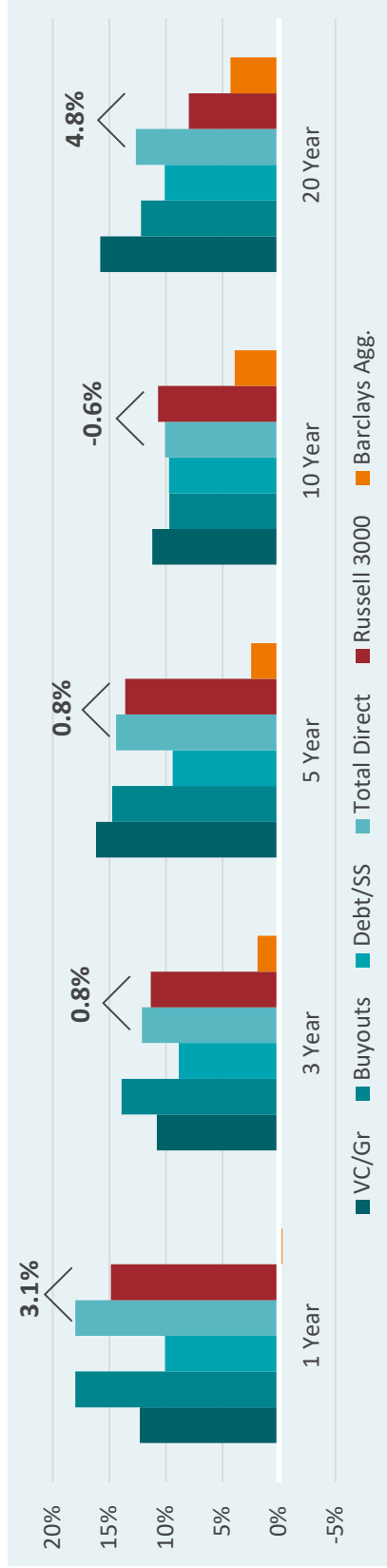
| | Month | QTD | YTD | 1 Year | 3 Year | 5 Year | 10 Year |
|------------------------|-------|--------|--------|--------|--------|--------|---------|
| Index | | | | | | | |
| Bloomberg Commodity | (6.9) | (9.4) | (11.2) | (11.2) | 0.3 | (8.8) | (3.8) |
| Wilshire US REIT | (8.4) | (6.9) | (4.8) | (4.8) | 2.1 | 7.9 | 12.2 |
| CS Leveraged Loans | (2.3) | (3.1) | 1.1 | 1.1 | 5.0 | 3.3 | 8.3 |
| Alerian MLP | (8.3) | (16.3) | (11.9) | (11.9) | (1.6) | (6.9) | 10.7 |
| Regional Index | | | | | | | |
| JPM EMBI Global Div | 1.3 | (1.3) | (4.3) | (4.3) | 5.2 | 4.8 | 8.2 |
| JPM GBI-EM Global Div | 1.3 | 2.1 | (6.2) | (6.2) | 5.9 | (1.0) | 3.5 |
| Hedge Funds | | | | | | | |
| HFRI Composite | (2.0) | (5.4) | (4.1) | (4.1) | 3.2 | 2.3 | 5.0 |
| HFRI FOF Composite | (1.2) | (4.4) | (3.5) | (3.5) | 1.5 | 1.5 | 3.2 |
| Currency (Spot) | | | | | | | |
| Euro | 1.0 | (1.6) | (4.8) | (4.8) | 1.7 | (3.7) | (1.9) |
| Pound | (0.2) | (2.3) | (5.9) | (5.9) | (4.8) | (5.1) | (1.2) |
| Yen | 3.5 | 3.5 | 2.7 | 2.7 | 3.1 | (0.9) | (1.9) |

Source: Morningstar, HFR, as of 12/31/18

Private vs. public performance

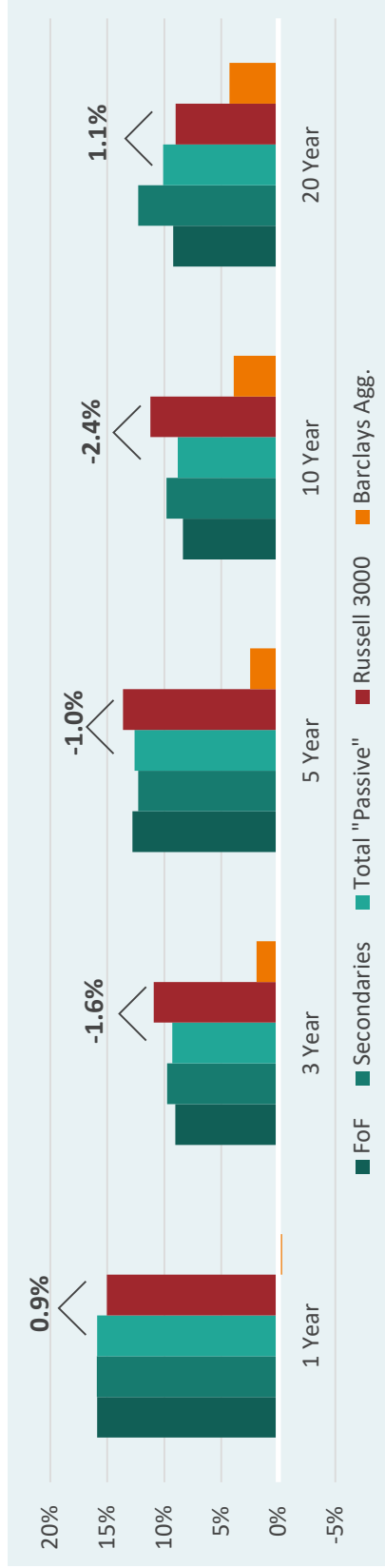
As of 6/30/2018

DIRECT PRIVATE EQUITY FUND INVESTMENTS



Direct private equity outperformed public equities across most time periods

"PASSIVE" STRATEGIES



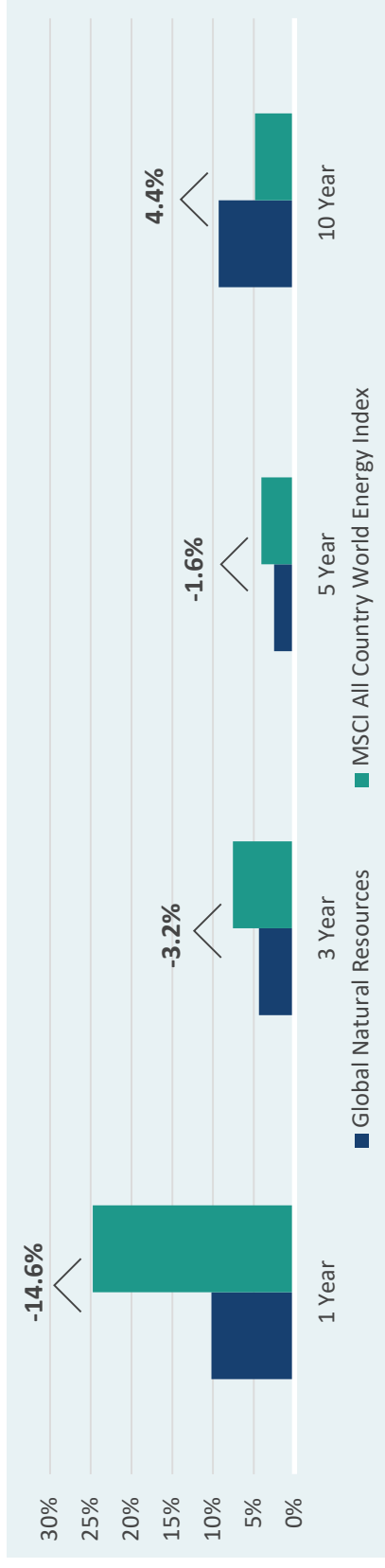
Fund-of-fund strategy performance relative to public equities has been mixed

Sources: Thomson Reuters Cambridge Universe's PME Module; U.S. Private Equity Funds sub asset classes as of June 30, 2018. Public Market Equivalent returns resulted from "Total Passive" and Total Direct's identical cash flows invested into and distributed from respective traditional asset comparable.

Private vs. liquid real assets performance

As of 6/30/2018

GLOBAL NATURAL RESOURCES FUNDS

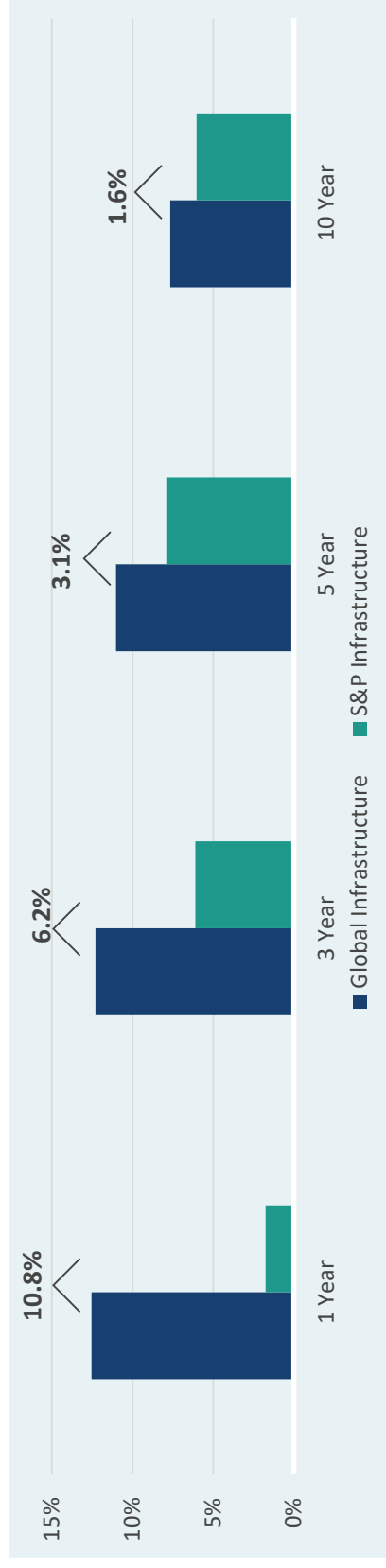


Aside from the 10-year period, natural resource funds underperformed the public index

Infrastructure funds

outperformed the public index across all periods

GLOBAL INFRASTRUCTURE FUNDS

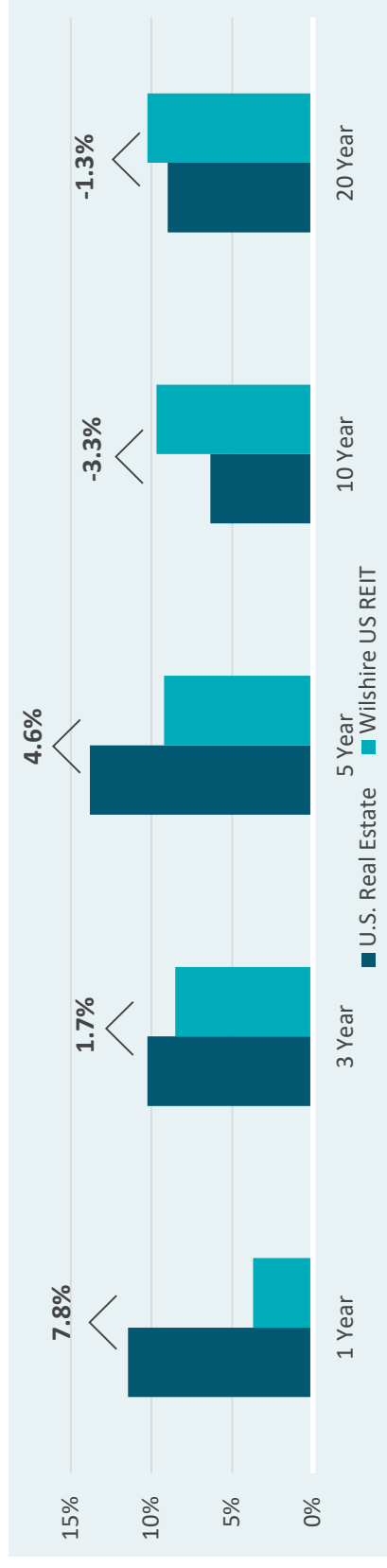


Sources: Thomson Reuters C/A PME: Global Natural Resources (vintage 2003 and later, inception of MSCI ACWI Energy benchmark) and Global Infrastructure (vintage 1996 and later, inception of S&P Infrastructure benchmark) universes as of June 30, 2018. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

Private vs. liquid & core real estate performance

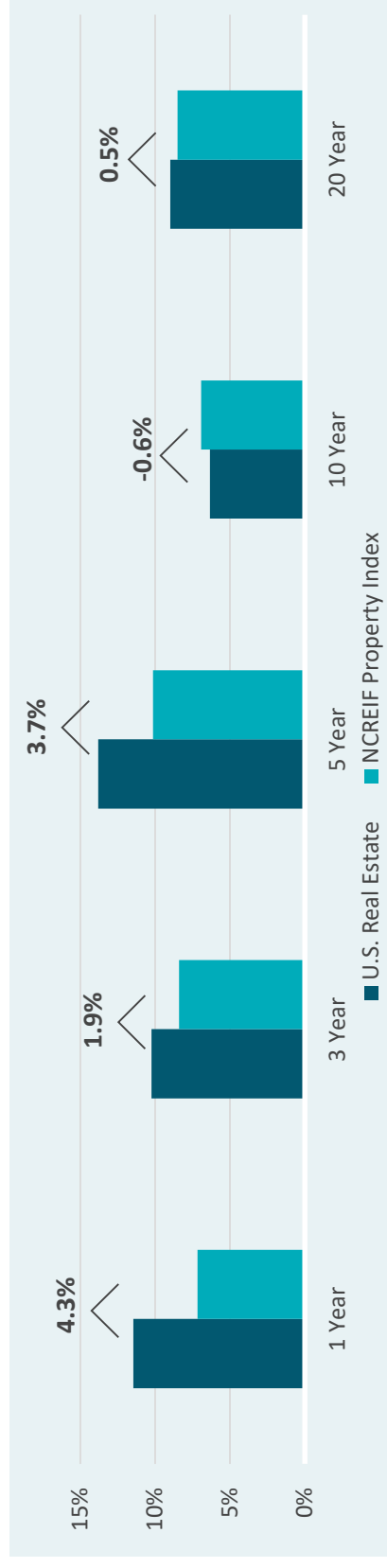
As of 6/30/2018

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



Private real estate performance relative to REITs has been mixed

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



Private real estate funds outperformed the index during most time periods

Sources: Thomson Reuters C/IA PME: Global and U.S. Real Estate universes as of June 30, 2018. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real estate universes.

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.langeerresearch.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.Bloomberq.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 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, 2018



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SEATTLE 206-622-3700

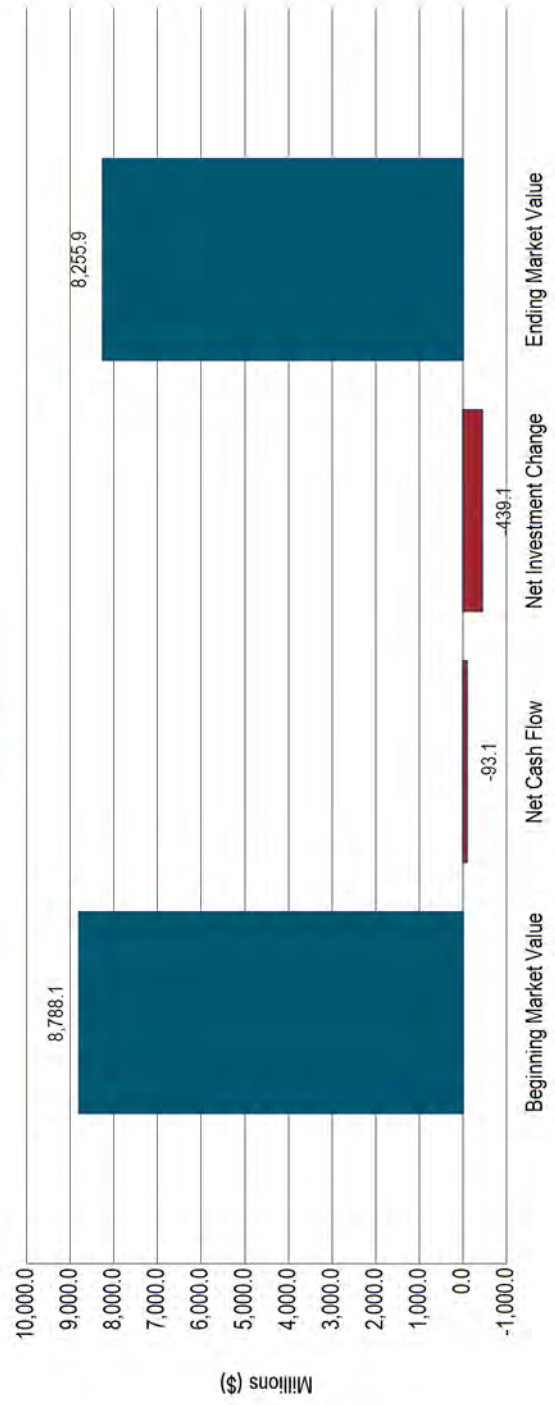
LOS ANGELES 310-297-1777

SAN FRANCISCO 415-362-3484

Portfolio Reconciliation

| | Last Three Months | Year-To-Date |
|----------------------------|------------------------|------------------------|
| Beginning Market Value | \$8,788,140,564 | \$8,532,697,023 |
| Net Cash Flow | -\$93,142,541 | -\$74,283,353 |
| Net Investment Change | -\$439,124,716 | -\$202,540,363 |
| Ending Market Value | \$8,255,873,307 | \$8,255,873,307 |

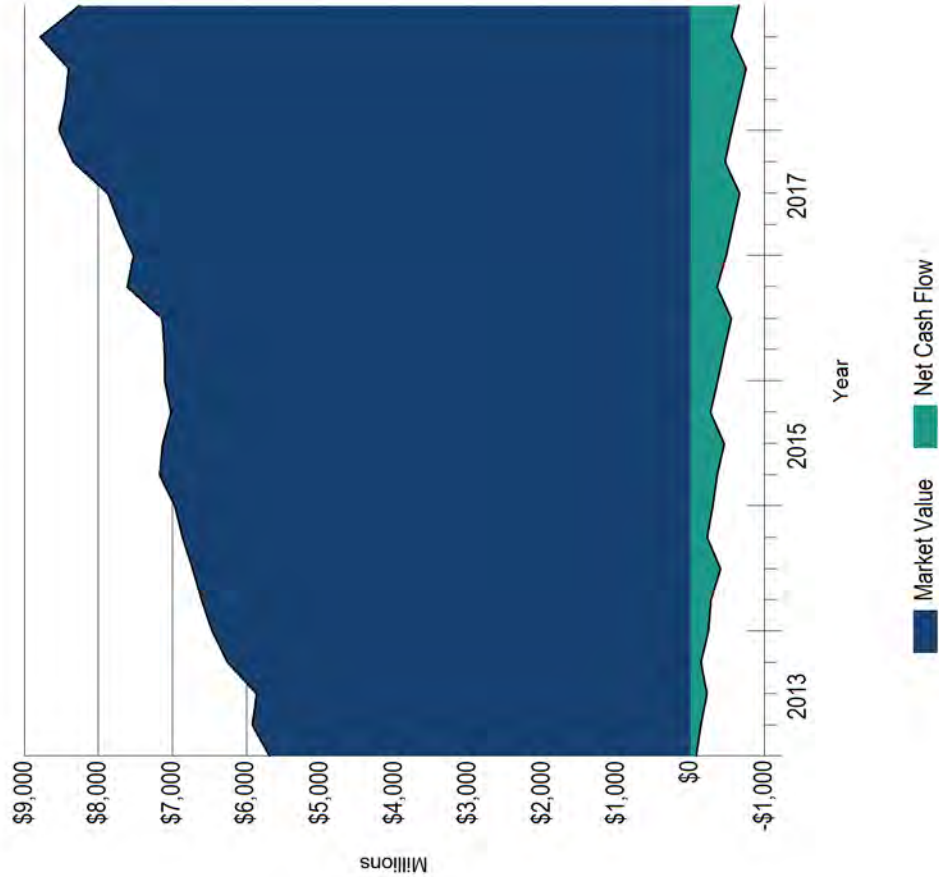
Change in Market Value Last Three Months



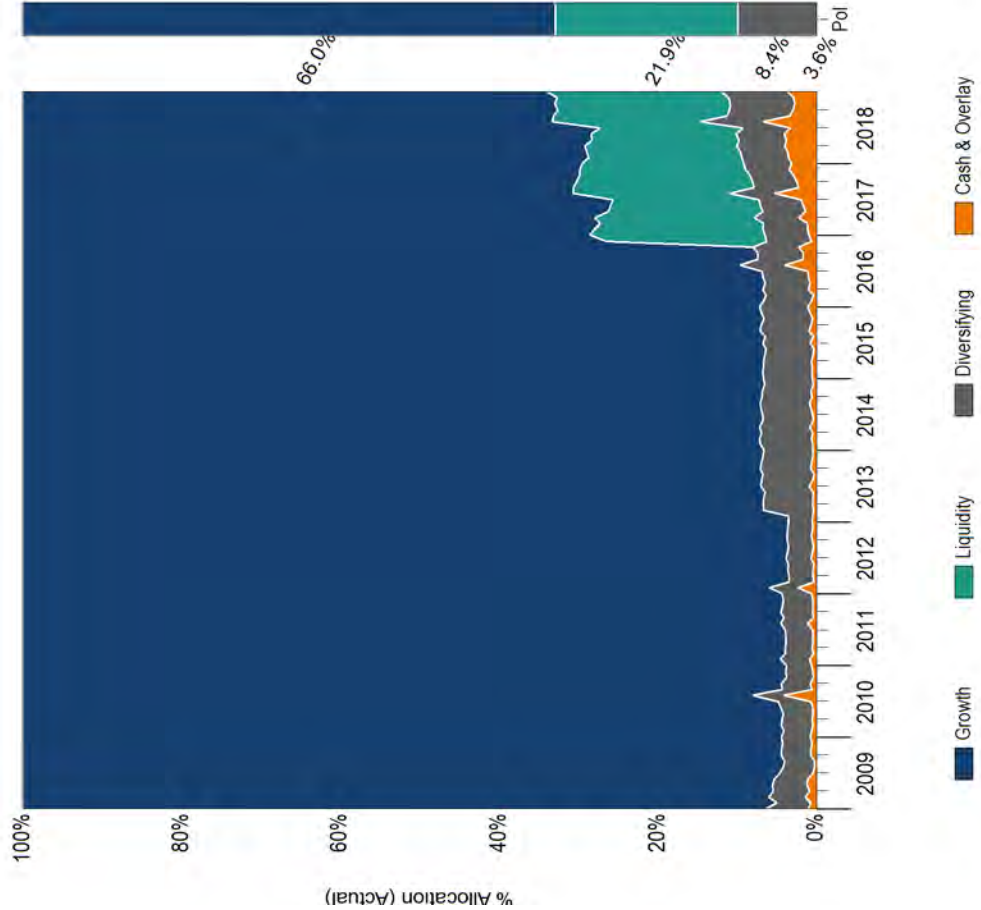
Contributions and withdrawals may include intra-account transfers between managers/funds.

Total Fund Asset Allocation History Period Ending: December 31, 2018

Market Value History
Cumulative Cash Flows

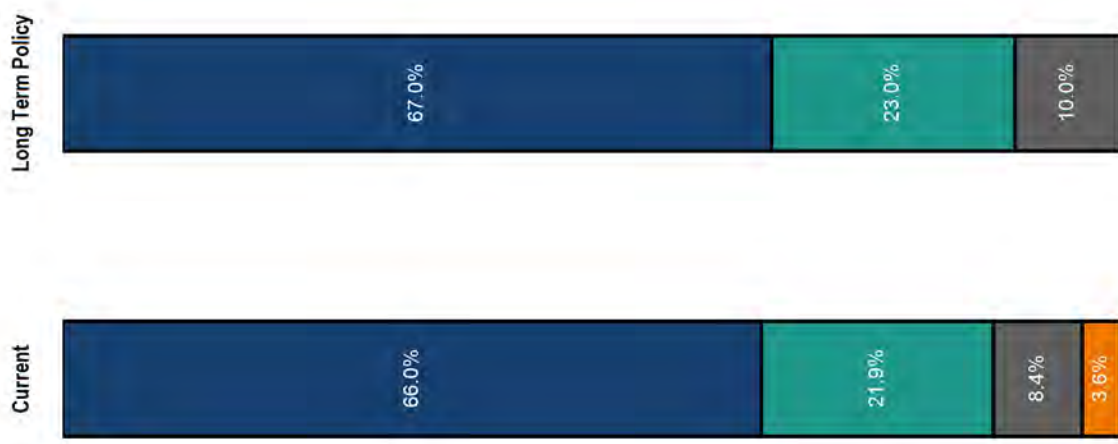


Asset Allocation History



Policy reflects FFP 4-Yr allocations approved in March 2018.

Total Fund
 Asset Allocation vs. Long Term Target Policy Period Ending: December 31, 2018



Allocation vs. Long Term Target

| | Current Balance | Current Allocation | Long Term Target | Difference |
|----------------|------------------------|--------------------|------------------|----------------|
| Growth | \$5,451,581,055 | 66.0% | 67.0% | -\$79,854,061 |
| Liquidity | \$1,810,918,374 | 21.9% | 23.0% | -\$87,932,486 |
| Diversifying | \$693,574,093 | 8.4% | 10.0% | -\$132,013,237 |
| Cash & Overlay | \$299,799,785 | 3.6% | -- | \$299,799,785 |
| Total | \$8,255,873,307 | 100.0% | 100.0% | |

Allocation vs. Current Targets

| | Current Balance | Current Allocation | Current Target | Difference |
|----------------|------------------------|--------------------|----------------|----------------|
| Growth | \$5,451,581,055 | 66.0% | 69.0% | -\$244,971,527 |
| Liquidity | \$1,810,918,374 | 21.9% | 23.0% | -\$87,932,486 |
| Diversifying | \$693,574,093 | 8.4% | 8.0% | \$33,104,229 |
| Cash & Overlay | \$299,799,785 | 3.6% | -- | \$299,799,785 |
| Total | \$8,255,873,307 | 100.0% | 100.0% | |

Long Term Targets reflect FFP 4-Yr allocations approved in March 2018.
 Current Targets reflect Phase 3 Targets approved in June 2018.



Total Fund
Executive Summary (Net of Fees) Period Ending: December 31, 2018

| | % of Portfolio | QTD | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs | 2018 | 2017 | 2016 | 2015 | 2014 |
|-----------------------------------|----------------|-------------|-------------|------------|------------|------------|-------------|-------------|------------|-------------|------------|
| Total Fund | 100.0 | -5.2 | -2.7 | 5.8 | 5.4 | 9.1 | -2.7 | 13.9 | 6.9 | 2.1 | 7.7 |
| Policy Index | | -4.3 | -0.9 | 7.1 | 6.1 | -- | -0.9 | 13.7 | 8.9 | 0.6 | 9.0 |
| Growth | 66.0 | -7.4 | -3.9 | 7.0 | 6.3 | -- | -3.9 | 18.7 | 7.6 | 2.3 | 8.1 |
| Custom Growth Benchmark | | -6.6 | -2.1 | 8.7 | 6.9 | -- | -2.1 | 19.3 | 10.1 | 0.3 | 8.4 |
| Diversifying | 8.4 | -0.9 | -2.3 | 0.3 | 0.2 | 2.3 | -2.3 | 2.6 | 0.8 | -1.8 | 1.7 |
| Custom Diversifying Benchmark | | 0.3 | 1.5 | 3.4 | 3.6 | 4.1 | 1.5 | 4.7 | 4.1 | 2.5 | 5.4 |
| Liquidity | 21.9 | 1.2 | 1.7 | -- | -- | -- | 1.7 | 1.4 | -- | -- | -- |
| BBgBarc US Govt/Credit 1-3 Yr: TR | | 1.2 | 1.6 | -- | -- | -- | 1.6 | 0.8 | -- | -- | -- |

**Correlation between the Growth and Diversifying composites is .13, .11 and .29 over the previous 1, 3 and 5 year periods respectively.*

Policy Index (7/1/2018-Present): 11% Russell 3000, 19% MSCI ACWI ex-US (Gross), 11% MSCI ACWI (Net), 23% BBgBarc 1-3 Yr Govt/Credit, 3.5% BBgBarc US Aggregate, 2% BBgBarc Global Aggregate, 4% ICE BofAML High Yield Master II +2%, 2% ICE BofAML High Yield Master II, 1% Wilshire REIT, 1.8% NCREIF Property Index, 7.2% NCREIF ODCE Index, 2.0% CPI +4%, 10% S&P 500 +4%(Lagged), 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), 25% BBgBarc 1-3 Yr Govt/Credit, 3.5% BBgBarc US Aggregate, 1.9% ICE BofAML High Yield Master II +2%, 4.3% ICE BofAML High Yield Master II, 1% Wilshire REIT, 1.6% NCREIF Property Index, 6.4% NCREIF ODCE Index, 2.5% CPI +4%, 10.1% S&P 500 +4%(Lagged), Policy Index (1/1/2017-9/30/2017): 22.9% Russell 3000, 11% MSCI ACWI ex-US (Gross), 10.9% MSCI ACWI (Net), 22.4% BBgBarc 1-3 Yr Govt/Credit, 3.2% BBgBarc US Aggregate, 1.7% ICE BofAML High Yield Master II +2%, 5.1% ICE BofAML High Yield Master II, 1% Wilshire REIT, 1.7% NCREIF Property Index, 6.8% NCREIF ODCE Index, 3.6% CPI +4%, 8.1% S&P 500 +4%(Lagged), 1.6% 90-day T-Bills, Policy Index (4/1/2012-12/31/16): 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, 5.4% Wilshire REIT, 1.35% FTSE/EPRA NAREIT Developed exUS, 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% Wilshire REIT, 3.1% NCREIF Property Index, 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% Wilshire REIT, 3.1% NCREIF Property Index, 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% Wilshire REIT, 3.1% NCREIF Property Index, 5% S&P 500 +4% (Lagged), 0.5% 91-Day T-Bills.

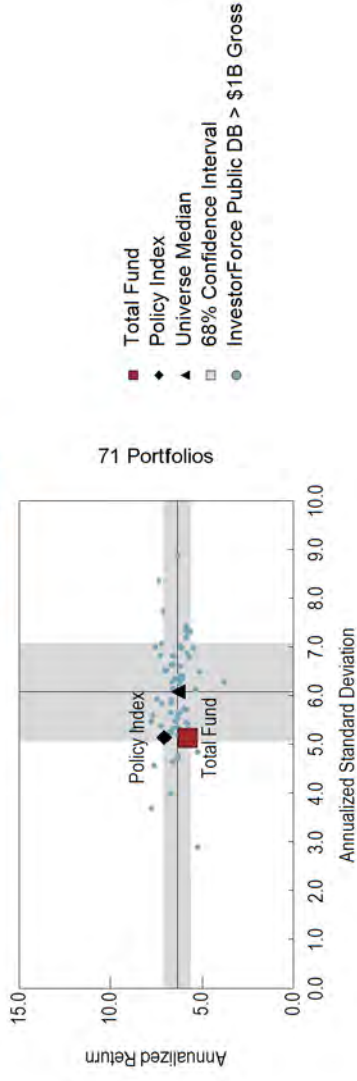
Total Fund
Executive Summary (Net of Fees)

Period Ending: December 31, 2018

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 | 5.81% | -1.24% | 5.14% | -0.96% | 0.96 | 1.44% | 0.92 | 0.93 | -0.87 | 91.11% | 108.37% |

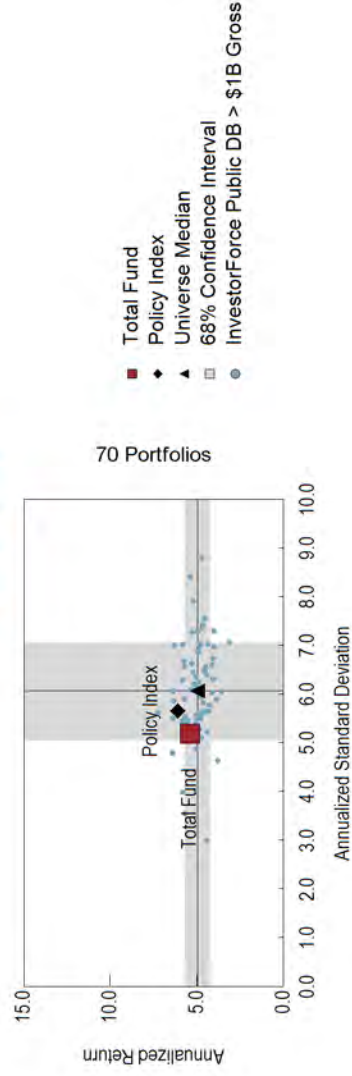
Risk vs. Return



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 | 5.42% | -0.69% | 5.19% | 0.04% | 0.88 | 1.64% | 0.92 | 0.92 | -0.42 | 85.96% | 89.92% |

Risk vs. Return



Total Fund Performance Summary (Gross of Fees) Period Ending: December 31, 2018

| | Market Value | % of Portfolio | 3 Mo | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|----------------------|----------------|--------------|-------------|------------|------------|-------------|-------------|-------------|-------------|------------|-------------|
| Total Fund | 8,255,873,307 | 100.0 | -5.1 | -2.5 | 6.2 | 5.9 | 9.7 | -2.5 | 14.2 | 7.4 | 2.7 | 8.4 |
| <i>Policy Index</i> | | | -4.3 | -0.9 | 7.1 | 6.1 | -- | -0.9 | 13.7 | 8.9 | 0.6 | 9.0 |
| <i>InvestorForce Public DB > \$1B Gross Rank</i> | | | 10 | 25 | 70 | 9 | 10 | 25 | 83 | 74 | 5 | 6 |
| Total Fund ex Overlay & Cash | 7,956,073,522 | 96.4 | -5.0 | -2.1 | 6.3 | 6.0 | 9.8 | -2.1 | 14.1 | 7.4 | 2.7 | 8.4 |
| <i>Policy Index</i> | | | -4.3 | -0.9 | 7.1 | 6.1 | -- | -0.9 | 13.7 | 8.9 | 0.6 | 9.0 |
| <i>InvestorForce Public DB > \$1B Gross Rank</i> | | | 9 | 20 | 60 | 9 | 9 | 20 | 84 | 74 | 5 | 6 |
| Growth | 5,451,581,055 | 66.0 | -7.4 | -3.6 | 7.4 | 6.8 | -- | -3.6 | 19.1 | 8.1 | 3.0 | 8.8 |
| <i>Custom Growth Benchmark</i> | | | -6.6 | -2.1 | 8.7 | 6.9 | -- | -2.1 | 19.3 | 10.1 | 0.3 | 8.4 |
| Total Domestic Equity | 1,040,209,174 | 12.6 | -16.0 | -7.2 | 8.6 | 7.6 | 13.7 | -7.2 | 23.9 | 11.5 | 1.1 | 11.4 |
| <i>Russell 3000</i> | | | -14.3 | -5.2 | 9.0 | 7.9 | 13.2 | -5.2 | 21.1 | 12.7 | 0.5 | 12.6 |
| <i>InvestorForce Public DB US Eq Gross Rank</i> | | | 88 | 78 | 56 | 36 | 14 | 78 | 6 | 77 | 21 | 50 |
| <i>BlackRock Russell 1000 Index</i> | | 1.4 | -13.8 | -4.8 | -- | -- | -- | -4.8 | -- | -- | -- | -- |
| <i>Russell 1000</i> | | | -13.8 | -4.8 | -- | -- | -- | -4.8 | -- | -- | -- | -- |
| <i>eV US Large Cap Equity Gross Rank</i> | | | 49 | 47 | -- | -- | -- | 47 | -- | -- | -- | -- |
| <i>Jackson Square Partners</i> | | 3.6 | -13.7 | -2.0 | 6.6 | 7.9 | 15.3 | -2.0 | 29.3 | -4.4 | 6.1 | 13.9 |
| <i>Russell 1000 Growth</i> | | | -15.9 | -1.5 | 11.1 | 10.4 | 15.3 | -1.5 | 30.2 | 7.1 | 5.7 | 13.0 |
| <i>eV US Large Cap Growth Equity Gross Rank</i> | | | 25 | 59 | 96 | 82 | 35 | 59 | 47 | 98 | 37 | 31 |
| <i>Robeco Boston Partners</i> | | 3.2 | -13.8 | -8.7 | 8.1 | 6.3 | 12.7 | -8.7 | 20.1 | 15.1 | -3.9 | 12.0 |
| <i>Russell 1000 Value</i> | | | -11.7 | -8.3 | 7.0 | 5.9 | 11.2 | -8.3 | 13.7 | 17.3 | -3.8 | 13.5 |
| <i>eV US Large Cap Value Equity Gross Rank</i> | | | 59 | 55 | 36 | 50 | 28 | 55 | 23 | 50 | 65 | 55 |
| <i>Emerald Advisers</i> | | 2.4 | -22.3 | -10.1 | 8.4 | 7.3 | 15.9 | -10.1 | 28.8 | 10.1 | 4.1 | 7.3 |
| <i>Russell 2000 Growth</i> | | | -21.7 | -9.3 | 7.2 | 5.1 | 13.5 | -9.3 | 22.2 | 11.3 | -1.4 | 5.6 |
| <i>eV US Small Cap Growth Equity Gross Rank</i> | | | 72 | 85 | 69 | 38 | 34 | 85 | 26 | 54 | 19 | 21 |
| <i>Ceredex</i> | | 2.1 | -16.6 | -11.3 | 8.6 | 4.8 | -- | -11.3 | 11.4 | 29.8 | -4.4 | 3.3 |
| <i>Russell 2000 Value</i> | | | -18.7 | -12.9 | 7.4 | 3.6 | -- | -12.9 | 7.8 | 31.7 | -7.5 | 4.2 |
| <i>eV US Small Cap Value Equity Gross Rank</i> | | | 22 | 25 | 23 | 33 | -- | 25 | 48 | 32 | 52 | 74 |

Individual closed end funds are not shown in performance summary table. Transition account has \$289,305 of residual cash. Goldman Sachs has \$223 of residual cash. JPM Global has \$158,190 of residual cash. Lazard has \$39,637 of residual cash. Intech Large Cap has \$8,665 of residual cash. Intech Global Low Vol has \$17,444 of residual cash. Parametric Defensive Equity funded 7/23/2018. 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. Effective 7/1/2018, Private Credit and Private Equity data provided by StepStone Group.

**Total Fund
Performance Summary (Gross of Fees)** Period Ending: December 31, 2018

| | Market Value | % of Portfolio | 3 Mo | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|----------------------|----------------|--------------|--------------|------------|------------|------------|--------------|-------------|------------|-------------|------------|
| Total International Equity | 1,442,678,741 | 17.5 | -10.3 | -14.3 | 2.9 | 1.5 | 5.9 | -14.3 | 25.5 | 1.2 | -1.2 | 0.3 |
| MSCI ACWI ex USA Gross | | | -11.4 | -13.8 | 5.0 | 1.1 | 7.1 | -13.8 | 27.8 | 5.0 | -5.3 | -3.4 |
| MSCI EAFE Gross | | | -12.5 | -13.4 | 3.4 | 1.0 | 6.8 | -13.4 | 25.6 | 1.5 | -0.4 | -4.5 |
| InvestorForce Public DB ex-US Eq Gross Rank | | | 9 | 44 | 91 | 39 | 79 | 44 | 90 | 89 | 28 | 5 |
| International Equity | 827,656,847 | 10.0 | -12.8 | -13.6 | 3.1 | 1.7 | 6.0 | -13.6 | 25.3 | 1.2 | -1.2 | 0.3 |
| MSCI ACWI ex USA Gross | | | -11.4 | -13.8 | 5.0 | 1.1 | 7.1 | -13.8 | 27.8 | 5.0 | -5.3 | -3.4 |
| InvestorForce Public DB ex-US Eq Gross Rank | | | 66 | 21 | 89 | 35 | 79 | 21 | 93 | 89 | 28 | 5 |
| Pyrford | | | -10.7 | -14.0 | 4.7 | -- | -- | -10.1 | 19.8 | 3.4 | -2.9 | -- |
| MSCI ACWI ex USA Value | | 5.0 | 12 | 5 | 55 | -- | -- | 5 | 84 | 74 | 59 | -- |
| eV ACWI ex-US Value Equity Gross Rank | | | 15.9 | -16.8 | 2.4 | 1.3 | -- | -16.8 | 30.9 | -1.4 | 0.5 | -1.2 |
| William Blair | | | -12.2 | -14.4 | 4.2 | 1.7 | -- | -14.4 | 32.0 | 0.1 | -1.3 | -2.6 |
| MSCI ACWI ex USA Growth | | 5.0 | 59 | 69 | 83 | 83 | -- | 69 | 81 | 55 | 69 | 37 |
| eV ACWI ex-US Growth Equity Gross Rank | | | -6.7 | -15.3 | -- | -- | -- | -15.3 | -- | -- | -- | -- |
| Emerging Markets Equity | 615,021,894 | 7.4 | -7.5 | -14.6 | -- | -- | -- | -14.6 | -- | -- | -- | -- |
| MSCI Emerging Markets | | | 49 | 51 | -- | -- | -- | 51 | -- | -- | -- | -- |
| InvestorForce Public DB Emg Mkt Eq Gross Rank | | | -6.9 | -12.3 | -- | -- | -- | -12.3 | -- | -- | -- | -- |
| PIMCO RAE Emerging Markets | | 3.9 | -7.5 | -14.6 | -- | -- | -- | -14.6 | -- | -- | -- | -- |
| MSCI Emerging Markets | | | 41 | 19 | -- | -- | -- | 19 | -- | -- | -- | -- |
| eV Emg Mkts Equity Gross Rank | | | -6.4 | -18.4 | -- | -- | -- | -18.4 | -- | -- | -- | -- |
| TT Emerging Markets | | 3.5 | -7.5 | -14.6 | -- | -- | -- | -14.6 | -- | -- | -- | -- |
| MSCI Emerging Markets | | | 36 | 83 | -- | -- | -- | 83 | -- | -- | -- | -- |
| eV Emg Mkts Equity Gross Rank | | | -11.9 | -7.8 | 7.1 | 5.7 | 7.9 | -7.8 | 23.7 | 7.6 | 2.2 | 5.2 |
| Total Global Equity | 681,154,924 | 8.3 | -12.8 | -9.4 | 6.6 | 4.3 | 9.5 | -9.4 | 24.0 | 7.9 | -2.4 | 4.2 |
| MSCI ACWI | | | 60 | 60 | 58 | 34 | 16 | 60 | 79 | 40 | 16 | 41 |
| InvestorForce Public DB Gbl Eq Gross Rank | | | -15.2 | -7.9 | 8.9 | 8.0 | -- | -7.9 | 32.9 | 5.6 | 9.2 | 3.9 |
| Artisan Partners | | 4.2 | -12.8 | -9.4 | 6.6 | 4.3 | -- | -9.4 | 24.0 | 7.9 | -2.4 | 4.2 |
| MSCI ACWI | | | 76 | 40 | 16 | 11 | -- | 40 | 11 | 61 | 4 | 56 |
| eV All Global Equity Gross Rank | | | -8.1 | -7.6 | 5.9 | 4.4 | -- | -7.6 | 15.1 | 11.7 | 0.2 | 4.5 |
| First Eagle | | 4.0 | -12.8 | -9.4 | 6.6 | 4.3 | -- | -9.4 | 24.0 | 7.9 | -2.4 | 4.2 |
| MSCI ACWI | | | 13 | 38 | 63 | 62 | -- | 38 | 89 | 19 | 49 | 51 |
| eV All Global Equity Gross Rank | | | | | | | | | | | | |

Individual closed end funds are not shown in performance summary table. Transition account has \$289,305 of residual cash. Goldman Sachs has \$223 of residual cash. JPM Global has \$158,190 of residual cash. Lazard has \$39,637 of residual cash. Intech Large Cap has \$8,665 of residual cash. Intech Global Low Vol has \$17,444 of residual cash. Parametric Defensive Equity funded 7/23/2018. 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. Effective 7/1/2018, Private Credit and Private Equity data provided by StepStone Group.

Total Fund Performance Summary (Gross of Fees) Period Ending: December 31, 2018

| | Market Value | % of Portfolio | 3 Mo | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs | 2018 | 2017 | 2016 | 2015 | 2014 |
|---------------------------------------|--------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Private Credit | 307,928,386 | 3.7 | 3.8 | 8.3 | 8.9 | 11.0 | 15.4 | 8.3 | 10.4 | 8.2 | 12.9 | 15.4 |
| ICE BofAML High Yield Master II +2% | | | -4.2 | -0.3 | 9.4 | 5.9 | 13.2 | -0.3 | 9.6 | 19.8 | -2.7 | 4.5 |
| Total High Yield | 327,878,586 | 4.0 | -4.8 | -3.2 | 5.6 | 2.8 | 9.9 | -3.2 | 6.5 | 14.3 | -3.5 | 1.2 |
| ICE BofAML High Yield Master II | | | -4.7 | -2.3 | 7.3 | 3.8 | 11.0 | -2.3 | 7.5 | 17.5 | -4.6 | 2.5 |
| eV US High Yield Fixed Inc Gross Rank | | | 73 | 88 | 71 | 87 | 64 | 88 | 74 | 47 | 68 | 83 |
| Allianz Global Investors | 327,878,586 | 4.0 | -4.8 | -3.2 | 5.6 | 2.8 | 9.9 | -3.2 | 6.5 | 14.3 | -3.5 | 1.2 |
| ICE BofAML High Yield Master II | | | -4.7 | -2.3 | 7.3 | 3.8 | 11.0 | -2.3 | 7.5 | 17.5 | -4.6 | 2.5 |
| eV US High Yield Fixed Inc Gross Rank | | | 73 | 88 | 71 | 87 | 64 | 88 | 74 | 47 | 68 | 83 |
| Total Real Estate | 699,299,265 | 8.5 | 0.5 | 7.4 | 8.0 | 11.5 | 11.4 | 7.4 | 11.1 | 5.5 | 13.5 | 20.6 |
| Real Estate Benchmark | | | 0.8 | 6.7 | 6.8 | 9.4 | 9.3 | 6.7 | 7.1 | 6.7 | 8.3 | 18.8 |
| NCREIF-ODCE | | | 1.8 | 8.3 | 8.2 | 10.4 | 7.0 | 8.3 | 7.6 | 8.8 | 15.0 | 12.5 |
| NCREIF Property Index | | | 1.4 | 6.7 | 7.2 | 9.3 | 7.5 | 6.7 | 7.0 | 8.0 | 13.3 | 11.8 |
| Adelante | 62,941,501 | 0.8 | -6.3 | -5.0 | 2.1 | 8.3 | 12.9 | -5.0 | 7.8 | 4.1 | 5.1 | 33.4 |
| Wilshire REIT | | | -6.9 | -4.8 | 2.1 | 7.9 | 12.2 | -4.8 | 4.2 | 7.2 | 4.2 | 31.8 |
| Private Equity | 952,102,813 | 11.5 | 2.2 | 12.1 | 11.1 | 12.4 | 10.9 | 12.1 | 11.9 | 9.4 | 11.6 | 17.3 |
| S&P 500 Index +4% (Lagged) | | | 8.7 | 22.6 | 21.9 | 18.5 | 16.4 | 22.6 | 23.3 | 20.0 | 3.4 | 24.5 |
| Diversifying | 693,574,093 | 8.4 | -0.9 | -2.0 | 0.7 | 0.6 | 2.7 | -2.0 | 2.8 | 1.3 | -1.4 | 2.2 |
| Custom Diversifying Benchmark | | | 0.3 | 1.5 | 3.4 | 3.6 | 4.1 | 1.5 | 4.7 | 4.1 | 2.5 | 5.4 |
| Diversifying Fixed Income | 495,702,114 | 6.0 | -0.2 | -1.7 | 1.3 | 2.4 | 3.5 | -1.7 | 2.8 | 2.8 | 1.6 | 6.6 |
| eV US Core Fixed Inc Gross Rank | | | 99 | 99 | 99 | 95 | 90 | 99 | 96 | 72 | 15 | 25 |
| AFL-CIO | 318,502,545 | 3.9 | 2.1 | 0.6 | 2.2 | 2.9 | 3.9 | 0.6 | 3.6 | 2.4 | 1.6 | 6.6 |
| BBGBarc US Aggregate TR | | | 1.6 | 0.0 | 2.1 | 2.5 | 3.5 | 0.0 | 3.5 | 2.6 | 0.6 | 6.0 |
| eV US Core Fixed Inc Gross Rank | | | 6 | 16 | 70 | 39 | 79 | 16 | 76 | 87 | 15 | 25 |
| Wellington Real Total Return | 177,199,569 | 2.1 | -3.9 | -5.6 | -1.3 | -2.3 | -- | -5.6 | 1.9 | -0.1 | -4.9 | -2.5 |
| CPI + 4% | | | 0.5 | 6.0 | 6.1 | 5.6 | -- | 6.0 | 6.2 | 6.2 | 4.8 | 4.8 |
| Diversifying Equity | 197,871,979 | 2.4 | -2.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Parametric Defensive Equity | 197,871,979 | 2.4 | -2.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 91 Day T-Bill +4% | | | 1.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |

Individual closed end funds are not shown in performance summary table. Transition account has \$289,305 of residual cash. JPM Global has \$158,190 of residual cash. Lazard has \$39,637 of residual cash. Intech Large Cap has \$8,665 of residual cash. Intech Global Low Vol has \$17,444 of residual cash. Parametric Defensive Equity funded 7/23/2018. 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. Effective 7/1/2018, Private Credit and Private Equity data provided by StepStone Group.

**Total Fund
Performance Summary (Gross of Fees)** Period Ending: December 31, 2018

| | Market Value | % of Portfolio | 3 Mo | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|----------------------|----------------|------------|------------|------------|------------|-----------|------------|------------|------------|------------|-------------|
| Liquidity | 1,810,918,374 | 21.9 | 1.2 | 1.8 | -- | -- | -- | 1.8 | 1.5 | -- | -- | -- |
| BBgBarc US Govt/Credit 1-3 Yr. TR | | | 1.2 | 1.6 | -- | -- | -- | 1.6 | 0.8 | -- | -- | -- |
| eV US Short Duration Fixed Inc Gross Rank | | | 18 | 24 | -- | -- | -- | 24 | 50 | -- | -- | -- |
| DFA Short Credit | 407,716,214 | 4.9 | 1.2 | 1.2 | -- | -- | -- | 1.2 | 1.9 | -- | -- | -- |
| ICE BofAML 1-5 Yrs US Corp & Govt. TR | | | 1.4 | 1.4 | -- | -- | -- | 1.4 | 1.3 | -- | -- | -- |
| eV US Short Duration Fixed Inc Gross Rank | | | 22 | 93 | -- | -- | -- | 93 | 26 | -- | -- | -- |
| Insight Short Duration | 874,572,034 | 10.6 | 0.8 | 1.7 | -- | -- | -- | 1.7 | 1.5 | -- | -- | -- |
| BBgBarc US Govt/Credit 1-3 Yr. TR | | | 1.2 | 1.6 | -- | -- | -- | 1.6 | 0.8 | -- | -- | -- |
| eV US Short Duration Fixed Inc Gross Rank | | | 71 | 38 | -- | -- | -- | 38 | 50 | -- | -- | -- |
| Sit Short Duration | 528,630,126 | 6.4 | 2.0 | 2.5 | -- | -- | -- | 2.5 | 1.3 | -- | -- | -- |
| BBgBarc US Govt 1-3 Yr TR | | | 1.3 | 1.6 | -- | -- | -- | 1.6 | 0.4 | -- | -- | -- |
| eV US Short Duration Fixed Inc Gross Rank | | | 1 | 1 | -- | -- | -- | 1 | 68 | -- | -- | -- |
| Total Cash | 266,783,799 | 3.2 | 0.6 | 1.7 | 1.2 | 0.1 | -- | 1.7 | 0.9 | 0.9 | 0.1 | -3.0 |
| 91 Day T-Bills | | | 0.6 | 1.9 | 1.1 | 0.6 | -- | 1.9 | 0.9 | 0.3 | 0.0 | 0.0 |
| Cash | 266,783,799 | 3.2 | 0.6 | 1.7 | 1.2 | 1.0 | 3.2 | 1.7 | 0.9 | 0.9 | 0.1 | 1.4 |

Individual closed end funds are not shown in performance summary table. Transition account has \$289,305 of residual cash. Goldman Sachs has \$223 of residual cash. JPM Global has \$158,190 of residual cash. Lazard has \$39,637 of residual cash. Intech Large Cap has \$8,665 of residual cash. Intech Global Low Vol has \$17,444 of residual cash. Parametric Defensive Equity funded 7/23/2018. 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. Effective 7/1/2018, Private Credit and Private Equity data provided by StepStone Group.

Total Fund Performance Summary (Net of Fees)

Period Ending: December 31, 2018

| | Market Value | % of Portfolio | 3 Mo | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|----------------------|----------------|--------------|--------------|------------|------------|-------------|--------------|-------------|-------------|-------------|-------------|
| Total Fund | 8,255,873,307 | 100.0 | -5.2 | -2.7 | 5.8 | 5.4 | 9.1 | -2.7 | 13.9 | 6.9 | 2.1 | 7.7 |
| <i>Policy Index</i> | | | -4.3 | -0.9 | 7.1 | 6.1 | -- | -0.9 | 13.7 | 8.9 | 0.6 | 9.0 |
| Total Fund ex Overlay & Cash | 7,956,073,522 | 96.4 | -5.0 | -2.4 | 5.9 | 5.5 | 9.2 | -2.4 | 13.8 | 6.9 | 2.1 | 7.7 |
| <i>Policy Index</i> | | | -4.3 | -0.9 | 7.1 | 6.1 | -- | -0.9 | 13.7 | 8.9 | 0.6 | 9.0 |
| Growth | 5,451,581,055 | 66.0 | -7.4 | -3.9 | 7.0 | 6.3 | -- | -3.9 | 18.7 | 7.6 | 2.3 | 8.1 |
| <i>Custom Growth Benchmark</i> | | | -6.6 | -2.1 | 8.7 | 6.9 | -- | -2.1 | 19.3 | 10.1 | 0.3 | 8.4 |
| Total Domestic Equity | 1,040,209,174 | 12.6 | -16.0 | -7.6 | 8.2 | 7.2 | 13.3 | -7.6 | 23.5 | 11.1 | 0.6 | 11.0 |
| <i>Russell 3000</i> | | | -14.3 | -5.2 | 9.0 | 7.9 | 13.2 | -5.2 | 21.1 | 12.7 | 0.5 | 12.6 |
| BlackRock Russell 1000 Index | 114,251,251 | 1.4 | -13.8 | -4.8 | -- | -- | -- | -4.8 | -- | -- | -- | -- |
| <i>Russell 1000</i> | | | -13.8 | -4.8 | -- | -- | -- | -4.8 | -- | -- | -- | -- |
| Jackson Square Partners | 294,082,588 | 3.6 | -13.8 | -2.4 | 6.1 | 7.4 | 14.9 | -2.4 | 28.7 | 4.8 | 5.6 | 13.4 |
| <i>Russell 1000 Growth</i> | | | -15.9 | -1.5 | 11.1 | 10.4 | 15.3 | -1.5 | 30.2 | 7.1 | 5.7 | 13.0 |
| Robeco Boston Partners | 265,438,078 | 3.2 | -13.8 | -8.9 | 7.7 | 6.0 | 12.3 | -8.9 | 19.7 | 14.7 | 4.2 | 11.6 |
| <i>Russell 1000 Value</i> | | | -11.7 | -8.3 | 7.0 | 5.9 | 11.2 | -8.3 | 13.7 | 17.3 | -3.8 | 13.5 |
| Emerald Advisers | 194,396,033 | 2.4 | -22.4 | -10.7 | 7.7 | 6.7 | 15.2 | -10.7 | 28.0 | 9.4 | 3.5 | 6.6 |
| <i>Russell 2000 Growth</i> | | | -21.7 | -9.3 | 7.2 | 5.1 | 13.5 | -9.3 | 22.2 | 11.3 | -1.4 | 5.6 |
| Ceredex | 172,032,560 | 2.1 | -16.7 | -11.8 | 8.0 | 4.2 | -- | -11.8 | 10.7 | 29.1 | -5.0 | 2.7 |
| <i>Russell 2000 Value</i> | | | -18.7 | -12.9 | 7.4 | 3.6 | -- | -12.9 | 7.8 | 31.7 | -7.5 | 4.2 |
| Total International Equity | 1,442,678,741 | 17.5 | -10.4 | -14.7 | 2.4 | 1.1 | 5.5 | -14.7 | 25.0 | 0.8 | -1.6 | 0.0 |
| <i>MSCI ACWI ex USA Gross</i> | | | -11.4 | -13.8 | 5.0 | 1.1 | 7.1 | -13.8 | 27.8 | 5.0 | -5.3 | -3.4 |
| MSCI EAFE Gross | | | -12.5 | -13.4 | 3.4 | 1.0 | 6.8 | -13.4 | 25.6 | 1.5 | -0.4 | -4.5 |
| International Equity | 827,656,847 | 10.0 | -12.9 | -13.9 | 2.7 | 1.3 | 5.6 | -13.9 | 24.8 | 0.8 | -1.6 | 0.0 |
| <i>MSCI ACWI ex USA Gross</i> | | | -11.4 | -13.8 | 5.0 | 1.1 | 7.1 | -13.8 | 27.8 | 5.0 | -5.3 | -3.4 |
| Plyford | 415,515,408 | 5.0 | -9.6 | -10.5 | 3.2 | -- | -- | -10.5 | 19.3 | 3.0 | -3.3 | -- |
| <i>MSCI ACWI ex USA Value</i> | | | -10.7 | -14.0 | 4.7 | -- | -- | -14.0 | 22.7 | 8.9 | -10.1 | -- |
| William Blair | 412,141,439 | 5.0 | -16.0 | -17.1 | 2.0 | 0.9 | -- | -17.1 | 30.4 | -1.8 | 0.0 | -1.7 |
| <i>MSCI ACWI ex USA Growth</i> | | | -12.2 | -14.4 | 4.2 | 1.7 | -- | -14.4 | 32.0 | 0.1 | -1.3 | -2.6 |
| Emerging Markets Equity | 615,021,894 | 7.4 | -6.8 | -15.7 | -- | -- | -- | -15.7 | -- | -- | -- | -- |
| <i>MSCI Emerging Markets</i> | | | -7.5 | -14.6 | -- | -- | -- | -14.6 | -- | -- | -- | -- |
| PIMCO RAE Emerging Markets | 323,920,700 | 3.9 | -7.0 | -12.6 | -- | -- | -- | -12.6 | -- | -- | -- | -- |
| <i>MSCI Emerging Markets</i> | | | -7.5 | -14.6 | -- | -- | -- | -14.6 | -- | -- | -- | -- |
| TT Emerging Markets | 291,101,194 | 3.5 | -6.6 | -18.9 | -- | -- | -- | -18.9 | -- | -- | -- | -- |
| <i>MSCI Emerging Markets</i> | | | -7.5 | -14.6 | -- | -- | -- | -14.6 | -- | -- | -- | -- |

Individual closed end funds are not shown in performance summary table. Transition account has \$289,305 of residual cash. JPM Global has \$158,190 of residual cash. Lazard has \$39.637 of residual cash. Intech Large Cap has \$8,665 of residual cash. Intech Global Low Vol has \$17,444 of residual cash. Parametric Defensive Equity funded 7/23/2018. Effective 7/1/2018, Private Credit and Private Equity data provided by StepStone Group.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2018

| | Market Value | % of Portfolio | 3 Mo | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs | 2018 | 2017 | 2016 | 2015 | 2014 |
|-------------------------------------|--------------------|----------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Total Global Equity | 681,154,924 | 8.3 | -12.0 | -8.5 | 6.3 | 5.0 | 7.3 | -8.5 | 22.8 | 6.9 | 1.6 | 4.5 |
| MSCI ACWI | | | -12.8 | -9.4 | 6.6 | 4.3 | 9.5 | -9.4 | 24.0 | 7.9 | -2.4 | 4.2 |
| Artisan Partners | 347,975,016 | 4.2 | -15.4 | -8.6 | 8.1 | 7.2 | -- | -8.6 | 31.9 | 4.8 | 8.4 | 3.1 |
| MSCI ACWI | | | -12.8 | -9.4 | 6.6 | 4.3 | -- | -9.4 | 24.0 | 7.9 | -2.4 | 4.2 |
| First Eagle | 333,004,273 | 4.0 | -8.3 | -8.3 | 5.1 | 3.7 | -- | -8.3 | 14.3 | 10.9 | -0.6 | 3.7 |
| MSCI ACWI | | | -12.8 | -9.4 | 6.6 | 4.3 | -- | -9.4 | 24.0 | 7.9 | -2.4 | 4.2 |
| Private Credit | 307,928,386 | 3.7 | 3.8 | 8.3 | 8.5 | 9.9 | 13.0 | 8.3 | 10.4 | 6.9 | 11.6 | 12.3 |
| ICE BofAML High Yield Master II +2% | | | -4.2 | -0.3 | 9.4 | 5.9 | 13.2 | -0.3 | 9.6 | 19.8 | -2.7 | 4.5 |
| Total High Yield | 327,878,586 | 4.0 | -4.9 | -3.6 | 5.2 | 2.5 | 9.6 | -3.6 | 6.1 | 13.9 | -3.9 | 0.8 |
| ICE BofAML High Yield Master II | | | -4.7 | -2.3 | 7.3 | 3.8 | 11.0 | -2.3 | 7.5 | 17.5 | -4.6 | 2.5 |
| Allianz Global Investors | 327,878,586 | 4.0 | -4.9 | -3.6 | 5.2 | 2.5 | 9.5 | -3.6 | 6.1 | 13.9 | -3.9 | 0.8 |
| ICE BofAML High Yield Master II | | | -4.7 | -2.3 | 7.3 | 3.8 | 11.0 | -2.3 | 7.5 | 17.5 | -4.6 | 2.5 |
| Total Real Estate | 699,299,265 | 8.5 | 0.5 | 7.4 | 7.7 | 10.8 | 10.5 | 7.4 | 11.0 | 4.8 | 12.4 | 19.1 |
| Real Estate Benchmark | | | 0.8 | 6.7 | 6.8 | 9.4 | 9.3 | 6.7 | 7.1 | 6.7 | 8.3 | 18.8 |
| NCREIF-ODCE | | | 1.8 | 8.3 | 8.2 | 10.4 | 7.0 | 8.3 | 7.6 | 8.8 | 15.0 | 12.5 |
| NCREIF Property Index | | | 1.4 | 6.7 | 7.2 | 9.3 | 7.5 | 6.7 | 7.0 | 8.0 | 13.3 | 11.8 |
| Adelante | 62,941,501 | 0.8 | -6.4 | -5.5 | 1.6 | 7.8 | 12.4 | -5.5 | 7.2 | 3.6 | 4.6 | 32.7 |
| Wilshire REIT | | | -6.9 | -4.8 | 2.1 | 7.9 | 12.2 | -4.8 | 4.2 | 7.2 | 4.2 | 31.8 |
| Private Equity | 952,102,813 | 11.5 | 2.2 | 12.1 | 10.9 | 11.6 | 9.1 | 12.1 | 11.9 | 8.9 | 9.9 | 15.2 |
| S&P 500 Index +4% (Lagged) | | | 8.7 | 22.6 | 21.9 | 18.5 | 16.4 | 22.6 | 23.3 | 20.0 | 3.4 | 24.5 |
| Diversifying | 693,574,093 | 8.4 | -0.9 | -2.3 | 0.3 | 0.2 | 2.3 | -2.3 | 2.6 | 0.8 | -1.8 | 1.7 |
| Custom Diversifying Benchmark | | | 0.3 | 1.5 | 3.4 | 3.6 | 4.1 | 1.5 | 4.7 | 4.1 | 2.5 | 5.4 |
| Diversifying Fixed Income | 495,702,114 | 6.0 | -0.2 | -2.0 | 1.0 | 2.0 | 3.2 | -2.0 | 2.6 | 2.3 | 1.1 | 6.1 |
| AFL-CIO | 318,502,545 | 3.9 | 1.9 | 0.2 | 1.7 | 2.5 | 3.4 | 0.2 | 3.2 | 1.9 | 1.1 | 6.1 |
| BBGBarc US Aggregate TR | | | 1.6 | 0.0 | 2.1 | 2.5 | 3.5 | 0.0 | 3.5 | 2.6 | 0.6 | 6.0 |
| Wellington Real Total Return | 177,199,569 | 2.1 | -3.9 | -5.6 | -1.5 | -2.6 | -- | -5.6 | 1.9 | -0.6 | -5.4 | -3.1 |
| CPI + 4% | | | 0.5 | 6.0 | 6.1 | 5.6 | -- | 6.0 | 6.2 | 6.2 | 4.8 | 4.8 |

Individual closed end funds are not shown in performance summary table. Transition account has \$289,305 of residual cash. Goldman Sachs has \$223 of residual cash. JPM Global has \$158,190 of residual cash. Lazard has \$39.637 of residual cash. Intech Large Cap has \$8,665 of residual cash. Intech Global Low Vol has \$17,444 of residual cash. Parametric Defensive Equity funded 7/23/2018. Effective 7/1/2018. Private Credit and Private Equity data provided by StepStone Group.

**Total Fund
Performance Summary (Net of Fees)** Period Ending: December 31, 2018

| | Market Value | % of Portfolio | 3 Mo | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs | 2018 | 2017 | 2016 | 2015 | 2014 |
|--------------------------------------|----------------------|----------------|-------------|------------|------------|------------|--------|------------|------------|------------|------------|-------------|
| Diversifying Equity | 197,871,979 | 2.4 | -2.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Parametric Defensive Equity | 197,871,979 | 2.4 | -2.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 91 Day T-Bill +4% | | | 1.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Liquidity | 1,810,918,374 | 21.9 | 1.2 | 1.7 | -- | -- | -- | 1.7 | 1.4 | -- | -- | -- |
| BBgBarc US Govt/Credit 1-3 Yr. TR | | | 1.2 | 1.6 | -- | -- | -- | 1.6 | 0.8 | -- | -- | -- |
| DFA Short Credit | 407,716,214 | 4.9 | 1.2 | 1.1 | -- | -- | -- | 1.1 | 1.8 | -- | -- | -- |
| ICE BofAML 1-5 Yrs US Corp & Govt TR | | | 1.4 | 1.4 | -- | -- | -- | 1.4 | 1.3 | -- | -- | -- |
| Insight Short Duration | 874,572,034 | 10.6 | 0.8 | 1.7 | -- | -- | -- | 1.7 | 1.5 | -- | -- | -- |
| BBgBarc US Govt/Credit 1-3 Yr. TR | | | 1.2 | 1.6 | -- | -- | -- | 1.6 | 0.8 | -- | -- | -- |
| Sit Short Duration | 528,630,126 | 6.4 | 2.0 | 2.3 | -- | -- | -- | 2.3 | 1.1 | -- | -- | -- |
| BBgBarc US Govt 1-3 Yr TR | | | 1.3 | 1.6 | -- | -- | -- | 1.6 | 0.4 | -- | -- | -- |
| Total Cash | 266,783,799 | 3.2 | 0.6 | 1.7 | 1.2 | 0.1 | -- | 1.7 | 0.9 | 0.9 | 0.1 | -3.0 |
| 91 Day T-Bills | | | 0.6 | 1.9 | 1.1 | 0.6 | -- | 1.9 | 0.9 | 0.3 | 0.0 | 0.0 |
| Cash | 266,783,799 | 3.2 | 0.6 | 1.7 | 1.2 | 1.0 | 2.9 | 1.7 | 0.9 | 0.9 | 0.1 | 1.4 |

Individual closed end funds are not shown in performance summary table. Transition account has \$289,305 of residual cash. Goldman Sachs has \$223 of residual cash. JPM Global has \$158,190 of residual cash. Lazard has \$39.637 of residual cash. Intech Large Cap has \$8,665 of residual cash. Intech Global Low Vol has \$17,444 of residual cash. Parametric Defensive Equity funded 7/23/2018. Effective 7/1/2018, Private Credit and Private Equity data provided by StepStone Group.

Total Fund
Closed End Funds - Investment Summary

Period Ending: December 31, 2018

| StepStone Group Analysis (*) | | | | | | | | | | | | | | |
|------------------------------|----------------------------------|--|------------------|----------|------------------------|---------------------|---------------------|----------------------|------------------------|---------------------------|------------------|--|--|--|
| Closing Date | Manager Name/Fund Name | Estimated Market Value as of 12/31/18 ¹ | Total Commitment | % Called | Current Qtr. Change in | | Total Distributions | Remaining Commitment | Distrib./Paid-In (DPI) | Tot. Value/Paid-In (TVPI) | Latest Valuation | | | |
| | | | | | Contributed Capital | Distributed Capital | | | | | | | | |
| | Private Credit | | | | | | | | | | | | | |
| 8/31/2015 | Angelo Gordon Energy Credit Opp. | \$6,755,595 | \$16,500,000 | 114% | \$18,750,000 | \$0 | \$18,128,316 | \$2,319,783 | 0.97 | 1.33 | 9/30/2018 | | | |
| 12/18/2017 | Stepstone CC Opportunities Fund | \$219,491,751 | \$650,000,000 | 34% | \$222,571,686 | \$4,524,464 | \$4,531,899 | \$431,952,778 | 0.02 | 1.01 | 9/30/2018 | | | |
| 7/1/2006 | Torchlight II | \$4,582,942 | \$128,000,000 | 170% | \$218,238,292 | \$13,330,649 | \$204,245,825 | \$0 | 0.94 | 0.96 | 12/31/2018 | | | |
| 12/12/2008 | Torchlight III | \$0 | \$75,000,000 | 112% | \$83,825,058 | \$36,421 | \$124,835,174 | \$0 | 1.49 | 1.49 | 12/31/2018 | | | |
| 8/1/2012 | Torchlight IV | \$23,552,031 | \$60,000,000 | 141% | \$84,469,432 | \$45,169 | \$90,626,591 | \$0 | 1.07 | 1.35 | 12/31/2018 | | | |
| 3/12/2015 | Torchlight V | \$53,546,067 | \$75,000,000 | 60% | \$45,000,000 | \$0 | \$4,739,774 | \$30,000,000 | 0.11 | 1.30 | 9/30/2018 | | | |
| | Total Private Credit | \$307,928,386 | | | | | | | | | | | | |

% of Portfolio (Market Value) 3.7%

*All Data provided by StepStone Group
¹Latest valuation + capital calls - distributions

Total Fund
Closed End Funds - Investment Summary **Period Ending: December 31, 2018**

| Verus Internal Analysis | | | | | | | | | | | | | | |
|--------------------------------------|--------------------------------|--|------------------------|----------------|------------------------|-----------------------------|----------------------------|----------------------------------|----------------------|--------------------------------------|---|------------------|--|--|
| Inception Date | Manager Name/Fund Name | Estimated Market Value as of 12/31/2018 ³ | Total Commitment | Total % Called | Capital Called | Current Qtr. Capital Called | Current Qtr. Distributions | Total Distributions ⁵ | Remaining Commitment | Distrib./ Paid-in (DPI) ¹ | Tot. Value/ Paid-in (TVPI) ² | Latest Valuation | | |
| Real Estate | | | | | | | | | | | | | | |
| 1/23/2012 | Angelo Gordon Realty Fund VIII | \$26,122,480 | \$80,000,000 | 94% | \$75,401,855 | \$0 | \$3,200,000 | \$94,978,501 | \$12,334,302 | 1.26 | 1.61 | 9/30/2018 | | |
| 12/8/2014 | Angelo Gordon Realty Fund IX | \$57,621,141 | \$85,000,000 | 86% | \$55,575,000 | \$4,875,000 | \$3,575,000 | \$8,775,000 | \$12,122,500 | 0.16 | 1.19 | 9/30/2018 | | |
| 6/23/2005 | DLJ RECP III | \$23,199,008 | \$75,000,000 | 95% | \$70,968,662 | \$0 | \$0 | \$72,565,242 | \$4,031,338 | 1.02 | 1.35 | 9/30/2018 | | |
| 2/11/2008 | DLJ RECP IV | \$90,413,218 | \$100,000,000 | 95% | \$95,460,264 | \$0 | \$0 | \$67,629,710 | \$4,539,736 | 0.71 | 1.66 | 9/30/2018 | | |
| 7/1/2014 | DLJ RECP V | \$47,833,399 | \$75,000,000 | 107% | \$79,931,685 | \$7,709,903 | \$0 | \$50,780,984 | \$24,803,276 | 0.64 | 1.23 | 9/30/2018 | | |
| 6/17/1998 | Hearthstone II ⁴ | \$3,484 | \$25,000,000 | 80% | \$19,932,386 | \$0 | \$0 | \$19,952,734 | \$2,520,348 | 1.00 | 1.00 | 9/30/2018 | | |
| 11/26/2007 | Invesco Real Estate II | \$425,670 | \$85,000,000 | 92% | \$78,202,813 | \$0 | \$0 | \$100,620,489 | \$6,797,187 | 1.29 | 1.29 | 12/31/2018 | | |
| 6/30/2013 | Invesco Real Estate III | \$12,774,765 | \$35,000,000 | 93% | \$32,386,423 | \$0 | \$0 | \$32,987,218 | \$2,613,577 | 1.02 | 1.41 | 12/31/2018 | | |
| 6/30/2014 | Invesco Real Estate IV | \$26,805,973 | \$35,000,000 | 85% | \$29,808,739 | \$2,448,117 | \$1,798,052 | \$9,376,527 | \$5,191,261 | 0.31 | 1.21 | 12/31/2018 | | |
| 7/16/2013 | LaSalle Income & Growth VI | \$29,017,358 | \$75,000,000 | 95% | \$71,428,571 | \$0 | \$8,033,126 | \$78,272,483 | \$3,571,429 | 1.10 | 1.50 | 9/30/2018 | | |
| 2/28/2017 | LaSalle Income & Growth VII | \$51,653,639 | \$75,000,000 | 72% | \$54,224,861 | \$7,635,483 | \$13,273,864 | \$13,273,864 | \$20,775,139 | 0.24 | 1.20 | 9/30/2018 | | |
| 7/3/2013 | Long Wharf Fund IV | \$12,101,592 | \$25,000,000 | 100% | \$25,000,000 | \$0 | \$1,627,540 | \$23,485,895 | \$0 | 0.94 | 1.42 | 12/31/2018 | | |
| 9/30/2016 | Long Wharf Fund V | \$49,447,742 | \$50,000,000 | 100% | \$50,000,000 | \$6,215,012 | \$2,627,670 | \$6,969,039 | \$0 | 0.14 | 1.13 | 12/31/2018 | | |
| 12/31/2011 | Oaktree REOF V | \$5,216,833 | \$50,000,000 | 100% | \$50,000,000 | \$0 | \$400,000 | \$80,116,587 | \$25,750,000 | 1.60 | 1.71 | 12/31/2018 | | |
| 9/30/2013 | Oaktree REOF VI | \$39,385,683 | \$80,000,000 | 100% | \$80,000,000 | \$0 | \$3,888,703 | \$73,678,405 | \$18,400,000 | 0.92 | 1.41 | 12/31/2018 | | |
| 4/1/2015 | Oaktree REOF VII | \$34,158,375 | \$85,000,000 | 47% | \$30,745,000 | \$6,500,000 | \$0 | \$4,615,000 | \$38,870,000 | 0.15 | 1.26 | 12/31/2018 | | |
| 11/10/2013 | Paulson Real Estate Fund II | \$24,739,053 | \$20,000,000 | 97% | \$19,345,623 | \$0 | \$0 | \$4,594,996 | \$654,377 | 0.24 | 1.52 | 9/30/2018 | | |
| 1/25/2012 | Siguler Gulf DREOF | \$31,764,566 | \$75,000,000 | 93% | \$69,375,000 | \$0 | \$15,697,719 | \$89,705,668 | \$5,625,000 | 1.29 | 1.75 | 9/30/2018 | | |
| 8/31/2013 | Siguler Gulf DREOF II | \$50,069,029 | \$70,000,000 | 82% | \$57,120,000 | \$0 | \$3,710,338 | \$29,608,106 | \$12,880,000 | 0.52 | 1.39 | 9/30/2018 | | |
| 1/27/2016 | Siguler Gulf DREOF II Co-Inv | \$23,611,725 | \$25,000,000 | 82% | \$20,537,862 | \$687,500 | \$972,301 | \$972,301 | \$4,462,138 | 0.05 | 1.20 | 9/30/2018 | | |
| Total Closed End Real Estate | | \$636,357,764 | \$1,185,000,000 | 90% | \$1,065,444,746 | \$36,071,015 | \$58,804,314 | \$862,958,749 | \$205,941,607 | 0.81 | 1.41 | | | |
| % of Portfolio (Market Value) | | 7.7% | | | | | | | | | | | | |

¹(DPI) is equal to (capital returned / capital called)
²(TVPI) is equal to (market value + capital returned) / capital called
³Latest valuation + capital calls - distributions
⁴No further capital to be called
⁵Total distributions may include recallable distributions

Total Fund
 Closed End Funds - Investment Summary
 Period Ending: December 31, 2018

StepStone Group Analysis (*)

| Closing Date | Manager Name/Fund Name | Estimated Market Value as of 12/31/18 ¹ | 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) | Tot. Value/Paid-In (TVPI) | Latest Valuation |
|---|--------------------------------------|--|------------------------|--------------------------------------|------------------------|--|--|----------------------|----------------------|------------------------|---------------------------|------------------|
| Private Equity & Venture Capital | | | | | | | | | | | | |
| 2/11/2004 | Adams Street Partners | \$149,976,465 | \$210,000,000 | 84% | \$175,403,125 | \$3,500,000 | \$5,674,744 | \$121,161,543 | \$34,596,875 | 0.69 | 1.55 | 9/30/2018 |
| 12/31/2008 | Adams Street Partners II | \$8,878,568 | \$30,000,000 | 95% | \$28,365,000 | \$0 | \$1,509,720 | \$0 | \$1,635,000 | 1.38 | 1.70 | 9/30/2018 |
| 12/31/2008 | Adams Street Partners - Fund 5 | \$2,521,424 | \$40,000,000 | 77% | \$30,611,900 | \$0 | \$1,002,150 | \$0 | \$9,388,100 | 0.46 | 1.20 | 9/30/2018 |
| 1/18/1996 | Adams Street Partners - BPF | \$2,456,860 | \$59,565,614 | 108% | \$64,307,595 | \$0 | \$209,461 | \$2,103,276 | \$2,048,205 | 1.59 | 1.62 | 6/30/2018 |
| 3/31/2016 | Adams Street Venture Innovation | \$24,907,754 | \$75,000,000 | 34% | \$25,162,500 | \$5,250,000 | \$0 | \$3,885,504 | \$49,837,500 | 0.00 | 0.99 | 9/30/2018 |
| 11/27/2013 | Aether Real Assets III | \$22,942,562 | \$25,000,000 | 84% | \$20,975,964 | \$434,041 | \$158,687 | \$1,529,981 | \$5,788,713 | 0.10 | 1.19 | 9/30/2018 |
| 11/30/2013 | Aether Real Assets III Surplus | \$56,216,534 | \$50,000,000 | 94% | \$46,891,321 | \$1,624,967 | \$1,073,361 | \$6,175,954 | \$5,727,835 | 0.08 | 1.28 | 9/30/2018 |
| 1/30/2016 | Aether Real Assets IV | \$28,874,312 | \$50,000,000 | 50% | \$25,189,265 | \$981,108 | \$687,976 | \$36,331,243 | \$26,328,058 | 0.06 | 1.21 | 9/30/2018 |
| 11/26/2003 | Bay Area Equity Fund | \$2,890,434 | \$10,000,000 | 100% | \$10,000,000 | \$0 | \$0 | \$2,026,313 | \$0 | 3.63 | 3.92 | 9/30/2018 |
| 11/26/2003 | Bay Area Equity Fund II | \$11,158,188 | \$10,000,000 | 100% | \$10,000,000 | \$0 | \$0 | \$49,128,304 | \$0 | 0.20 | 1.32 | 9/30/2018 |
| 1/16/2008 | Carpenter Bancfund | \$0 | \$30,000,000 | 98% | \$29,314,657 | \$0 | \$0 | \$7,107,576 | \$904,309 | 1.68 | 1.68 | 9/30/2018 |
| 6/30/2013 | Commonfund | \$48,010,389 | \$50,000,000 | 86% | \$43,071,846 | \$374,998 | \$1,118,878 | \$25,225,856 | \$7,225,005 | 0.17 | 1.28 | 9/30/2018 |
| 11/26/2003 | EIF US Power Fund I | -\$9,042 | \$30,000,000 | 130% | \$38,960,280 | \$0 | \$64,348 | \$13,844,471 | \$0 | 1.65 | 1.65 | 9/30/2018 |
| 7/15/2005 | EIF US Power Fund II | \$20,221,097 | \$50,000,000 | 130% | \$65,029,556 | \$0 | \$919,034 | \$39,187,764 | \$1 | 1.00 | 1.31 | 9/30/2018 |
| 5/31/2007 | EIF US Power Fund III | \$23,187,413 | \$65,000,000 | 110% | \$71,430,128 | \$21,031 | \$21,031 | \$10,040,744 | \$0 | 1.00 | 1.33 | 9/30/2018 |
| 8/31/2010 | EIF US Power Fund IV | \$45,299,312 | \$50,000,000 | 120% | \$59,968,849 | \$343,261 | \$0 | \$5,500,000 | \$3,777,443 | 0.42 | 1.18 | 9/30/2018 |
| 11/28/2016 | EIF US Power Fund V | \$39,759,201 | \$50,000,000 | 89% | \$44,299,203 | \$6,869,298 | \$12,500 | \$23,594,952 | \$9,891,068 | 0.14 | 1.04 | 9/30/2018 |
| 2/12/2004 | Nogales | \$0 | \$15,000,000 | 120% | \$18,026,408 | \$0 | \$0 | \$24,699,218 | \$1,291,060 | 0.77 | 0.77 | 9/30/2017 |
| 2/28/2010 | Oaktree PIF 2009 | \$9,436,522 | \$40,000,000 | 87% | \$34,812,448 | \$0 | \$0 | \$18,678,543 | \$6,308,961 | 1.13 | 1.40 | 9/30/2018 |
| 8/15/2013 | Ocean Avenue Fund II | \$26,472,694 | \$30,000,000 | 82% | \$24,600,000 | \$2,400,000 | \$3,750,000 | \$13,948,271 | \$4,800,000 | 0.41 | 1.48 | 9/30/2018 |
| 4/15/2016 | Ocean Avenue Fund III | \$31,387,958 | \$50,000,000 | 56% | \$28,000,000 | \$0 | \$0 | \$3,658,641 | \$22,000,000 | 0.20 | 1.42 | 9/30/2018 |
| 11/30/2007 | Paladin III | \$25,141,407 | \$25,000,000 | 132% | \$33,058,868 | \$304,691 | \$33,215 | \$166,966,622 | \$538,351 | 0.71 | 1.47 | 9/30/2018 |
| 8/22/2011 | Pathway 6 | \$35,749,111 | \$40,000,000 | 92% | \$36,930,846 | \$777,916 | \$4,016,884 | \$20,993,394 | \$5,066,589 | 0.51 | 1.47 | 6/30/2018 |
| 7/10/2013 | Pathway 7 | \$63,231,506 | \$70,000,000 | 87% | \$60,663,445 | \$2,629,535 | \$2,725,665 | \$41,905,281 | \$11,763,038 | 0.23 | 1.27 | 6/30/2018 |
| 11/23/2015 | Pathway 8 | \$35,100,660 | \$50,000,000 | 64% | \$32,083,722 | \$3,415,158 | \$767,128 | \$29,158,659 | \$19,347,637 | 0.11 | 1.21 | 6/30/2018 |
| 1/19/1999 | Pathway | \$21,505,882 | \$125,000,000 | 100% | \$124,513,501 | \$71,000 | \$2,355,823 | \$0 | \$11,156,115 | 1.34 | 1.51 | 6/30/2018 |
| 7/31/2009 | Pathway 2008 | \$21,179,039 | \$30,000,000 | 96% | \$28,664,294 | \$228,214 | \$2,715,862 | \$64,468,378 | \$3,670,543 | 0.86 | 1.60 | 6/30/2018 |
| 6/30/2014 | Siguler Gulf CCCERA Opportunities | \$143,655,665 | \$200,000,000 | 68% | \$135,702,500 | \$3,450,000 | \$22,482,384 | \$71,776,773 | \$72,156,609 | 0.31 | 1.37 | 9/30/2018 |
| 8/31/2013 | Siguler Gulf Secondary Opportunities | \$19,511,832 | \$50,000,000 | 60% | \$29,999,802 | \$0 | \$18,332,343 | \$65,018,668 | \$42,440,738 | 0.97 | 1.62 | 9/30/2018 |
| 12/8/2015 | Wastewater Opportunity Fund | \$12,439,068 | \$25,000,000 | 72% | \$17,974,369 | \$4,536,304 | \$3,596,436 | \$3,611,308 | \$7,047,858 | 0.20 | 0.89 | 9/30/2018 |
| Total Private Equity and Venture Capital | | \$952,102,813 | \$1,634,565,614 | 85% | \$1,394,011,393 | \$37,211,522 | \$75,727,631 | \$871,727,238 | \$364,735,589 | 0.63 | 1.31 | |
| | | | | % of Portfolio (Market Value) | | | | | | | | |
| | | | | | | | | | | | | |

11.5%

* All Data provided by StepStone Group
¹Latest valuation + capital calls - distributions

Total Fund

Closed End Funds - IRR Summary

Period Ending: December 31, 2018

| Private Credit | Inception | Fund Level(G) | CCCERA(G) | Fund Level(N) | CCCERA(N) | IRR Date |
|--|------------|---------------|-----------|---------------|-----------|------------|
| Angelo Gordon Energy Cred Opp. | 09/24/2015 | - | - | - | 14.5% | 09/30/2018 |
| Stepstone CC Opportunities Fund ¹ | 02/02/2018 | - | - | - | - | - |
| Torchlight II | 07/01/2006 | 0.0% | 0.2% | -1.2% | -1.0% | 12/31/2018 |
| Torchlight III | 12/12/2008 | 18.3% | 16.3% | 13.7% | 13.8% | 06/30/2018 |
| Torchlight IV | 08/01/2012 | 13.6% | 14.0% | 10.5% | 11.2% | 12/31/2018 |
| Torchlight V | 03/12/2015 | 24.2% | 24.0% | 15.9% | 15.7% | 09/30/2018 |
| Real Estate | Inception | Fund Level(G) | CCCERA(G) | Fund Level(N) | CCCERA(N) | IRR Date |
| Angelo Gordon VIII | 01/23/2012 | - | - | - | 15.9% | 09/30/2018 |
| Angelo Gordon IX | 12/08/2014 | - | - | - | 11.8% | 09/30/2018 |
| DLJ RECP III | 06/23/2005 | 1.0% | 1.0% | -2.0% | -2.0% | 06/30/2018 |
| DLJ RECP IV | 02/11/2008 | 7.0% | 7.0% | 4.0% | 5.0% | 06/30/2018 |
| DLJ RECP V | 07/01/2014 | 26.0% | 26.0% | 14.0% | 14.0% | 06/30/2018 |
| Hearthstone II | 06/17/1998 | - | 30.1% | - | 30.1% | 09/30/2018 |
| Invesco Fund III | 06/30/2013 | 17.2% | - | 13.6% | - | 12/31/2018 |
| Invesco Fund IV | 06/30/2014 | 18.1% | - | 12.7% | - | 09/30/2018 |
| LaSalle Income & Growth VI | 07/16/2013 | 16.3% | 16.3% | 13.5% | 13.5% | 09/30/2018 |
| LaSalle Income & Growth VII | 02/28/2017 | 15.8% | 16.4% | 13.7% | 14.1% | 09/30/2018 |
| Long Wharf IV | 07/03/2013 | 17.2% | 17.3% | 12.4% | 12.4% | 12/31/2018 |
| Long Wharf V | 09/30/2016 | 16.1% | 18.2% | 10.2% | 11.4% | 12/31/2018 |
| Oaktree REOF V | 12/31/2011 | 17.0% | - | 12.6% | - | 12/31/2018 |
| Oaktree REOF VI | 09/30/2013 | 14.9% | - | 10.0% | - | 12/31/2018 |
| Oaktree REOF VII | 04/01/2015 | 73.7% | - | 39.7% | - | 12/31/2018 |
| Paulson | 11/10/2013 | - | - | 14.9% | - | 12/31/2017 |
| Siguler Guff I | 01/25/2012 | 14.8% | 17.3% | 13.3% | 14.1% | 09/30/2018 |
| Siguler Guff II | 08/31/2013 | 14.2% | 13.8% | 12.7% | 11.4% | 09/30/2018 |
| Siguler Guff DREOF II Co-Inv | 01/27/2016 | 13.0% | 13.1% | 11.9% | 10.0% | 09/30/2018 |

¹ Manager has yet to report IRR figure due to no capital invested or meaningful distributions.

² Fund level data includes CCCERA and all other fund investors.

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

Total Fund
 Closed End Funds - IRR Summary

Period Ending: December 31, 2018

| Private Equity & Venture Capital | Inception | Fund Level (G) | CCCERA (G) | Fund Level (N) | CCCERA (N) | IRR Date |
|---|------------|----------------|------------|----------------|------------|------------|
| Adams Street Partners | 3/18/1996 | 11.5% | 12.9% | - | 10.4% | 9/30/2018 |
| Adams Street Partners II | 1/16/2009 | 17.4% | 17.3% | - | 14.8% | 9/30/2018 |
| Adams Street Partners - Fund 5 | 9/21/2012 | 9.7% | 9.6% | - | 6.8% | 9/30/2018 |
| Adams Street Partners Venture | 4/28/2017 | 9.5% | 9.5% | - | -2.6% | 9/30/2018 |
| Adams Street Partners - BPF | 1/18/1996 | 10.7% | 14.3% | - | 11.6% | 9/30/2018 |
| Aether Real Assets III | 11/27/2013 | 10.4% | - | 7.6% | - | 9/30/2018 |
| Aether Real Assets III Surplus | 11/27/2013 | 11.5% | - | 9.8% | - | 9/30/2018 |
| Aether Real Assets IV | 1/1/2016 | 23.5% | - | 17.3% | - | 9/30/2018 |
| Bay Area Equity Fund I | 6/14/2004 | 25.8% | 25.8% | 23.2% | 23.2% | 9/30/2018 |
| Bay Area Equity Fund II | 12/7/2009 | 6.0% | 6.0% | 5.0% | 5.0% | 9/30/2018 |
| CommonFund | 6/28/2013 | - | - | - | 10.3% | 9/30/2018 |
| Energy Investor Fund | 11/26/2003 | 33.5% | 34.7% | 28.5% | 28.3% | 9/30/2018 |
| Energy Investor Fund II | 8/16/2005 | 6.8% | 6.4% | 4.2% | 3.8% | 9/30/2018 |
| Energy Investor Fund III | 5/30/2007 | 8.2% | 8.2% | 5.7% | 5.7% | 9/30/2018 |
| Energy Investor Fund IV | 11/28/2011 | 10.6% | 10.8% | 6.4% | 6.2% | 9/30/2018 |
| Energy Investor Fund V | 11/26/2016 | 20.5% | 17.9% | 8.3% | 6.8% | 9/30/2018 |
| Oaktree PIF 2009 | 2/18/2010 | 7.2% | - | 7.0% | - | 12/31/2018 |
| Ocean Avenue II | 6/11/2014 | - | - | 15.9% | - | 12/31/2018 |
| Ocean Avenue III | 4/15/2016 | - | - | 35.9% | - | 12/31/2018 |
| Paladin III | 11/30/2007 | 16.6% | - | 8.6% | - | 9/30/2018 |
| Pathway 6 | 5/24/2011 | 17.0% | 17.0% | 14.3% | 14.3% | 9/30/2018 |
| Benchmark ⁴ | | 15.0% | - | - | - | 9/30/2018 |
| Pathway 7 | 2/7/2013 | 15.8% | 15.8% | 12.7% | 12.7% | 9/30/2018 |
| Benchmark ⁵ | | 14.6% | - | - | - | 9/30/2018 |
| Pathway 8 ¹ | 11/6/2015 | 22.7% | 23.3% | 20.2% | 21.1% | 9/30/2018 |
| Benchmark ⁶ | | 14.4% | - | - | - | 9/30/2018 |
| Pathway Private Equity Fund | 11/9/1998 | 10.4% | 10.4% | 8.6% | 8.6% | 9/30/2018 |
| Benchmark ⁷ | | 10.5% | - | - | - | 9/30/2018 |
| Pathway Private Equity Fund 2008 | 12/26/2008 | 15.4% | 15.4% | 12.7% | 12.7% | 9/30/2018 |
| Benchmark ⁸ | | 13.6% | - | - | - | 9/30/2018 |
| Siguler Guff CCCERA Opportunities | 6/3/2014 | 19.2% | 19.8% | 18.6% | 16.5% | 9/30/2018 |
| Siguler Guff Secondary Opportunities ⁸ | 11/30/2016 | 76.0% | 550.2% | 70.4% | 291.8% | 9/30/2018 |
| Wastewater Opportunity Fund | 12/8/2015 | -1.3% | - | -14.8% | - | 9/30/2018 |

¹Manager has yet to report IRR figure due to no capital invested or meaningful distributions.

²Fund level data includes CCCERA and all other fund investors.

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

⁴Private IQ global all private equity median pooled return for vintage years 2011-2014, as of September 30, 2018.

⁵Private IQ global all private equity median pooled return for vintage years 2012-2016, as of September 30, 2018.

⁶Private IQ global all private equity median pooled return for vintage years 2015-2018, as of September 30, 2018.

⁷Private IQ global all private equity median pooled return for vintage years 1999-2011, as of September 30, 2018.

⁸Private IQ global all private equity median pooled return for vintage years 2008-2014, as of September 30, 2018.

**Total Fund
Performance Analysis - 5 Years (Net of Fees) Period Ending: December 31, 2018**

| | 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 | 7.44% | -2.96% | 12.63% | -2.67% | 0.97 | 4.95% | 0.85 | 0.54 | -0.60 | 90.69% | 109.25% |
| Robeco Boston Partners | 5.97% | 0.03% | 12.01% | -0.41% | 1.07 | 3.02% | 0.94 | 0.44 | 0.01 | 103.97% | 102.71% |
| Emerald Advisers | 6.66% | 1.53% | 17.40% | 1.47% | 1.01 | 5.60% | 0.90 | 0.35 | 0.27 | 105.52% | 97.90% |
| Ceredex | 4.23% | 0.63% | 13.91% | 1.16% | 0.85 | 5.53% | 0.87 | 0.26 | 0.11 | 87.04% | 91.49% |
| William Blair | 0.87% | -0.82% | 11.62% | -0.75% | 0.96 | 2.79% | 0.94 | 0.02 | -0.29 | 85.12% | 95.63% |
| Artisan Partners | 7.15% | 2.89% | 12.70% | 2.68% | 1.05 | 5.58% | 0.81 | 0.51 | 0.52 | 113.23% | 91.94% |
| First Eagle | 3.67% | -0.59% | 7.67% | 0.85% | 0.66 | 4.57% | 0.88 | 0.39 | -0.13 | 56.66% | 66.35% |
| Allianz Global Investors | 2.45% | -1.37% | 4.79% | -1.04% | 0.91 | 1.06% | 0.96 | 0.38 | -1.29 | 82.91% | 100.75% |
| Adelante | 7.83% | -0.04% | 13.35% | 0.40% | 0.94 | 1.76% | 0.99 | 0.54 | -0.02 | 89.83% | 93.88% |
| AFL-CIO | 2.48% | -0.04% | 2.50% | 0.29% | 0.87 | 0.74% | 0.94 | 0.73 | -0.06 | 87.61% | 80.91% |
| Wellington Real Total Return | -2.58% | -8.15% | 5.34% | -10.27% | 1.38 | 5.16% | 0.07 | -0.60 | -1.58 | -18.79% | 1,080.85% |

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

Total Fund Investment Fund Fee Analysis **Period Ending: December 31, 2018**

| Name | Asset Class | Fee Schedule | Market Value | Estimated Fee Value | Estimated Fee |
|------------------------------|--------------|--|---------------|---------------------|---------------|
| BlackRock Russell 1000 Index | Growth | 0.03% of Assets | \$114,251,251 | \$34,275 | 0.03% |
| Jackson Square Partners | Growth | 0.50% of First 100.0 Mil, 0.40% of Next 150.0 Mil, 0.35% Thereafter | \$294,082,588 | \$1,254,289 | 0.43% |
| Robeco Boston Partners | Growth | 0.50% of First 25.0 Mil, 0.30% Thereafter | \$265,438,078 | \$846,314 | 0.32% |
| Emerald Advisers | Growth | 0.75% of First 10.0 Mil, 0.60% Thereafter | \$194,396,033 | \$1,181,376 | 0.61% |
| Ceredex | Growth | 0.85% of First 10.0 Mil, 0.68% of Next 40.0 Mil, 0.51% Thereafter | \$172,032,560 | \$979,366 | 0.57% |
| Pyrford | Growth | 0.70% of First 50.0 Mil, 0.50% of Next 50.0 Mil, 0.35% Thereafter | \$415,515,408 | \$1,704,304 | 0.41% |
| 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 | \$412,141,439 | \$1,651,424 | 0.40% |
| 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 | \$323,920,700 | \$1,770,143 | 0.55% |
| TT Emerging Markets | Growth | 0.70% of First 100.0 Mil, 0.65% of Next 100.0 Mil, 0.60% Thereafter | \$291,101,194 | \$1,896,607 | 0.65% |
| Artisan Partners | Growth | 0.75% of Assets | \$347,975,016 | \$2,609,813 | 0.75% |
| First Eagle | Growth | 0.75% of Assets | \$333,004,273 | \$2,497,532 | 0.75% |
| Allianz Global Investors | Growth | 0.50% of First 50.0 Mil, 0.40% of Next 50.0 Mil, 0.35% Thereafter | \$327,878,586 | \$1,247,575 | 0.38% |
| AFL-CIO | Diversifying | 0.43% of Assets | \$318,502,545 | \$1,369,561 | 0.43% |

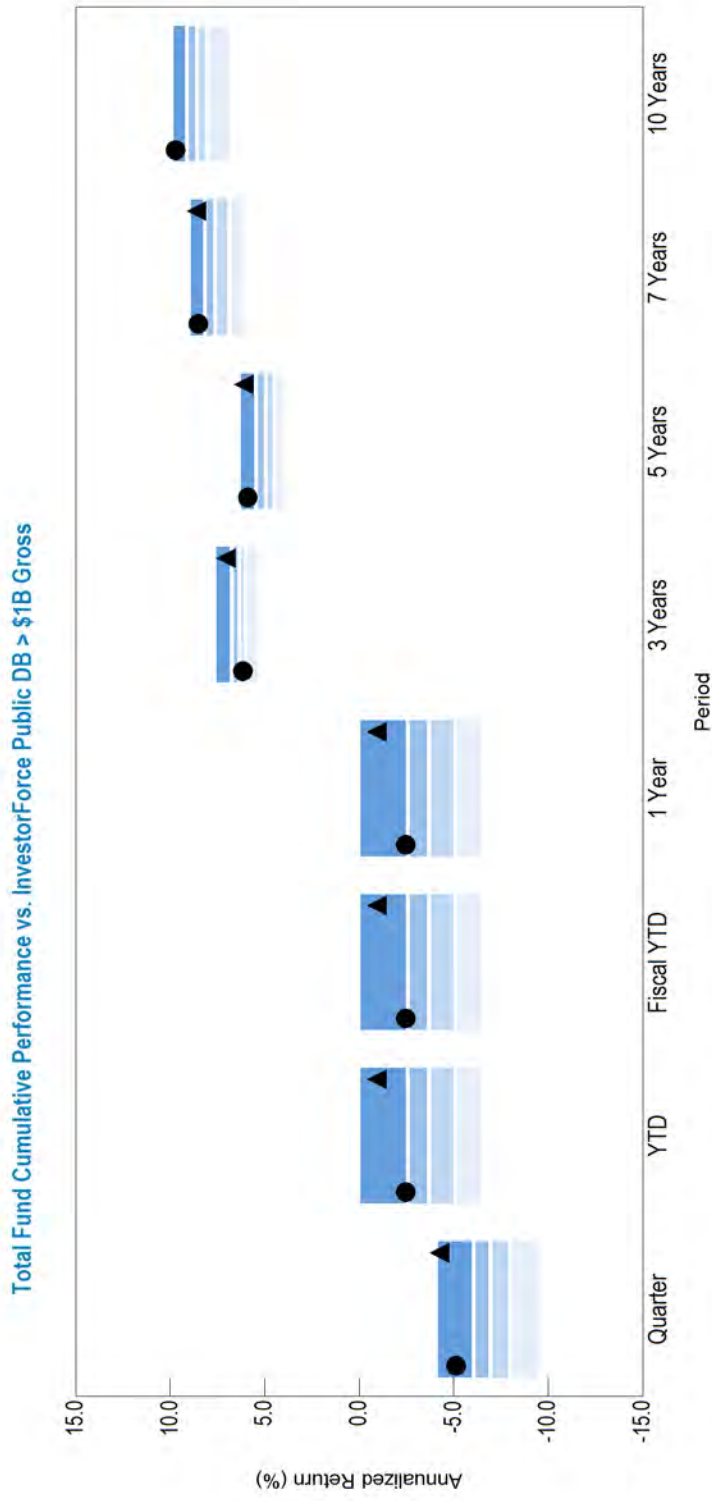
Mutual fund fees shown are sourced from Morningstar and are as of the most current prospectus.

**Total Fund
Investment Fund Fee Analysis** **Period Ending: December 31, 2018**

| Name | Asset Class | Fee Schedule | Market Value | Estimated Fee Value | Estimated Fee |
|------------------------------|--------------|---|---------------|---------------------|---------------|
| Wellington Real Total Return | Diversifying | 0.35% of Assets | \$177,199,569 | \$620,198 | 0.35% |
| Parametric Defensive Equity | Diversifying | 0.42% of First 200.0 Mil, 0.39% Thereafter | \$197,871,979 | \$831,062 | 0.42% |
| DFA Short Credit | Liquidity | 0.20% of First 25.0 Mil, 0.10% Thereafter | \$407,716,214 | \$432,716 | 0.11% |
| Insight Short Duration | Liquidity | 0.06% of First 500.0 Mil, 0.05% of Next 500.0 Mil, 0.04% Thereafter | \$874,572,034 | \$487,286 | 0.06% |
| Sit Short Duration | Liquidity | 0.15% of Assets | \$528,630,126 | \$792,945 | 0.15% |

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, 2018

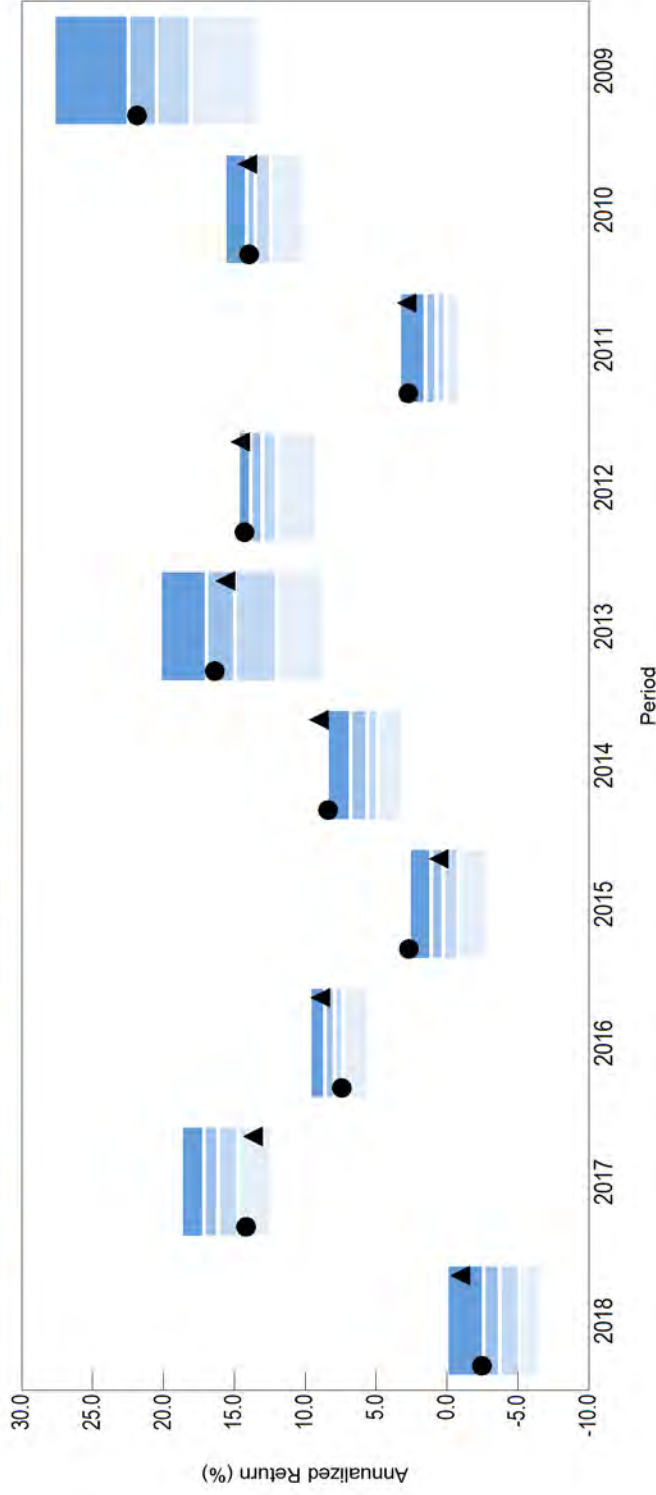


| Period | 5th Percentile | 25th Percentile | Median | 75th Percentile | 95th Percentile | # of Portfolios | Total Fund | Policy Index |
|------------|----------------|-----------------|--------|-----------------|-----------------|-----------------|------------|--------------|
| Quarter | -10.0 | -8.0 | -6.0 | -4.0 | -2.0 | 73 | -5.0 | -4.0 |
| YTD | -10.0 | -8.0 | -6.0 | -4.0 | -2.0 | 71 | -2.5 | -0.9 |
| Fiscal YTD | -10.0 | -8.0 | -6.0 | -4.0 | -2.0 | 71 | -2.5 | -0.9 |
| 1 Year | -10.0 | -8.0 | -6.0 | -4.0 | -2.0 | 71 | -2.5 | -0.9 |
| 3 Years | -10.0 | -8.0 | -6.0 | -4.0 | -2.0 | 71 | 6.2 | 7.1 |
| 5 Years | -10.0 | -8.0 | -6.0 | -4.0 | -2.0 | 70 | 5.9 | 6.1 |
| 7 Years | -10.0 | -8.0 | -6.0 | -4.0 | -2.0 | 69 | 8.5 | 8.6 |
| 10 Years | -10.0 | -8.0 | -6.0 | -4.0 | -2.0 | 67 | 9.7 | -- |

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 (Gross of Fees) Period Ending: December 31, 2018

Total Fund Consecutive Periods vs. InvestorForce Public DB > \$1B Gross

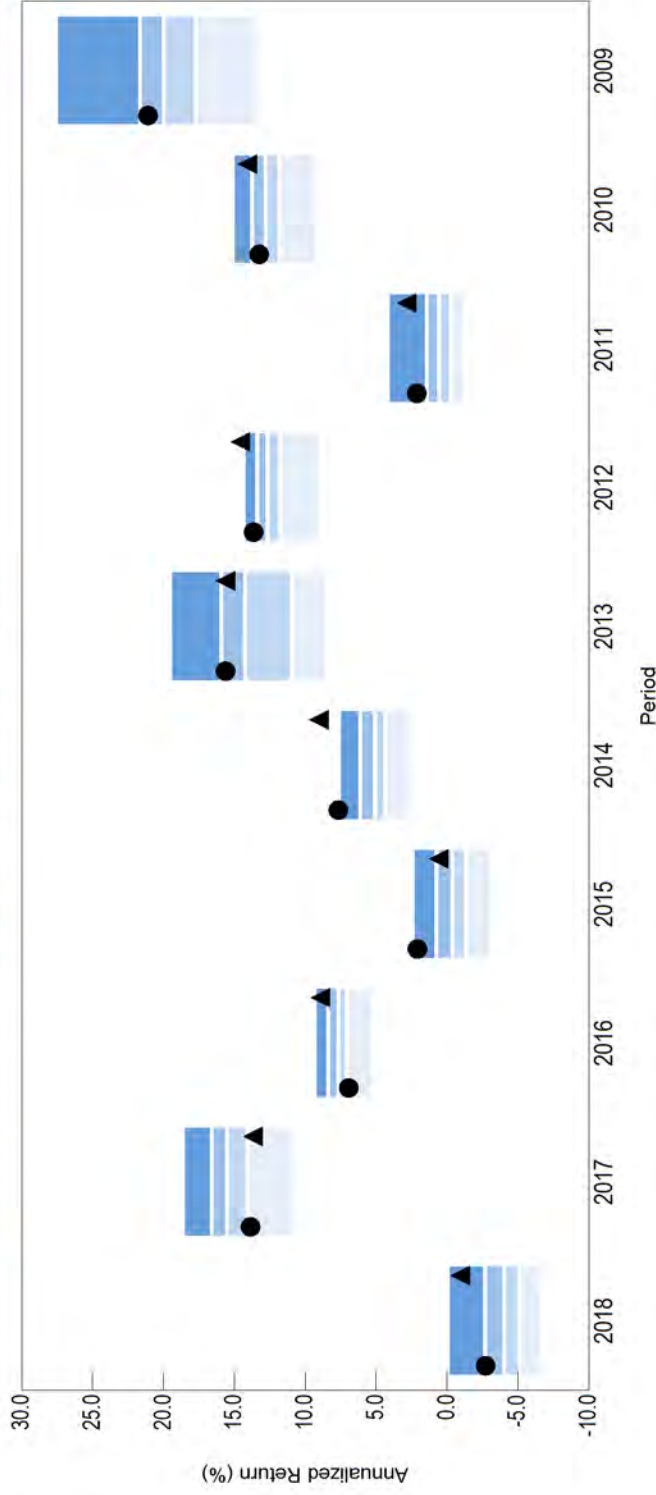


| Return (Rank) | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 |
|-----------------|-----------|-----------|----------|----------|---------|-----------|-----------|---------|-----------|-----------|
| 5th Percentile | 0.0 | 18.8 | 9.7 | 2.7 | 8.5 | 20.2 | 14.7 | 3.3 | 15.7 | 27.7 |
| 25th Percentile | -2.6 | 17.2 | 8.6 | 1.1 | 6.8 | 17.0 | 13.9 | 1.6 | 14.2 | 22.5 |
| Median | -3.7 | 16.2 | 8.0 | 0.3 | 5.7 | 15.0 | 13.0 | 0.8 | 13.5 | 20.5 |
| 75th Percentile | -5.1 | 14.8 | 7.4 | -0.7 | 4.9 | 12.0 | 12.1 | 0.1 | 12.5 | 18.1 |
| 95th Percentile | -6.6 | 12.4 | 5.5 | -2.8 | 3.1 | 8.7 | 9.2 | -0.9 | 10.2 | 13.4 |
| # of Portfolios | 71 | 98 | 92 | 98 | 79 | 67 | 74 | 68 | 66 | 66 |
| ● Total Fund | -2.5 (25) | 14.2 (83) | 7.4 (74) | 2.7 (5) | 8.4 (6) | 16.4 (33) | 14.3 (13) | 2.7 (9) | 14.0 (29) | 21.9 (34) |
| ▲ Policy Index | -0.9 (8) | 13.7 (89) | 8.9 (15) | 0.6 (40) | 9.0 (2) | 15.6 (43) | 14.6 (8) | 2.8 (9) | 14.1 (27) | -- (--) |

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.

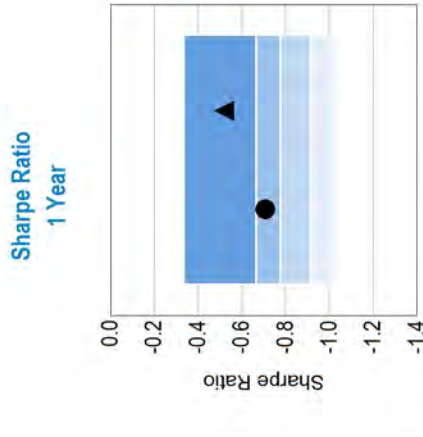
Total Fund
Peer Universe Comparison: Consecutive Periods (Net of Fees) Period Ending: December 31, 2018

Total Fund Consecutive Periods vs. InvestorForce Public DB > \$1B Net

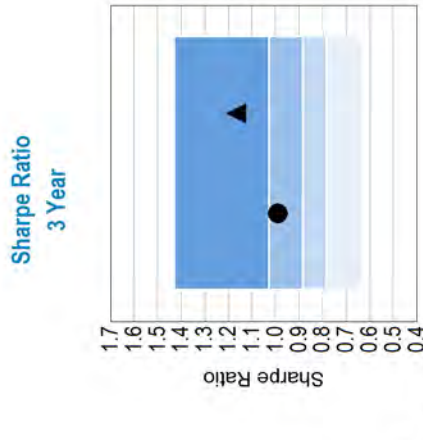


| Period | 5th Percentile | 25th Percentile | Median | 75th Percentile | 95th Percentile | # of Portfolios | Total Fund | Policy Index |
|--------|----------------|-----------------|--------|-----------------|-----------------|-----------------|------------|--------------|
| 2018 | -0.1 | -2.7 | -4.0 | -5.1 | -6.6 | 63 | -2.7 (27) | -0.9 (8) |
| 2017 | 18.6 | 16.6 | 15.6 | 14.1 | 10.7 | 61 | 13.9 (81) | 13.7 (85) |
| 2016 | 9.3 | 8.4 | 7.7 | 7.1 | 5.3 | 62 | 6.9 (78) | 8.9 (13) |
| 2015 | 2.4 | 0.8 | -0.4 | -1.3 | -3.2 | 57 | 2.1 (12) | 0.6 (29) |
| 2014 | 7.6 | 6.1 | 5.1 | 4.4 | 2.6 | 55 | 7.7 (5) | 9.0 (2) |
| 2013 | 19.5 | 16.0 | 14.3 | 11.0 | 8.5 | 48 | 15.6 (33) | 15.6 (33) |
| 2012 | 14.3 | 13.4 | 12.7 | 11.8 | 9.0 | 44 | 13.6 (21) | 14.6 (1) |
| 2011 | 4.2 | 1.5 | 0.6 | -0.3 | -1.2 | 42 | 2.1 (12) | 2.8 (11) |
| 2010 | 15.1 | 13.8 | 12.8 | 11.8 | 9.3 | 41 | 13.3 (34) | 14.1 (15) |
| 2009 | 27.5 | 21.7 | 20.0 | 17.7 | 13.4 | 40 | 21.1 (33) | -- (--) |

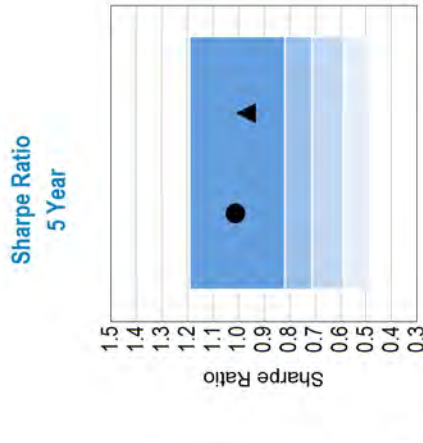
Total Fund
 Sharpe Ratio Ranking (Gross of Fees) Period Ending: December 31, 2018



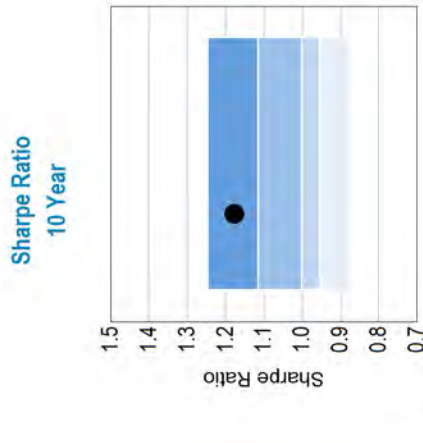
| | | |
|----------------------|------|----|
| ● Total Fund Value | -0.7 | 35 |
| ▲ Policy Index Value | -0.5 | 10 |
| Universe 5th %tile | -0.3 | |
| Universe 25th %tile | -0.7 | |
| Universe Median | -0.8 | |
| Universe 75th %tile | -0.9 | |
| Universe 95th %tile | -1.0 | |



| | | |
|----------------------|-----|----|
| ● Total Fund Value | 1.0 | 31 |
| ▲ Policy Index Value | 1.2 | 13 |
| Universe 5th %tile | 1.4 | |
| Universe 25th %tile | 1.0 | |
| Universe Median | 0.9 | |
| Universe 75th %tile | 0.8 | |
| Universe 95th %tile | 0.6 | |



| | | |
|----------------------|-----|----|
| ● Total Fund Value | 1.0 | 9 |
| ▲ Policy Index Value | 1.0 | 10 |
| Universe 5th %tile | 1.2 | |
| Universe 25th %tile | 0.8 | |
| Universe Median | 0.7 | |
| Universe 75th %tile | 0.6 | |
| Universe 95th %tile | 0.5 | |



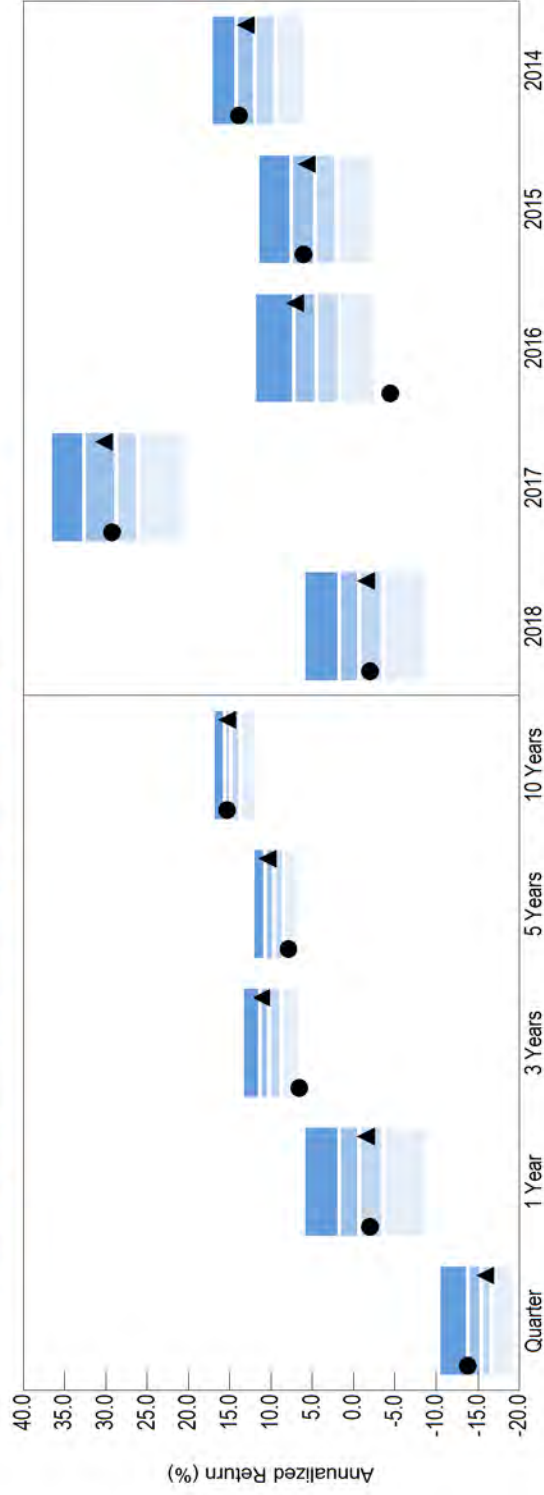
| | | |
|----------------------|-----|----|
| ● Total Fund Value | 1.2 | 7 |
| ▲ Policy Index Value | -- | -- |
| Universe 5th %tile | 1.2 | |
| Universe 25th %tile | 1.1 | |
| Universe Median | 1.0 | |
| Universe 75th %tile | 1.0 | |
| Universe 95th %tile | 0.9 | |

Domestic Equity Managers

Jackson Square Partners
 Manager Performance Comparisons (Gross of Fees)

Period Ending: December 31, 2018

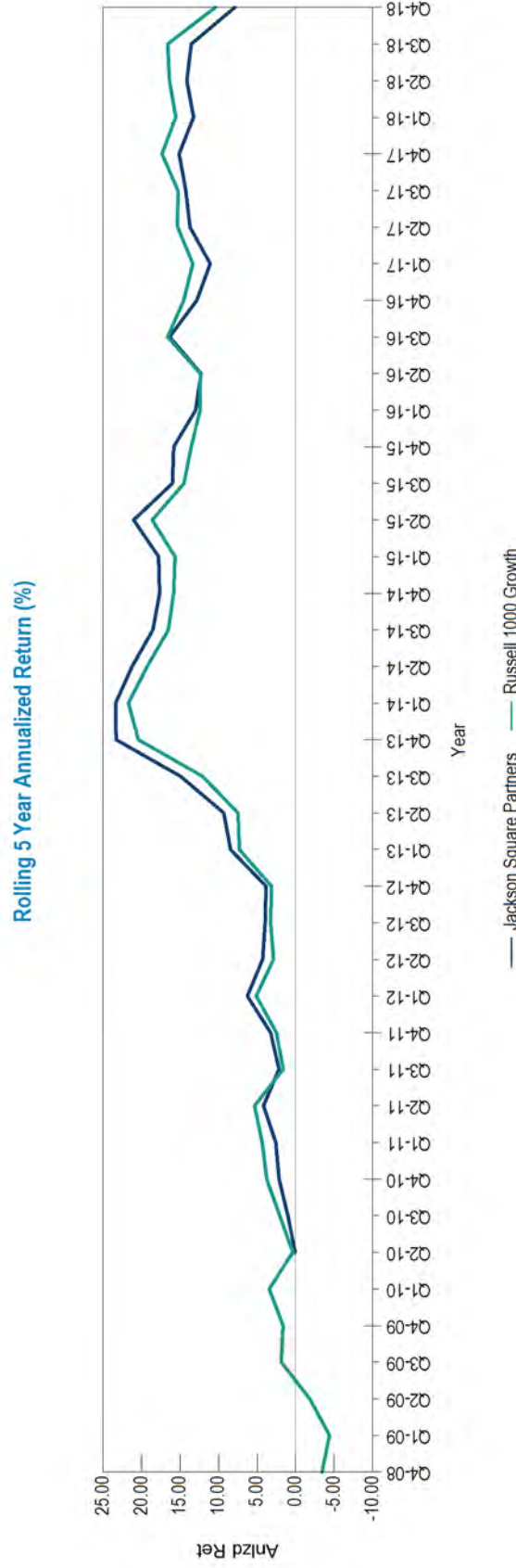
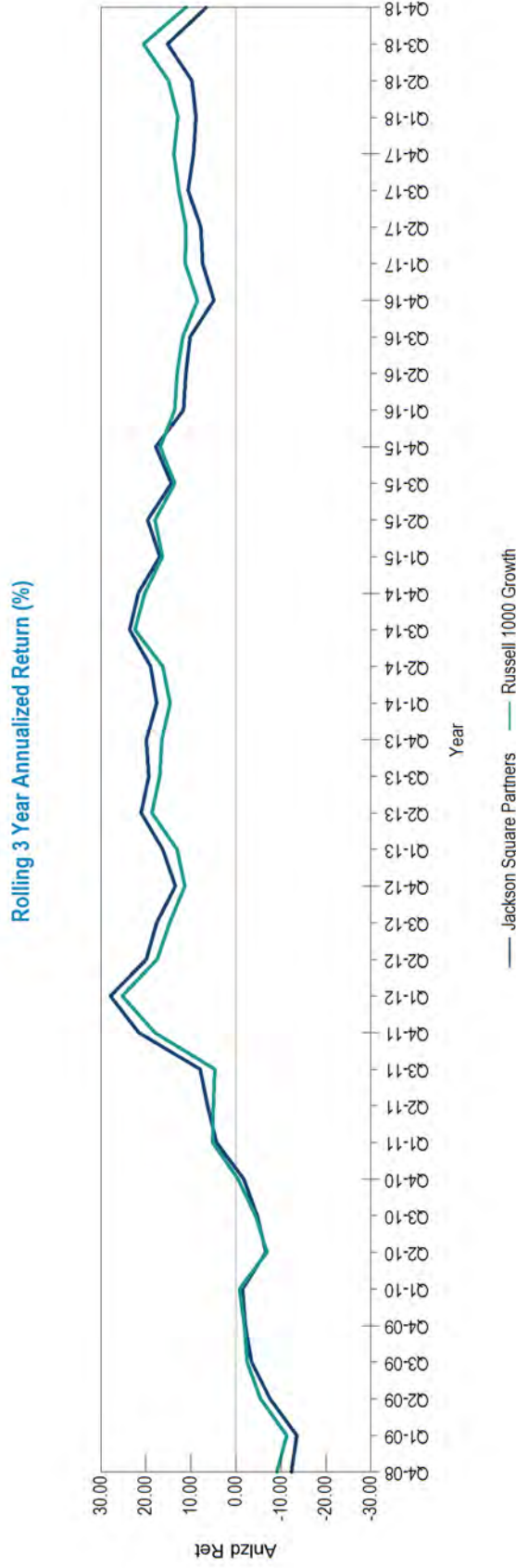
Jackson Square Partners vs. eV US Large Cap Growth Equity Gross Universe



Return (Rank)

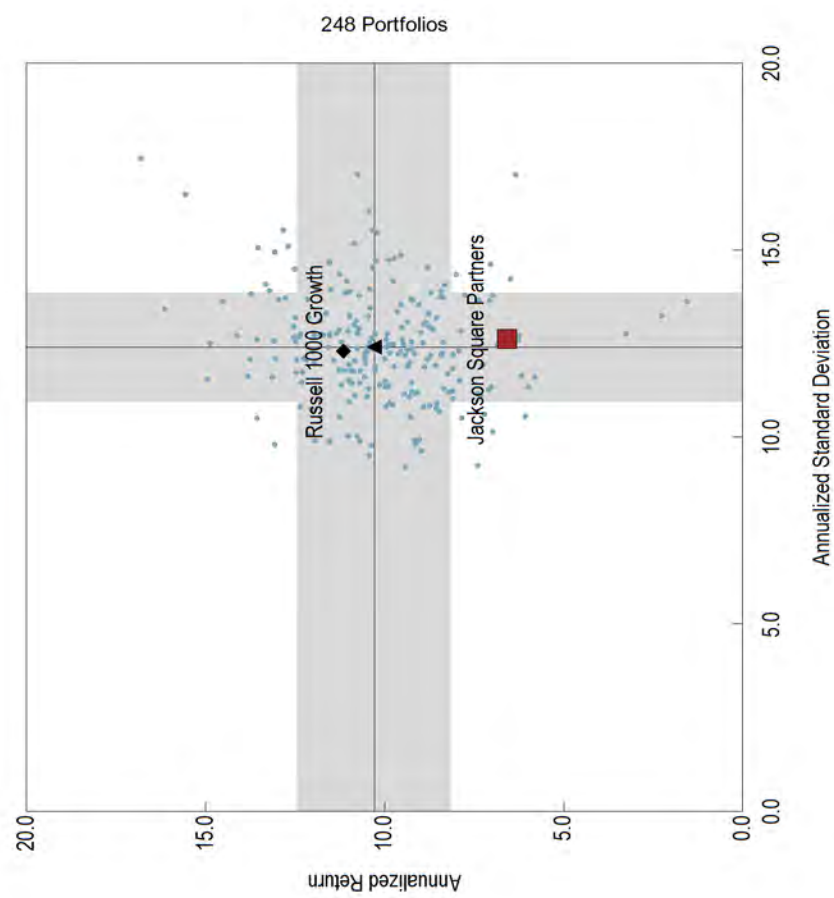
| | | | | | | | | | |
|---------------------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|
| 5th Percentile | -10.3 | 6.1 | 13.5 | 12.2 | 17.0 | 36.7 | 12.0 | 11.6 | 17.3 |
| 25th Percentile | -13.8 | 1.7 | 11.4 | 10.8 | 15.7 | 32.7 | 7.3 | 7.6 | 14.3 |
| Median | -15.3 | -0.6 | 10.3 | 9.6 | 14.9 | 28.8 | 4.6 | 4.7 | 12.0 |
| 75th Percentile | -16.6 | -3.5 | 8.8 | 8.5 | 13.8 | 26.2 | 1.8 | 2.1 | 9.5 |
| 95th Percentile | -19.2 | -8.8 | 6.6 | 6.8 | 11.6 | 20.5 | -2.7 | -2.4 | 5.8 |
| # of Portfolios | 255 | 255 | 248 | 244 | 217 | 265 | 282 | 270 | 291 |
| ● Jackson Square Partners | -13.7 (25) | -2.0 (59) | 6.6 (96) | 7.9 (82) | 15.3 (35) | 29.3 (47) | -4.4 (98) | 6.1 (37) | 13.9 (31) |
| ▲ Russell 1000 Growth | -15.9 (60) | -1.5 (57) | 11.1 (29) | 10.4 (32) | 15.3 (36) | 30.2 (42) | 7.1 (26) | 5.7 (42) | 13.0 (38) |

Jackson Square Partners
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018

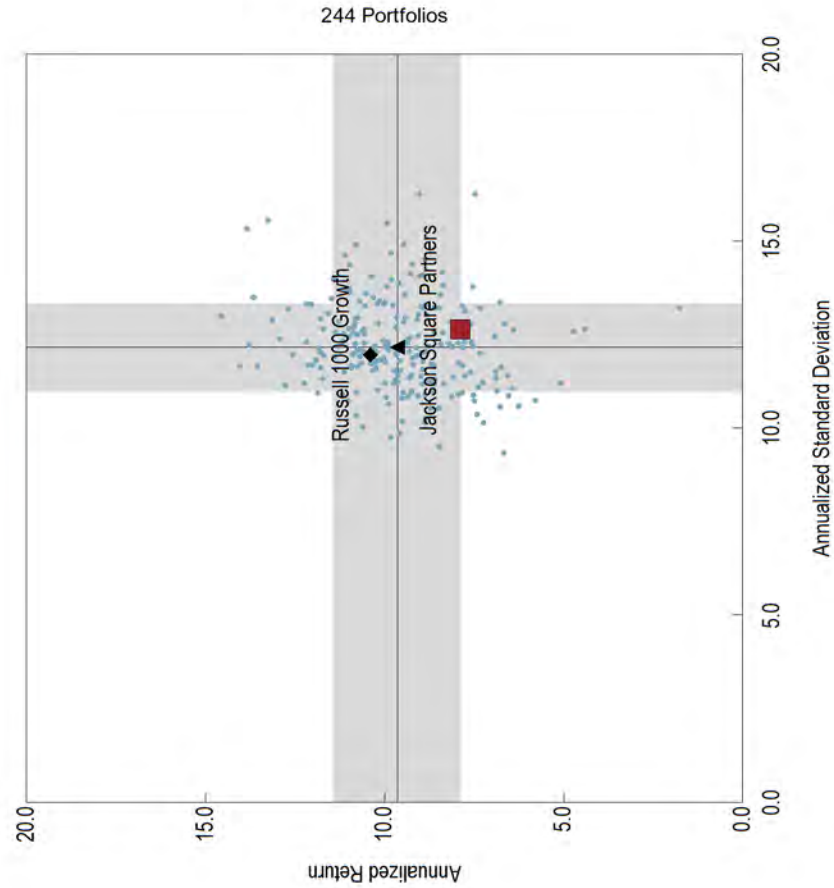


Jackson Square Partners
 Risk vs. Return 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018

3 Years



5 Years



3 Years

5 Years

| | 3 Years | 5 Years |
|--|---------|---------|
| Jackson Square Partners | 11.1% | 10.4% |
| Russell 1000 Growth | 6.6% | 7.9% |
| eV US Large Cap Growth Equity Gross Median | 10.3% | 9.6% |
| Annualized Standard Deviation | 12.3% | 12.0% |
| Sharpe Ratio | 0.8 | 0.8 |

Robeco Boston Partners Manager Portfolio Overview

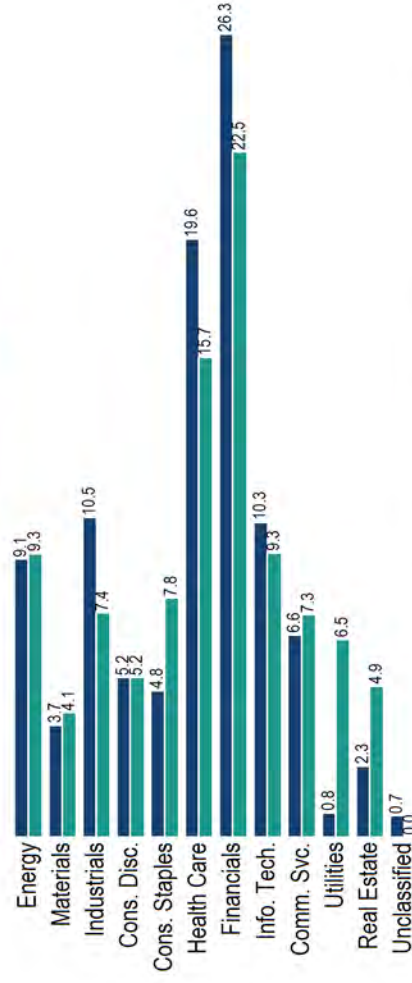
Period Ending: December 31, 2018

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.

Characteristics

| | Portfolio | Russell 1000 Value |
|---------------------------------|-----------|-----------------------|
| Number of Holdings | 84 | 725 |
| Weighted Avg. Market Cap. (\$B) | 143.70 | 111.52 |
| Median Market Cap. (\$B) | 34.86 | 8.19 |
| Price To Earnings | 16.43 | 18.10 |
| Price To Book | 2.88 | 2.57 |
| Price To Sales | 2.69 | 3.05 |
| Return on Equity (%) | 17.65 | 14.22 |
| Yield (%) | 2.76 | 2.83 |
| Beta | 1.15 | 1.00 |

Sector Allocation (%) vs Russell 1000 Value



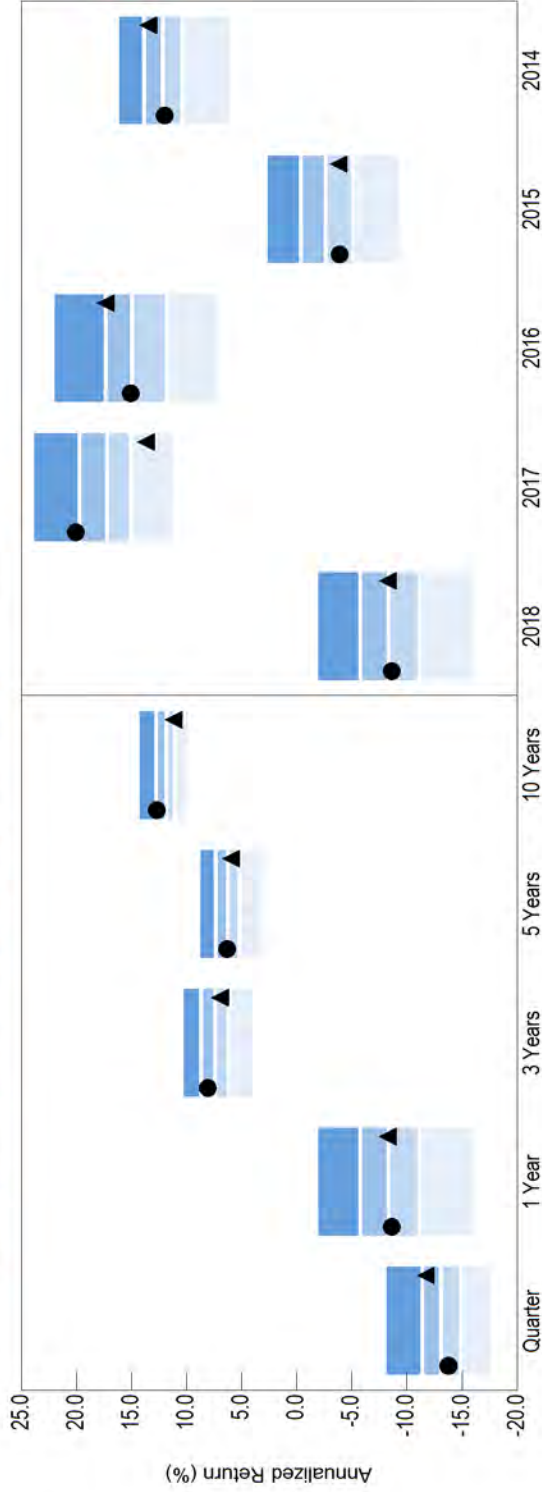
Largest Holdings

| | End Weight | Return | Top Contributors | | Bottom Contributors | |
|------------------------|------------|--------|------------------|--------|---------------------|--------|
| | | | Avg Wgt | Return | Avg Wgt | Return |
| BERKSHIRE HATHAWAY 'B' | 4.55 | -4.64 | 2.29 | 6.45 | 3.07 | -26.94 |
| JOHNSON & JOHNSON | 4.55 | -6.01 | | | 3.75 | -15.88 |
| CISCO SYSTEMS | 3.53 | -10.33 | 1.15 | 8.49 | 1.30 | -42.97 |
| JP MORGAN CHASE & CO. | 3.39 | -12.89 | 0.77 | 11.43 | 3.75 | -12.89 |
| PFIZER | 3.29 | -0.19 | 0.54 | 10.75 | | |
| COMCAST A | 3.16 | -2.79 | 0.73 | 1.52 | 1.70 | -25.66 |
| BANK OF AMERICA | 2.92 | -15.88 | 0.17 | 5.38 | 1.80 | -23.41 |
| PROCTER & GAMBLE | 2.86 | 11.43 | 0.74 | 0.44 | 3.24 | -11.62 |
| CHEVRON | 2.73 | -10.18 | 0.17 | 0.01 | 3.42 | -10.33 |
| WELLS FARGO & CO | 2.63 | -11.62 | 0.26 | 0.15 | 2.15 | -16.19 |
| | | | 0.17 | 0.05 | 1.73 | -19.11 |
| | | | 1.04 | -0.41 | | |
| | | | | 0.00 | | |

Unclassified sector allocation includes cash allocations.

Robeco Boston Partners
 Manager Performance Comparisons (Gross of Fees) Period Ending: December 31, 2018

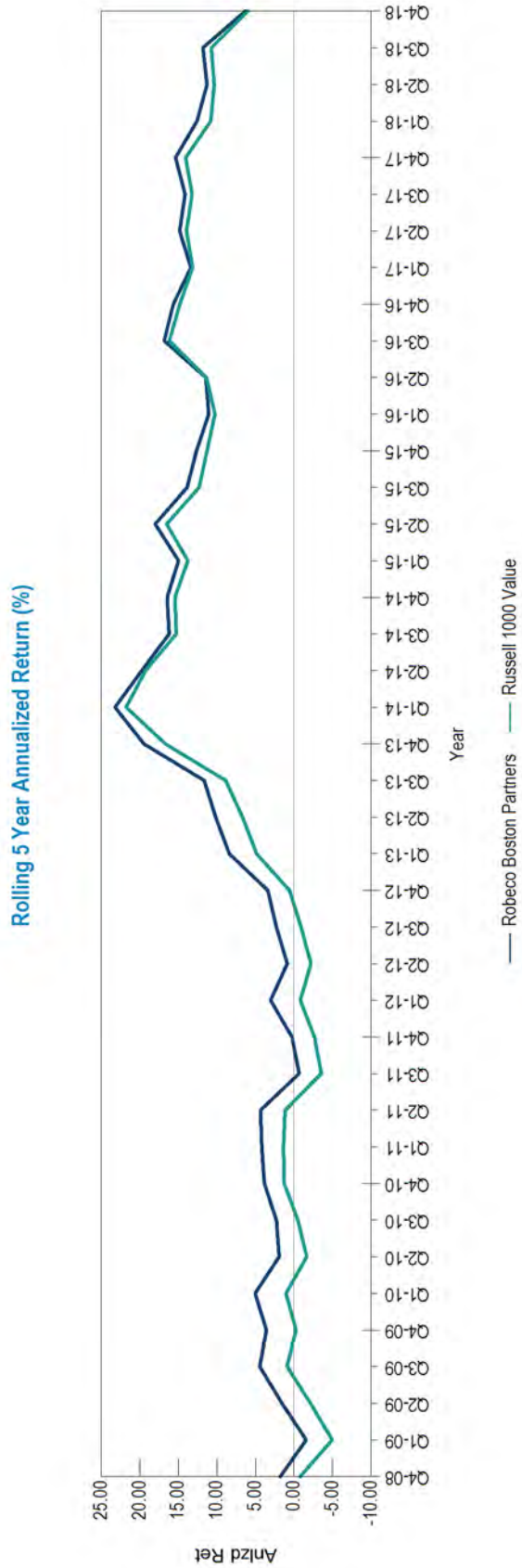
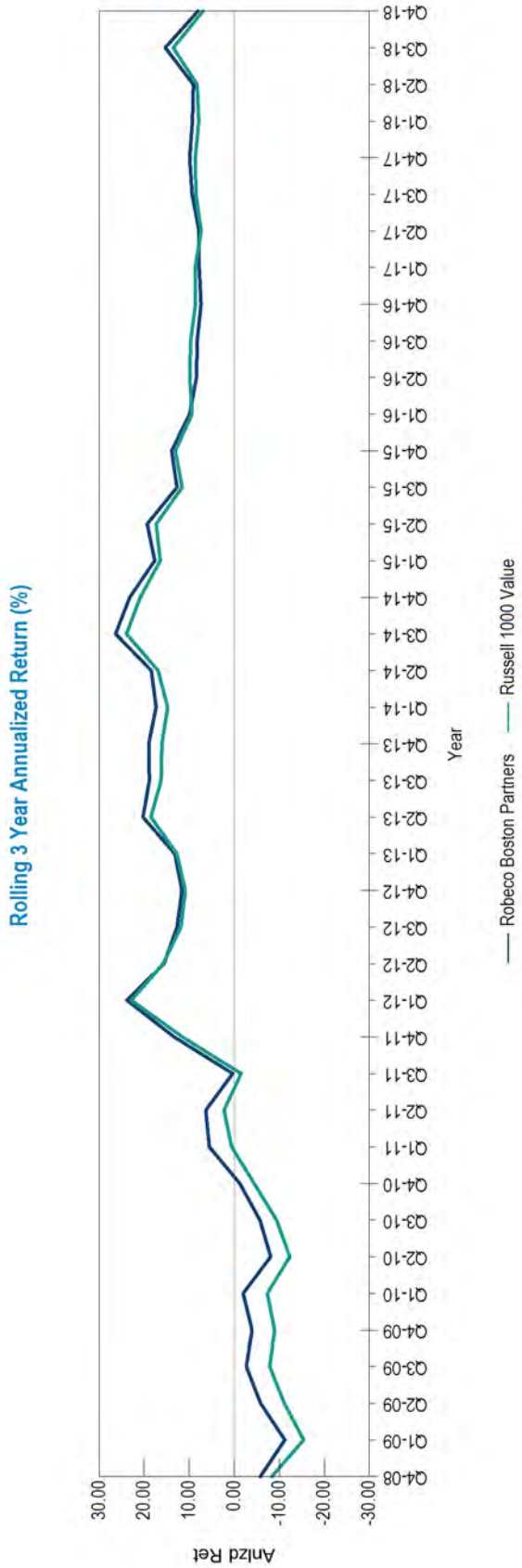
Robeco Boston Partners vs. eV US Large Cap Value Equity Gross Universe



Return (Rank)

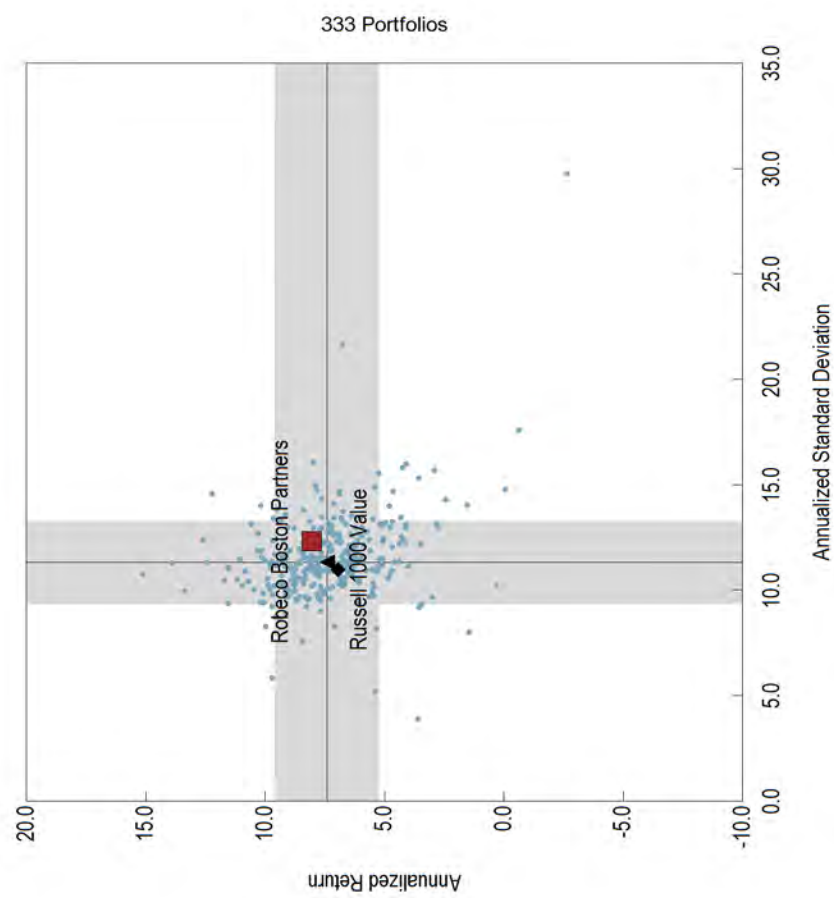
| | Quarter | 1 Year | 3 Years | 5 Years | 10 Years | 2014 | 2015 | 2016 | 2017 | 2018 |
|--------------------------|------------|-----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 5th Percentile | -8.1 | -1.8 | 10.4 | 8.9 | 14.4 | -1.8 | 2.8 | 22.1 | 24.0 | -1.8 |
| 25th Percentile | -11.4 | -5.8 | 8.7 | 7.3 | 12.8 | -5.8 | -0.4 | 17.4 | 19.8 | -5.8 |
| Median | -13.1 | -8.3 | 7.4 | 6.3 | 11.9 | -8.3 | -2.6 | 15.0 | 17.2 | -8.3 |
| 75th Percentile | -14.8 | -11.1 | 6.2 | 5.2 | 11.1 | -11.1 | -5.1 | 11.8 | 15.1 | -11.1 |
| 95th Percentile | -17.6 | -16.1 | 3.8 | 3.0 | 9.8 | -16.1 | -9.4 | 7.0 | 11.2 | -16.1 |
| # of Portfolios | 336 | 336 | 333 | 326 | 272 | 336 | 312 | 346 | 342 | 336 |
| ● Robeco Boston Partners | -13.8 (59) | -8.7 (55) | 8.1 (36) | 6.3 (50) | 12.7 (28) | -8.7 (55) | -3.9 (65) | 15.1 (50) | 20.1 (23) | -8.7 (55) |
| ▲ Russell 1000 Value | -11.7 (30) | -8.3 (50) | 7.0 (59) | 5.9 (60) | 11.2 (74) | -8.3 (50) | -3.8 (64) | 17.3 (26) | 13.7 (87) | -8.3 (50) |

Robeco Boston Partners
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018

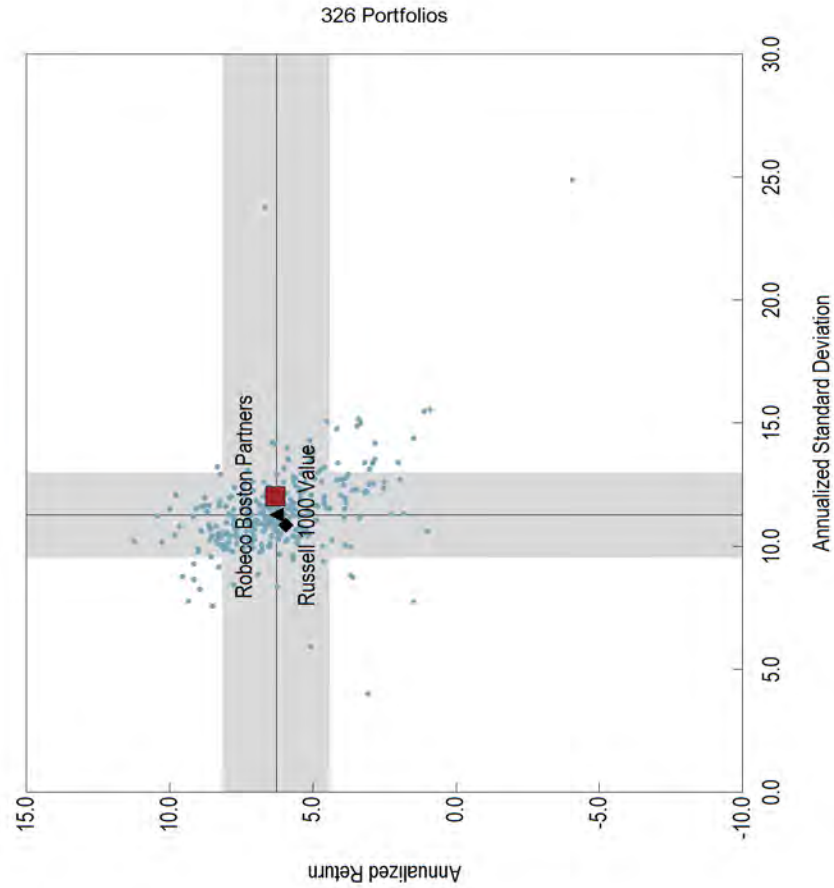


Robeco Boston Partners
 Risk vs. Return 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018

3 Years



5 Years



3 Years

5 Years

| | Annualized Return | Annualized Standard Deviation | Sharpe Ratio |
|---|-------------------|-------------------------------|--------------|
| Robeco Boston Partners | 8.1% | 12.3% | 0.6 |
| Russell 1000 Value | 7.0% | 11.0% | 0.5 |
| eV US Large Cap Value Equity Gross Median | 7.4% | 11.3% | 0.5 |

Emerald Advisers Manager Portfolio Overview

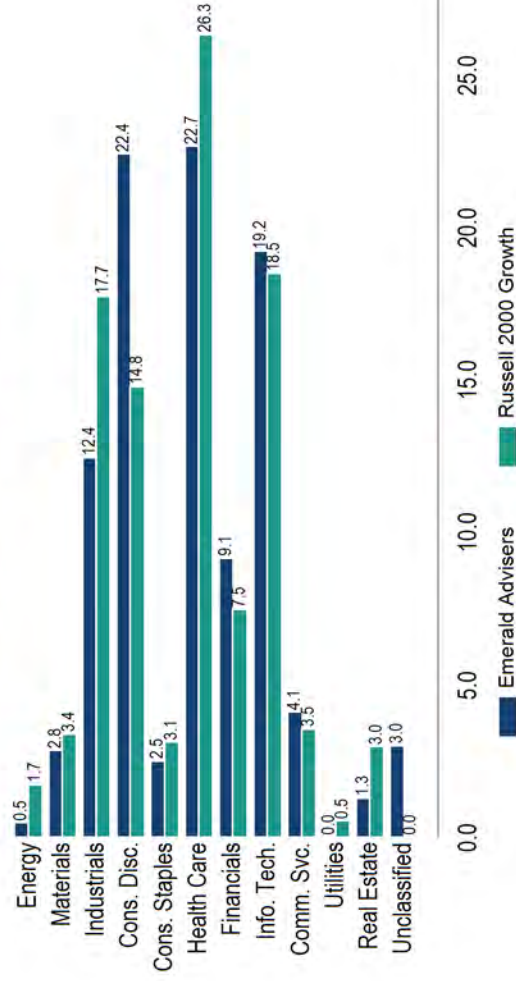
Period Ending: December 31, 2018

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

Characteristics

| | Portfolio | Russell 2000 Growth |
|---------------------------------|-----------|---------------------|
| Number of Holdings | 118 | 1,257 |
| Weighted Avg. Market Cap. (\$B) | 2.41 | 2.17 |
| Median Market Cap. (\$B) | 1.53 | 0.78 |
| Price To Earnings | 5.89 | 14.61 |
| Price To Book | 5.91 | 4.90 |
| Price To Sales | 3.86 | 3.66 |
| Return on Equity (%) | -2.95 | 7.00 |
| Yield (%) | 0.52 | 0.60 |
| Beta | 1.08 | 1.00 |

Sector Allocation (%) vs Russell 2000 Growth

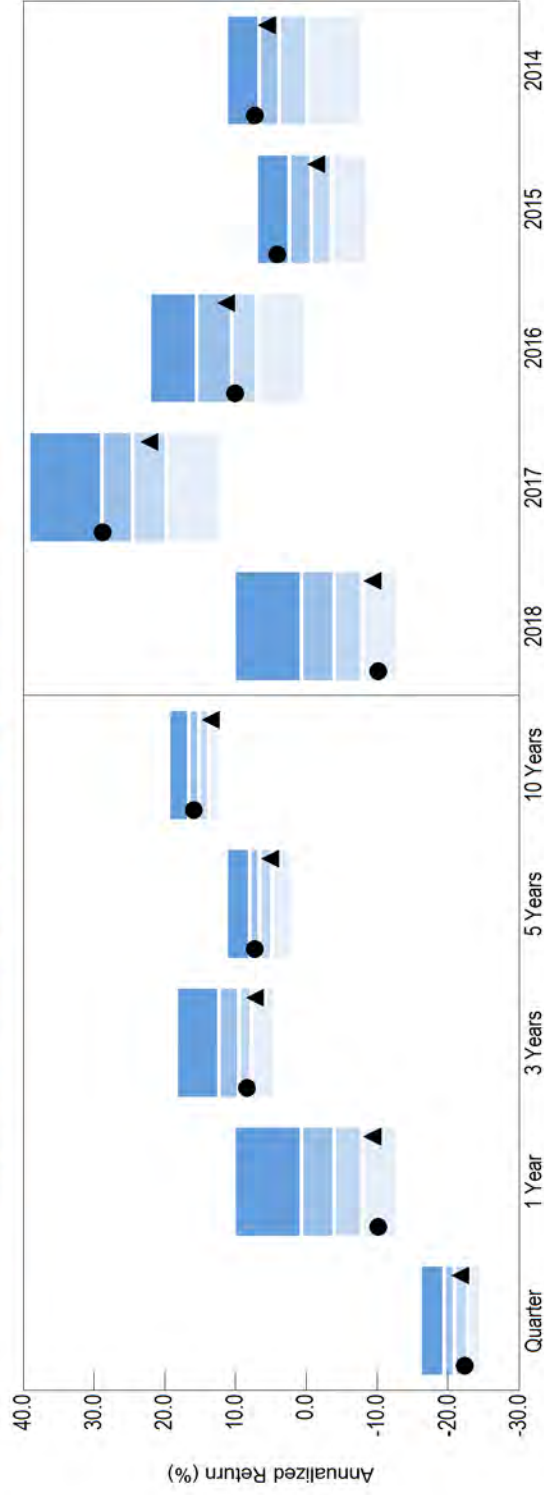


Largest Holdings

| | End Weight | Return | Top Contributors | | | Bottom Contributors | | |
|--------------------|------------|--------|------------------|--------|--------------|---------------------|--------|--------------|
| | | | Avg Wgt | Return | Contribution | Avg Wgt | Return | Contribution |
| CHEGG | 3.29 | -0.04 | 1.04 | 19.23 | 0.20 | 2.20 | -38.35 | -0.84 |
| CIENA | 2.20 | 8.55 | 1.77 | 8.55 | 0.15 | 1.77 | -35.29 | -0.62 |
| PLANET FITNESS CLA | 2.15 | -0.76 | 0.73 | 19.89 | 0.14 | 0.80 | -63.38 | -0.51 |
| TREX | 2.03 | -22.89 | 0.85 | 7.57 | 0.06 | 1.18 | -42.59 | -0.50 |
| EPAM SYSTEMS | 2.02 | -15.75 | 0.89 | 5.96 | 0.05 | 1.75 | -27.78 | -0.49 |
| FIVE BELOW | 2.00 | -21.33 | 0.89 | 5.96 | 0.05 | 0.69 | -67.90 | -0.47 |
| VONAGE HOLDINGS | 1.75 | -38.35 | 0.55 | 8.32 | 0.05 | 1.51 | -30.79 | -0.47 |
| VARONIS SYSTEMS | 1.74 | -27.78 | 0.72 | 6.24 | 0.04 | 1.57 | -29.13 | -0.46 |
| CADENCE BANCORP.'A | 1.54 | -35.29 | 0.83 | 3.02 | 0.03 | 2.00 | -21.33 | -0.43 |
| TELADOC HEALTH | 1.53 | -42.59 | 0.21 | 0.42 | 0.00 | 1.34 | -31.38 | -0.42 |
| | | | 0.24 | -0.20 | 0.00 | | | |

Unclassified sector allocation includes cash allocations.

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

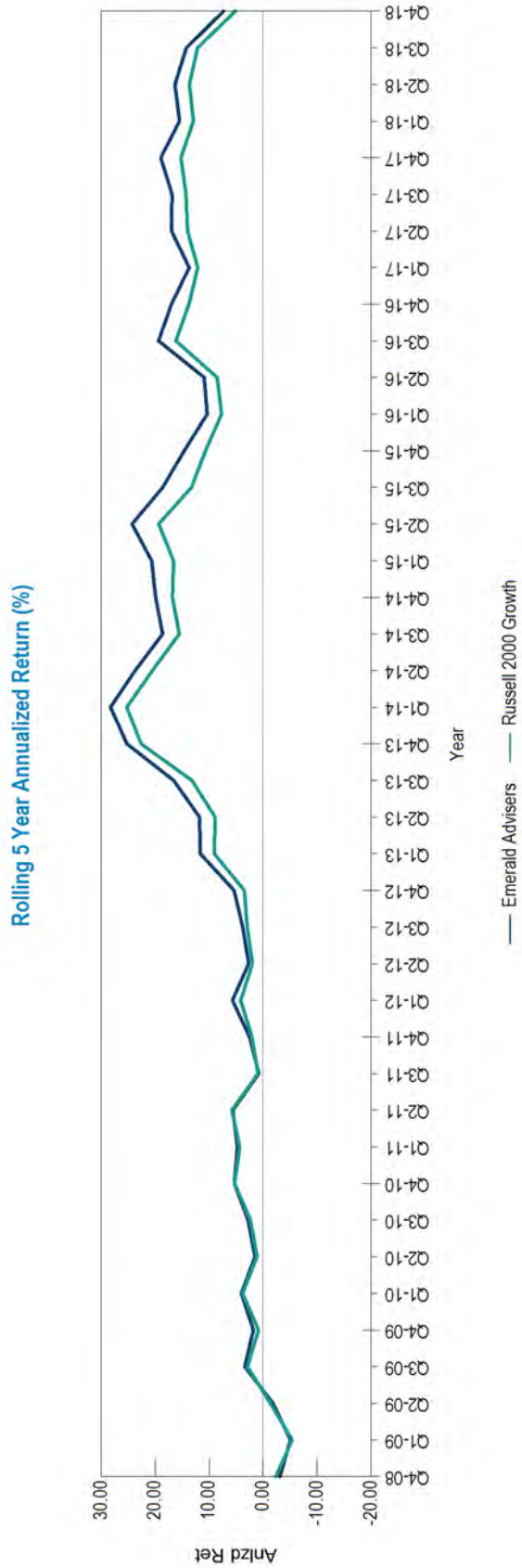
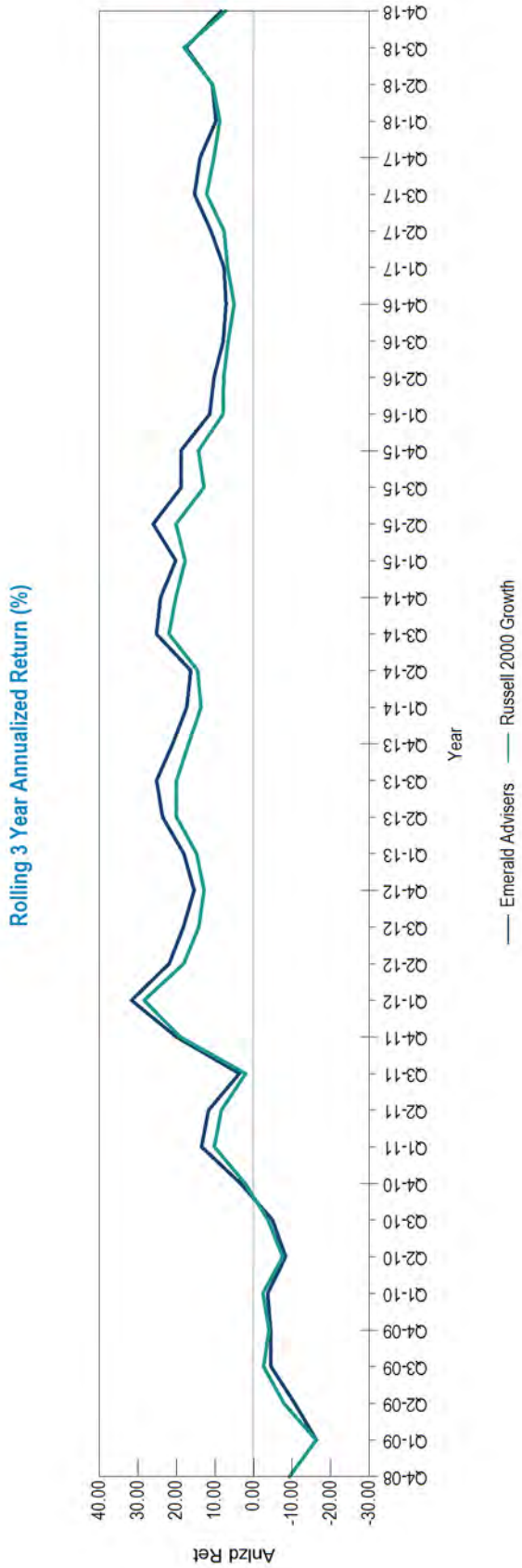


Return (Rank)

| Period | 5th Percentile | 25th Percentile | Median | 75th Percentile | 95th Percentile | # of Portfolios |
|---------------------|----------------|-----------------|----------|-----------------|-----------------|-----------------|
| Quarter | -16.1 | -19.4 | -20.8 | -22.7 | -24.6 | 164 |
| 1 Year | 10.2 | 0.7 | -3.9 | -7.9 | -12.8 | 164 |
| 3 Years | 18.3 | 12.4 | 9.6 | 7.8 | 4.6 | 160 |
| 5 Years | 11.3 | 8.1 | 6.7 | 4.9 | 2.1 | 155 |
| 10 Years | 19.4 | 16.6 | 15.2 | 13.9 | 12.4 | 140 |
| 2014 | 11.3 | 6.7 | 3.9 | -0.1 | -7.6 | 161 |
| 2015 | 7.1 | 2.5 | -0.6 | -3.5 | -8.7 | 154 |
| 2016 | 22.2 | 15.5 | 10.6 | 7.1 | 0.2 | 170 |
| 2017 | 39.2 | 28.9 | 24.6 | 19.8 | 12.1 | 174 |
| 2018 | 10.2 | 0.7 | -3.9 | -7.9 | -12.8 | 164 |
| Emerald Advisers | -22.3 (72) | -10.1 (85) | 8.4 (69) | 7.3 (38) | 15.9 (34) | 10.1 (54) |
| Russell 2000 Growth | -21.7 (65) | -9.3 (80) | 7.2 (80) | 5.1 (73) | 13.5 (81) | 11.3 (49) |

● Emerald Advisers
▲ Russell 2000 Growth

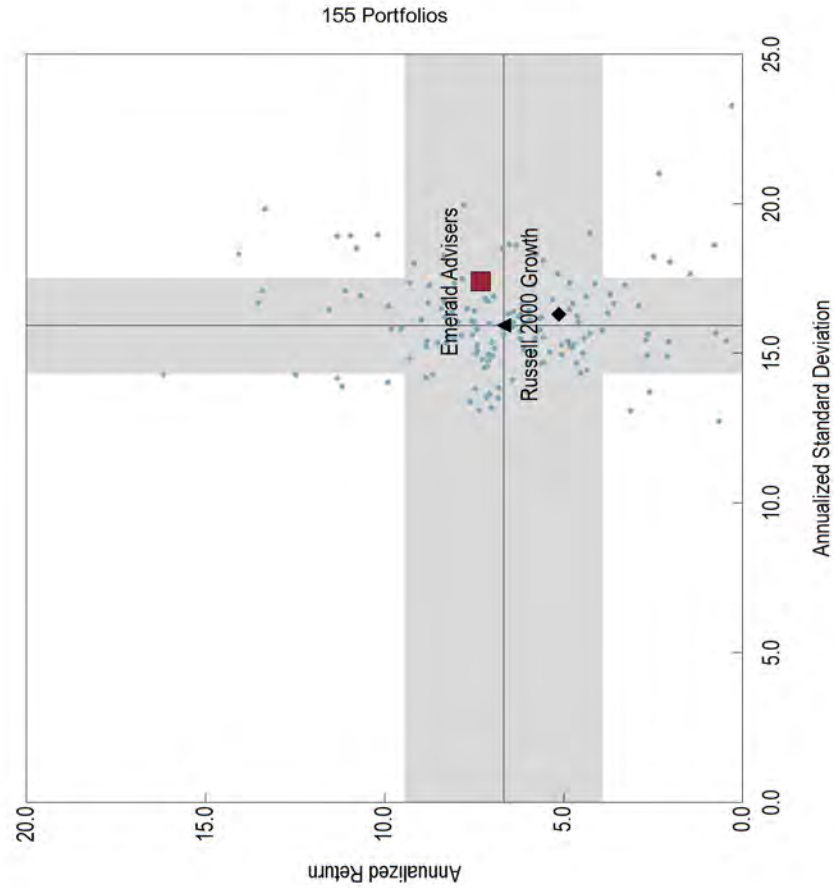
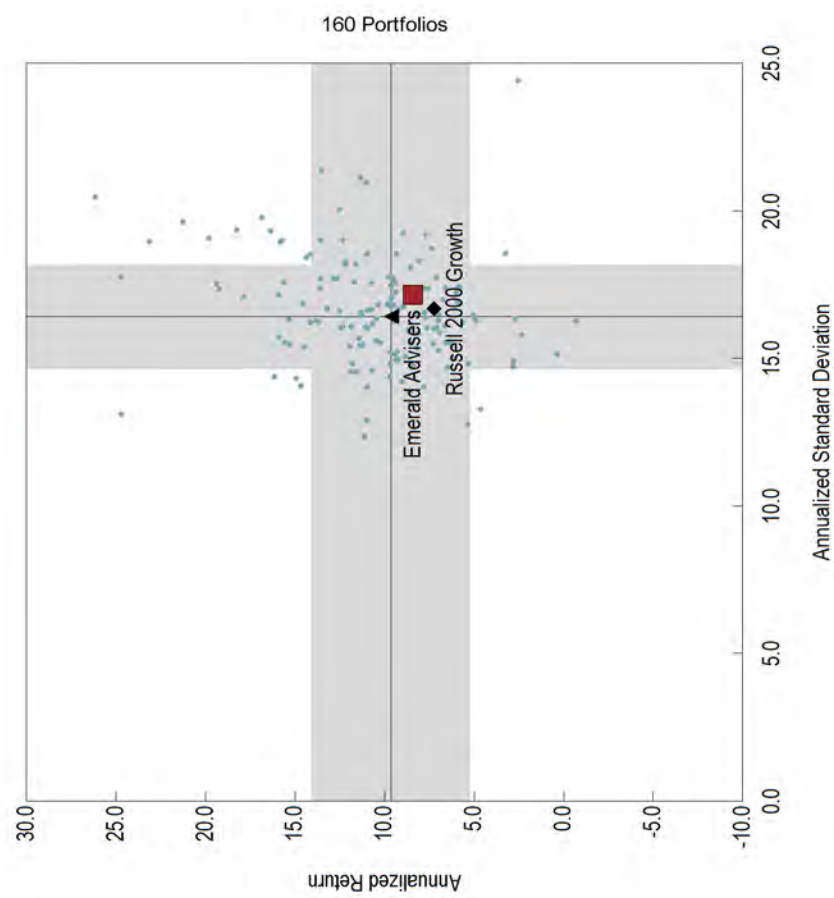
Emerald Advisers
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018



Emerald Advisers Period Ending: December 31, 2018
Risk vs. Return 3 & 5 Year (Gross of Fees)

3 Years

5 Years



3 Years

5 Years

| | Anlzd Return | Anlzd Standard Deviation | Sharpe Ratio |
|--|--------------|--------------------------|--------------|
| Emerald Advisers | 8.4% | 17.2% | 0.4 |
| Russell 2000 Growth | 7.2% | 16.7% | 0.4 |
| eV US Small Cap Growth Equity Gross Median | 9.6% | 16.4% | 0.5 |

| | Anlzd Return | Anlzd Standard Deviation | Sharpe Ratio |
|--|--------------|--------------------------|--------------|
| Emerald Advisers | 7.3% | 17.4% | 0.4 |
| Russell 2000 Growth | 5.1% | 16.3% | 0.3 |
| eV US Small Cap Growth Equity Gross Median | 6.7% | 15.9% | 0.4 |

Ceredex Manager Portfolio Overview

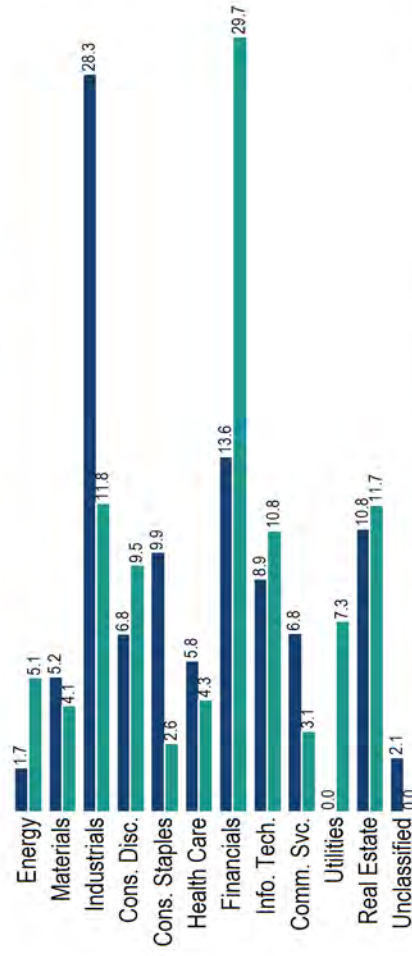
Period Ending: December 31, 2018

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 | 81 | 1,387 |
| Weighted Avg. Market Cap. (\$B) | 2.22 | 1.81 |
| Median Market Cap. (\$B) | 1.57 | 0.59 |
| Price To Earnings | 19.07 | 13.15 |
| Price To Book | 2.44 | 1.53 |
| Price To Sales | 2.30 | 2.65 |
| Return on Equity (%) | 15.23 | 7.78 |
| Yield (%) | 2.94 | 2.22 |
| Beta | 0.79 | 1.00 |

Sector Allocation (%) vs Russell 2000 Value



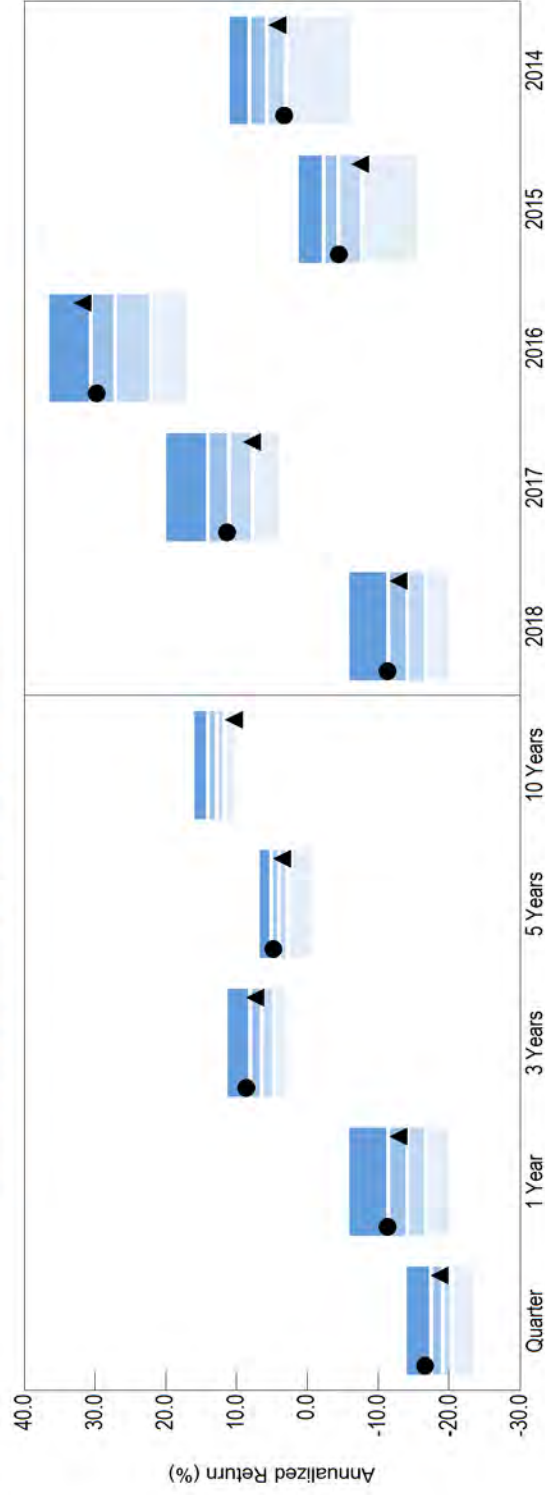
Top Contributors

| | End Weight | Return | Avg Wgt | Contribution | Bottom Contributors | Avg Wgt | Return | Contribution |
|--------------------------|------------|--------|---------|--------------|---------------------|---------|--------|--------------|
| B & G FOODS | 4.96 | 6.99 | 4.08 | 0.29 | ENERGIZER HOLDINGS | 4.38 | -22.51 | -0.99 |
| POWER INTEGRATIONS | 4.81 | -3.26 | 1.28 | 0.25 | TETRA TECH | 3.73 | -24.05 | -0.90 |
| MEREDITH | 4.77 | 2.68 | 4.63 | 0.12 | EVERCORE A | 2.72 | -28.40 | -0.77 |
| ENERGIZER HOLDINGS | 4.60 | -22.51 | 0.02 | 0.00 | KEMPER | 4.09 | -17.23 | -0.70 |
| HILL-ROM HOLDINGS | 4.34 | -6.00 | 0.22 | -0.16 | CUBIC | 2.43 | -26.43 | -0.64 |
| KEMPER | 4.00 | -17.23 | 0.02 | -14.00 | AMC ENTERTAINMENT | 1.45 | -39.26 | -0.57 |
| TETRA TECH | 3.36 | -24.05 | 0.02 | -20.16 | HDG. CL.A | 1.23 | -45.64 | -0.56 |
| PHYSICIANS REALTY TST. | 3.33 | -3.59 | 0.02 | -15.42 | US SILICA HOLDINGS | 1.07 | -50.81 | -0.54 |
| TANGER FAC.OUTLET CNTRS. | 2.84 | -10.28 | 0.41 | -1.22 | SM ENERGY | 2.36 | -20.76 | -0.49 |
| OUTFRONT MEDIA | 2.80 | -7.61 | 0.03 | -21.90 | HERMAN MILLER | 1.71 | -27.46 | -0.47 |
| | | | | | APOGEE ENTERPRISES | | | |

Unclassified sector allocation includes cash allocations.

Ceredex
 Manager Performance Comparisons (Gross of Fees) Period Ending: December 31, 2018

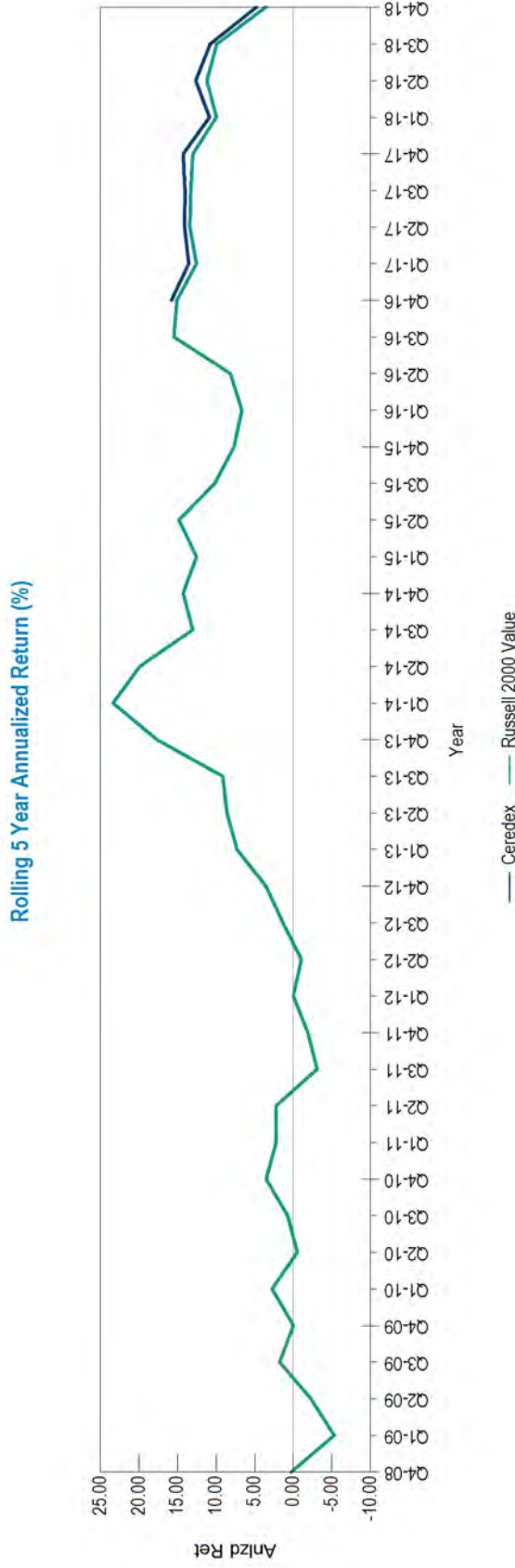
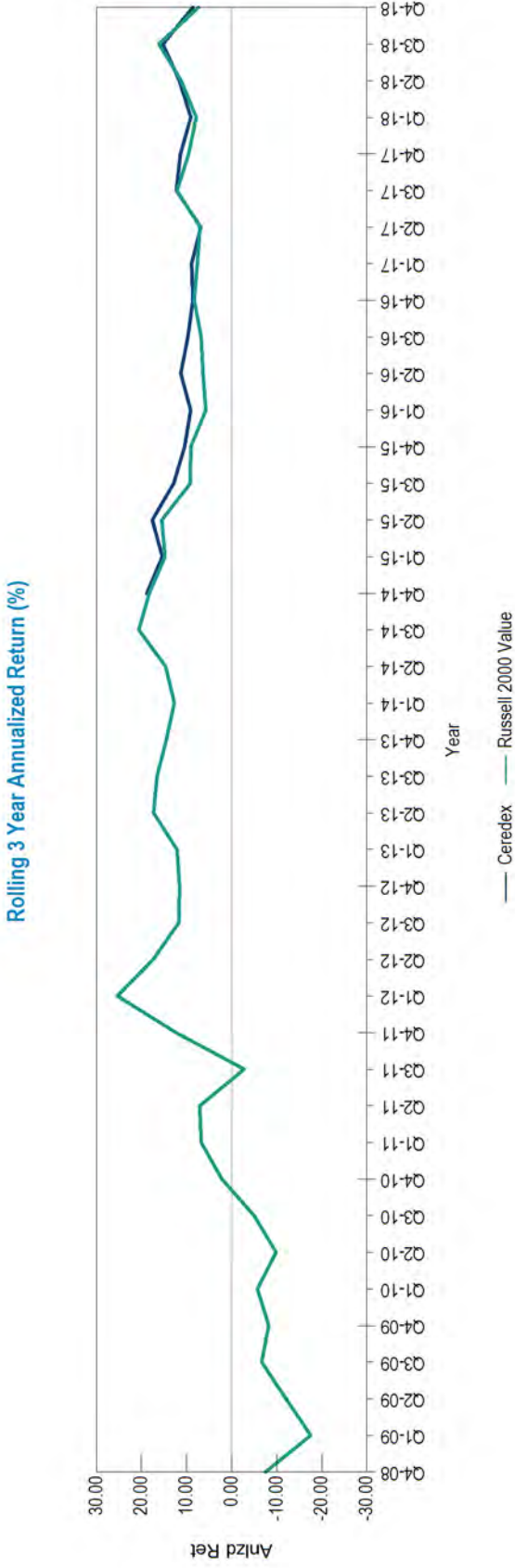
Ceredex vs. eV US Small Cap Value Equity Gross Universe



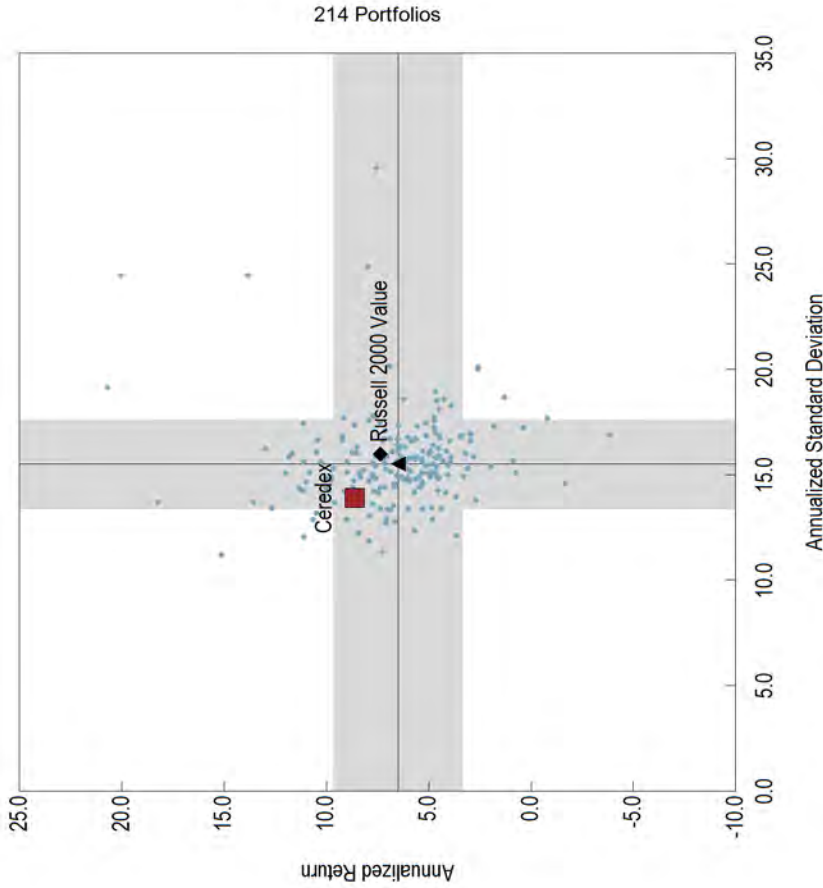
Return (Rank)

| | | | | | | | | | | |
|----------------------|------------|------------|----------|----------|-----------|------------|-----------|-----------|-----------|----------|
| 5th Percentile | -13.8 | -5.7 | 11.4 | 7.0 | 16.2 | -5.7 | 20.2 | 36.7 | 1.5 | 11.2 |
| 25th Percentile | -17.5 | -11.4 | 8.2 | 5.2 | 14.1 | -11.4 | 14.1 | 30.7 | -2.2 | 8.2 |
| Median | -19.0 | -14.0 | 6.5 | 4.1 | 12.9 | -14.0 | 11.1 | 27.2 | -4.3 | 5.8 |
| 75th Percentile | -20.3 | -16.7 | 4.8 | 2.9 | 11.7 | -16.7 | 7.8 | 22.2 | -7.7 | 3.1 |
| 95th Percentile | -23.5 | -20.2 | 2.7 | -0.8 | 10.0 | -20.2 | 3.7 | 16.8 | -15.8 | -6.3 |
| # of Portfolios | 220 | 220 | 214 | 205 | 177 | 220 | 224 | 222 | 212 | 206 |
| ● Ceredex | -16.6 (22) | -11.3 (25) | 8.6 (23) | 4.8 (33) | -- | -11.3 (25) | 11.4 (48) | 29.8 (32) | -4.4 (52) | 3.3 (74) |
| ▲ Russell 2000 Value | -18.7 (45) | -12.9 (39) | 7.4 (36) | 3.6 (63) | 10.4 (94) | -12.9 (39) | 7.8 (75) | 31.7 (17) | -7.5 (74) | 4.2 (68) |

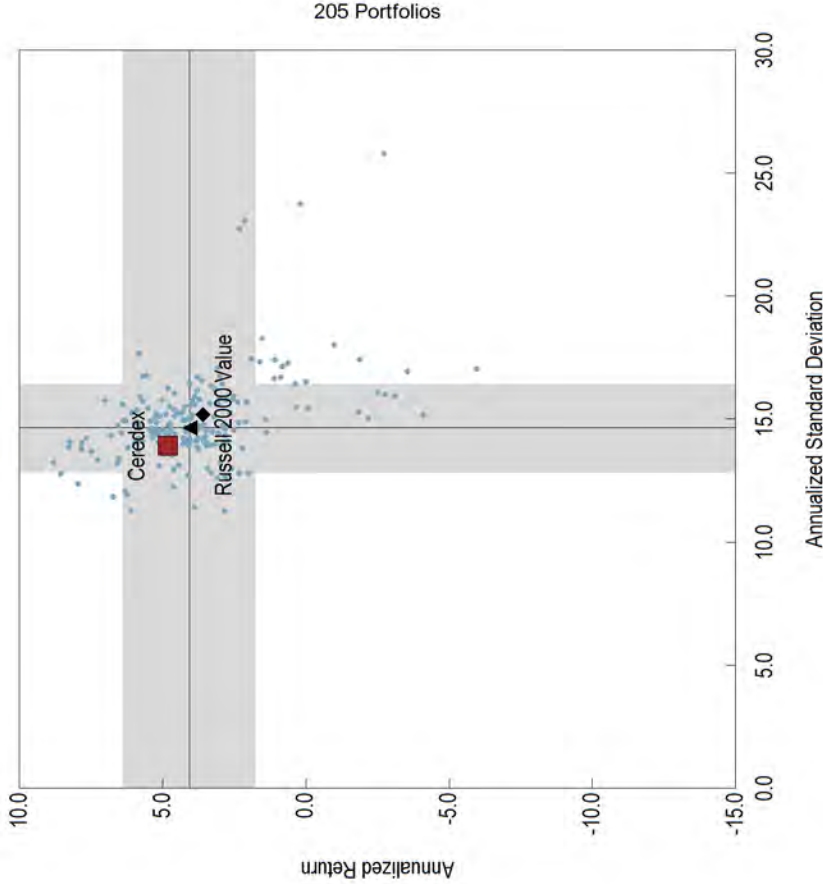
Ceredex
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018



3 Years



5 Years



3 Years

5 Years

Ceredex
Russell 2000 Value
eV US Small Cap Value Equity Gross Median

Ceredex
Russell 2000 Value
eV US Small Cap Value Equity Gross Median

International Equity Managers

Pyrford Manager Portfolio Overview

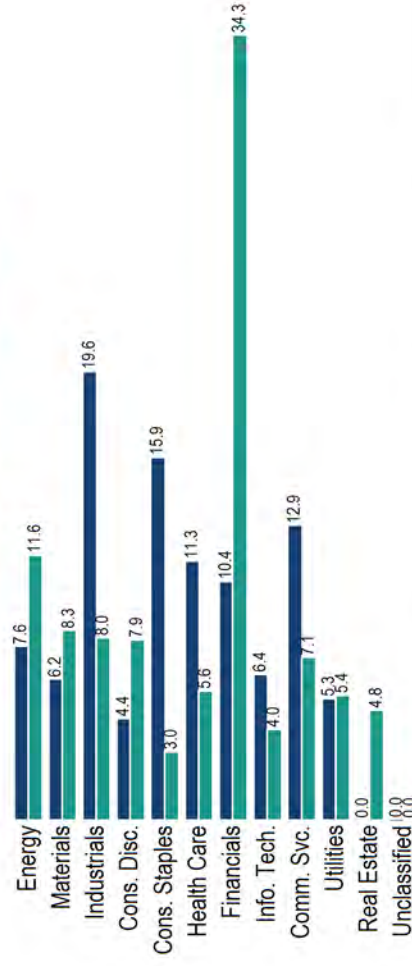
Period Ending: December 31, 2018

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

| | Portfolio | MSCI ACWI ex USA Value |
|---------------------------------|-----------|------------------------|
| Number of Holdings | 74 | 1,277 |
| Weighted Avg. Market Cap. (\$B) | 56.86 | 47.74 |
| Median Market Cap. (\$B) | 20.64 | 6.43 |
| Price To Earnings | 17.88 | 11.78 |
| Price To Book | 3.09 | 1.37 |
| Price To Sales | 2.37 | 1.72 |
| Return on Equity (%) | 17.41 | 12.01 |
| Yield (%) | 4.09 | 4.67 |
| Beta | 0.72 | 1.00 |

Sector Allocation (%) vs MSCI ACWI ex USA Value



Country Allocation

| | Manager Ending Allocation (USD) | Index Ending Allocation (USD) |
|---------------------------------------|---------------------------------|-------------------------------|
| Totals | | |
| Developed | 92.4% | 73.9% |
| Emerging* | 7.6% | 26.1% |
| Cash | 0.0% | |
| Top 10 Largest Countries | | |
| Switzerland | 14.3% | 3.2% |
| United Kingdom | 13.0% | 15.2% |
| Australia | 11.5% | 4.8% |
| Japan | 10.8% | 16.7% |
| France | 8.7% | 7.0% |
| Germany | 8.0% | 5.8% |
| Hong Kong | 5.2% | 2.6% |
| Singapore | 5.2% | 0.9% |
| Netherlands | 4.7% | 1.2% |
| Sweden | 4.6% | 1.5% |
| Total-Top 10 Largest Countries | 86.0% | 59.0% |

Top Contributors

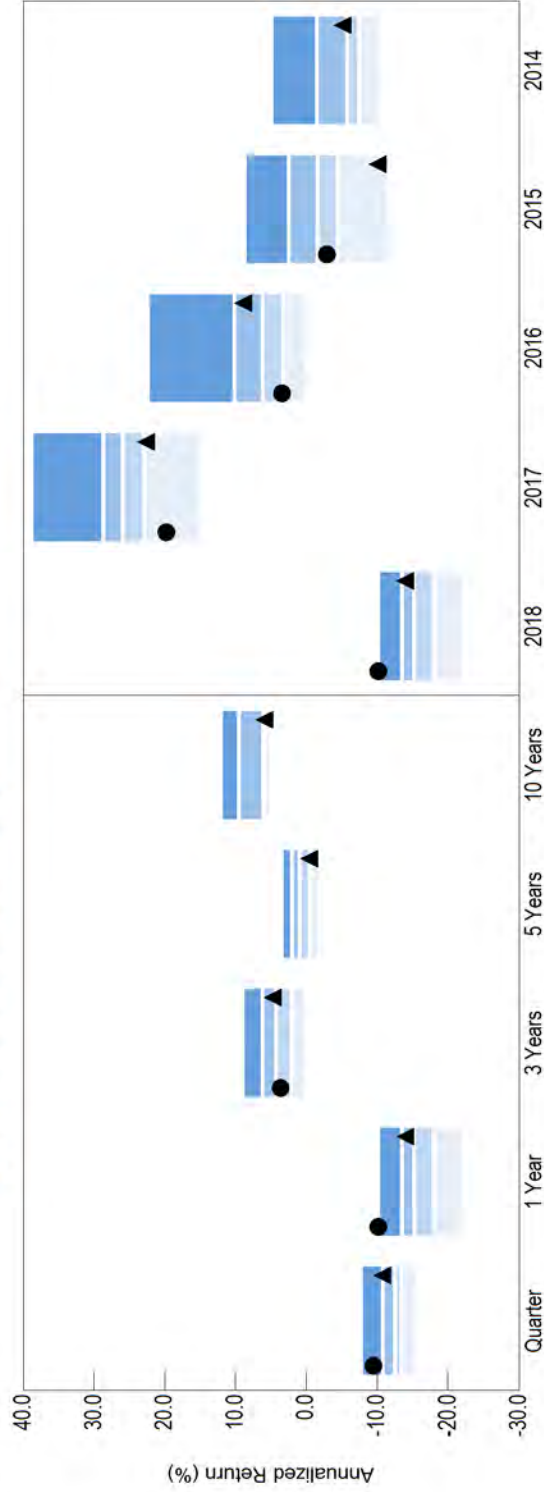
| | Avg Wgt | Return | Contribution |
|-----------------------|---------|--------|--------------|
| NEWCREST MINING | 0.77 | 9.28 | 0.07 |
| ROCHE HOLDING | 3.08 | 1.44 | 0.04 |
| WOOLWORTHS GROUP | 2.00 | 1.94 | 0.04 |
| NIHON KOHDEN | 1.39 | 2.66 | 0.04 |
| FIELMANN | 1.20 | 2.77 | 0.03 |
| TELENOR | 1.78 | 1.58 | 0.03 |
| CHUNGHWA TELECOM | 1.34 | 2.05 | 0.03 |
| POWER ASSETS HOLDINGS | 0.77 | -0.06 | 0.00 |
| ABC-MART | 1.04 | -0.40 | 0.00 |
| RUBIS | 0.76 | -1.03 | -0.01 |

Bottom Contributors

| | Avg Wgt | Return | Contribution |
|--------------------------|---------|--------|--------------|
| BRITISH AMERICAN TOBACCO | 1.49 | -29.55 | -0.44 |
| WOODSIDE PETROLEUM | 1.87 | -21.01 | -0.39 |
| GEA GROUP | 1.18 | -28.49 | -0.34 |
| BUREAU VERITAS | 1.47 | -21.21 | -0.31 |
| FUCHS PETROLUB | 1.72 | -17.59 | -0.30 |
| SAP | 1.56 | -19.09 | -0.30 |
| ROYAL DUTCH SHELL A | 2.20 | -13.31 | -0.29 |
| SUMITOMO RUBBER INDS. | 1.45 | -19.17 | -0.28 |
| LEGRAND | 1.21 | -22.71 | -0.28 |
| COMPUTERSHARE | 1.70 | -16.16 | -0.27 |

Unclassified sector allocation includes cash allocations.

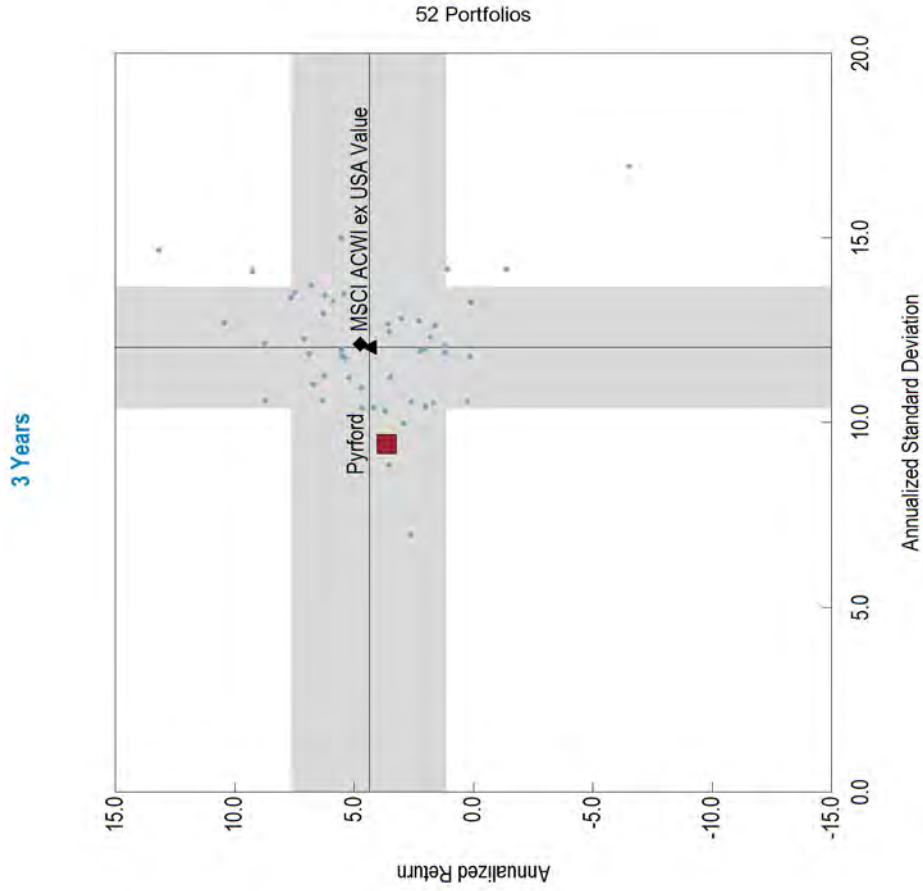
Pyrford vs. eV ACWI ex-US Value Equity Gross Universe



Return (Rank)

| | | | | | | | | | | |
|--------------------------|------------|------------|----------|-----------|----------|------------|-----------|----------|------------|-----------|
| 5th Percentile | -7.8 | -10.2 | 9.0 | 3.5 | 12.1 | -10.2 | 38.8 | 22.3 | 8.7 | 4.9 |
| 25th Percentile | -10.8 | -13.4 | 6.3 | 2.1 | 9.6 | -13.4 | 28.8 | 10.2 | 2.5 | -1.4 |
| Median | -12.5 | -15.2 | 4.4 | 1.0 | 6.2 | -15.2 | 26.0 | 6.2 | -1.6 | -5.7 |
| 75th Percentile | -13.4 | -17.9 | 2.2 | -0.4 | 5.8 | -17.9 | 23.0 | 3.3 | -4.3 | -7.4 |
| 95th Percentile | -15.7 | -21.9 | 0.1 | -1.8 | 5.0 | -21.9 | 15.0 | -0.1 | -11.6 | -10.4 |
| # of Portfolios | 54 | 54 | 52 | 44 | 27 | 54 | 56 | 55 | 45 | 37 |
| ● Pyrford | -9.5 (12) | -10.1 (5) | 3.6 (55) | -- (-) | -- (-) | -10.1 (5) | 19.8 (84) | 3.4 (74) | -2.9 (59) | -- (-) |
| ▲ MSCI ACWI ex USA Value | -10.7 (22) | -14.0 (32) | 4.7 (43) | -0.4 (75) | 6.0 (66) | -14.0 (32) | 22.7 (77) | 8.9 (35) | -10.1 (93) | -5.1 (49) |

Pyrford
 Risk vs. Return 3 Year (Gross of Fees) Period Ending: December 31, 2018



| | 3 Years | | |
|---|-------------------|-------------------------------|--------------|
| | Annualized Return | Annualized Standard Deviation | Sharpe Ratio |
| Pyrford | 3.6% | 9.4% | 0.3 |
| MSCI ACWI ex USA Value | 4.7% | 12.1% | 0.3 |
| eV ACWI ex-US Value Equity Gross Median | 4.4% | 12.0% | 0.3 |

William Blair Manager Portfolio Overview

Period Ending: December 31, 2018

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

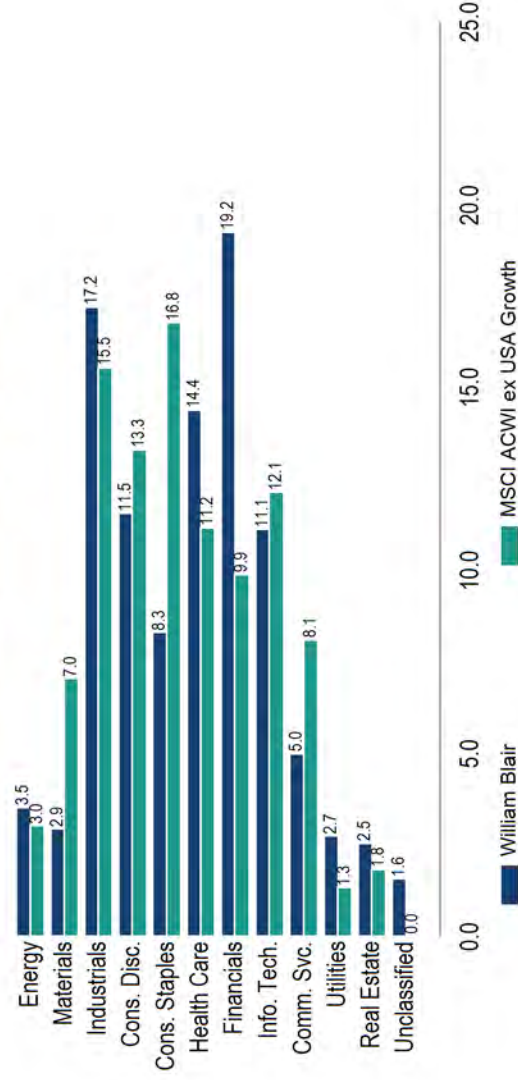
Characteristics

| | Portfolio | MSCI ACWI ex USA Growth |
|---------------------------------|-----------|-------------------------------|
| Number of Holdings | 185 | 1,133 |
| Weighted Avg. Market Cap. (\$B) | 51.18 | 64.60 |
| Median Market Cap. (\$B) | 8.97 | 7.49 |
| Price To Earnings | 23.07 | 21.68 |
| Price To Book | 4.81 | 3.78 |
| Price To Sales | 4.26 | 3.42 |
| Return on Equity (%) | 23.36 | 19.26 |
| Yield (%) | 2.19 | 2.19 |
| Beta | 1.07 | 1.00 |

Country Allocation

| | Manager Ending Allocation (USD) | Index Ending Allocation (USD) |
|---------------------------------------|---------------------------------------|-------------------------------------|
| Totals | | |
| Developed | 84.5% | 74.0% |
| Emerging* | 13.9% | 26.0% |
| Top 10 Largest Countries | | |
| United Kingdom | 15.3% | 7.6% |
| Japan | 14.0% | 16.5% |
| France | 12.1% | 7.9% |
| Canada | 5.9% | 6.5% |
| Netherlands | 5.5% | 3.4% |
| Hong Kong | 5.1% | 2.6% |
| Germany | 4.9% | 6.1% |
| Switzerland | 4.3% | 8.6% |
| Australia | 4.1% | 4.6% |
| China* | 4.0% | 7.7% |
| Total-Top 10 Largest Countries | 75.3% | 71.6% |

Sector Allocation (%) vs MSCI ACWI ex USA Growth



Top Contributors

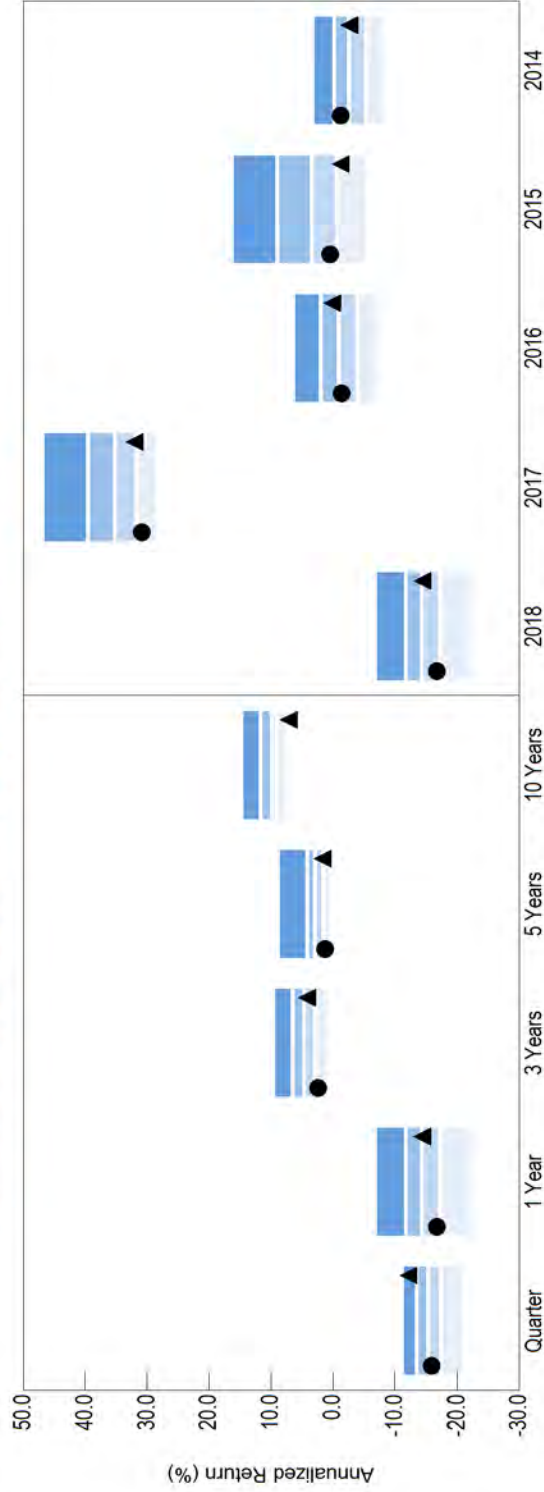
| | Avg Wgt | Return | Contribution | Avg Wgt | Return | Contribution |
|---------------------|---------|--------|--------------|------------------|--------|--------------|
| BANK CENTRAL ASIA | 0.88 | 11.93 | 0.10 | TOTAL | 2.33 | -17.49 |
| HDFC BANK | 0.49 | 9.82 | 0.05 | SUNCOR ENERGY | 1.50 | -27.19 |
| INTERGLOBE AVIATION | 0.08 | 46.43 | 0.04 | LONZA GROUP | 1.62 | -24.66 |
| GREGGS | 0.19 | 17.20 | 0.03 | DSV 'B' | 1.41 | -27.72 |
| TITAN COMPANY | 0.16 | 19.99 | 0.03 | AIRBUS | 1.63 | -23.61 |
| LI NING | 0.17 | 13.45 | 0.02 | PHILIPS | 1.62 | -22.41 |
| MARUTI SUZUKI INDIA | 0.42 | 5.49 | 0.02 | ELTN.KONINKLUKE | 1.11 | -30.13 |
| M DIAS BRANCO | 0.16 | 13.03 | 0.02 | WIRECARD | 1.80 | -17.46 |
| INDUSTRIA ON | 0.25 | 7.46 | 0.02 | TORONTO-DOMINION | 1.01 | -30.86 |
| MR PRICE GROUP | 0.15 | 11.09 | 0.02 | BANK | 0.90 | -34.40 |
| BRITANNIA INDS. | | | | ARKEMA | | |
| | | | | ASSTEAD GROUP | | |

Bottom Contributors

Unclassified sector allocation includes cash allocations.

William Blair
 Manager Performance Comparisons (Gross of Fees) Period Ending: December 31, 2018

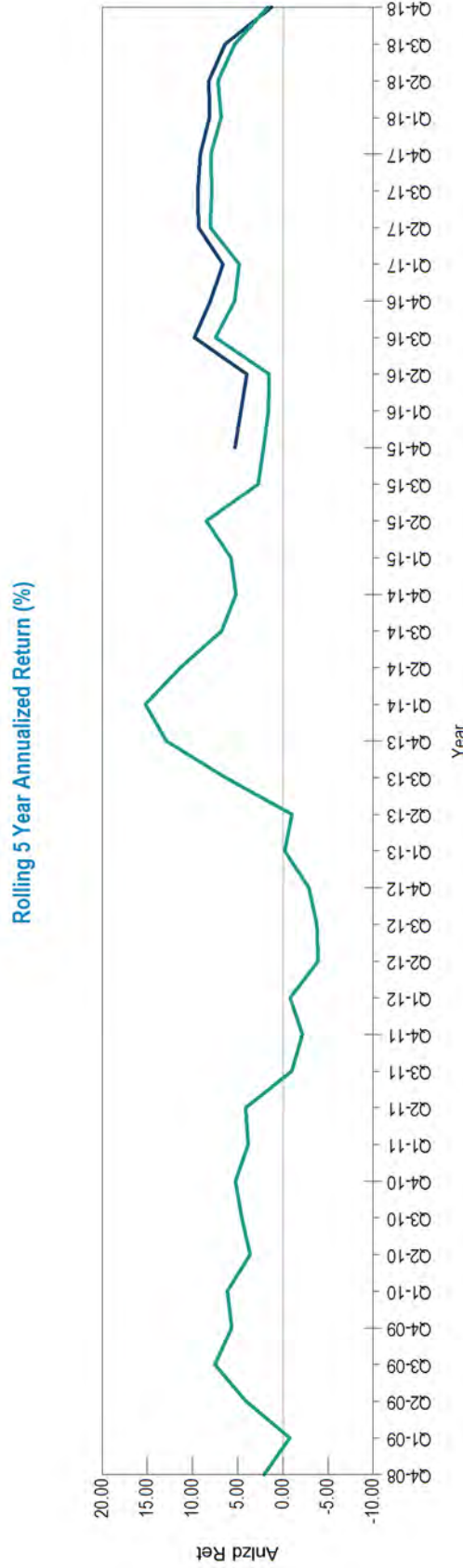
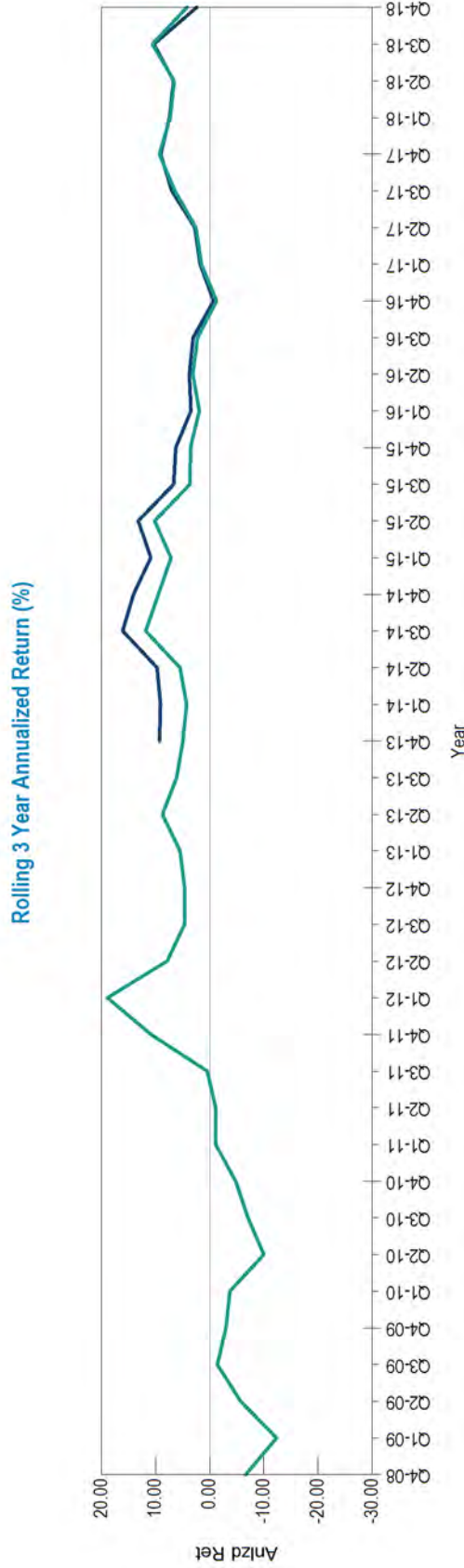
William Blair vs. eV ACWI ex-US Growth Equity Gross Universe



Return (Rank)

| | | | | | | | | | |
|---------------------------|------------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| 5th Percentile | -11.2 | 9.6 | 8.9 | 14.7 | 14.7 | 46.8 | 6.3 | 16.3 | 3.2 |
| 25th Percentile | -13.5 | 6.5 | 4.2 | 11.7 | 11.7 | 39.6 | 2.0 | 9.0 | -0.1 |
| Median | -15.3 | 4.7 | 3.0 | 9.9 | 9.9 | 35.3 | -0.9 | 3.5 | -2.5 |
| 75th Percentile | -17.4 | 2.9 | 1.6 | 9.1 | 9.1 | 31.8 | -3.9 | -0.5 | -5.3 |
| 95th Percentile | -21.0 | 0.7 | 0.4 | 7.4 | 7.4 | 28.3 | -7.4 | -5.4 | -8.2 |
| # of Portfolios | 82 | 82 | 71 | 51 | 51 | 94 | 90 | 70 | 50 |
| ● William Blair | -15.9 (59) | 2.4 (83) | 1.3 (83) | -- | -- | 30.9 (81) | -1.4 (55) | 0.5 (69) | -1.2 (37) |
| ▲ MSCI ACWI ex USA Growth | -12.2 (19) | 4.2 (64) | 1.7 (74) | 7.1 (96) | 7.1 (96) | 32.0 (75) | 0.1 (45) | -1.3 (83) | -2.6 (53) |

William Blair
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018



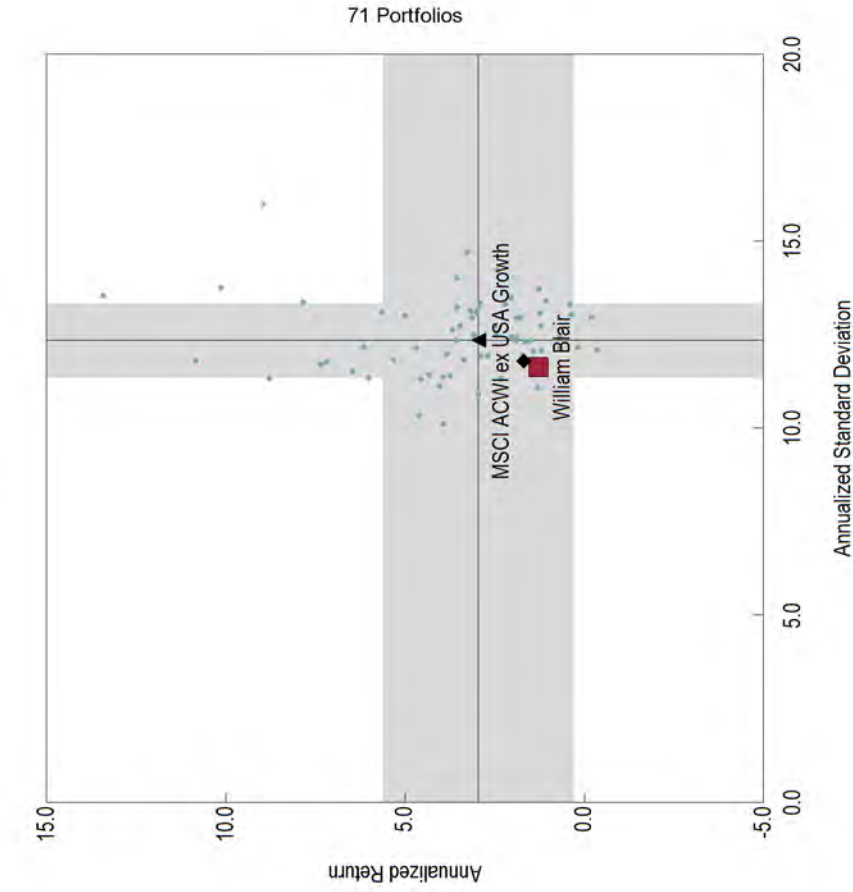
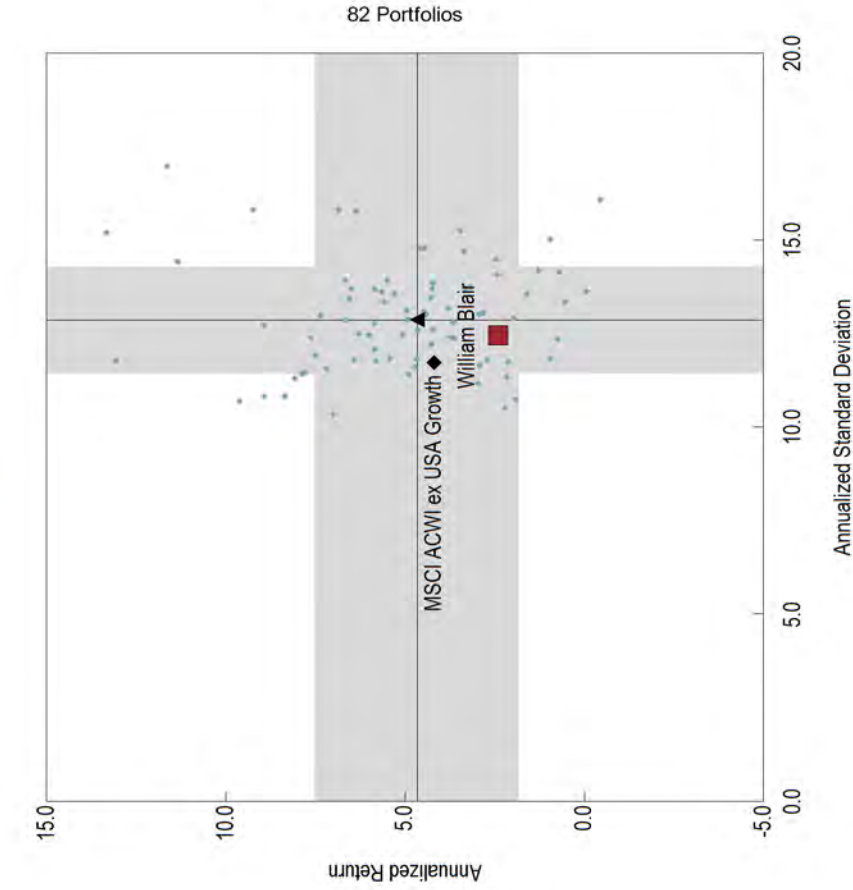
William Blair

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

Period Ending: December 31, 2018

3 Years

5 Years



3 Years

5 Years

| | Anlzd Return | Anlzd Standard Deviation | Sharpe Ratio |
|--|--------------|--------------------------|--------------|
| William Blair | 2.4% | 12.4% | 0.1 |
| MSCI ACWI ex USA Growth | 4.2% | 11.7% | 0.3 |
| eV ACWI ex-US Growth Equity Gross Median | 4.7% | 12.9% | 0.3 |

| | Anlzd Return | Anlzd Standard Deviation | Sharpe Ratio |
|--|--------------|--------------------------|--------------|
| William Blair | 1.3% | 11.6% | 0.1 |
| MSCI ACWI ex USA Growth | 1.7% | 11.8% | 0.1 |
| eV ACWI ex-US Growth Equity Gross Median | 3.0% | 12.3% | 0.2 |

PIMCO RAE Emerging Markets Manager Portfolio Overview

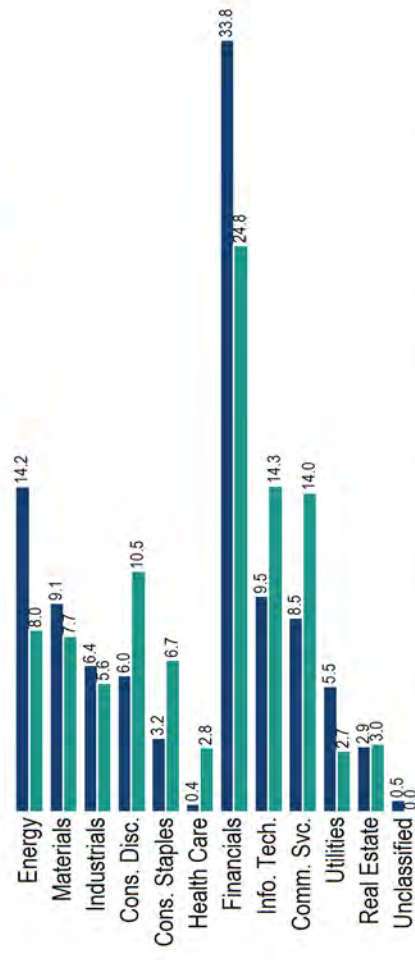
Period Ending: December 31, 2018

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.

Characteristics

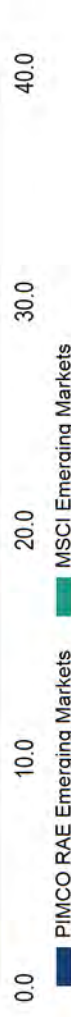
| | Portfolio | MSCI Emerging Markets |
|---------------------------------|-----------|-----------------------|
| Number of Holdings | 573 | 1,125 |
| Weighted Avg. Market Cap. (\$B) | 34.55 | 69.96 |
| Median Market Cap. (\$B) | 3.64 | 4.95 |
| Price To Earnings | 10.74 | 16.63 |
| Price To Book | 1.17 | 2.89 |
| Price To Sales | 1.20 | 2.58 |
| Return on Equity (%) | 10.79 | 17.46 |
| Yield (%) | 4.30 | 2.94 |
| Beta | | 1.00 |

Sector Allocation (%) vs MSCI Emerging Markets



Country Allocation

| | Manager Ending Allocation (USD) | Index Ending Allocation (USD) |
|---------------------------------------|---------------------------------|-------------------------------|
| Totals | | |
| Developed | 10.5% | 0.0% |
| Emerging* | 89.0% | 100.0% |
| Top 10 Largest Countries | | |
| China* | 20.1% | 30.3% |
| Korea* | 19.9% | 13.8% |
| Hong Kong | 10.1% | 0.0% |
| Taiwan* | 10.0% | 11.4% |
| Russia* | 9.9% | 3.6% |
| Brazil* | 5.4% | 7.5% |
| India* | 5.2% | 9.4% |
| South Africa* | 4.5% | 6.2% |
| Thailand* | 3.0% | 2.4% |
| Turkey* | 2.6% | 0.6% |
| Total-Top 10 Largest Countries | 90.7% | 85.4% |



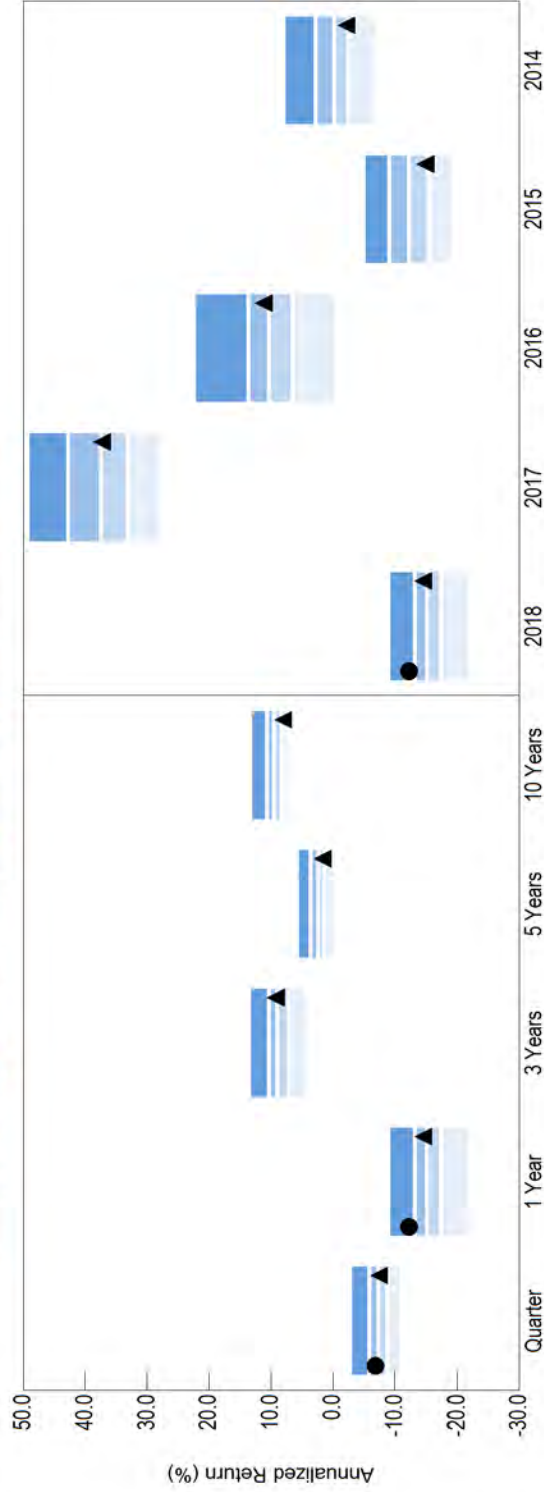
Bottom Contributors

| | End Weight | Return | Contribution | End Weight | Return | Contribution |
|---|------------|--------|--------------|------------|--------|--------------|
| CIA.ENG.T.DE | 0.36 | 110.39 | 0.40 | 2.83 | -17.17 | -0.49 |
| MINASGR.ADR 1:1 | 0.55 | 64.66 | 0.35 | 3.91 | -11.42 | -0.45 |
| BANCO DO BRASIL ON | 0.42 | 42.73 | 0.18 | 1.39 | -21.98 | -0.31 |
| BNC.BRADESCO | 0.13 | 122.28 | 0.15 | 0.99 | -28.74 | -0.28 |
| PF.SPN.ADR 1:1 | 1.21 | 12.11 | 0.15 | 3.93 | -5.61 | -0.22 |
| ADANI POWER | 0.53 | 25.03 | 0.13 | 0.87 | -23.64 | -0.20 |
| KOREA ELECTRIC POWER | 0.27 | 45.45 | 0.12 | 0.57 | -26.81 | -0.15 |
| ITAU UNIBANCO BANCO HLDG.ADR 1:1 | 0.39 | 27.32 | 0.11 | 0.65 | -22.92 | -0.15 |
| GOLD FIELDS SPN.ADR 1:1 | 0.16 | 61.94 | 0.10 | 0.41 | -31.53 | -0.13 |
| BANCO DO ESTADO DO RIO GRANDE DO SUL B PN | 0.19 | 46.47 | 0.09 | 0.47 | -25.44 | -0.12 |
| POWER FINANCE | 0.09 | 0.09 | 0.00 | | | |

Unclassified sector allocation includes cash allocations.

PIMCO RAE Emerging Markets
 Manager Performance Comparisons (Gross of Fees) Period Ending: December 31, 2018

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



Return (Rank)

| | | | | | | | | |
|------------------------------|-----------|----------|----------|----------|-----------|-----------|------------|-----------|
| 5th Percentile | -2.8 | 13.5 | 5.7 | 13.2 | 49.2 | 22.4 | -5.0 | 8.0 |
| 25th Percentile | -5.8 | 10.4 | 3.6 | 10.7 | 42.8 | 13.7 | -9.0 | 2.9 |
| Median | -7.3 | 9.1 | 2.4 | 9.5 | 37.6 | 10.4 | -12.2 | -0.1 |
| 75th Percentile | -8.7 | 7.2 | 1.5 | 8.4 | 33.2 | 6.6 | -15.3 | -2.4 |
| 95th Percentile | -11.0 | 4.1 | -0.3 | 7.2 | 27.8 | -0.6 | -19.2 | -7.0 |
| # of Portfolios | 356 | 336 | 294 | 150 | 343 | 337 | 273 | 251 |
| ● PIMCO RAE Emerging Markets | -6.9 (41) | -- (-) | -- (-) | -- (-) | -- (-) | -- (-) | -- (-) | -- (-) |
| ▲ MSCI Emerging Markets | -7.5 (55) | 9.2 (47) | 1.6 (72) | 8.0 (86) | 37.3 (53) | 11.2 (45) | -14.9 (70) | -2.2 (74) |

TT Emerging Markets Manager Portfolio Overview

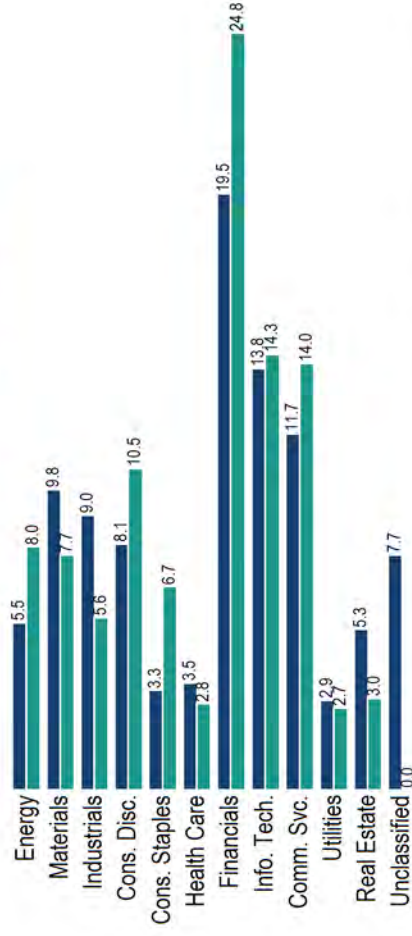
Period Ending: December 31, 2018

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.

Characteristics

| | Portfolio | MSCI Emerging Markets |
|---------------------------------|-----------|-----------------------|
| Number of Holdings | 63 | 1,125 |
| Weighted Avg. Market Cap. (\$B) | 40.97 | 69.96 |
| Median Market Cap. (\$B) | 8.59 | 4.95 |
| Price To Earnings | 14.37 | 16.63 |
| Price To Book | 2.91 | 2.89 |
| Price To Sales | 3.84 | 2.58 |
| Return on Equity (%) | 21.74 | 17.46 |
| Yield (%) | 2.08 | 2.94 |
| Beta | | 1.00 |

Sector Allocation (%) vs MSCI Emerging Markets



Country Allocation

| | Manager Ending Allocation (USD) | Index Ending Allocation (USD) |
|---------------------------------------|---------------------------------|-------------------------------|
| Totals | | |
| Developed | 15.5% | 0.0% |
| Emerging* | 78.4% | 100.0% |
| Frontier** | 1.7% | 0.0% |
| Top 10 Largest Countries | | |
| India* | 16.2% | 9.4% |
| Korea* | 15.4% | 13.8% |
| China* | 15.2% | 30.3% |
| Brazil* | 9.8% | 7.5% |
| South Africa* | 8.1% | 6.2% |
| United Kingdom | 6.1% | 0.0% |
| Russia* | 5.8% | 3.6% |
| United States | 4.4% | 0.0% |
| Cash | 4.4% | 0.0% |
| Taiwan* | 3.2% | 11.4% |
| Total-Top 10 Largest Countries | 88.7% | 82.4% |

Unclassified sector allocation includes cash allocations.

| Top Contributors | | | | Bottom Contributors | | | |
|------------------|--------|--------------|--------------------------------|---------------------|--------|--------------|-------------------------------------|
| End Weight | Return | Contribution | | End Weight | Return | Contribution | |
| 1.23 | 52.92 | 0.65 | CIA SANEAMENTO DO PARANA UNITS | 3.12 | -30.65 | -0.96 | BAIDU 'A' ADR 10:1 |
| 2.56 | 22.39 | 0.57 | ICICI BANK | 4.35 | -16.81 | -0.73 | ALIBABA GROUP HLDG.SPN.ADR 1:1 |
| 1.85 | 25.91 | 0.48 | LOMA NEGRA SPN.ADR 1:5 | 4.17 | -16.11 | -0.67 | CHINA PACIFIC INSURANCE (GROUP) 'H' |
| 1.92 | 23.83 | 0.46 | BB SEGURIDADE ON | 3.19 | -19.11 | -0.61 | HANA FINANCIAL GROUP |
| 1.55 | 27.39 | 0.42 | ATACADAO DISTRIBUICAO | 3.25 | -16.61 | -0.54 | SAMSUNG ELTN.PREF. |
| 1.11 | 28.05 | 0.31 | PUBLIC JOINT STOCK POLYUS GDR | 2.13 | -23.64 | -0.50 | SASOL |
| 1.81 | 12.86 | 0.23 | OBEROI REALTY | 5.94 | -6.76 | -0.40 | NASPERS |
| 0.79 | 24.75 | 0.19 | PAKUWON JATI | 1.69 | -21.78 | -0.37 | GENTING |
| 1.21 | 15.78 | 0.19 | LONGFOR GROUP HOLDINGS | 1.90 | -18.39 | -0.35 | SUZANO PAPEL E CELULOSE ON |
| 1.54 | 11.79 | 0.18 | FUTURE RETAIL | 1.51 | -22.97 | -0.35 | SUNNY OPTICAL TECH.(GP.) |

Global Equity Managers

Artisan Partners Manager Portfolio Overview

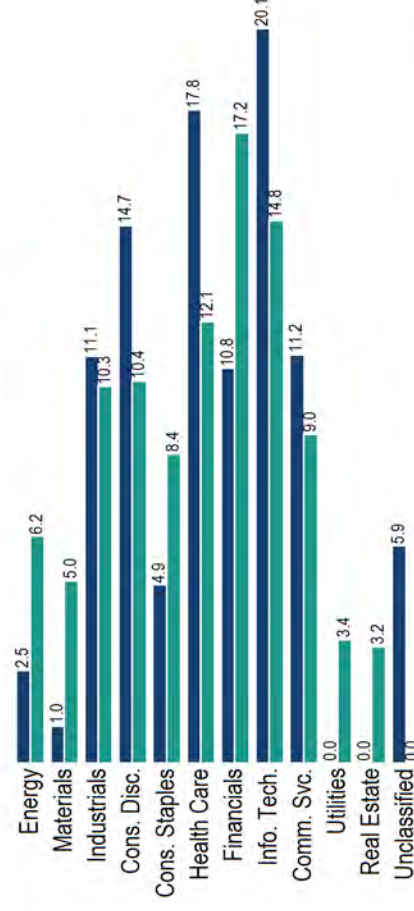
Period Ending: December 31, 2018

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.

Characteristics

| | Portfolio | MSCI ACWI |
|---------------------------------|-----------|-----------|
| Number of Holdings | 47 | 2,758 |
| Weighted Avg. Market Cap. (\$B) | 75.46 | 120.64 |
| Median Market Cap. (\$B) | 22.83 | 8.52 |
| Price To Earnings | 23.15 | 18.55 |
| Price To Book | 6.92 | 3.40 |
| Price To Sales | 6.38 | 3.22 |
| Return on Equity (%) | 20.04 | 18.75 |
| Yield (%) | 1.10 | 2.76 |
| Beta | 1.25 | 1.00 |

Sector Allocation (%) vs MSCI ACWI



Country Allocation

| | Manager Ending Allocation (USD) | Index Ending Allocation (USD) |
|---------------------------------------|---------------------------------------|-------------------------------------|
| Totals | | |
| Developed | 91.5% | 88.1% |
| Emerging* | 2.6% | 11.9% |
| Top 10 Largest Countries | | |
| United States | 50.9% | 54.3% |
| United Kingdom | 8.2% | 5.2% |
| Hong Kong | 7.4% | 1.2% |
| Cash | 5.9% | 0.0% |
| Japan | 5.7% | 7.6% |
| Switzerland | 4.9% | 2.7% |
| Denmark | 3.0% | 0.5% |
| India* | 2.6% | 1.1% |
| Netherlands | 2.4% | 1.1% |
| France | 2.2% | 3.4% |
| Total-Top 10 Largest Countries | 93.4% | 77.1% |

Top Contributors

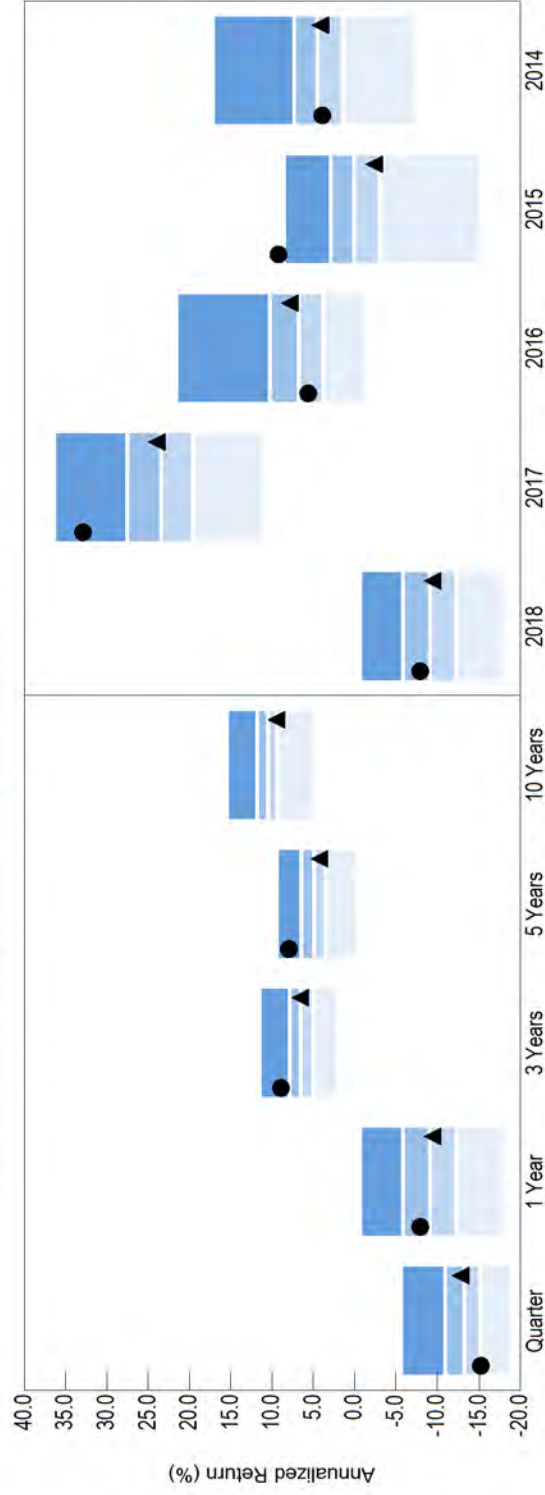
| | Avg Wgt | Return | Contribution |
|-------------------|---------|--------|--------------|
| HDFC BANK ADR 1:3 | 1.95 | 10.08 | 0.20 |
| GENMAB | 2.05 | 3.95 | 0.08 |
| CREE | 0.48 | 12.95 | 0.06 |
| SANDS CHINA | 1.56 | -3.30 | -0.05 |
| TENCENT HOLDINGS | 1.99 | -2.89 | -0.06 |
| S&P GLOBAL | 0.48 | -12.78 | -0.06 |
| BURBERRY GROUP | 0.45 | -15.34 | -0.07 |
| STATE STREET | 0.32 | -24.16 | -0.08 |
| XIAOMI-W ORD | 0.48 | -16.69 | -0.08 |
| ASTRAZENECA | 2.51 | -3.81 | -0.10 |

Bottom Contributors

| | Avg Wgt | Return | Contribution |
|-------------------|---------|--------|--------------|
| FEVERTREE DRINKS | 2.51 | -40.48 | -1.02 |
| NOBLE ENERGY | 2.40 | -39.60 | -0.95 |
| VISA 'A' | 6.76 | -11.94 | -0.81 |
| TEMENOS N | 2.84 | -26.62 | -0.75 |
| IHS MARKIT | 6.59 | -11.10 | -0.73 |
| NINTENDO | 2.59 | -26.87 | -0.70 |
| PIONEER NTRL.RES. | 2.82 | -24.50 | -0.69 |
| AMADEUS IT GROUP | 2.65 | -25.17 | -0.67 |
| APTIV | 2.45 | -26.40 | -0.65 |
| LONZA GROUP | 2.48 | -24.66 | -0.61 |

Unclassified sector allocation includes cash allocations.

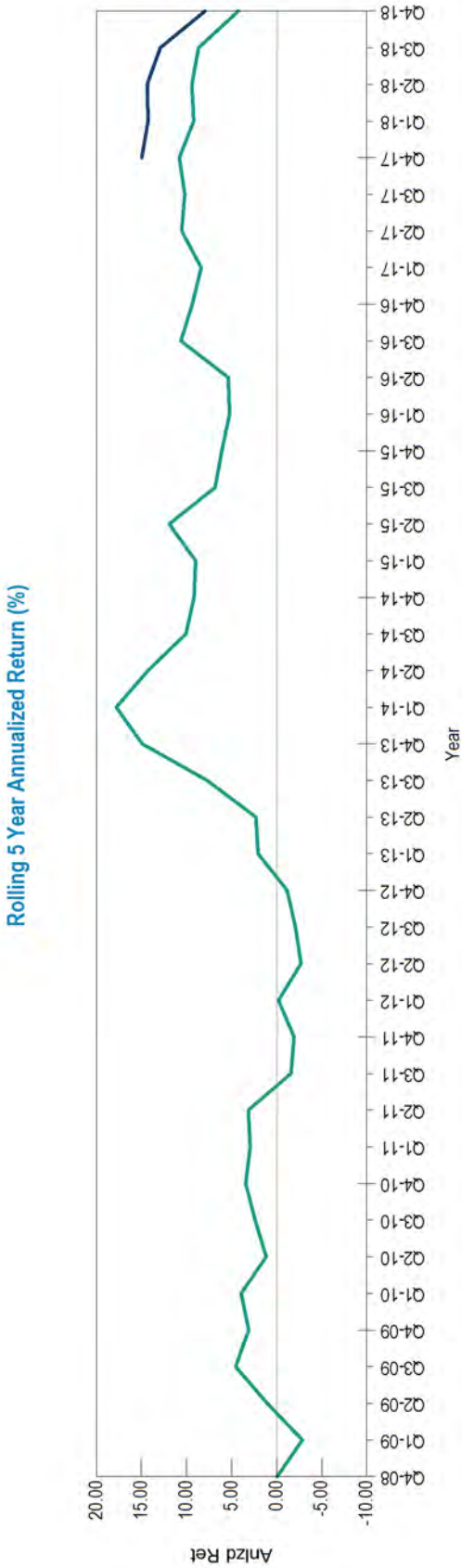
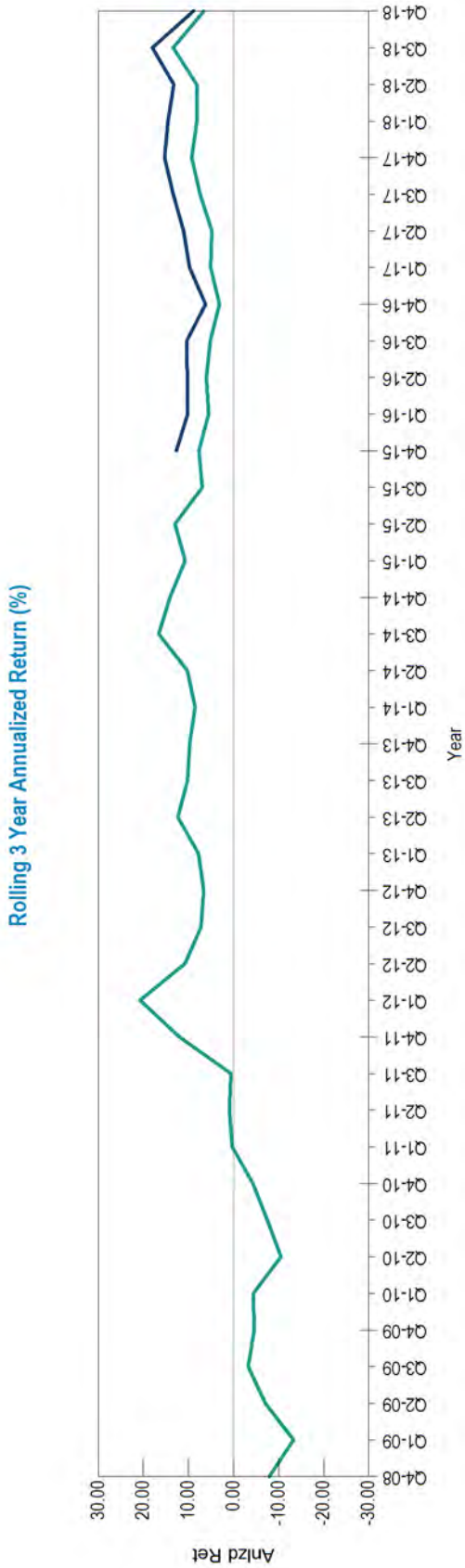
Artisan Partners vs. eV All Global Equity Gross Universe



Return (Rank)

| | | | | | | | | | | |
|--------------------|------------|-----------|----------|----------|----------|-----------|-----------|----------|-----------|----------|
| 5th Percentile | -5.7 | -0.7 | 11.5 | 9.4 | 15.4 | -0.7 | 36.3 | 21.5 | 8.5 | 17.1 |
| 25th Percentile | -11.0 | -5.8 | 7.9 | 6.5 | 11.8 | -5.8 | 27.6 | 10.3 | 3.0 | 7.4 |
| Median | -13.2 | -9.1 | 6.6 | 5.0 | 10.5 | -9.1 | 23.5 | 6.8 | 0.1 | 4.6 |
| 75th Percentile | -15.2 | -12.2 | 5.0 | 3.6 | 9.4 | -12.2 | 19.6 | 3.9 | -2.9 | 1.5 |
| 95th Percentile | -18.9 | -18.1 | 2.0 | -0.3 | 4.8 | -18.1 | 11.0 | -1.4 | -15.1 | -7.4 |
| # of Portfolios | 920 | 920 | 861 | 743 | 480 | 920 | 880 | 842 | 692 | 609 |
| ● Artisan Partners | -15.2 (76) | -7.9 (40) | 8.9 (16) | 8.0 (11) | -- (-) | -7.9 (40) | 32.9 (11) | 5.6 (61) | 9.2 (4) | 3.9 (56) |
| ▲ MSCIACWI | -12.8 (45) | -9.4 (53) | 6.6 (51) | 4.3 (66) | 9.5 (75) | -9.4 (53) | 24.0 (47) | 7.9 (42) | -2.4 (73) | 4.2 (54) |

Artisan Partners
 Manager Performance - Rolling 3 Year (Gross of Fees) Period Ending: December 31, 2018

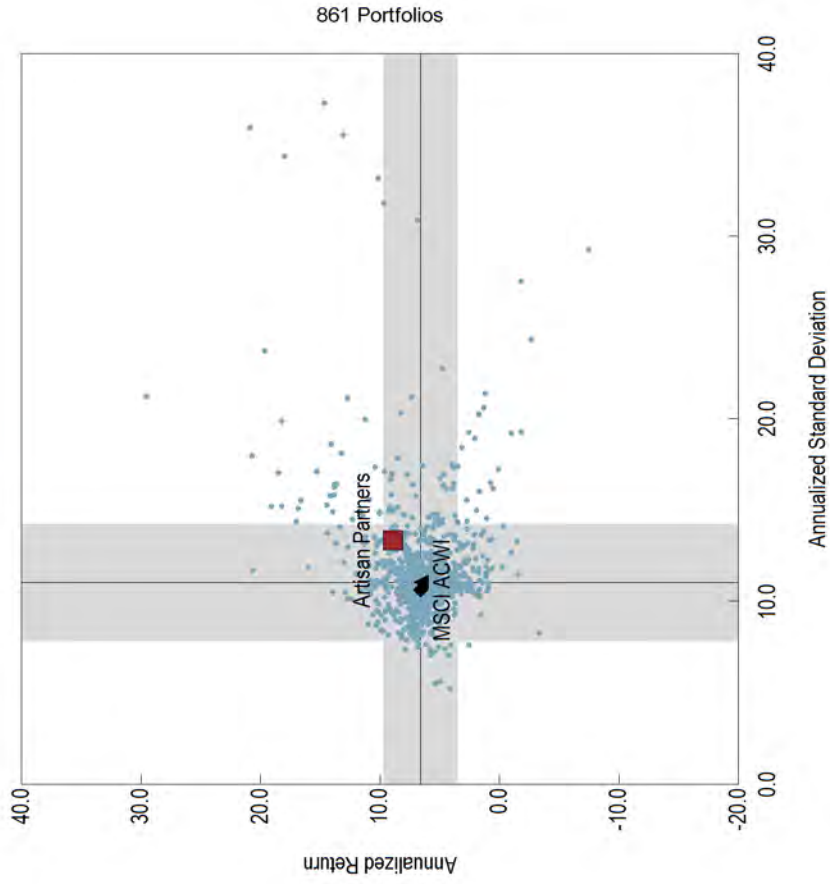


Artisan Partners

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

Period Ending: December 31, 2018

3 Years

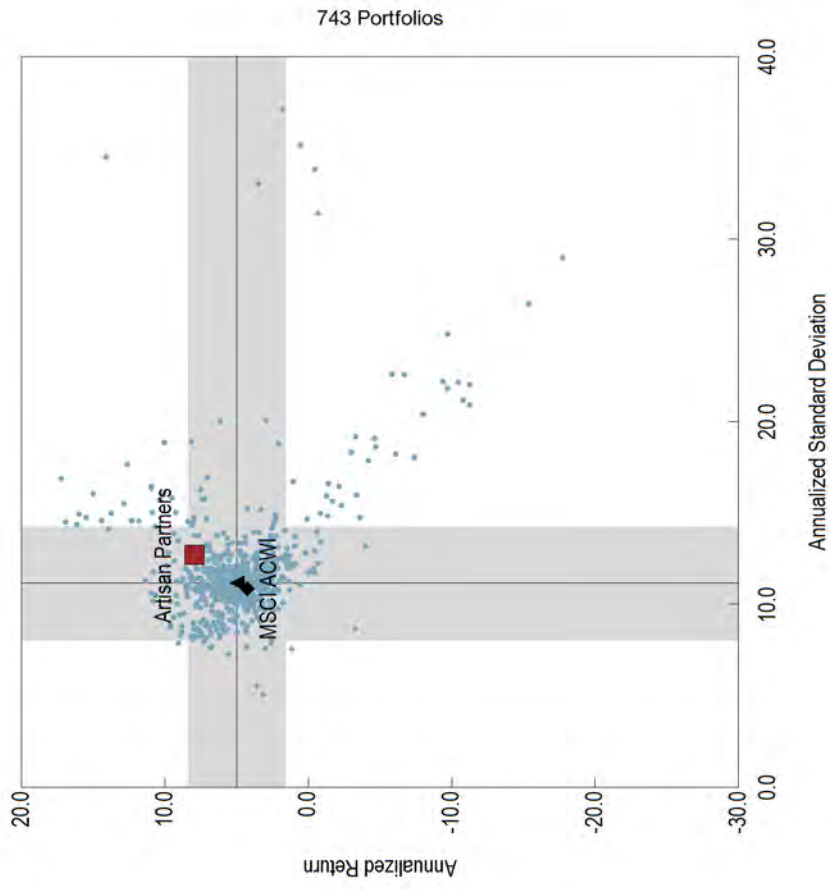


| | | | |
|-----------------------------------|------|-------|-----|
| Artisan Partners | 8.9% | 13.3% | 0.6 |
| MSCI ACWI | 6.6% | 10.6% | 0.5 |
| eV All Global Equity Gross Median | 6.6% | 11.0% | 0.5 |

3 Years

| | | | |
|-----------------------------------|------|-------|-----|
| Artisan Partners | 8.0% | 12.7% | 0.6 |
| MSCI ACWI | 4.3% | 10.9% | 0.3 |
| eV All Global Equity Gross Median | 5.0% | 11.2% | 0.4 |

5 Years



| | | | |
|-----------------------------------|------|-------|-----|
| Artisan Partners | 8.0% | 12.7% | 0.6 |
| MSCI ACWI | 4.3% | 10.9% | 0.3 |
| eV All Global Equity Gross Median | 5.0% | 11.2% | 0.4 |

5 Years

| | | | |
|-----------------------------------|------|-------|-----|
| Artisan Partners | 8.0% | 12.7% | 0.6 |
| MSCI ACWI | 4.3% | 10.9% | 0.3 |
| eV All Global Equity Gross Median | 5.0% | 11.2% | 0.4 |

First Eagle Manager Portfolio Overview

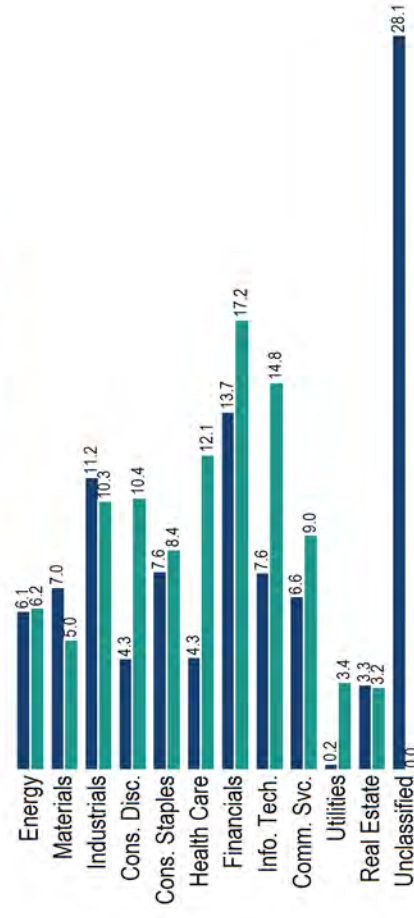
Period Ending: December 31, 2018

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 | 167 | 2,758 |
| Weighted Avg. Market Cap. (\$B) | 65.89 | 120.64 |
| Median Market Cap. (\$B) | 16.49 | 8.52 |
| Price To Earnings | 16.39 | 18.55 |
| Price To Book | 2.73 | 3.40 |
| Price To Sales | 3.29 | 3.22 |
| Return on Equity (%) | 16.39 | 18.75 |
| Yield (%) | 2.87 | 2.76 |
| Beta | 0.64 | 1.00 |

Sector Allocation (%) vs MSCI ACWI



Country Allocation

| | Manager Ending Allocation (USD) | Index Ending Allocation (USD) |
|---------------------------------------|---------------------------------|-------------------------------|
| Totals | 80.7% | 88.1% |
| Developed | 4.1% | 11.9% |
| Emerging* | 15.2% | |
| Cash | | |
| Top 10 Largest Countries | 47.7% | 54.3% |
| United States | 15.2% | 0.0% |
| Cash | 11.0% | 7.6% |
| Japan | 5.2% | 3.4% |
| France | 4.9% | 5.2% |
| United Kingdom | 3.4% | 3.0% |
| Canada | 2.0% | 2.7% |
| Switzerland | 1.9% | 1.6% |
| Korea* | 1.4% | 0.4% |
| Singapore | 1.3% | 1.2% |
| Hong Kong | | |
| Total-Top 10 Largest Countries | 94.0% | 79.4% |

Top Contributors

| | Avg Wgt | Return | Contribution |
|-----------------------|---------|--------|--------------|
| BARRICK GOLD (NYS) | 0.46 | 23.11 | 0.11 |
| OMNICOM GROUP | 1.19 | 8.57 | 0.10 |
| JARDINE MATHESON HDG. | 0.83 | 10.88 | 0.09 |
| AGNICO EAGLE MINES | 0.37 | 18.56 | 0.07 |
| WHEATON PRMTL. (NYS) | 0.43 | 12.24 | 0.05 |
| NEWCREST MINING | 0.55 | 9.28 | 0.05 |
| NEWMONT MINING | 0.34 | 15.23 | 0.05 |
| WILLIS TOWERS WATSON | 0.56 | 8.18 | 0.05 |
| FRANCO-NEVADA | 0.28 | 12.51 | 0.03 |
| XILINX | 0.49 | 6.68 | 0.03 |

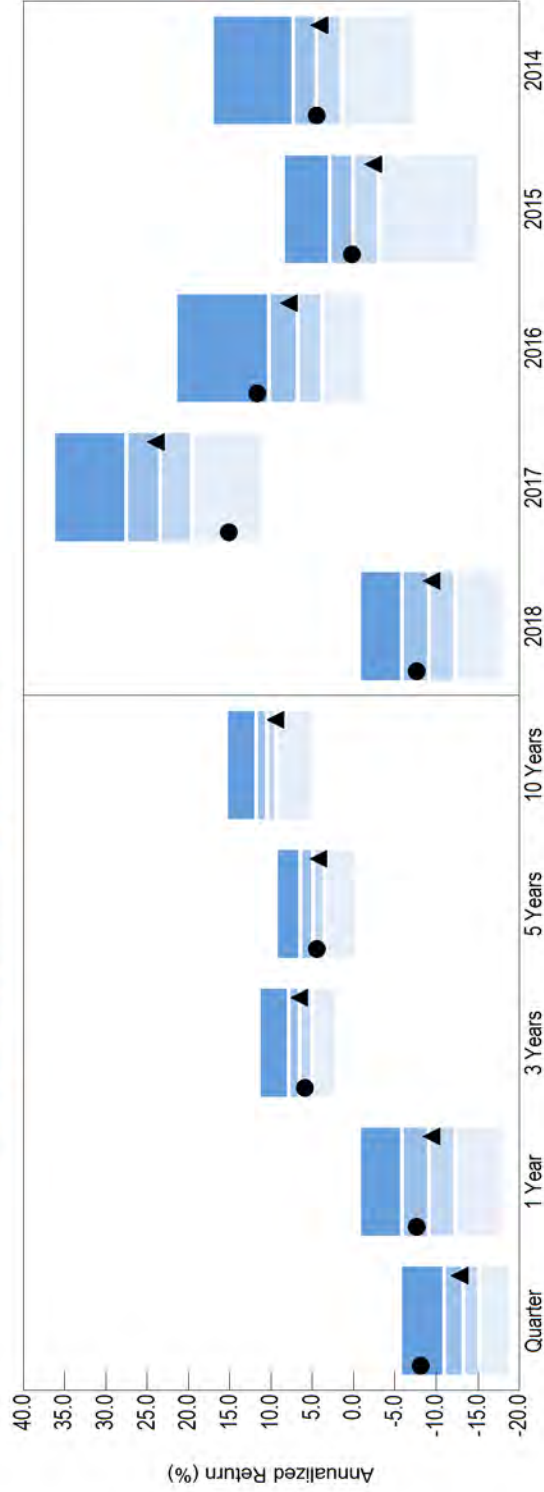
Bottom Contributors

| | Avg Wgt | Return | Contribution |
|--------------------------|---------|--------|--------------|
| SCHLUMBERGER | 1.41 | -40.10 | -0.56 |
| NATIONAL OILWELL VARCO | 1.20 | -40.24 | -0.48 |
| WEYERHAEUSER | 1.31 | -31.40 | -0.41 |
| EXXON MOBIL | 1.66 | -18.98 | -0.31 |
| BRITISH AMERICAN TOBACCO | 1.01 | -29.55 | -0.30 |
| FANUC | 1.48 | -19.43 | -0.29 |
| ORACLE | 2.23 | -12.08 | -0.27 |
| TECHNIPFMC | 0.72 | -37.01 | -0.27 |
| SOMPO HOLDINGS FLOWSERVE | 1.27 | -20.16 | -0.26 |

Unclassified sector allocation includes cash allocations and Gold allocations (9.1% as of 12/31/2018).

First Eagle
 Manager Performance Comparisons (Gross of Fees) Period Ending: December 31, 2018

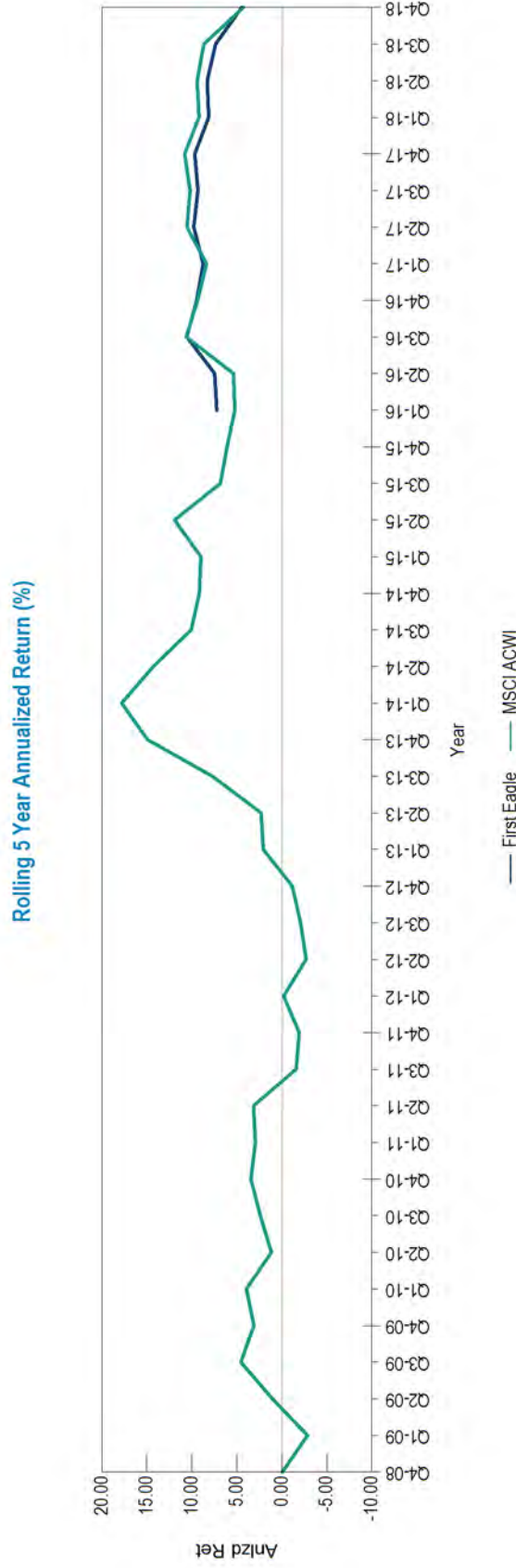
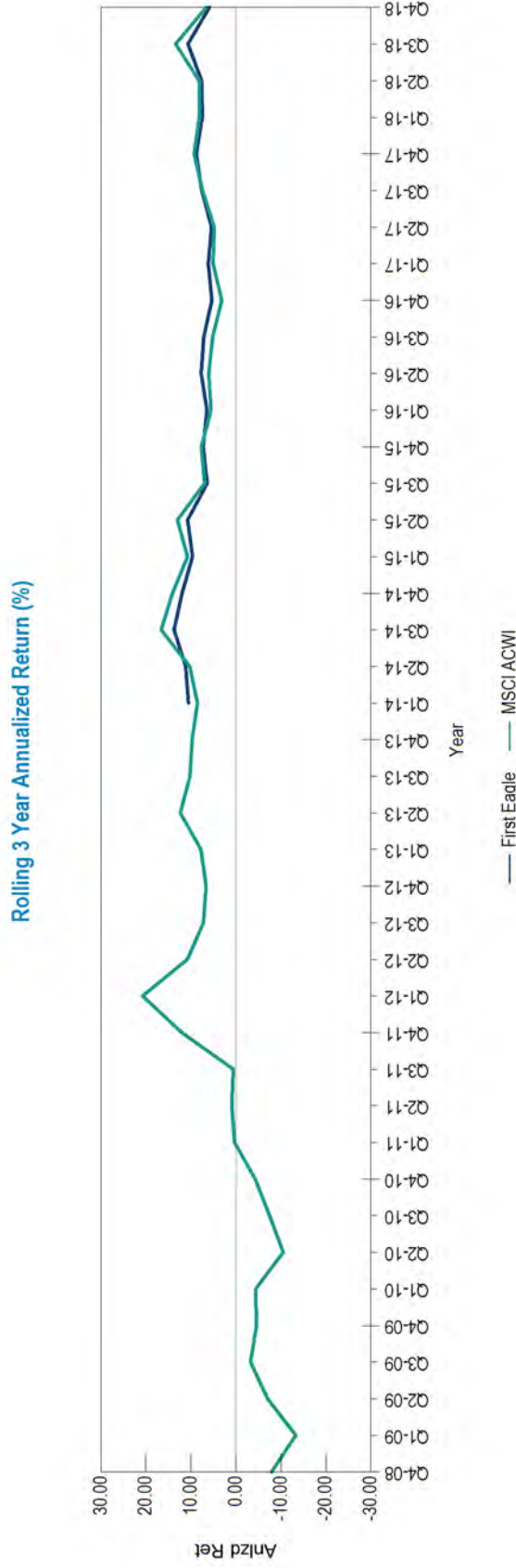
First Eagle vs. eV All Global Equity Gross Universe



Return (Rank)

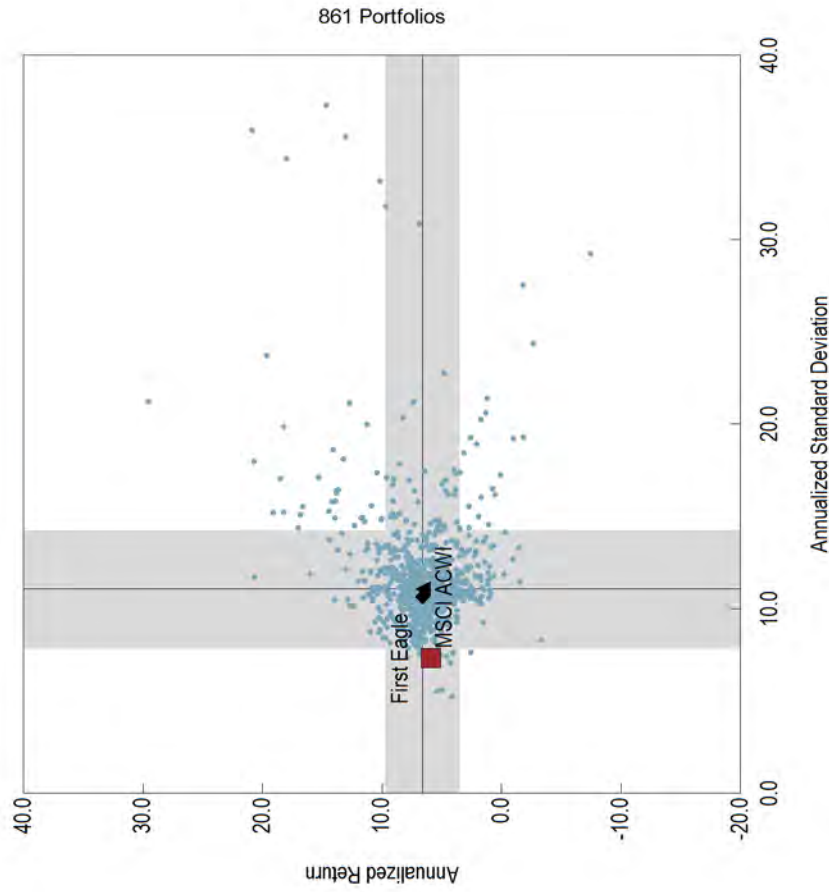
| | Quarter | 1 Year | 3 Years | 5 Years | 10 Years | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------------|------------|-----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|
| 5th Percentile | -5.7 | -0.7 | 11.5 | 9.4 | 15.4 | 36.3 | 8.5 | 21.5 | 36.3 | -0.7 |
| 25th Percentile | -11.0 | -5.8 | 7.9 | 6.5 | 11.8 | 27.6 | 3.0 | 10.3 | 27.6 | -5.8 |
| Median | -13.2 | -9.1 | 6.6 | 5.0 | 10.5 | 23.5 | 0.1 | 6.8 | 23.5 | -9.1 |
| 75th Percentile | -15.2 | -12.2 | 5.0 | 3.6 | 9.4 | 19.6 | -2.9 | 3.9 | 19.6 | -12.2 |
| 95th Percentile | -18.9 | -18.1 | 2.0 | -0.3 | 4.8 | 11.0 | -15.1 | -1.4 | 11.0 | -18.1 |
| # of Portfolios | 920 | 920 | 861 | 743 | 480 | 880 | 692 | 842 | 880 | 920 |
| ● First Eagle | -8.1 (13) | -7.6 (38) | 5.9 (63) | 4.4 (62) | -- (-) | 15.1 (89) | 0.2 (49) | 11.7 (19) | 15.1 (89) | -7.6 (38) |
| ▲ MSCIACWI | -12.8 (45) | -9.4 (53) | 6.6 (51) | 4.3 (66) | 9.5 (75) | 24.0 (47) | -2.4 (73) | 7.9 (42) | 24.0 (47) | -9.4 (53) |

First Eagle
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018



First Eagle
 Risk vs. Return 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018

3 Years



3 Years

First Eagle
 MSCI ACWI
 eV All Global Equity Gross Median

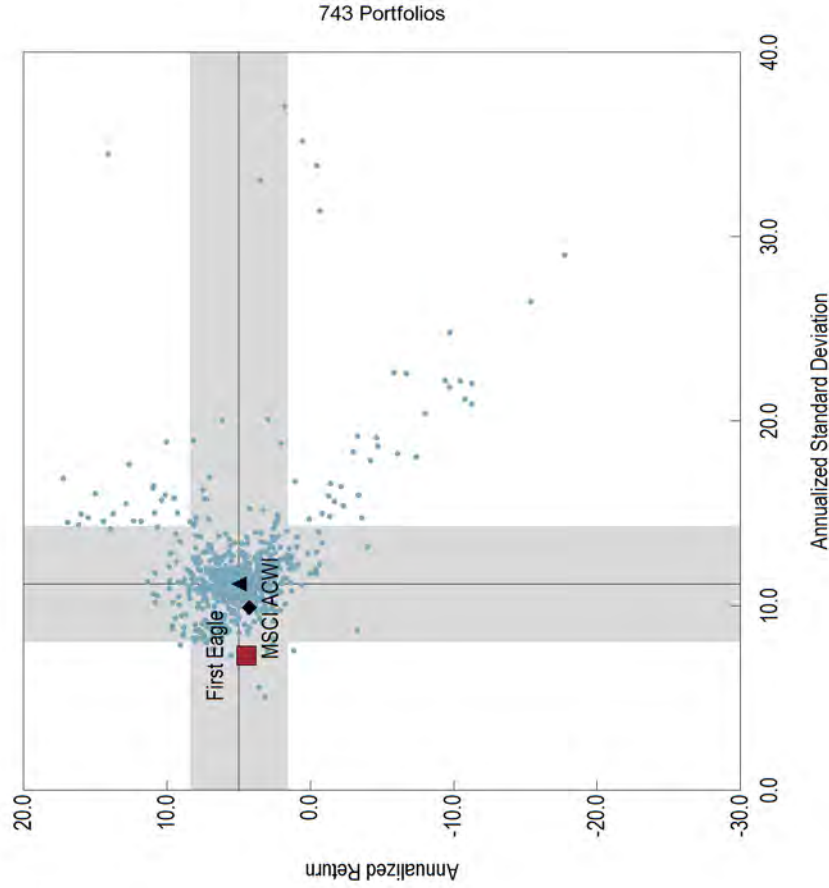
5.9%
 6.6%
 6.6%

7.3%
 10.6%
 11.0%

0.7
 0.5
 0.5

Sharpe Ratio

5 Years



5 Years

4.4%
 4.3%
 5.0%

7.7%
 10.9%
 11.2%

0.5
 0.3
 0.4

Sharpe Ratio

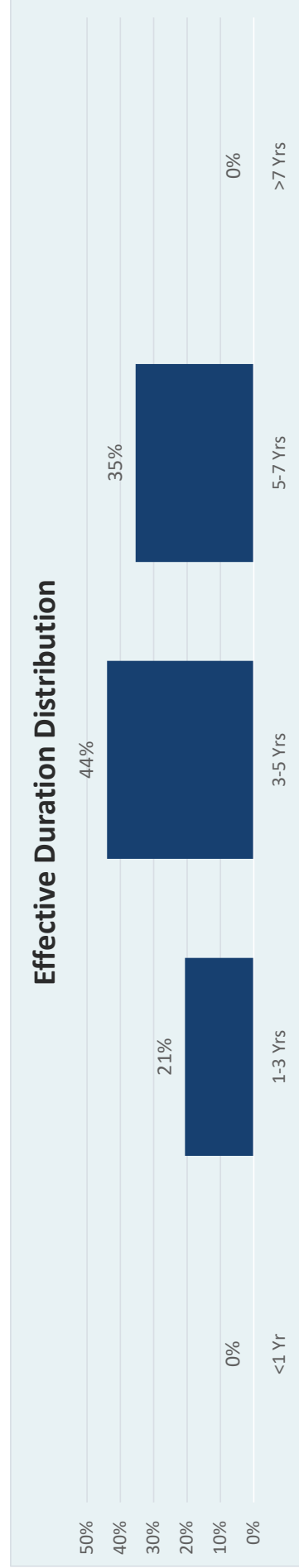
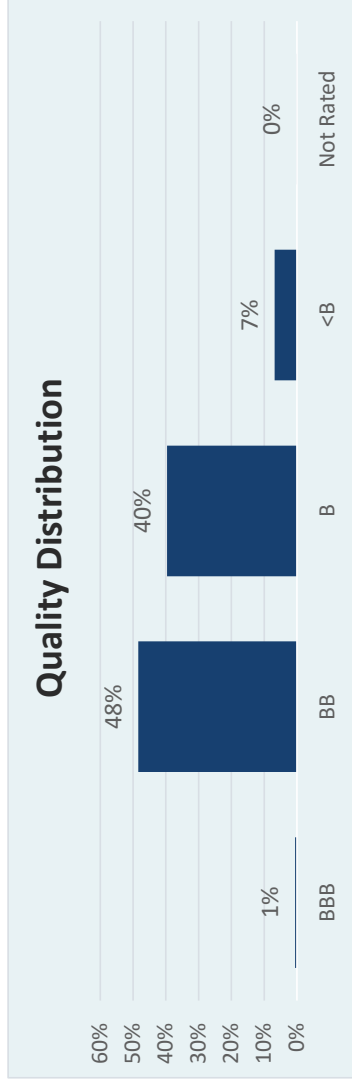
High Yield Managers

Allianz Global Investors Manager Portfolio Overview

Period Ending: December 31, 2018

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

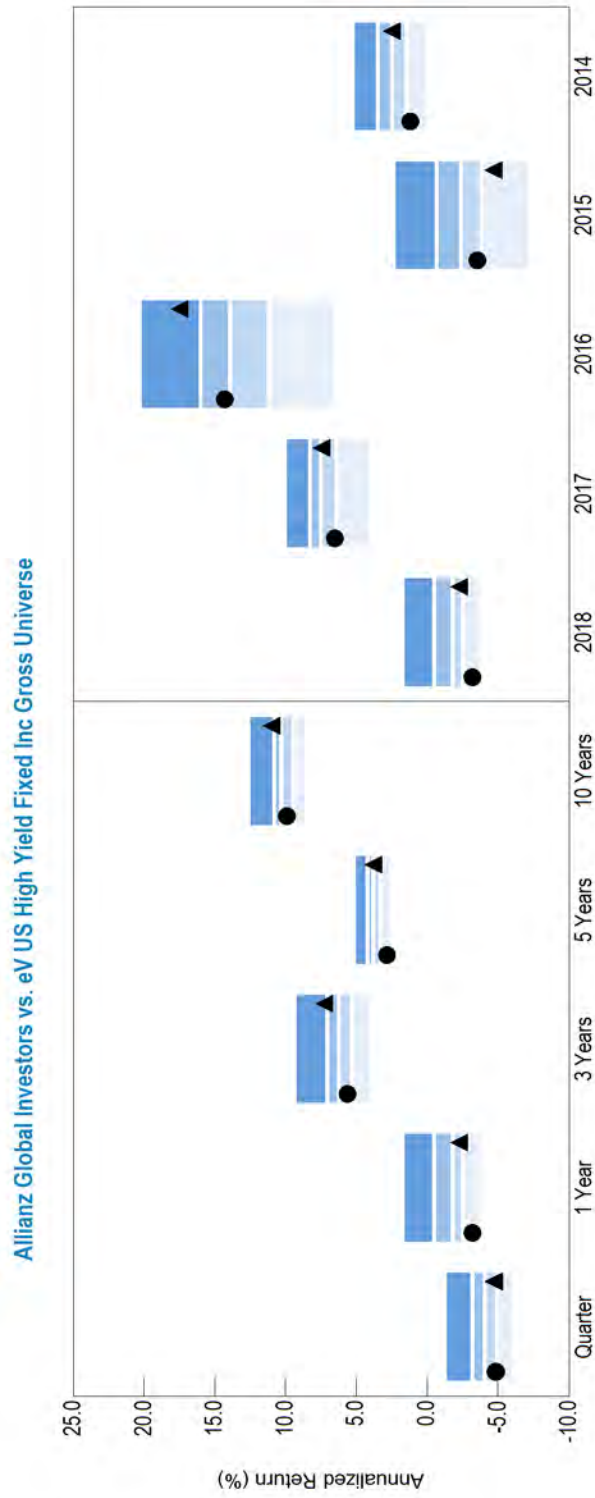
| | Allianz | ICE BofAML HY Master II |
|--------------------|---------|----------------------------|
| Effective Duration | 4.40 | 4.20 |
| Yield to Maturity | 7.60 | 8.00 |
| Average Quality | B1 | B1 |
| Average Coupon | 6.4% | 6.4% |



Quality distribution excludes cash.

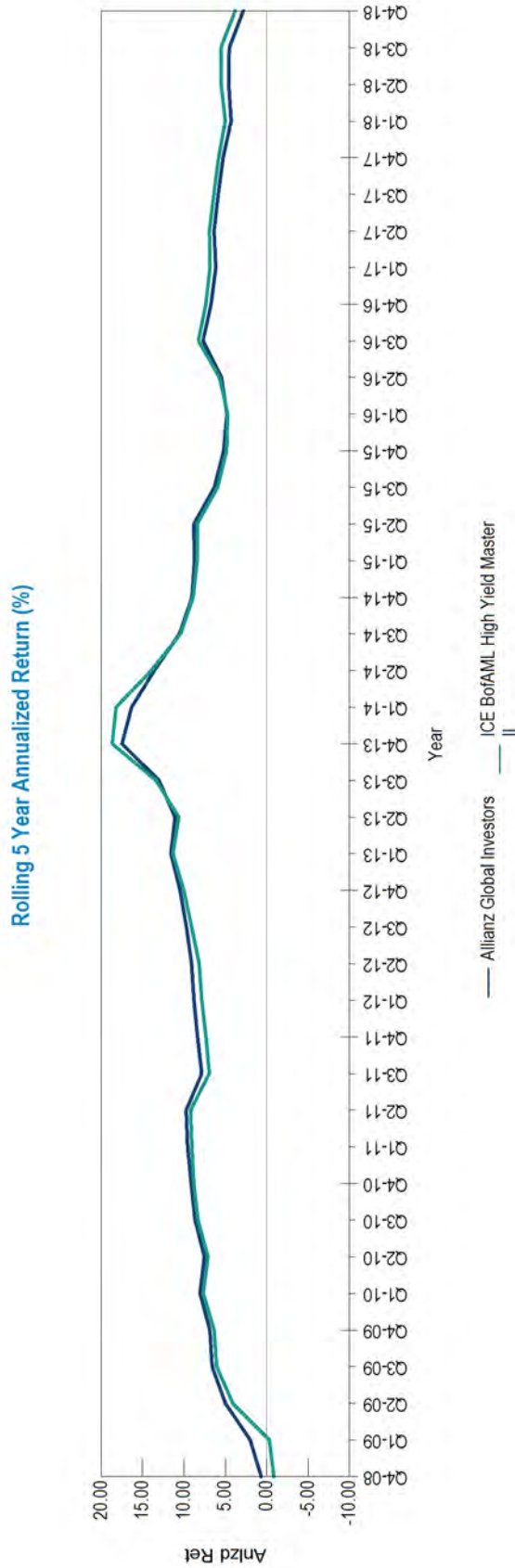
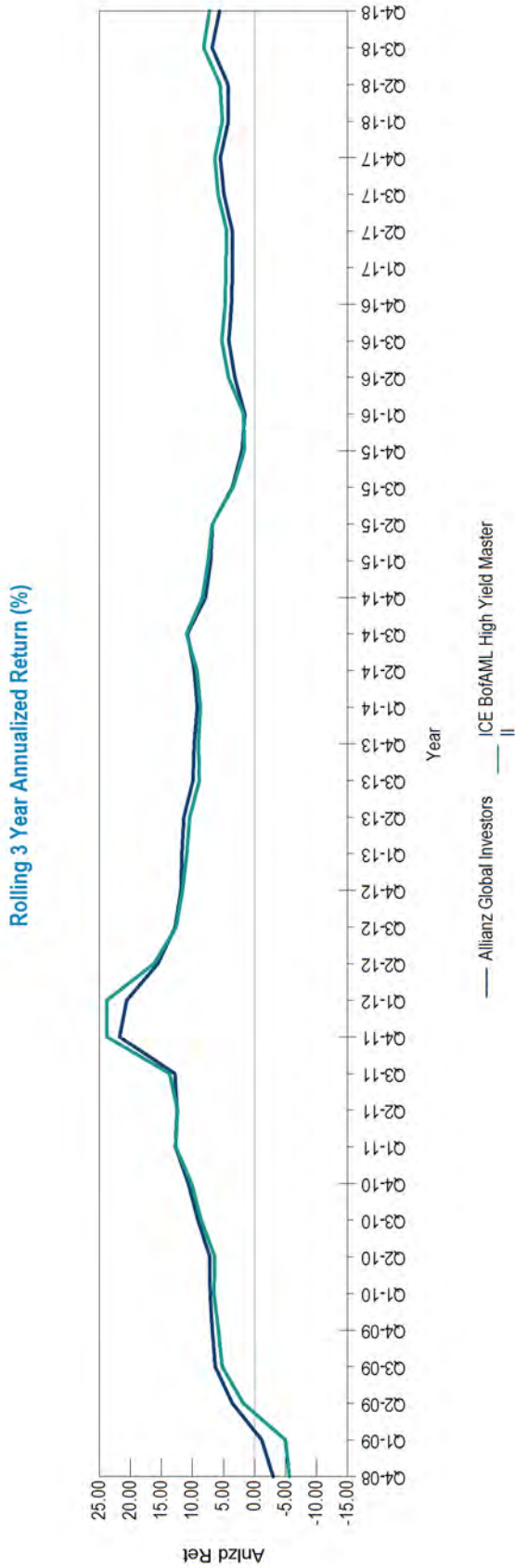


Allianz Global Investors
 Manager Performance Comparisons (Gross of Fees) Period Ending: December 31, 2018



| | Quarter | 1 Year | 3 Years | 5 Years | 10 Years | 2014 | 2015 | 2016 | 2017 | 2018 | | | | | | | |
|-----------------------------------|-----------|-----------|----------|----------|-----------|------|------|-----------|----------|-----------|-----|-----------|-----------|----------|----------|----------|-----|
| 5th Percentile | -1.3 | 1.7 | 9.3 | 5.2 | 12.6 | | | 20.3 | 10.0 | 1.7 | | | | | | | |
| 25th Percentile | -3.2 | -0.5 | 7.1 | 4.3 | 10.9 | | | 16.0 | 8.3 | -0.5 | | | | | | | |
| Median | -4.0 | -1.8 | 6.3 | 3.8 | 10.3 | | | 14.0 | 7.5 | -1.8 | | | | | | | |
| 75th Percentile | -4.9 | -2.5 | 5.4 | 3.3 | 9.5 | | | 11.3 | 6.5 | -2.5 | | | | | | | |
| 95th Percentile | -6.0 | -3.8 | 4.0 | 2.5 | 8.5 | | | 6.6 | 4.0 | -3.8 | | | | | | | |
| # of Portfolios | 210 | 210 | 197 | 179 | 126 | | | 183 | 198 | 210 | | | | | | | |
| ● Allianz Global Investors | -4.8 (73) | -3.2 (88) | 5.6 (71) | 2.8 (87) | 9.9 (64) | | | 14.3 (47) | 6.5 (74) | -3.2 (88) | | | | | | | |
| ▲ ICE BofAML High Yield Master II | -4.7 (68) | -2.3 (69) | 7.3 (23) | 3.8 (49) | 11.0 (21) | | | 17.5 (14) | 7.5 (53) | -2.3 (69) | | | | | | | |
| | | | | | | | | | | | 155 | -3.5 (68) | -4.6 (83) | 2.5 (50) | 2.5 (50) | 1.2 (83) | 5.2 |

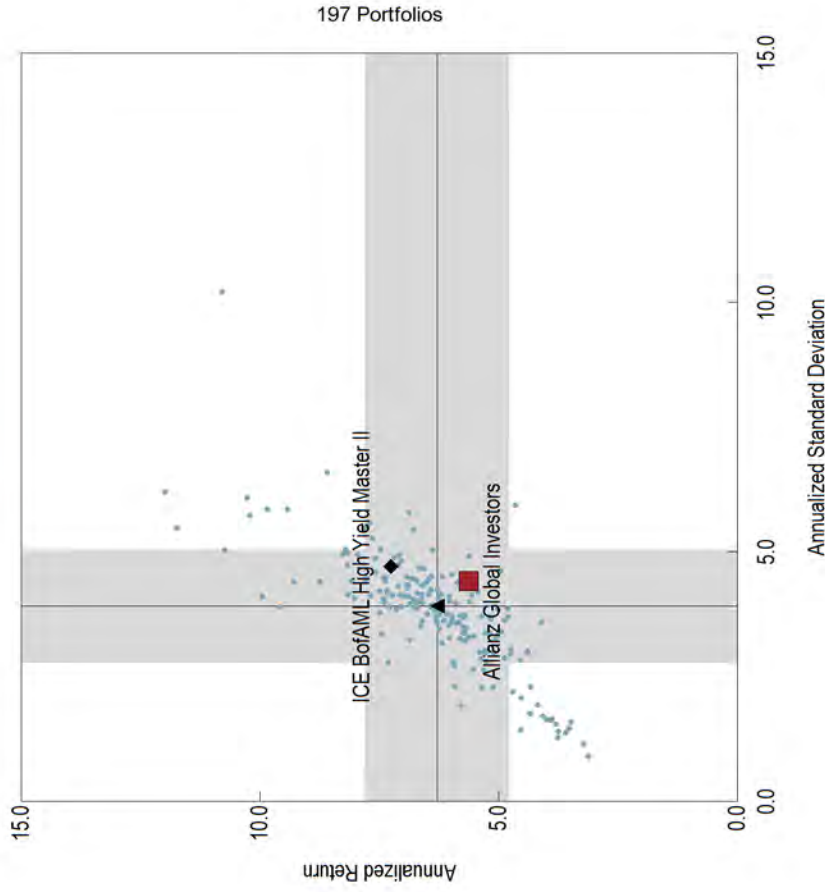
Allianz Global Investors
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018



Allianz Global Investors
 Risk vs. Return 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018

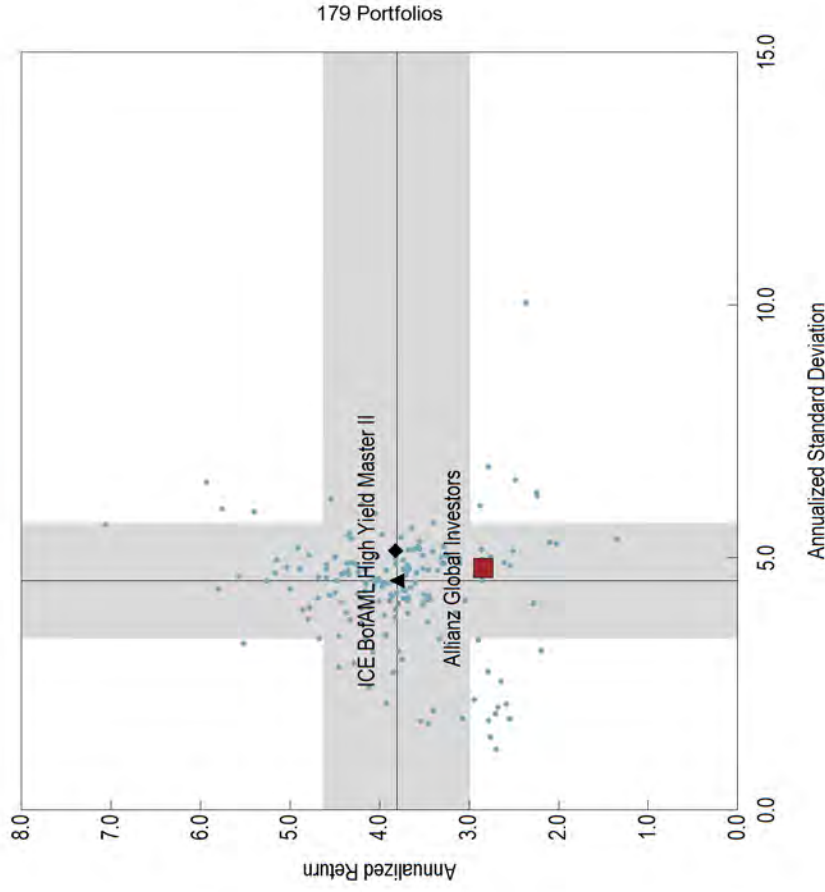
3 Years



3 Years

| | Anlzd Return | Anlzd Standard Deviation | Sharpe Ratio |
|---|--------------|--------------------------|--------------|
| Allianz Global Investors | 5.6% | 4.4% | 1.0 |
| ICE BofAML High Yield Master II | 7.3% | 4.7% | 1.3 |
| eV US High Yield Fixed Inc Gross Median | 6.3% | 3.9% | 1.4 |

5 Years



5 Years

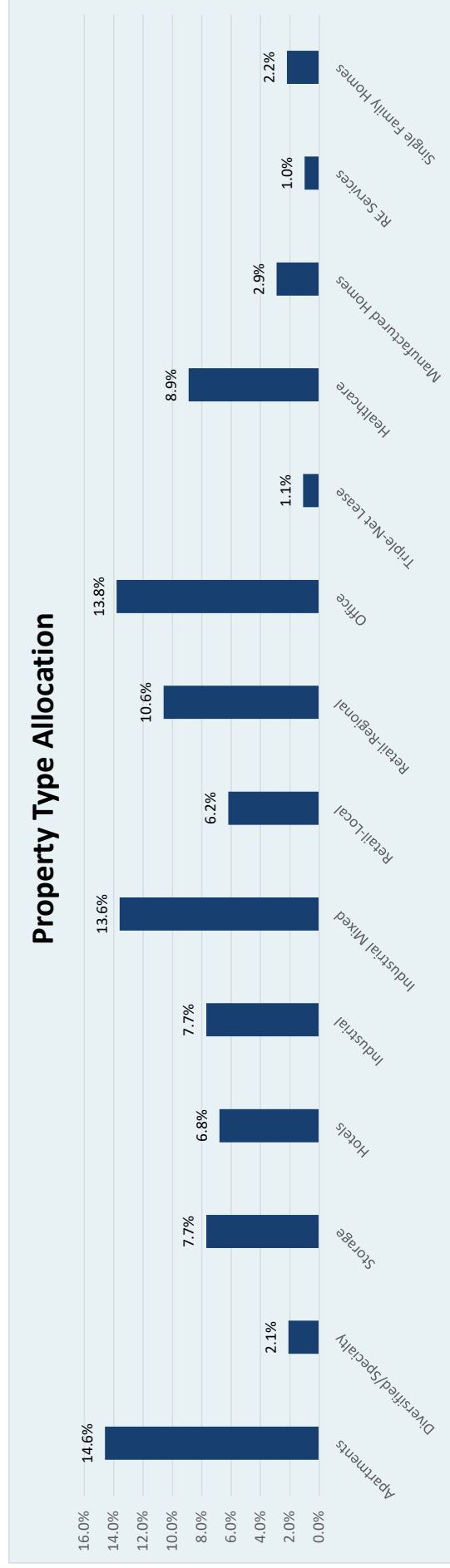
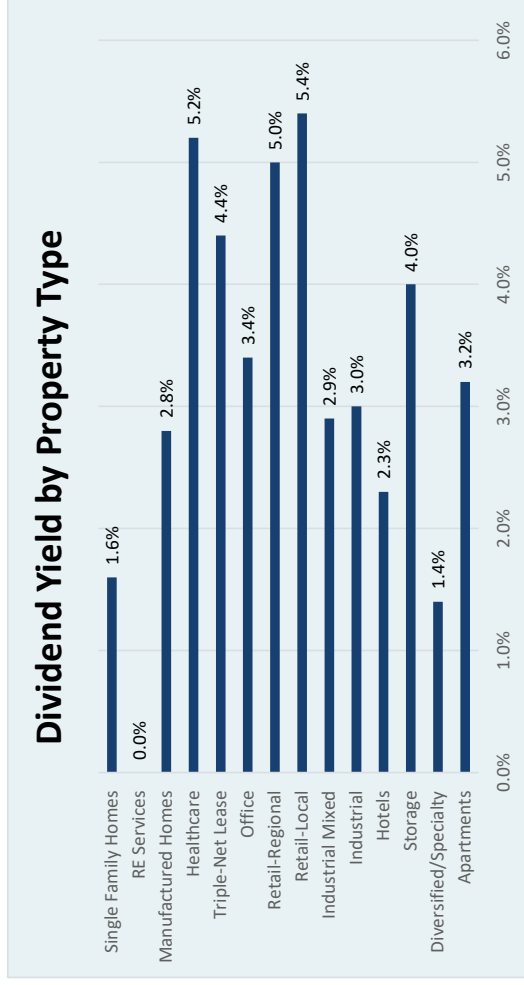
| | Anlzd Return | Anlzd Standard Deviation | Sharpe Ratio |
|---|--------------|--------------------------|--------------|
| Allianz Global Investors | 2.8% | 4.8% | 0.5 |
| ICE BofAML High Yield Master II | 3.8% | 5.1% | 0.6 |
| eV US High Yield Fixed Inc Gross Median | 3.8% | 4.5% | 0.7 |

Real Estate Managers

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

Top Five Holdings

| Company | Property Type | Allocation |
|----------------------|------------------|------------|
| Simon Property Group | Retail-Regional | 9.1% |
| Pologis Inc. | Industrial | 6.4% |
| Equity Residential | Apartments | 5.7% |
| Equinix Inc | Industrial Mixed | 5.4% |
| Ventas, inc | Healthcare | 4.9% |



0.8% is allocated to Cash and Cash Equivalents

Diversifying Fixed Income Managers

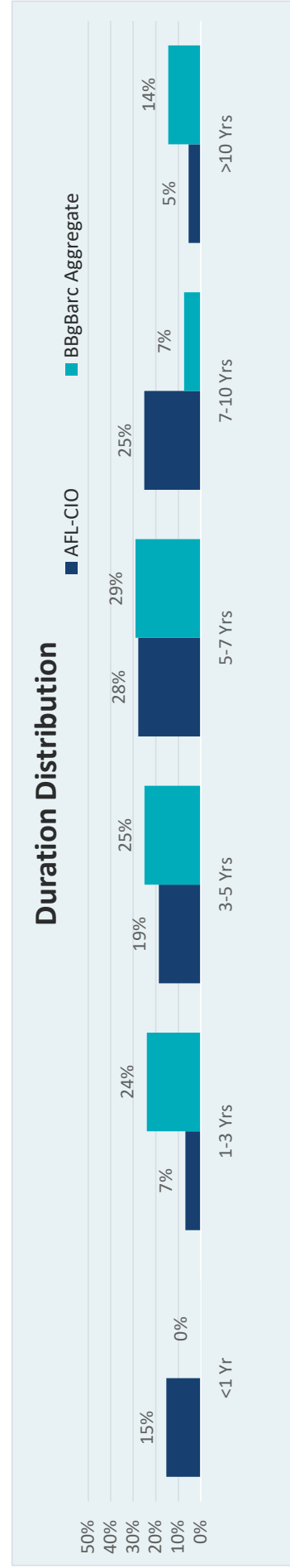
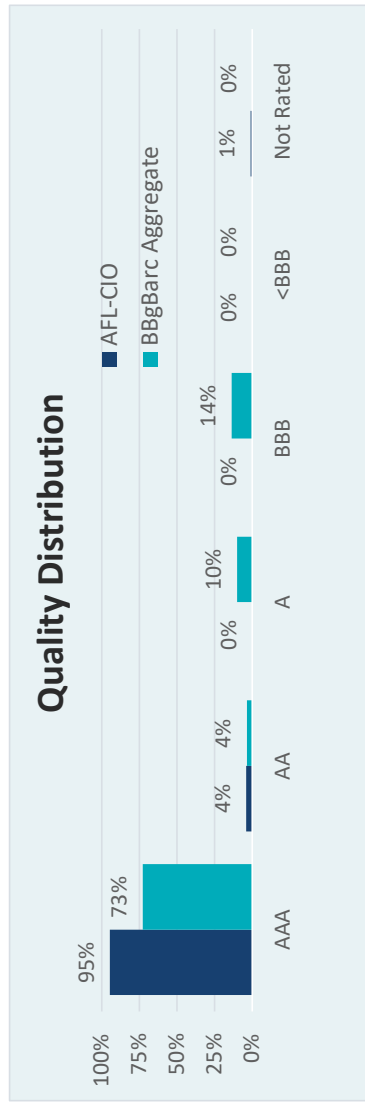
AFL-CIO

Manager Portfolio Overview

Period Ending: December 31, 2018

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 |
|--------------------|---------|-------------------|
| Effective Duration | 5.57 | 5.93 |
| Yield to Maturity | 3.42 | 3.19 |
| Average Quality | AAA | AA |
| Average Coupon | 3.4% | 3.2% |



Duration and Quality distributions exclude cash.

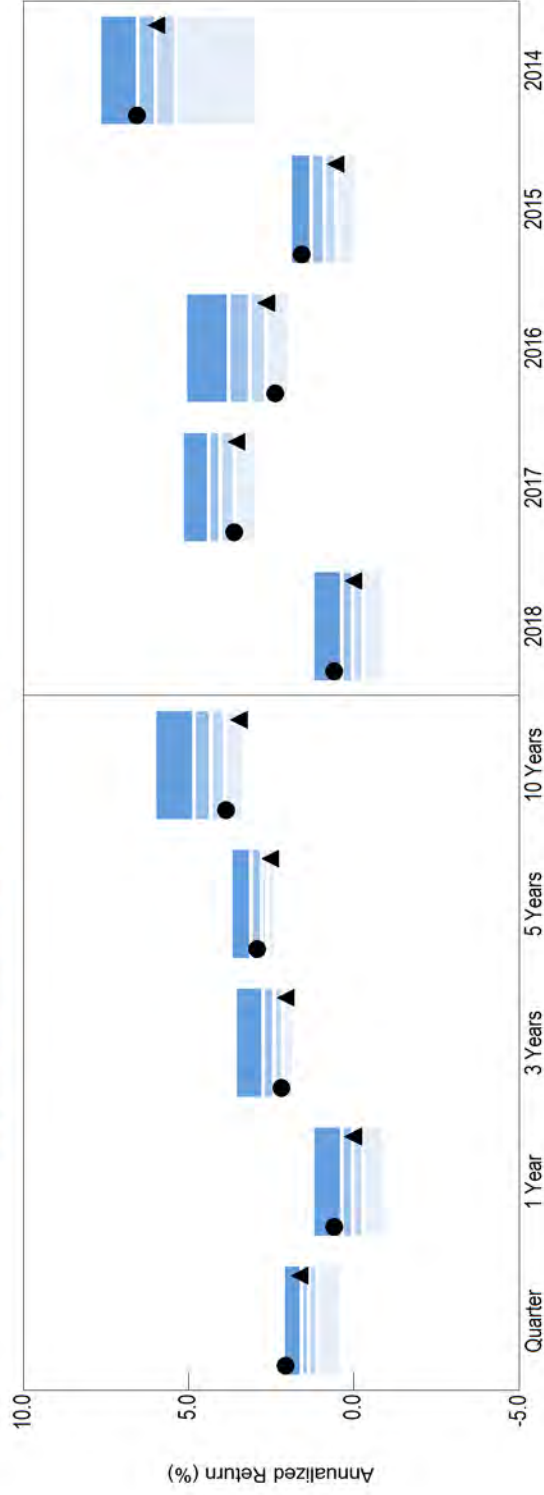


AFL-CIO

Manager Performance Comparisons (Gross of Fees)

Period Ending: December 31, 2018

AFL-CIO vs. eV US Core Fixed Inc Gross Universe



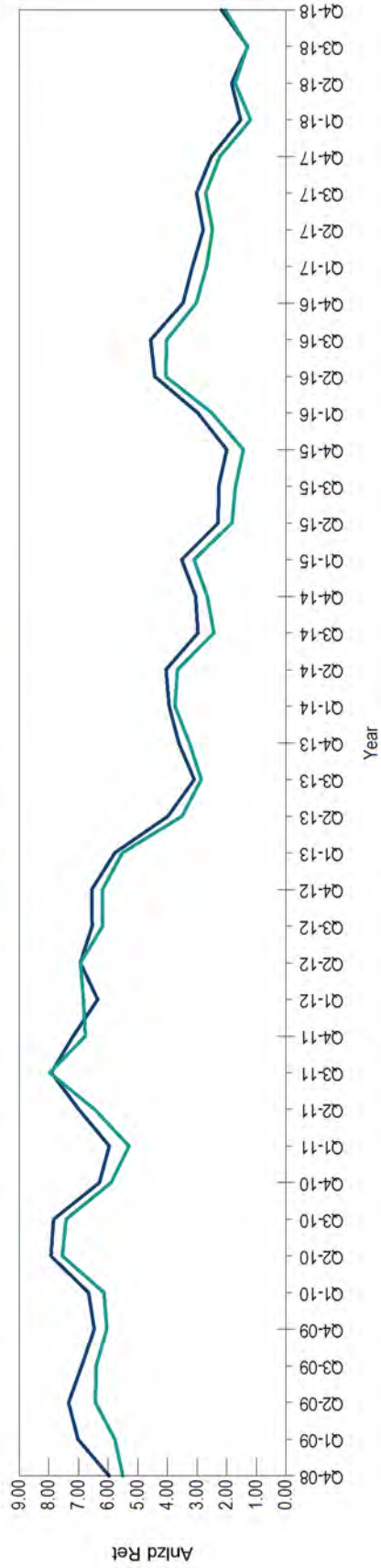
Return (Rank)

| Period | 5th Percentile | 25th Percentile | Median | 75th Percentile | 95th Percentile | # of Portfolios |
|-------------------------|----------------|-----------------|----------|-----------------|-----------------|-----------------|
| Quarter | 2.1 | 1.6 | 1.4 | 1.1 | 0.4 | 240 |
| 1 Year | 1.2 | 0.4 | 0.0 | -0.3 | -0.9 | 240 |
| 3 Years | 3.6 | 2.8 | 2.4 | 2.1 | 1.8 | 237 |
| 5 Years | 3.7 | 3.1 | 2.8 | 2.6 | 2.4 | 232 |
| 10 Years | 6.0 | 4.8 | 4.3 | 3.9 | 3.3 | 210 |
| 2014 | 7.7 | 6.5 | 6.0 | 5.4 | 2.9 | 213 |
| 2015 | 1.9 | 1.3 | 0.9 | 0.5 | -0.1 | 196 |
| 2016 | 5.1 | 3.8 | 3.2 | 2.7 | 2.0 | 223 |
| 2017 | 5.2 | 4.4 | 4.0 | 3.6 | 2.9 | 233 |
| 2018 | 1.2 | 0.4 | 0.0 | -0.3 | -0.9 | 240 |
| AFL-CIO | 2.1 (6) | 1.6 (16) | 1.2 (70) | 0.6 (39) | 0.6 (16) | 240 |
| BBgBarc US Aggregate TR | 1.6 (19) | 0.0 (54) | 2.1 (84) | 2.5 (84) | 3.5 (93) | 240 |

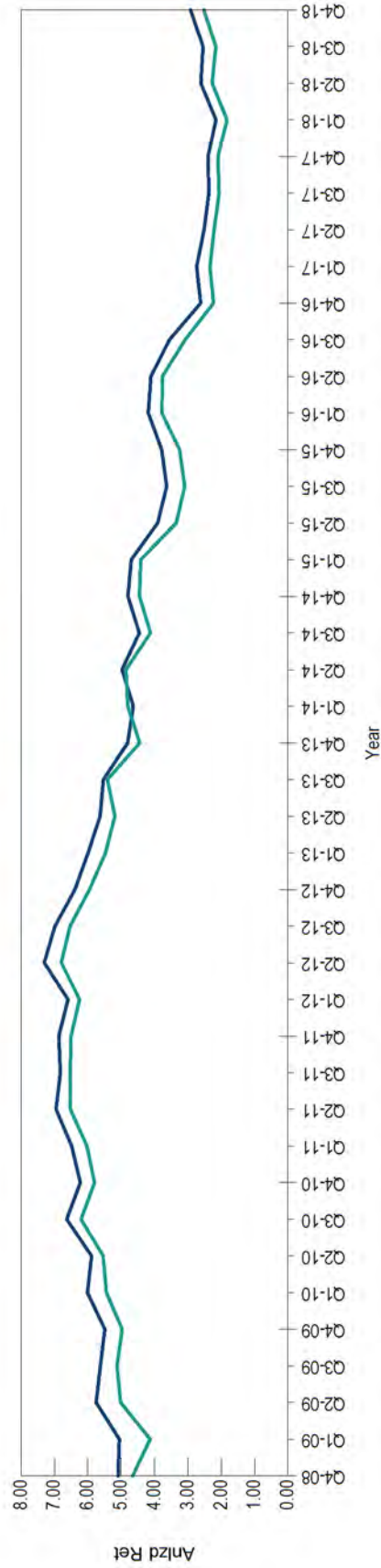
● AFL-CIO
▲ BBgBarc US Aggregate TR

AFL-CIO
 Manager Performance - Rolling 3 & 5 Year (Gross of Fees) Period Ending: December 31, 2018

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)

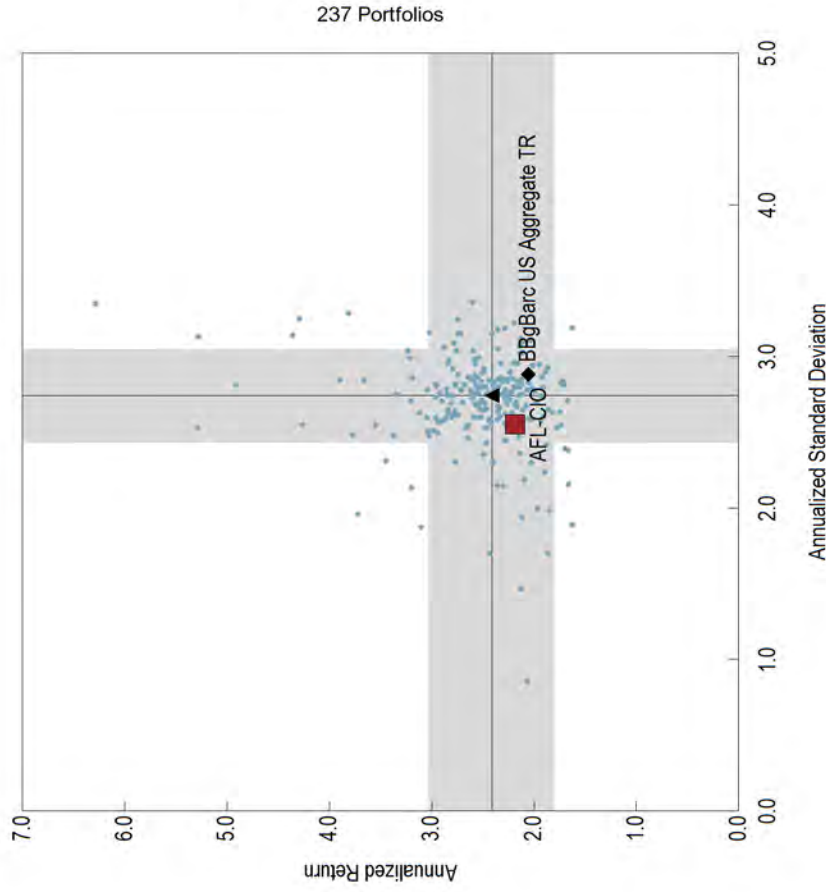


AFL-CIO

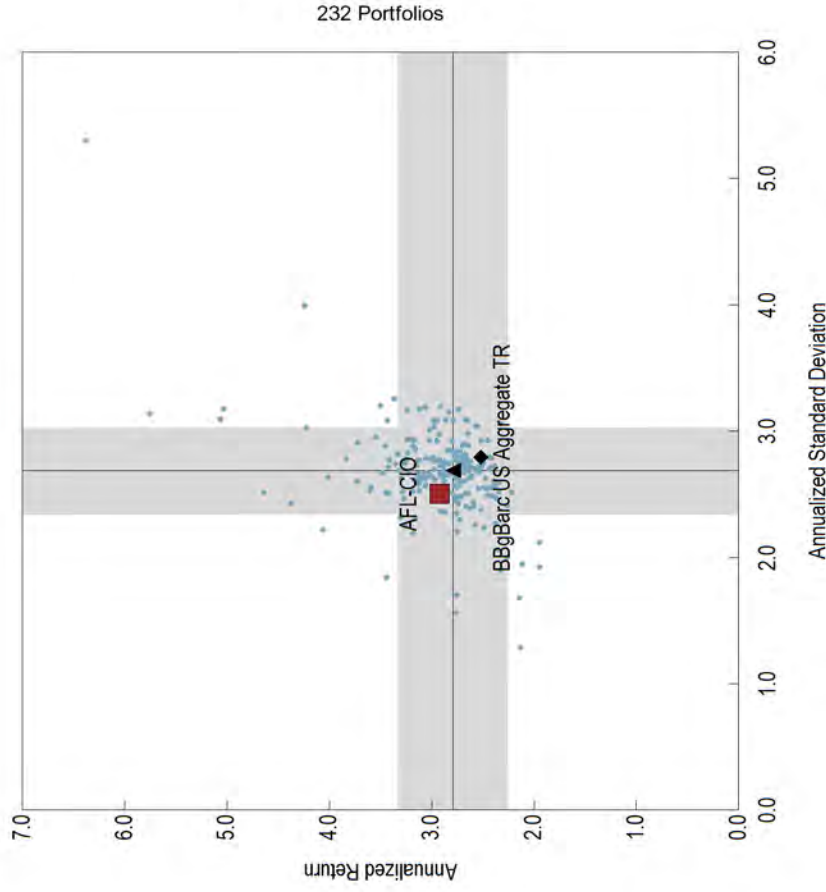
Risk vs. Return 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018

3 Years



5 Years



3 Years

5 Years

AFL-CIO
BBgBarc US Aggregate TR
eV US Core Fixed Inc Gross Median

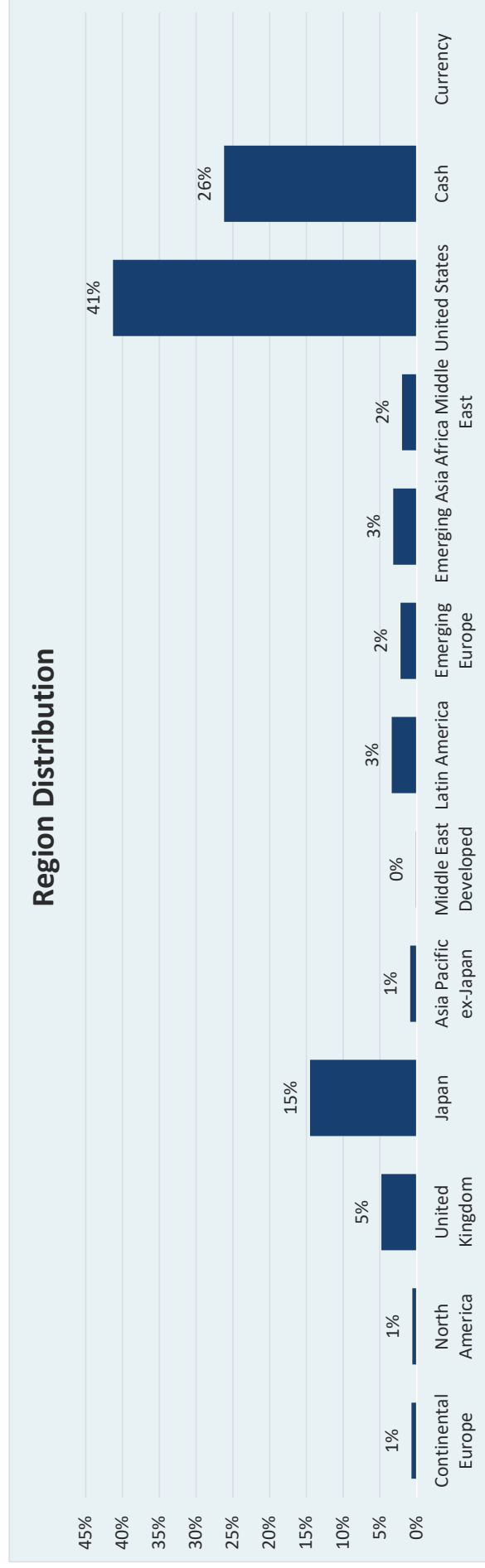
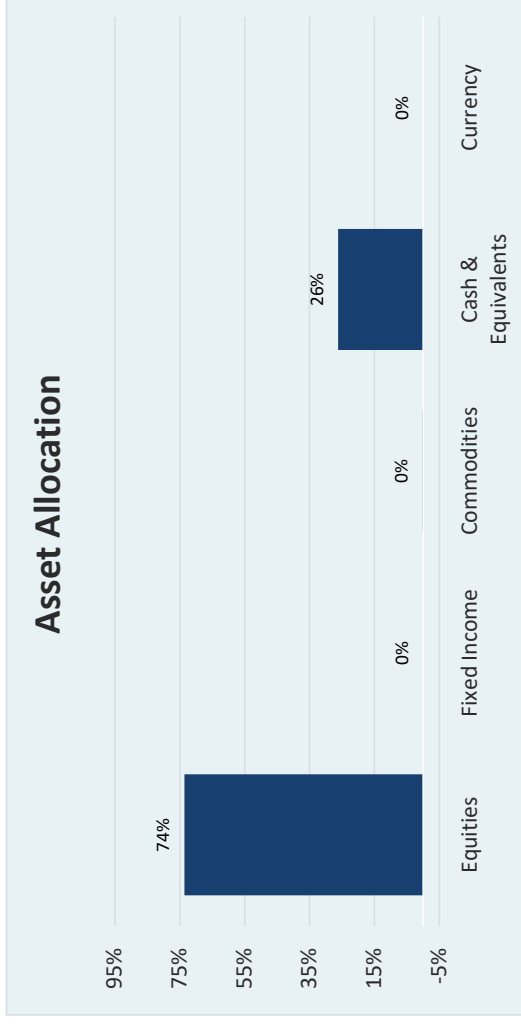
AFL-CIO
BBgBarc US Aggregate TR
eV US Core Fixed Inc Gross Median

Wellington Total Return Manager Portfolio Overview

Period Ending: December 31, 2018

Tactical multi-asset class real return strategy with a focus on managing risk of active strategies used to gain exposure to attractive assets of markets.

| Wellington Total Return | |
|------------------------------|------|
| Number of Equity Holdings | 1099 |
| Number of Commodity Holdings | 151 |
| Effective Duration (Years) | 3.80 |
| Average Quality | n/a |



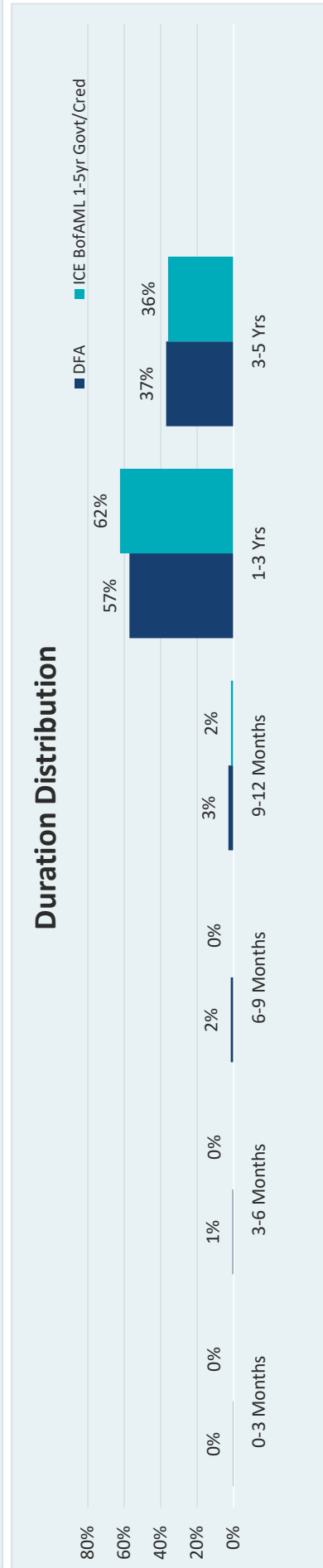
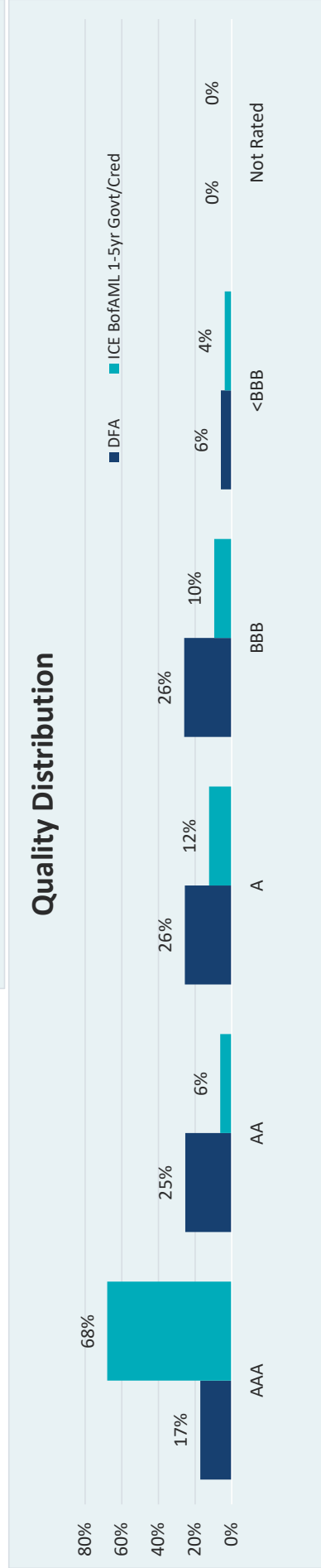
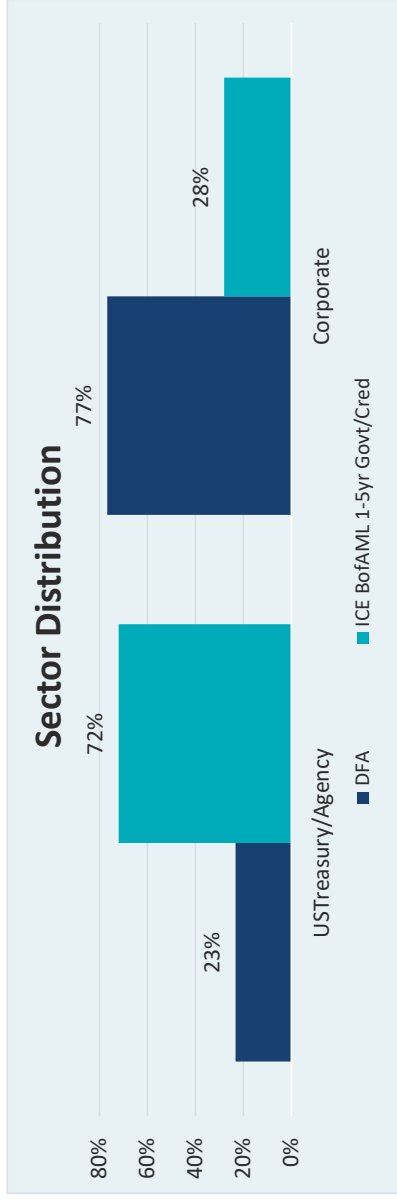
Liquidity Managers

DFA Short Credit Manager Portfolio Overview

Period Ending: December 31, 2018

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 | 2.51 | 2.61 |
| Yield to Maturity | 3.25 | 2.87 |
| Average Quality | A+ | Aa1 |
| Average Coupon | 2.77% | 2.63% |

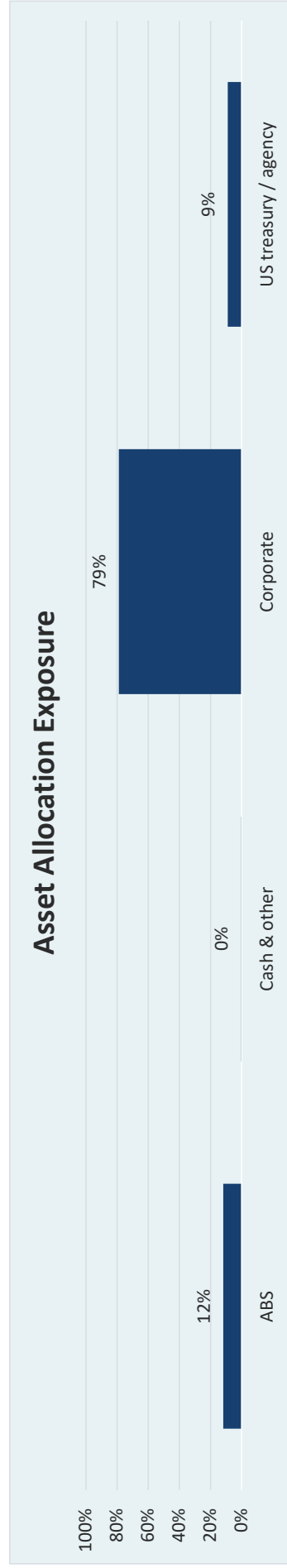
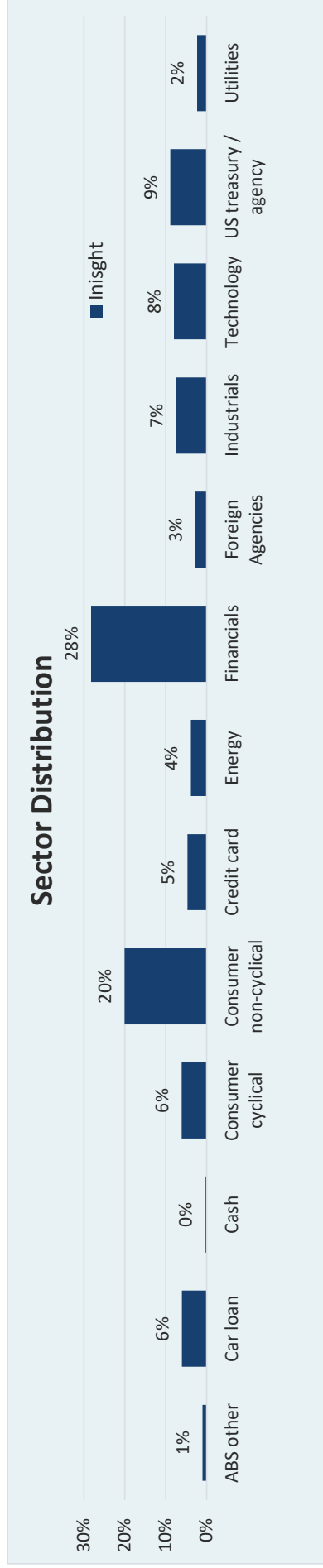
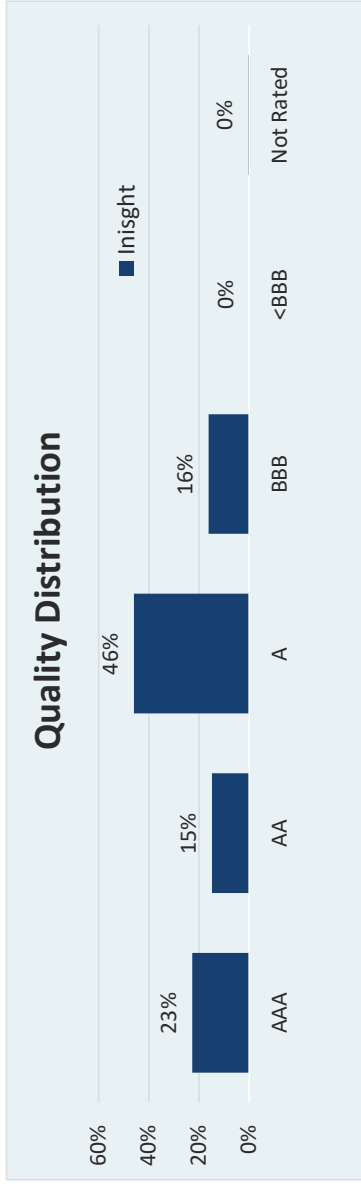


Insight Short Duration Manager Portfolio Overview

Period Ending: December 31, 2018

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 | 1.54 | 1.91 |
| Yield to Maturity | 3.18 | 2.53 |
| Average Quality | A+ | AAA |
| Average Coupon | 2.5% | 2.1% |

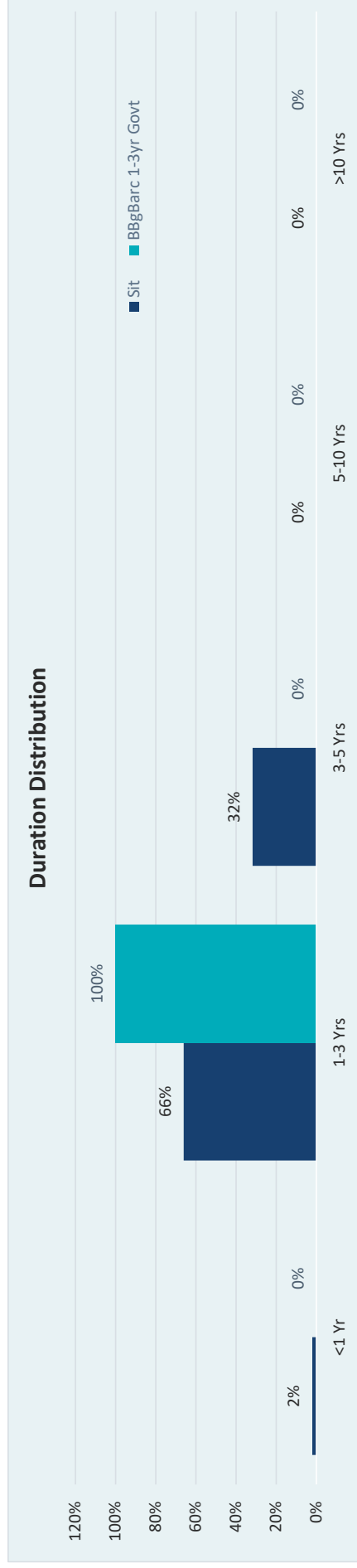
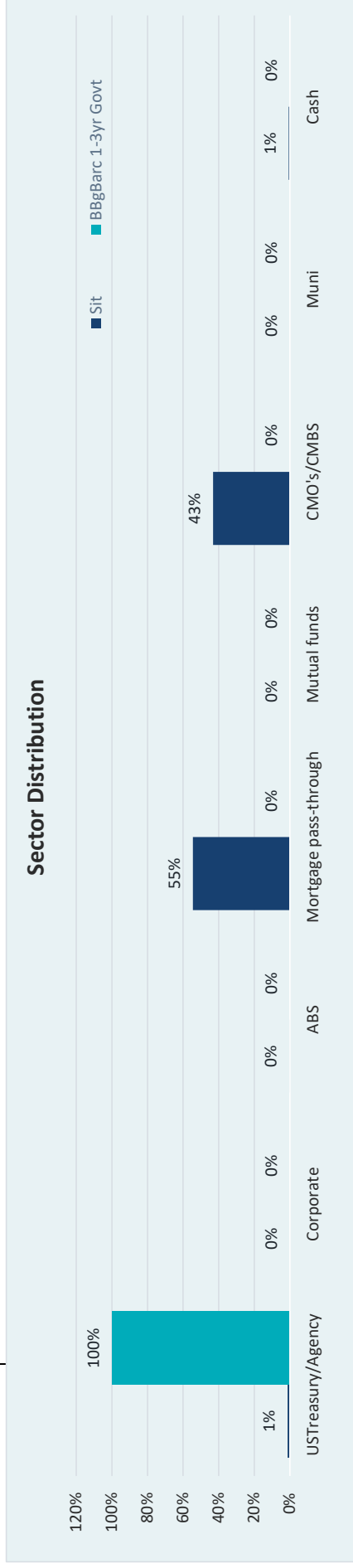


Sit Short Duration Manager Portfolio Overview

Period Ending: December 31, 2018

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 |
|--------------------------|------|-----------------------|
| Adjusted Duration | 2.60 | 1.9 |
| Yield to Maturity | 3.10 | 2.5 |
| Average Quality | AAA | AAA |
| Average Coupon | 6.5% | 2.0% |



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.

Manager Line Up

| Manager | Inception Date | Data Source | Manager | Inception Date | Data Source |
|---------------------------------|----------------|-----------------|--------------------------------|----------------|-----------------|
| BlackRock Russell 1000 Index | 4/20/2017 | BlackRock | Long Wharf Fund IV | 7/3/2013 | Long Wharf |
| Jackson Square Partners | 5/1/2005 | State Street | Long Wharf Fund V | 9/30/2016 | Long Wharf |
| Robeco Boston Partners | 6/1/1995 | State Street | Invesco Real Estate II | 11/26/2007 | Invesco |
| Emerald Advisors | 4/7/2003 | State Street | Invesco Real Estate III | 6/30/2013 | Invesco |
| Ceredex | 11/6/2011 | State Street | Invesco Real Estate IV | 6/30/2014 | Invesco |
| Plyford | 4/25/2014 | State Street | Oaktree REOF V | 12/31/2011 | Oaktree |
| William Blair | 10/29/2010 | William Blair | Oaktree REOF VI | 9/30/2013 | Oaktree |
| Artisan Partners | 10/1/2012 | SEI Trust | Oaktree REOF VII | 4/1/2015 | Oaktree |
| First Eagle | 1/18/2011 | State Street | Siguler Guff DREOF | 1/25/2012 | Siguler Guff |
| PIMCO RAE Emerging Markets | 2/28/2017 | State Street | Siguler Guff DREOF II | 8/31/2013 | Siguler Guff |
| TT Emerging Markets | 7/27/2017 | TT | Siguler Guff DREOF II Co-Inv | 1/27/2016 | Siguler Guff |
| AFL-CIO | 6/30/1991 | AFL-CIO | Paulson Real Estate Fund II | 11/10/2013 | State Street |
| Sit Short Duration | 1/2/2016 | State Street | Adams Street Partners | 3/18/1996 | StepStone Group |
| DFA Short Credit | 11/21/2016 | State Street | Adams Street Partners II | 1/16/2009 | StepStone Group |
| Insight Short Duration | 11/18/2016 | State Street | Adams Street Partners Venture | 4/28/2017 | StepStone Group |
| BlackRock | 4/20/2017 | BlackRock | Adams Street Partners - BFP | 1/18/1996 | StepStone Group |
| Torchlight II | 9/30/2006 | StepStone Group | Adams Street Partners - Fund 5 | 9/21/2012 | StepStone Group |
| Torchlight III | 12/31/2008 | StepStone Group | Bay Area Equity Fund | 6/14/2004 | StepStone Group |
| Torchlight IV | 7/1/2012 | StepStone Group | Bay Area Equity Fund II | 12/7/2009 | StepStone Group |
| Torchlight V | 7/1/2012 | StepStone Group | Carpenter Bancfund | 1/31/2008 | StepStone Group |
| Allianz Global Investors | 4/25/2000 | State Street | EIF US Power Fund I | 11/26/2003 | StepStone Group |
| BlackRock Transition | 1/1/2016 | State Street | EIF US Power Fund II | 8/16/2005 | StepStone Group |
| Wellington Real Total Return | 2/26/2013 | State Street | EIF US Power Fund III | 5/30/2007 | StepStone Group |
| Aether Real Assets III | 11/27/2013 | StepStone Group | EIF US Power Fund IV | 11/28/2011 | StepStone Group |
| Commonfund | 6/28/2013 | StepStone Group | EIF US Power Fund V | 11/28/2016 | StepStone Group |
| Adelante | 9/30/2001 | State Street | Nogales | 2/15/2004 | StepStone Group |
| Cash | - | State Street | Paladin III | 11/30/2007 | StepStone Group |
| Angelo Gordon Realty Fund VIII | 1/23/2012 | Angelo Gordon | Ocean Avenue Fund II | 6/11/2014 | StepStone Group |
| Angelo Gordon Realty Fund IX | 12/8/2014 | Angelo Gordon | Ocean Avenue Fund III | 4/15/2016 | StepStone Group |
| Angelo Gordon Energy Credit Opp | 9/24/2015 | StepStone Group | Pathway | 1/19/1998 | StepStone Group |
| DLJ RECP III | 6/23/2005 | DLJ | Pathway 2008 | 12/26/2008 | StepStone Group |
| DLJ RECP IV | 2/11/2008 | DLJ | Pathway 6 | 5/24/2011 | StepStone Group |

| | | | | | |
|-----------------------------|-----------|-----------------|---------------------------------|------------|-----------------|
| DLJ RECP V | 7/1/2014 | DLJ | Pathway 7 | 2/7/2013 | StepStone Group |
| Wastewater Opp. Fund | 12/8/2015 | StepStone Group | Siguler Guff CCCERA Opps | 6/3/2014 | StepStone Group |
| LaSalle Income & Growth VI | 7/16/2013 | LaSalle | Siguler Guff Secondary Opps | 11/30/2016 | StepStone Group |
| LaSalle Income & Growth VII | 2/28/2017 | LaSalle | Aether Real Assets IV | 3/16/2016 | StepStone Group |
| Hearststone II | 6/17/1998 | Hearststone | StepStone CC Opportunities Fund | 2/1/2018 | StepStone Group |
| Parametric Overlay | 3/29/2017 | State Street | Parametric Defensive Equity | 7/23/2018 | State Street |

Policy & Custom Index Composition

| | |
|---|---|
| Policy Index (7/1/2018 - present) | 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 (7/1/2018 - present) | 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 (7/1/2018 - present) | 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. |

Other Disclosures

All data prior to 12/31/2014 was provided by previous consultant. As of 7/1/2018 all Private Equity and Private Credit data is provided by StepStone Group.

Glossary

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: Portfolio Return - [Risk-free Rate + Portfolio Beta x (Market Return - 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: Portfolio Excess Return / 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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Verus receives universe data from InvestorForce, eVestment Alliance, and Morningstar. We believe this data to be robust and appropriate for peer comparison. Nevertheless, these universes may not be comprehensive of all peer investors/managers but rather of the investors/managers that comprise that database. The resulting universe composition is not static and will change over time. Returns are annualized when they cover more than one year. Investment managers may revise their data after report distribution. Verus will make the appropriate correction to the client account but may or may not disclose the change to the client based on the materiality of the change.



Meeting Date
02/27/19
Agenda Item
#8b.

Memorandum

Date: February 27, 2019
To: CCCERA Board of Retirement
From: Timothy Price, Chief Investment Officer
Subject: Investment Staff Report – Q4 2018

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 69% MSCI ACWI, 23% Bloomberg 1-3 Year Gov/Credit, and 8% 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, and has outperformed the Simple Target Index over the trailing five 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. Through the fourth quarter of 2018, all managers held high quality portfolios (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 an aggregate 2.1 years, which is considered short duration. Additional details on the liquidity program managers are available in the appendix.

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. In the fourth quarter, CCCERA's Growth portfolio returned -7.4%, with weakness in the global public equity markets more than offsetting positive results from our private credit, private real estate and private equity programs.

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 fourth quarter, the Risk Diversifying mandate fulfilled most of these goals. The entire mandate is able to be liquidated within 30 days, meeting the requirement of high liquidity. The beta of the mandate to growth markets is approximately 0.1, which shows good diversification. Trailing real (net of inflation) returns over the past five years is -1.6%, which is well below expectations. The addition of the Parametric Defensive Equity portfolio to the risk-diversifying sub-portfolio during the prior quarter helped diversify the program, but Wellington's inflation-sensitive continues struggle in a low inflationary environment.

The Liquidity, Growth, and Risk Diversifying sub-portfolios are largely functioning well and within expectations. The product teams and asset managers are stable, and at this time we see few causes of organizational concern at our investment managers. CCCERA's Total Fund in aggregate is performing in line with expectations, having a higher return and 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.

Liquidity

| Objective | Measurement | Current Period Data | Status |
|---------------------|-------------------------------------|---------------------|----------------------|
| High Quality | Credit Quality | A+ | Meeting Expectations |
| Low Risk | Duration | 2.1 years | Meeting Expectations |
| Appropriately Sized | Months of Benefit Payments Invested | 43 Months | Meeting Expectations |

Growth

| Objective | Measurement | Current Period Data | Status |
|------------------------------|----------------------------|--|----------------------|
| Growth of Plan Assets | Absolute Returns | Trailing 5yr return of 6.8% | Meeting Expectations |
| | Benchmark Relative Returns | 2.5% over ACWI over trailing 5 years | Meeting Expectations |
| Efficient Capital Deployment | Sharpe Ratio | CCCERA: 0.93 MSCI ACWI: 0.34 (over trailing 5 years) | Meeting Expectations |

Risk Diversifying

| Objective | Measurement | Current Period Data | Status |
|---------------------------------------|--|-----------------------------------|----------------------|
| Offset Volatility in Growth Portfolio | Beta | 0.1 over trailing 5 years | Meeting Expectations |
| Positive Real Returns | Returns | Trailing 5yr real return of -1.8% | 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 | Meeting 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 | 2% | 0% | N |
| Sit | Good | -4% | -8% | N |
| DFA | Good | -5% | -10% | N |

Performance

| | Portfolio Average Credit Quality | Portfolio Average Duration | Portfolio Average Coupon | 1 Year Total Return |
|---------|----------------------------------|----------------------------|--------------------------|---------------------|
| Insight | A+ | 1.5 | 2.5 | 1.7% |
| Sit | AAA | 2.6 | 6.5 | 2.5% |
| DFA | A+ | 2.5 | 2.8 | 1.2% |

Manager Notes:

Sit:

Mike Brilley, head of fixed income, will be retiring at the end of 2018. No expected impact as Mike played no direct role on CCCERA's account and will not be replaced.

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 | -10% | -18% | N |
| Jackson Square | Good | -24% | -20% | N |
| BlackRock Index Fund | Good | 46% | 5% | N |
| Emerald Advisors | Good | -17% | -19% | N |
| Ceredex | Good | -26% | -21% | N |
| Pyrford (BMO) | Good | 1% | 2% | N |
| William Blair | Good | -24% | -34% | N |
| First Eagle | Good | -19% | -21% | N |
| Artisan Global | Good | -5% | -17% | N |
| PIMCO/RAE EM | Good | -1% | -5% | N |
| TT EM | Good | 21% | -1% | N |
| Adelante | Good | -4% | -6% | N |
| Allianz | Good | 4% | n/a | 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 | -9% | 6% | Y |
| Jackson Square | -2% | 8% | Y |
| BlackRock Index Fund | -5% | 8% | Y |
| Emerald Advisors | -11% | 7% | Y |
| Ceredex | -11% | 5% | Y |
| Pyrford (BMO) | -11% | 2% | Y |
| William Blair | -17% | 1% | N |
| First Eagle | -8% | 4% | Y |
| Artisan Global | -8% | 8% | Y |
| PIMCO/RAE EM | -12% | 3% | Y |
| TT EM | -18% | 5% | Y |
| Adelante | -5% | 8% | Y |
| Allianz | -4% | 2% | Y |
| | 1Yr Premium | 5 Year Premium | |
| Private Equity | 22% | 8% | Y |
| Private Credit | 18% | 7% | Y |
| Real Estate | 17% | 7% | Y |

Manager Notes:

William Blair reclassified \$7 billion in assets from investment management to advisory, accounting for a portion of the decline of firm-wide assets.

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.

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.

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.

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 | -5% | -5% | N |
| Parametric | Good | 13% | -9% | N |
| Wellington | Satisfactory | -26% | -7% | Y |

Performance

| | Trailing 1 Year Correlation to Growth | Trailing 3 Year Correlation to Growth | 1 Year Return | 5 Year Return | % of Portfolio Liquid in 30 Days |
|------------|---------------------------------------|---------------------------------------|---------------|---------------|----------------------------------|
| AFL-CIO | -0.4 | -0.2 | 1% | 3% | 100% |
| Parametric | 0.9 | 0.9 | -3% | 6% | 100% |
| Wellington | 0.1 | 0.1 | -5% | -2% | 100% |

Manager Notes:

Wellington:

The Real Total Return strategy follows a dual mandate of diversification as well as a sensitivity to inflation. The lack of inflationary pressures in the U.S. has meant that the inflation sensitive strategies have experienced negative results over the past several years. Staff is currently evaluating alternate strategies that we may wish to pursue within this portion of the Risk Diversifying Sub-Portfolio

On May 12, 2017, the US Securities and Exchange Commission notified Wellington that it was opening an investigation into some aspects of Wellington's private company investment activities. The investigation appeared to be focused on private equity investments and associated valuation practices unrelated to the CCCERA Real Total Return portfolio. On October 24, 2018, The SEC informed Wellington that it had concluded its investigation and does not intend to recommend any enforcement action against the firm.

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.

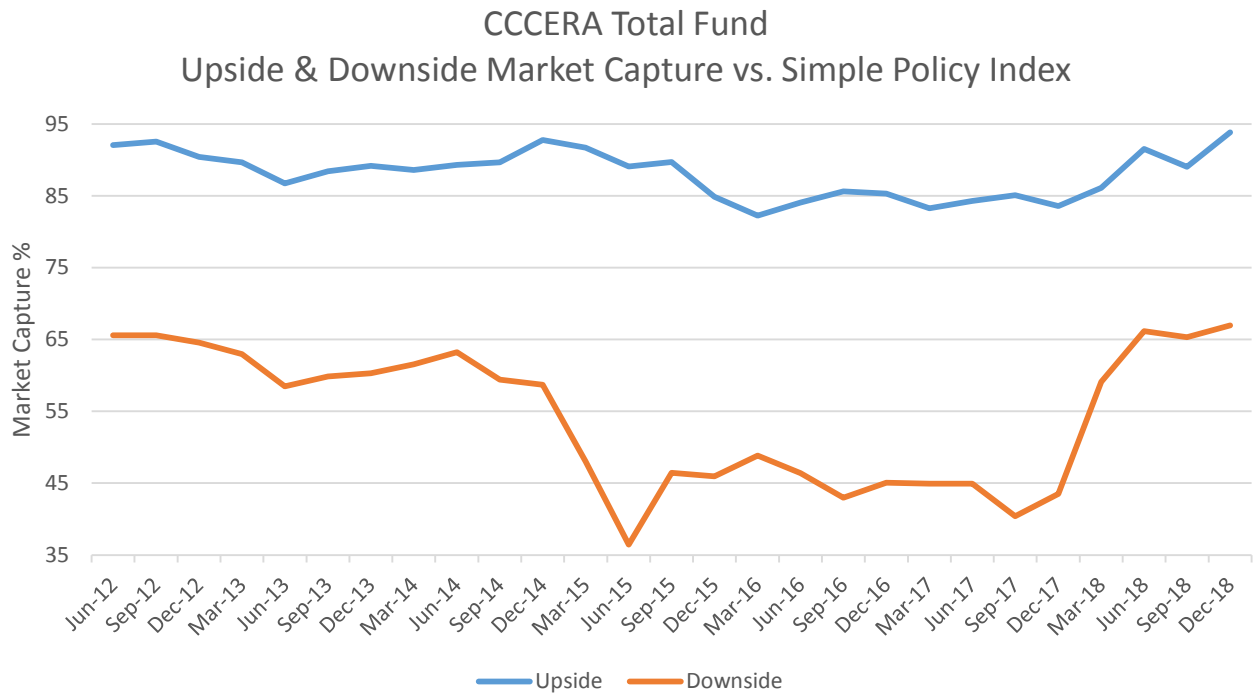
AFL-CIO: Portfolio of domestic, high quality fixed income securities which are backed by commercial and residential mortgages.

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.

Wellington: Multi-strategy fund which tactically rotates between assets to produce returns.

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 June 2018 the composition was 61% MSCI ACWI, 27% Bloomberg 1-3 Year Gov/Credit, and 12% 3-Month Treasury Bills and from July 2018 to present the composition is 69% MSCI ACWI, 23% Bloomberg 1-3 Year Gov/Credit, and 8% 3-Month Treasury Bills.

Total Fund Quarterly Attribution

| | CCCERA Total Fund | | | Simple Target Index | | | Analysis | | |
|-------------------|-------------------|--------|---------------------|---------------------|--------|---------------------|-----------------------|-------------------|--------------|
| | Allocation | Return | Return Contribution | Allocation | Return | Return Contribution | Allocation Difference | Return Difference | Total Effect |
| Liquidity | 25% | 1.2% | 0.3% | 23% | 1.2% | 0.3% | 2% | 0.1% | 0.0% |
| Growth | 67% | -7.4% | -5.0% | 69% | -12.8% | -8.8% | -2% | 5.4% | 3.8% |
| Risk Diversifying | 8% | -0.9% | -0.1% | 8% | 0.6% | 0.0% | 0% | -1.4% | -0.1% |
| Total Fund | 100% | | -4.7% | 100% | | -8.5% | 0% | | 3.7% |

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 | -2.5 | -5.8 | 6.2 | 4.3 | 5.9 | 2.9 | 9.8 | 7.2 |
| Volatility | 6.2 | 8.8 | 5.2 | 6.8 | 5.2 | 7.4 | 8.0 | 10.5 |
| Sharpe | -0.7 | -0.9 | 1.0 | 0.5 | 1.0 | 0.3 | 1.2 | 0.7 |

The Simple Target Index is made up of 69% MSCI ACWI, 23% Bloomberg 1-3 Year Gov/Credit, and 8% 3-Month Treasury Bill. This purpose of this index is to examine whether or not CCCERA is being rewarded for pursuing a more nuanced portfolio versus a very simple representative index.

CCCERA’s Total Fund has produced high risk adjusted returns over most trailing periods. Additionally, the CCCERA Portfolio has exceeded the Simple Target Index over all trailing periods. This would indicate that CCCERA has been rewarded for engaging in more complex investments which target outperformance versus investing passively in the publicly traded market.

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. Over all trailing periods, the Total Fund has produced a better Sharpe ratio relative to the Simple Target Index, indicating that CCCERA is being favorably rewarded for the risk taken in the portfolio.

Retirement Board Meeting
February 27, 2019

RETIREMENT PROCESS

Meeting Date
02/27/19
Agenda Item
#9

Tim Hoppe, Retirement
Services Manager

Christina Dunn, Deputy CEO



Retirement Process Overview

| Steps prior to retirement | Timing |
|--------------------------------------|---|
| 1. Informational Session | Throughout career |
| 2. Pre-Retirement Workshop | Within 5 years of Retirement |
| 3. Retirement Estimate | Requested by member 6 months to 1 year prior to retirement date |
| 4. One-on-one Counseling Appointment | 60-90 days prior to retirement date |

Step 1: Informational Sessions

- CCCERA conducts informational sessions for active members covering:
 - Tiers administered by CCCERA
 - General information on contribution rates and how to find each member's rate
 - Vesting requirements
 - How Final Average Salary (FAS) is calculated
 - Service credit and review types of purchases
 - Reciprocity
 - Annual benefit statements
 - Where to get additional information
 - Frequently asked questions

Step 2: Pre-Retirement Workshops

- CCCERA conducts pre-retirement workshops for members within 5 years of retirement covering:
 - Same information as informational sessions (above)
 - Individualized retirement estimate is provided to attendees
 - Pre and post tax considerations
 - Death during active membership
 - Health and dental benefits and contact information
 - Presentations from county health benefits representative, Mass Mutual representative, and retiree organizations
 - Next steps to complete retirement including necessary documents
 - Attendees have the opportunity to meet with a retirement counselor one-on-one immediately after session

Step 3: Retirement Estimates

- What items are reviewed when completing a pre-retirement estimate:
 - Actual pensionable salary including differentials provided by employer
 - MOUs are reviewed for future agreed upon salary increases
 - Sick leave and vacation accruals are included as reported by the employer
 - Upon request from the member will include possible leave of absences, salary changes, or position changes
- Legacy members with on-call or standby pay differentials receive two estimates: one with the differentials included and one without the differentials.

Step 4: One-on-One Counseling Appointment

- Member makes an appointment with their retirement counselor for a one-on-one appointment
- During the appointment the following items are reviewed:
 - Retirement calculation components including any purchases completed
 - Required paperwork – i.e. birth certificates, social security cards, divorce documentation
 - Reciprocity
 - Each payment option – Unmodified, Optional Settlement Allowance 1-4

Step 4: One-on-One Counseling Appointment

- During the appointment the following items are reviewed
continued:
 - Timing of first pension check
 - Next steps
 - Compensation enhancement policy
 - Acknowledgement of pending AB197 lawsuit
 - Insurance Deductions
 - Optional Deductions
 - Direct Deposits
 - Service purchases
- Average time of appointment is 1 hour

Retirement Application and Calculation Process

- Member submits retirement application and all necessary paperwork
- Employer submits final active payroll

Retirement Calculation process....

| Final Steps to Retirement payment | Average Timing |
|---|--|
| 1. Retirement Calculation | 8 weeks after final active payroll |
| 2. Retirement Payment Choices submitted to CCCERA | 2 weeks after final Retirement Calculation |
| 3. First pension check | 1 week after Retirement Payment Choice submitted to CCCERA |

Step 1: Retirement Calculation

- The retirement calculation process begins once the final active paycheck is received by CCCERA from the employer.
- The Information is received through employer reports and information requests to employers.
- The member's entire career retirement information is audited. The audit includes service time and contributions.
- The highest 12 or 36 months of salary, depending on member's tier(s), for the final average salary portion of the retirement calculation is determined.

Step 1: Retirement Calculation

- The retirement counselor manually completes the retirement calculation
- The supervisor reviews the contributions and calculation for accuracy
- The final calculation is verified in the pension administration software system
- Payment Choices are created manually and verified with the pension administration system

Step 2 and 3: Retirement Payment Choice and First Pension Check

- Member meets with retirement counselor to discuss final calculations and payment choices
- Member determines payment option choice and signs the choice of retirement allowance form
- The signed form is returned to CCCERA and the member is placed on the next available pension payroll.
- Initial pension check runs are completed 2 times per month

What can affect the timing of an initial pension check?

When processing retirement applications there are up to four parties that complete tasks:

Member

Responsible for:

Providing needed documents (i.e divorce information)

Completing the Retirement payment choice

Employer

Responsible for:

Submitting final active payroll information

Submitting information regarding pay codes under review for pensionability

CCCERA

Responsible for:

Completing retirement calculation

Researching pay codes for pensionability and possible enhancements

Completing retirement payment choice options for member to review

Adding member to pension payroll

Reciprocal Agency Responsibility:
Reciprocal Information (if applicable)

What can affect the timing of an initial pension check?

Member Responsibility:

- Required documentation not on file, for example: Birth Certificates, Marriage Licenses, Social Security Cards, divorce/QDRO documentation
- The member may retire during a divorce and the retirement calculation is delayed until the divorce is finalized
- Member delays in submitting the signed choice of retirement allowance form to CCCERA

What can affect the timing of an initial pension check?

Employer Responsibility:

- Final paychecks from employers are delayed

Example of employer with a monthly payroll:

| Last Day of Employment | Retirement Date | Final paycheck is processed |
|------------------------|-----------------|-----------------------------|
| March 5th | March 6th | April 10th |
| March 15th | March 16th | April 10th |
| March 30th | March 31st | May 10th |

- Payroll data that contains pay codes which require additional research – the employer may need to complete research in order to provide the needed documents to CCCERA

What can affect the timing of an initial pension check?

CCCERA Responsibility:

- An increase in retirements can slow down the processing of retirement applications
- Payroll data that contains pay codes which require additional research – communication with the employer and the member regarding the pay codes
- Retirement calculations are a manual process that take time and are additionally verified to the pension administration system.
- Reciprocal Agency is slow in providing information

Items reviewed during the retirement calculation

Individual pay code reviews:

For Legacy (pre-PEPRA) members, “Compensation earnable” does not include, in any case, the following: Payments for additional services rendered outside of normal working hours, whether paid in a lump sum or otherwise. (Government Code 31461(b)(3).) Pay codes must meet the following requirements:

- 1) Must be the normal working hours set forth in the applicable employment agreement
- 2) Must be required by the employer to be worked by the employee (as distinguished from voluntarily worked), and
- 3) Must be ordinarily worked by all others in the same grade or classification at the same rate of pay during the final average salary period.

Employers determine pay and report to CCCERA as pensionable only that pay for work that meets the three elements.

Policy On Determining “Compensation Earnable” Under Assembly Bill 197 For Purposes of Calculating Retirement Benefits For “Legacy” (Pre-PEPRA) Members

Items reviewed during the retirement calculation

Vacation pay/buy back reviews:

For Legacy (pre-PEPRA) members, “Compensation earnable” does not include, in any case, the following: Payments for unused vacation, annual leave, personal leave, sick leave, or compensatory time off, however denominated, whether paid in a lump sum or otherwise, in an amount that exceeds that which may be earned and payable in each 12-month period during the final average salary period, regardless of when reported or paid. (Government Code 31461(b)(2).)

Policy On Determining “Compensation Earnable” Under Assembly Bill 197 For Purposes of Calculating Retirement Benefits For “Legacy” (Pre-PEPRA) Members

Items reviewed during the retirement calculation

Leave cash outs “estoppel class” reviews:

Certain Legacy (pre-PEPRA) members are entitled to include additional leave cash out amounts in their “compensation earnable” if the following requirements are met:

- Before Dec. 31, 2012, the member's employer allowed, during employment, a cash out of unused leave time in amounts in excess of the amount of leave time earned in the selected FAS period.
- On Dec. 31, 2012, the member had accrued (“banked”) such excess leave time.
- At retirement, the member still has some or all of that banked leave time at commencement of his or her final average salary period.
- The member cashes out some or all of that bank during service in the FAS period (not upon termination).

Policy On Determining “Compensation Earnable” Under Assembly Bill 197 For Purposes of Calculating Retirement Benefits For “Legacy” (Pre-PEPRA) Members

Items reviewed during the retirement calculation

Compensation enhancement reviews:

Staff makes an initial assessment as to whether any item of compensation included in the final compensation was paid to enhance a member's retirement benefit. Items considered:

- Whether the compensation was earned within the period during which final compensation is to be calculated
- Whether the compensation exceeds a members' base pay, and if so, whether the earnings codes reported are retirement compensable
- Information provided by the member and employer as to the facts and circumstances concerning an item of compensation

For enhancements, staff prepares an administrative recommendation to the Board, affording the member and the employer notice and an opportunity to respond and appear

Policy Regarding Assessment and Determination of Compensation Enhancements

Steps CCCERA takes to shorten the timeline

- Encourage members to provide necessary documentation prior to retirement: workshops, newsletters, member handbook, website, in-person counseling appointments
- Information to the participating employers about pay reporting and retirement process: employer handbook, website, in-person meetings with employers
- During the retirement process providing written and verbal communication on outstanding items needed including required documents and choice of retirement allowance form
- Cross training staff for additional quality assurance reviewers
- When additional research is needed with particular pay codes the retirement calculation will be processed prior to the final determination in order to begin providing the member with an allowance

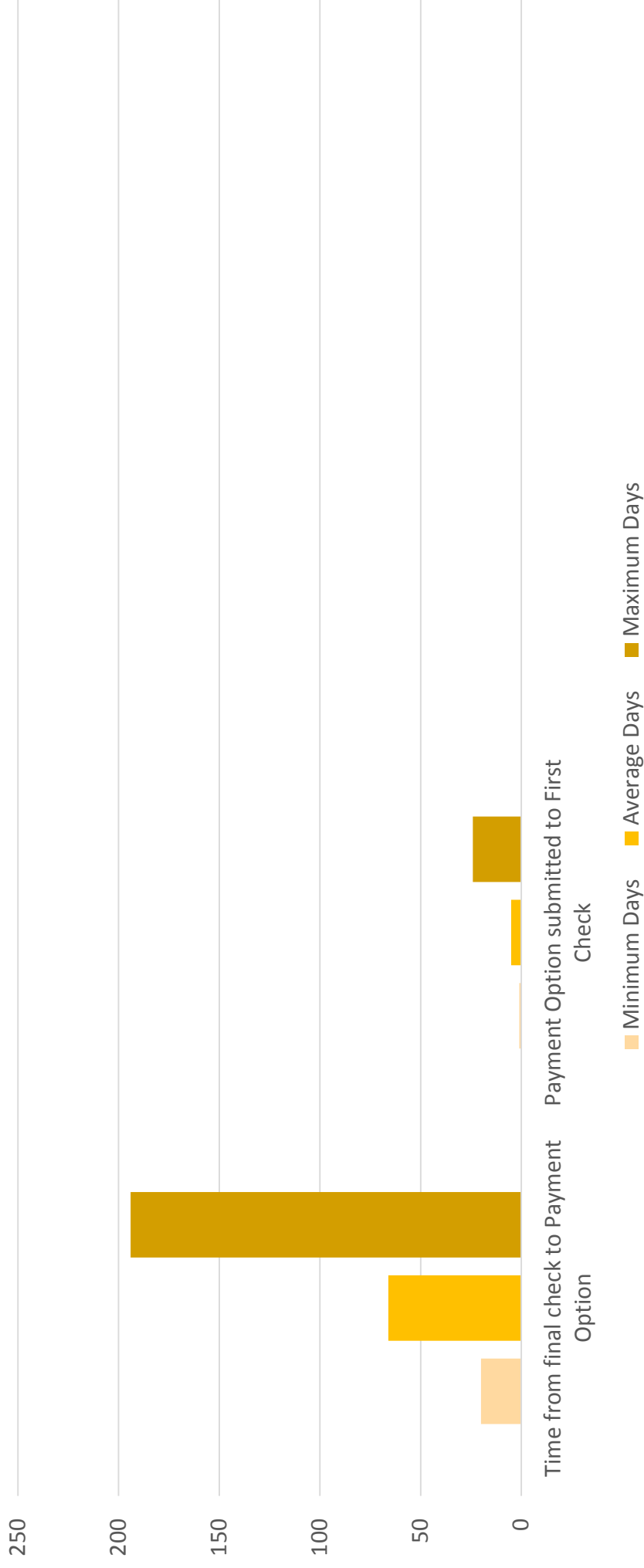
Statistical Information

Average Retirement Estimates completed each year: 1,850

Average Service Retirements processed each year: 360

Statistical Information

Average Retirement Processing Times



Member Survey Results

- **Informational session average score – 4.7 out of 5**
- **Pre-Retirement Workshop average score – 4.5 out of 5**
- **In office survey results – 4.9 out of 5**

Retirement Process

Questions?



Meeting Date
02/27/19
Agenda Item
#10

MEMORANDUM

Date: February 27, 2019

To: CCCERA Board of Retirement

From: Christina Dunn, Deputy Chief Executive Officer

Subject: Information on fire standby differential paid by Contra Costa County Fire Protection District

At the November 28, 2018 meeting, concerns were raised by the Contra Costa County Fire Protection District ("District") regarding the exclusion of "standby" pay from some of their retiring member's final average salary. The Board of Retirement indicated its interest in discussing the review process at the time of retirement specifically related to the "standby" pay code for the District members.

Overview

The District has been reporting the fire standby differential as pensionable to CCCERA, and retirement contributions have been submitted to CCCERA for this pay code. As employees of the District have retired, it was determined that some of the employees that received "standby" pay in their final average salary period did not meet the requirements set forth by the CCCERA policy, therefore the "standby" pay was not included in the employee's compensation earnable.

CCCERA is governed by the following provisions:

"Compensation Earnable" Excludes Payments For Additional Services Rendered Outside of Normal Working Hours.

Applicable Law: "Compensation earnable" does not include, in any case, the following:

Payments for additional services rendered outside of normal working hours, whether paid in a lump sum or otherwise. (G.C. § 31461(b)(3).)

CCCERA Policies and Practices. Pay received for "overtime" is not included in "compensation earnable." To be included, the time for which compensation is received (1) must be the normal working hours set forth in the applicable employment agreement, (2) must be required by the employer to be worked by the

employee (as distinguished from voluntarily worked), and (3) must be ordinarily worked by all others in the same grade or classification at the same rate of pay during the FAS period. Pay that will be reviewed under these conditions is often described as "standby" and "on-call." Employers must report to CCCERA as pensionable only that pay for work that is required of and ordinarily served by everyone in the same grade or classification, at the same rate of pay.

(CCCERA Policy on Determining "Compensation Earnable" under Assembly Bill 197 for purposes of calculating retirement benefits for Legacy members, Section III.D., ("Policy") a copy of which is enclosed)

CCCERA is required to conduct an individual member analysis to determine whether retiring members' pay qualifies. As a result, during the retirement process, CCCERA analyzes each retiring member's pay history, applicable MOU provisions, etc. to make a determination.

There is a pending lawsuit regarding whether "standby" pay (as well as other types of pay) is properly excluded from pensionable compensation for pre-PEPRA (Legacy) CCCERA members (the "AB 197 Lawsuit"). The AB 197 lawsuit is currently on appeal with the Supreme Court of the State of California, Case No. S247095. During the pendency of this lawsuit, CCCERA is required to follow the Superior Court's order and the CCCERA Policy, which was approved by the court. There is another pending lawsuit, in which members seek a return of retirement contributions based on the AB 197 changes, which has been stayed pending the outcome of the main AB 197 lawsuit.

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
BOARD OF RETIREMENT

**POLICY ON DETERMINING "COMPENSATION EARNABLE"
UNDER ASSEMBLY BILL 197
FOR PURPOSES OF CALCULATING RETIREMENT BENEFITS
FOR "LEGACY" (PRE-PEPRA) MEMBERS**

Adopted: 9/10/2014

I. INTRODUCTION

In 1997, the California Supreme Court held that "compensation earnable" used to determine a retiring member's retirement allowance ordinarily includes all cash payments received for services performed, with the exception of overtime pay. *Ventura Deputy Sheriffs' Assn. v. Board of Retirement*, 16 Cal.4th 483 (1997). In 2012, the California Legislature enacted and the Governor signed into law Assembly Bill 197, which changed the way the Board of Retirement must calculate "compensation earnable". The effective date of AB 197 was January 1, 2013, but that date was postponed until July 12, 2014 by an order of the Contra Costa County Superior Court.¹ AB 197 applies to the calculation of benefits for all active or deferred employees who first became CCCERA members before January 1, 2013 ("Legacy Members.") AB 197 does not apply to "New Members," generally those who became members of CCCERA for the first time on or after January 1, 2013. The retirement allowances of "New Members" will be calculated under the provisions of the California Public Employees' Pension Reform Act of 2013 ("PEPRA.")

On May 12, 2014, the Contra Costa County Superior Court issued a final Judgment and Writ interpreting AB 197 and concluding that it was consistent with prior law. The Court's Statement of Decision supporting the Judgment concluded that several of CCCERA's prior practices were not consistent with applicable law — primarily with reference to the inclusion of leave sell-backs and cash-outs for time not both earned and payable annually during the one- or three-year final average salary ("FAS") period. Although the litigation is now on appeal, the Judgment and Writ have not been stayed, and CCCERA is legally bound to apply them to all retirements occurring on or after July 12, 2014.

AB 197 and the Judgment and Writ changed the way CCCERA is obligated to calculate Legacy Members' retirement allowances, primarily by requiring CCCERA to exclude certain elements of compensation that previously were treated as "compensation earnable" if earned or received during the FAS period. AB 197 provides that these exclusions from "compensation earnable" are intended to be consistent with and not in conflict with the holdings in *Salus v. San Diego County Employees Retirement Association*, 117 Cal.App.4th 734 (2004) and *In re Retirement Cases*, 110 Cal.App.4th 426 (2003). (Gov. Code § 31461(c).) These two appellate court decisions held as follows: (1) Compensation that may only be received at termination and never

¹ *Contra Costa County Deputy Sheriffs Association, et al., v. CCCERA, et al.*, Contra Costa County Superior Court, Case No. N12-1870.

during service must be excluded from "compensation earnable"; and (2) Amounts received at the end of a career that "distort" the notion of "average annual compensation" must also be excluded. The Legislature intended that the Board's implementation of AB 197 be guided by these two principles, and the CCCERA Board intends to follow these principles in implementing the requirements of AB 197.

II. PURPOSE

The purpose of this Policy is to set forth what elements of pay constitute "compensation earnable" for Legacy Members under AB 197 and the Superior Court's Final Judgment and Writ.

III. POLICY

This Policy identifies what elements of compensation are now considered "compensation earnable" during the FAS period and sets forth the policies and practices CCCERA intends to follow in implementing the new law. A list of general pay items that are included in, and excluded from, "compensation earnable" by CCCERA effective on and after July 12, 2014 is attached hereto as Attachment A.

Where an item of remuneration is not excluded categorically from "compensation earnable," CCCERA's participating employers will need to collect and pay both employer and employee contributions on such amounts, if and when paid during service.

A. "Compensation Earnable" Is the Average Annual Compensation For the Period Under Consideration.

Applicable Law: *"Compensation earnable" by a member means the average compensation as determined by the board, for the period under consideration upon the basis of the average number of days ordinarily worked by persons in the same grade or class of positions during the period, and at the same rate of pay. The computation for any absence shall be based on the compensation of the position held by the member at the beginning of the absence. Compensation, as defined in Section 31460, that has been deferred shall be deemed "compensation earnable" when earned, rather than when paid. (Gov. Code Section 31461(a).)*

CCCERA Policies and Practices. This provision remains unchanged under AB 197. The section primarily defines what constitutes an ordinary work week, excluding compensation received for non-mandatory "overtime." Consistent with the Supreme Court decision in *Ventura Deputy Sheriffs' Assn. v. Board of Retirement*, 16 Cal.4th 483 (1997), "compensation earnable" ordinarily includes all cash payments received for services performed during normal working hours, and usually does not have to be earned or received by everybody else in the same grade or class. Thus, "compensation earnable" ordinarily includes regular salary, service and skill based differentials (e.g. POST, CPA, bilingual pay), holiday pay, allowances (uniform, automobile). "Compensation earnable" excludes overtime pay.

B. "Compensation Earnable" Excludes Payments For Unused Leave To The Extent They Exceed What Was Both Earned and Could Have Been Sold Back For Cash During Service During The FAS Period

Applicable Law: *"Compensation earnable" does not include, in any case, the following: Payments for unused vacation, annual leave, personal leave, sick leave, or compensatory time off, however denominated, whether paid in a lump sum or otherwise, in an amount that exceeds that which may be earned and payable in each 12-month period during the final average salary period, regardless of when reported or paid. (G.C. § 31461(b)(2).)*

CCCERA Policies and Practices. Every CCCERA employer has policies and memoranda of understanding governing its employees' ability to earn vacation, sick, compensatory and other leave time, and to receive the value of some or all of those accruals in cash in lieu of time off, but not all such cash payment for unused leave can be included as "compensation earnable". Cash payment for unused leave will be included only to the extent it does not exceed that which may be earned and payable in each 12-month period during the final average salary period.

The CCCERA Board has determined that if a Legacy Member has an employment agreement that allows an annual "sell back" of a certain number of leave hours (*e.g.*, every calendar or fiscal year), then the payment to be included in the FAS period will be limited to that same number of hours per year, regardless of whether the member actually cashed out more during the selected one- or three-year FAS period. Thus, if a member earns 240 hours of vacation leave in a calendar year and is allowed to sell back 80 hours of unused leave each calendar year, the amount that can be counted as "earned and payable" during the FAS period will be 80 hours, even if the member chose a FAS period that "straddles" two calendar years and sells back 80 hours twice during that period. This avoids the distortion that could arise between comparable members solely due to the selection of the twelve (or thirty-six) month FAS period, and yields a true "average annual" compensation earnable.

In general, it does not matter whether the member actually received the cash in lieu of time while still employed or at termination. If it was both earned and payable during the FAS period and does not exceed the employment agreement annual sell back limits, it will be "compensation earnable," regardless of when actually paid.

CCCERA will not need to trace the origin of each hour of leave earned, accrued and/or sold during a member's career. CCCERA will look to the applicable employment agreement to determine how much a member may earn and receive in cash in each time period (*e.g.*, each calendar year or fiscal year) during the FAS period to determine how much is to be included in "compensation earnable."

(i) **Exception: "Estoppel Class" Members Are Entitled to Include Additional Leave Cash Out Amounts Beyond What AB 197 Allows.**

Applicable Law. The Judgment and Writ recognize that some Legacy Members of CCCERA may be entitled to include additional leave cash-out amounts in their "compensation earnable" beyond the amounts allowed by AB 197. The requirements are:

- Before Dec. 31, 2012, the member's employer allowed, during employment, a cash out of unused leave time in amounts in excess of the amount of leave time earned in the selected FAS period.
- On Dec. 31, 2012, the member had accrued ("banked") such excess leave time.
- At retirement, the member still has some or all of that banked leave time at commencement of his or her FAS period.
- The member cashes out some or all of that bank during service in the FAS period (not upon termination).

If all the foregoing requirements are met, CCCERA also will include in the Legacy Member's "compensation earnable" for the FAS period the lesser of (a) the accrued bank or (b) the amount of the bank actually cashed out during the FAS period.

The CCCERA Board has determined that the bank can be preserved entirely if the member never uses or sells back more than what the member earns and can sell after December 31, 2012. For example, assume that the member had a bank of 320 hours on December 31, 2012, and prior to the beginning of the final compensation period the member only uses or sells back hours that the member earned after December 31, 2012. If the employer allows the member to sell back 320 hours during the final compensation period, it will all count towards the retirement allowance.

C. **"Compensation Earnable" Excludes Termination Pay.**

Applicable Law: *"Compensation earnable" does not include, in any case, the following: Payments made at the termination of employment, except those payments that do not exceed what is earned and payable in each 12-month period during the final average salary period, regardless of when reported or paid. (G.C. § 31461(b)(4).)*

CCCERA Policies and Practices. AB 197 made clear, based on case law precedent, that payments that are not both earned and payable to the member during service, but only received because of termination of employment, may not be included in the calculation of the retirement allowance. For example, severance pay and termination pay are generally excluded from "compensation earnable." It is recognized, however, that some pay for unused leave that could have been received during service may not be received until termination, solely due to the member's choice not to take it during service. Taking the money in a "lump sum" at termination does not necessarily disqualify it from inclusion in "compensation earnable." So long as the total of leave cashouts received during the FAS period and at termination does not exceed the amount that was both earned and could have been paid in cash during the FAS period, it will be included in calculating the retirement allowance, subject to the annual "sell back" limitation described in

Section III.B. of this Policy. Amounts in excess of that amount will be excluded from "compensation earnable."

D. "Compensation Earnable" Excludes Payments For Additional Services Rendered Outside of Normal Working Hours.

Applicable Law: *"Compensation earnable" does not include, in any case, the following: Payments for additional services rendered outside of normal working hours, whether paid in a lump sum or otherwise. (G.C. § 31461(b)(3).)*

CCCERA Policies and Practices. Pay received for "overtime" is not included in "compensation earnable." To be included, the time for which compensation is received (1) must be the normal working hours set forth in the applicable employment agreement, (2) must be required by the employer to be worked by the employee (as distinguished from voluntarily worked), and (3) must be ordinarily worked by all others in the same grade or classification at the same rate of pay during the FAS period. Pay that will be reviewed under these conditions is often described as "standby" and "on-call." Employers must report to CCCERA as pensionable only that pay for work that is required of and ordinarily served by everyone in the same grade or classification, at the same rate of pay.

E. "Compensation Earnable" Excludes Compensation Determined By the Board To Have Been Paid To Enhance A Member's Retirement Benefits.

Applicable Law: *"Compensation earnable" does not include, in any case, the following: Any compensation determined by the board to have been paid to enhance a member's retirement benefit under that system. That compensation may include:*

(A) Compensation that had previously been provided in kind to the member by the employer or paid directly by the employer to a third party other than the retirement system for the benefit of the member, and which was converted to and received by the member in the form of a cash payment in the final average salary period.

(B) Any one-time or ad hoc payment made to a member, but not to all similarly situated members in the member's grade or class.

(C) Any payment that is made solely due to the termination of the member's employment, but is received by the member while employed, except those payments that do not exceed what is earned and payable in each 12-month period during the final average salary period regardless of when reported or paid.

(G.C. § 31461(b)(1).)

CCCERA Policies and Practices. AB 197 gives the Board authority to review employer pay practices generally, and compensation received individually, to determine if any element of compensation being considered as "compensation earnable" during the FAS period was paid to "enhance" the member's retirement benefit. Examples would include converting from the use of an automobile for many years during service to the sudden receipt of an auto allowance in the year before retirement; converting from employer payments to third-party insurance providers

during a member's career to making direct cash payments to the member instead, and having the member separately purchase insurance coverage with the cash; a bonus received at the end of career solely for announcing one's retirement; retroactive grants of cashable leave time; pay received for voluntary after-hours "on-call" service substantially exceeding the member's practice during his or her career; "termination pay" that could not have been received during service; departmental transfers to higher paying positions in a member's final year after it is known the member is retiring; and similar examples of activities that appear to distort the "average annual" compensation earnable the member would have received had he or she not been nearing retirement.

Before the Board makes a determination under this provision, it will afford the member appropriate due process, including an opportunity to appear before the Board and present evidence to support the inclusion of the pay item in calculating the member's retirement allowance, as set forth in the Policy Regarding Assessment and Determination of Compensation Enhancements.

IV. IMPLEMENTATION BY CCCERA

The Retirement Chief Executive Officer, with assistance from legal counsel, is responsible for implementing the Board's determination related to "compensation earnable." The CEO is authorized to examine new pay codes and determine their pensionability as follows: If new pay codes are substantially similar to ones addressed in this Policy, the CEO is authorized to notify the employer of the pay item's pensionability without taking the item to the Board. If new pay codes are unusual or unique, the CEO will present the pay code to the Board for the Board's determination on pensionability. In all cases, the CEO will keep the Board informed regarding significant ongoing issues and challenges, as appropriate.

This Policy was adopted by the Board of Retirement on September 10, 2014 and supersedes the predecessor "Determining Which Pay Items are 'Compensation' for Retirement Purposes," as amended, and the Addendum thereto.

Attachment A

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
BOARD OF RETIREMENT

**CHART OF GENERAL PAY ITEMS THAT ARE INCLUDED IN AND EXCLUDED
FROM "COMPENSATION EARNABLE" EFFECTIVE JULY 12, 2014 UNDER
ASSEMBLY BILL 197 AND THE SUPERIOR COURT'S JUDGMENT AND WRIT
FOR "LEGACY" (PRE-PEPRA) MEMBERS**

The following list applies to the calculation of benefits for all active or deferred employees who first became CCCERA members before January 1, 2013 ("Legacy Members.") New members after that date will have their retirement allowances calculated under the provisions of the California Public Employees' Pension Reform Act of 2013 ("PEPRA.")

"Compensation earnable" ordinarily includes:

- Regular base salary
- FLSA premium pay for regularly scheduled work assignment (fire and law enforcement)
- Longevity pay
- Cash payments for special skills and qualifications and unique services, such as:
 - bilingual pay
 - shift differential
 - special assignment differential
 - holiday pay
- Educational incentive pay (e.g. POST, CPA)
- In-service leave cash outs (earned and payable each year, regardless of when actually paid)
- Allowances (e.g. uniform, automobile)
- Standby or on-call pay (for work during normal working hours, required by the employer and not voluntary, and ordinarily worked by all others in the same grade or classification at the same rate of pay during the FAS period)

"Compensation earnable" ordinarily excludes:

- Overtime pay
- Expense reimbursements
- The monetary value of advantages received in kind, such as:
 - uniforms
 - employer payments to third-party insurers
 - lodging
 - transportation
 - the use of an automobile.
- Employer contributions to deferred compensation plans
- Lump sum at termination for accrued unused leave that could not be cashed out annually during service
- Severance pay



MEMORANDUM

Date: February 27, 2019

To: CCCERA Board of Retirement

From: Timothy Price, Chief Investment Officer

Subject: Annual Statement of Compliance with Board Resolutions

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 2018 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 2018 and one resolution from 2017 remained in effect at the beginning of 2018. These resolutions are noted below and included with the memo as Appendix 1.

| RESOLUTION | CONTENT | DATE ADOPTED |
|-------------------|-------------------------------------|---------------------|
| 2017-6 | Asset Allocation Targets and Ranges | 7/12/17 |
| 2018-2 | Asset Allocation Targets and Ranges | 6/27/18 |

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 2017-6 and 2018-2 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 2018

| | Liquidity | | Growth | | Diversifying | | Cash & Overlay |
|-----------|------------|--------|------------|--------|--------------|-------|----------------|
| | Allocation | Range | Allocation | Range | Allocation | Range | Allocation |
| January | 19.5% | 16-28% | 71.0% | 60-80% | 5.9% | 0-10% | 3.6% |
| February | 19.6 | 16-28 | 70.8 | 60-80 | 6.0 | 0-10 | 3.7 |
| March | 19.4 | 16-28 | 70.5 | 60-80 | 6.1 | 0-10 | 4.1 |
| April | 18.9 | 16-28 | 71.2 | 60-80 | 6.1 | 0-10 | 3.9 |
| May | 18.6 | 16-28 | 71.1 | 60-80 | 6.1 | 0-10 | 4.2 |
| June | 18.3 | 16-28 | 72.3 | 60-80 | 6.1 | 0-10 | 3.3 |
| July | 19.2 | 16-28 | 65.7 | 60-80 | 8.1 | 0-10 | 6.9 |
| August | 22.5 | 16-28 | 65.9 | 60-80 | 8.1 | 0-10 | 3.4 |
| September | 22.1 | 16-28 | 66.7 | 60-80 | 8.2 | 0-10 | 3.0 |
| October | 22.2 | 16-28 | 66.8 | 60-80 | 8.2 | 0-10 | 2.8 |
| November | 21.8 | 16-28 | 67.0 | 60-80 | 8.2 | 0-10 | 2.9 |
| December | 22.0 | 16-28 | 66.0 | 60-80 | 8.4 | 0-10 | 3.6 |

Appendix 1

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

INVESTMENT ASSET ALLOCATION TARGETS AND RANGES – Phase 2b

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, on September 28, 2016, the Board adopted an Investment Policy Statement (IPS), pursuant to which the Board is to periodically set, review and revise its asset allocation targets.

WHEREAS, on October 26, 2016, the Board adopted Resolution 2016-3, establishing the first phase of CCCERA's investment asset allocation targets and ranges.

WHEREAS, on March 8, 2017, the Board adopted Resolution 2017-1, establishing the first step of the second phase of CCCERA's investment asset allocation targets and ranges.

WHEREAS, in order to continue to implement the IPS, it is prudent to move forward with establishing part b of the second phase of CCCERA's investment asset allocation targets and ranges.

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 IPS 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 and Investment Consultant 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 2017 the long-term asset allocation targets determined by the Board are as follows:

Liquidity: 27%
Growth: 61%

Diversifying: 12%

The Phase 2b targets differ slightly from the target long-term allocations due to fixed size of the liquidity program relative to the continued growth of the total fund. The \$2 billion liquidity program now represents 25% of the projected total fund value with the inclusion of estimated employer contribution pre-payments at the end of July 2017.

The Liquidity sub-portfolio will have a target allocation of 25% once the annual funding has been completed (typically in July of each year). 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.

In order to allocate assets such that the long-term allocation targets are satisfied, investment staff and the Investment Consultant recommended an Implementation Plan to the Board at the September 28, 2016 Board meeting. The Implementation Plan included 3 phases to prudently migrate the portfolio from its current asset allocation to the long-term asset allocation. This resolution provides the second step of Phase 2 asset allocation targets and ranges as an interim step towards reaching the desired long-term asset allocation. Phase 3 targets, once established, will be adopted by the Board and will supersede these Phase 2 targets.

Phase 2b Targets

| Sub-Portfolio Strategy | Phase 2b Target | Range |
|-------------------------------|------------------------|---------------|
| Growth | 69.0% | 60-80% |
| Jackson Square | 4.5% | |
| Boston Partners | 4.5% | |
| Emerald | 3.0% | |
| Ceredex | 3.0% | |
| BlackRock Index Fund | 1.3% | |
| Pyrford | 5.2% | |
| William Blair | 5.2% | |
| Artisan | 4.3% | |
| First Eagle | 4.3% | |
| TT Emerging Markets | 4.2% | |
| PIMCO/RAE Emerging Markets | 4.2% | |
| Adelante | 1.0% | |
| Private Real Estate | 8.0% | |
| Private Real Assets | 1.4% | |
| Private Equity | 8.2% | |
| Opportunistic | 0.5% | |
| Torchlight | 1.9% | |
| Allianz | 4.3% | |
| Liquidity | 25.0% | 16-28% |
| Insight | 12.6% | |

| | | |
|------------------------------|---------------|--------------|
| DFA | 6.2% | |
| Sit | 6.2% | |
| Risk Diversifying | 6.0% | 0-10% |
| AFL-CIO HIT | 3.5% | |
| Wellington Real Total Return | 2.5% | |
| Total | 100.0% | |

By this action, Resolution 2017-1 is hereby superseded.

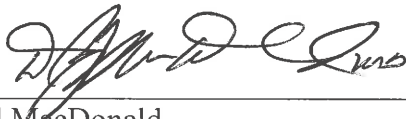
THIS RESOLUTION WAS ADOPTED BY THE AFFIRMATIVE VOTE OF THE BOARD OF RETIREMENT OF THE CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION THIS 12th DAY OF July, 2017.

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



Todd Smithey
Chairperson of the Board of Retirement

Attest:



David 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 September 28, 2016, 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 Investment Consultant 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 2018 the long-term asset allocation targets determined by the Board are as follows:

Liquidity: 23%
Growth: 67%
Diversifying: 10%

The Phase 3 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 Phase 3 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 23% 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.

Phase 3 Targets

| Sub-Portfolio Strategy | Phase 3 Target | Range |
|-------------------------------|-----------------------|---------------|
| Growth | 69.0% | 60-80% |
| Jackson Square | 3.0% | |
| Boston Partners | 3.0% | |
| Emerald | 2.0% | |
| Ceredex | 2.0% | |
| BlackRock Index Fund | 1.0% | |
| Pyrford | 5.5% | |
| William Blair | 5.5% | |
| Artisan | 4.0% | |
| First Eagle | 4.0% | |
| TT Emerging Markets | 4.0% | |
| PIMCO/RAE Emerging Markets | 4.0% | |
| Adelante | 1.0% | |
| Private Real Estate | 9.0% | |
| Private Equity | 10.0% | |
| Private Credit | 4.0% | |
| Allianz | 2.0% | |
| Risk Parity Manager(s) | 5.0% | |
| Liquidity | 23.0% | 16-28% |
| Insight | 12.0% | |
| DFA | 5.5% | |
| Sit | 5.5% | |
| Risk Diversifying | 8.0% | 0-10% |
| AFL-CIO HIT | 3.5% | |
| Wellington Real Total Return | 2.0% | |
| Parametric Defensive Equity | 2.5% | |
| Total | 100.0% | |

THIS RESOLUTION WAS ADOPTED BY THE AFFIRMATIVE VOTE OF THE BOARD OF RETIREMENT OF THE CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION THIS TWENTY-SEVENTH DAY OF JUNE, 2018.


AYES: Gordon, Holcombe, Kwon, MacDonald, Phillips, Pigeon, Smithey, Telles and Watts

NOES:

ABSTAIN:

ABSENT: Anderson


 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, 2018

| | Market Value | Percentage of Total Fund | Phase 2b Target Percentage | Phase 2b Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|----------------------|--------------------------|----------------------------|-----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 813,131,021 | 9.4% | 12.6% | -3.2% | | |
| Sit | 485,009,895 | 5.6% | 6.2% | -0.6% | | |
| Dimensional Fund Advisors | 393,251,042 | 4.5% | 6.2% | -1.7% | | |
| Total Liquidity | 1,691,391,958 | 19.5% | 25.0% | -5.5% | 27.0% | -7.5% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 426,591,400 | 4.9% | 4.5% | 0.4% | | |
| Jackson Square | 432,818,181 | 5.0% | 4.5% | 0.5% | | |
| BlackRock Index Fund | 126,577,880 | 1.5% | 1.3% | 0.2% | | |
| Emerald Advisors | 295,033,523 | 3.4% | 3.0% | 0.4% | | |
| Ceredex | 267,314,848 | 3.1% | 3.0% | 0.1% | | |
| Total Domestic Equity | 1,548,335,832 | 17.9% | 16.3% | 1.6% | 6.0% | 11.9% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 481,361,859 | 5.6% | 5.2% | 0.4% | 6.0% | -0.4% |
| William Blair | 524,522,005 | 6.0% | 5.2% | 0.8% | 6.0% | 0.0% |
| First Eagle | 380,029,743 | 4.4% | 4.3% | 0.1% | | |
| Artisan Global Opportunities | 409,709,625 | 4.7% | 4.3% | 0.4% | | |
| PIMCO/RAE Emerging Markets | 407,853,774 | 4.7% | 4.2% | 0.5% | 5.0% | -0.3% |
| TT Emerging Markets | 384,425,558 | 4.4% | 4.2% | 0.2% | 5.0% | -0.6% |
| Total Global & International Equity | 2,587,902,564 | 29.8% | 27.4% | 2.4% | 22.0% | 7.8% |
| Private Equity | | | | | | |
| Private Credit | 850,321,000 | 9.8% | 9.6% | 0.2% | 12.0% | -2.2% |
| Real Estate - Value Add | 145,026,000 | 1.7% | 2.4% | -0.7% | 12.0% | -10.3% |
| Real Estate - Opportunistic & Distressed | 153,472,000 | 1.8% | 4.0% | -2.2% | 4.0% | -2.2% |
| Real Estate - REIT (Adelante) | 447,720,000 | 5.2% | 4.0% | 1.2% | 4.0% | 1.2% |
| High Yield (Allianz) | 65,681,931 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| Total Other Growth Assets | 358,363,036 | 4.1% | 4.3% | -0.2% | | |
| Total Growth Assets | 2,020,583,966 | 23.3% | 25.3% | -2.0% | 33.0% | -9.7% |
| Total Growth Assets | 6,156,822,363 | 71.0% | 69.0% | 2.0% | 61.0% | 10.0% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 322,611,736 | 3.7% | 3.5% | 0.2% | 3.0% | 0.7% |
| Diversifying Strategies (Wellington) | 189,834,561 | 2.2% | 2.5% | -0.3% | 9.0% | -6.8% |
| Total Risk Diversifying | 512,446,297 | 5.9% | 6.0% | -0.1% | 12.0% | -6.1% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 53,534,669 | 0.6% | 0.0% | 0.6% | | |
| Cash | 257,404,477 | 3.0% | 0.0% | 3.0% | 0.0% | 3.0% |
| Total Cash and Overlay | 310,939,146 | 3.6% | 0.0% | 3.6% | 0.0% | 3.6% |
| Total Fund | 8,671,599,764 | 100% | 100% | 0% | 100% | 0% |

*Phase 2b targets and ranges reflect Phase 2b asset allocation targets accepted by the Board on July 12, 2017 (BOR Resolution 2017-6)

Contra Costa County Employees' Retirement Association
Asset Allocation as of February 28, 2018

| Liquidity | Market Value | Percentage of Total Fund | Phase 2b Target Percentage | Phase 2b Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---------------------------|----------------------|--------------------------|----------------------------|-----------------------|------------------|------------------------|
| Insight | 788,626,763 | 9.3% | 12.6% | -3.3% | | |
| Sit | 484,375,126 | 5.7% | 6.2% | -0.5% | | |
| Dimensional Fund Advisors | 379,139,208 | 4.5% | 6.2% | -1.7% | | |
| Total Liquidity | 1,652,141,097 | 19.6% | 25.0% | -5.4% | 27.0% | -7.4% |

Range
16% - 28%

Growth

Domestic Equity

| | | | | | | |
|------------------------------|----------------------|--------------|--------------|-------------|-------------|--------------|
| Boston Partners | 408,820,574 | 4.8% | 4.5% | 0.3% | | |
| Jackson Square | 418,692,539 | 5.0% | 4.5% | 0.5% | | |
| BlackRock Index Fund | 121,921,497 | 1.4% | 1.3% | 0.1% | | |
| Emerald Advisors | 286,004,976 | 3.4% | 3.0% | 0.4% | | |
| Ceredex | 253,525,537 | 3.0% | 3.0% | 0.0% | | |
| Total Domestic Equity | 1,488,965,123 | 17.6% | 16.3% | 1.3% | 6.0% | 11.6% |

Global & International Equity

| | | | | | | |
|--|----------------------|--------------|--------------|-------------|--------------|-------------|
| Pyrford (BMO) | 457,365,858 | 5.4% | 5.2% | 0.2% | 6.0% | -0.6% |
| William Blair | 503,807,791 | 6.0% | 5.2% | 0.8% | 6.0% | -0.0% |
| First Eagle | 364,916,565 | 4.3% | 4.3% | 0.0% | | |
| Artisan Global Opportunities | 400,377,649 | 4.7% | 4.3% | 0.4% | | |
| PIMCO/RAE Emerging Markets | 386,264,553 | 4.6% | 4.2% | 0.4% | 5.0% | -0.4% |
| TT Emerging Markets | 373,210,657 | 4.4% | 4.2% | 0.2% | 5.0% | -0.6% |
| Total Global & International Equity | 2,485,943,073 | 29.4% | 27.4% | 2.0% | 22.0% | 7.4% |

Private Equity

| | | | | | | |
|--|----------------------|--------------|--------------|--------------|--------------|--------------|
| Private Credit | 855,627,000 | 10.1% | 9.6% | 0.5% | 12.0% | -1.9% |
| Real Estate - Value Add | 145,628,000 | 1.7% | 2.4% | -0.7% | 12.0% | -10.3% |
| Real Estate - Opportunistic & Distressed | 153,472,000 | 1.8% | 4.0% | -2.2% | 4.0% | -2.2% |
| Real Estate - REIT (Adelante) | 431,302,000 | 5.1% | 4.0% | 1.1% | 4.0% | 1.1% |
| High Yield (Allianz) | 61,081,553 | 0.7% | 1.0% | -0.3% | 1.0% | -0.3% |
| High Yield (Allianz) | 353,481,721 | 4.2% | 4.3% | -0.1% | | |
| Total Other Growth Assets | 2,000,592,274 | 23.7% | 25.3% | -1.6% | 33.0% | -9.3% |

| | | | | | | |
|----------------------------|----------------------|--------------|--------------|-------------|--------------|-------------|
| Total Growth Assets | 5,975,500,470 | 70.8% | 69.0% | 1.8% | 61.0% | 9.8% |
|----------------------------|----------------------|--------------|--------------|-------------|--------------|-------------|

Range
60% - 80%

Risk Diversifying

| | | | | | | |
|--------------------------------------|--------------------|-------------|-------------|-------------|--------------|--------------|
| AFL-CIO | 319,971,431 | 3.8% | 3.5% | 0.3% | 3.0% | 0.8% |
| Diversifying Strategies (Wellington) | 188,566,349 | 2.2% | 2.5% | -0.3% | 9.0% | -6.8% |
| Total Risk Diversifying | 508,537,780 | 6.0% | 6.0% | 0.0% | 12.0% | -6.0% |

Range
0% - 10%

Cash and Overlay

| | | | | | | |
|-------------------------------|--------------------|-------------|-------------|-------------|-------------|-------------|
| Overlay (Parametric) | 55,940,953 | 0.7% | 0.0% | 0.7% | | |
| Cash | 252,933,564 | 3.0% | 0.0% | 3.0% | 0.0% | 3.0% |
| Total Cash and Overlay | 308,874,517 | 3.7% | 0.0% | 3.7% | 0.0% | 3.7% |

| | | | | | | |
|-------------------|----------------------|-------------|-------------|-----------|-------------|-----------|
| Total Fund | 8,445,053,862 | 100% | 100% | 0% | 100% | 0% |
|-------------------|----------------------|-------------|-------------|-----------|-------------|-----------|

*Phase 2b targets and ranges reflect Phase 2b asset allocation targets accepted by the Board on July 12, 2017 (BOR Resolution 2017-6)

Contra Costa County Employees' Retirement Association
Asset Allocation as of March 31, 2018

| | Market Value | Percentage of Total Fund | Phase 2b Target Percentage | Phase 2b Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|----------------------|--------------------------|----------------------------|-----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 765,466,226 | 9.2% | 12.6% | -3.4% | | |
| Sit | 486,026,489 | 5.8% | 6.2% | -0.4% | | |
| Dimensional Fund Advisors | 366,956,381 | 4.4% | 6.2% | -1.8% | | |
| Total Liquidity | 1,618,449,096 | 19.4% | 25.0% | -5.6% | 27.0% | -7.6% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 397,295,187 | 4.8% | 4.5% | 0.3% | | |
| Jackson Square | 407,118,868 | 4.9% | 4.5% | 0.4% | | |
| BlackRock Index Fund | 119,150,367 | 1.4% | 1.3% | 0.1% | | |
| Emerald Advisors | 283,871,667 | 3.4% | 3.0% | 0.4% | | |
| Ceredex | 253,419,337 | 3.0% | 3.0% | 0.0% | | |
| Total Domestic Equity | 1,460,855,426 | 17.5% | 16.3% | 1.2% | 6.0% | 11.5% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 453,344,092 | 5.4% | 5.2% | 0.2% | 6.0% | -0.6% |
| William Blair | 497,379,241 | 6.0% | 5.2% | 0.8% | 6.0% | -0.0% |
| First Eagle | 361,749,312 | 4.3% | 4.3% | 0.0% | | |
| Artisan Global Opportunities | 392,301,901 | 4.7% | 4.3% | 0.4% | | |
| PIMCO/RAE Emerging Markets | 382,799,181 | 4.6% | 4.2% | 0.4% | 5.0% | -0.4% |
| TT Emerging Markets | 362,092,392 | 4.3% | 4.2% | 0.1% | 5.0% | -0.7% |
| Total Global & International Equity | 2,449,666,119 | 29.3% | 27.4% | 1.9% | 22.0% | 7.3% |
| Private Equity | 828,032,000 | 9.9% | 9.6% | 0.3% | 12.0% | -2.1% |
| Private Credit | 152,571,000 | 1.8% | 2.4% | -0.6% | 12.0% | -10.2% |
| Real Estate - Value Add | 156,378,000 | 1.9% | 4.0% | -2.1% | 4.0% | -2.1% |
| Real Estate - Opportunistic & Distressed | 427,934,000 | 5.1% | 4.0% | 1.1% | 4.0% | 1.1% |
| Real Estate - REIT (Adelante) | 63,257,765 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| High Yield (Allianz) | 349,782,801 | 4.2% | 4.3% | -0.1% | | |
| Total Other Growth Assets | 1,977,955,566 | 23.7% | 25.3% | -1.6% | 33.0% | -9.3% |
| Total Growth Assets | 5,888,477,112 | 70.5% | 69.0% | 1.5% | 61.0% | 9.5% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 320,733,542 | 3.8% | 3.5% | 0.3% | 3.0% | 0.8% |
| Diversifying Strategies (Wellington) | 189,654,903 | 2.3% | 2.5% | -0.2% | 9.0% | -6.7% |
| Total Risk Diversifying | 510,388,444 | 6.1% | 6.0% | 0.1% | 12.0% | -5.9% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 52,759,931 | 0.6% | 0.0% | 0.6% | | |
| Cash | 286,494,804 | 3.4% | 0.0% | 3.4% | 0.0% | 3.4% |
| Total Cash and Overlay | 339,254,734 | 4.1% | 0.0% | 4.1% | 0.0% | 4.1% |
| Total Fund | 8,356,569,386 | 100% | 100% | 0% | 100% | 0% |

*Phase 2b targets and ranges reflect Phase 2b asset allocation targets accepted by the Board on July 12, 2017 (BOR Resolution 2017-6)

Contra Costa County Employees' Retirement Association
Asset Allocation as of April 30, 2018

| | Market Value | Percentage of Total Fund | Phase 2b Target Percentage | Phase 2b Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|----------------------|--------------------------|----------------------------|-----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 742,687,548 | 8.9% | 12.6% | -3.7% | | |
| Sit | 482,392,205 | 5.8% | 6.2% | -0.4% | | |
| Dimensional Fund Advisors | 353,731,175 | 4.2% | 6.2% | -2.0% | | |
| Total Liquidity | 1,578,810,928 | 18.9% | 25.0% | -6.1% | 27.0% | -8.1% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 400,492,093 | 4.8% | 4.5% | 0.3% | | |
| Jackson Square | 406,108,294 | 4.9% | 4.5% | 0.4% | | |
| BlackRock Index Fund | 119,552,567 | 1.4% | 1.3% | 0.1% | | |
| Emerald Advisors | 284,936,016 | 3.4% | 3.0% | 0.4% | | |
| Ceredex | 256,372,010 | 3.1% | 3.0% | 0.1% | | |
| Total Domestic Equity | 1,467,460,980 | 17.6% | 16.3% | 1.3% | 6.0% | 11.6% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 457,047,263 | 5.5% | 5.2% | 0.3% | 6.0% | -0.5% |
| William Blair | 500,712,563 | 6.0% | 5.2% | 0.8% | 6.0% | 0.0% |
| First Eagle | 363,961,646 | 4.4% | 4.3% | 0.1% | | |
| Artisan Global Opportunities | 396,967,889 | 4.8% | 4.3% | 0.5% | | |
| PIMCO/RAE Emerging Markets | 382,271,252 | 4.6% | 4.2% | 0.4% | 5.0% | -0.4% |
| TT Emerging Markets | 357,216,664 | 4.3% | 4.2% | 0.1% | 5.0% | -0.7% |
| Total Global & International Equity | 2,458,177,276 | 29.5% | 27.4% | 2.1% | 22.0% | 7.5% |
| Private Equity | 851,493,000 | 10.2% | 9.6% | 0.6% | 12.0% | -1.8% |
| Private Credit | 163,650,000 | 2.0% | 2.4% | -0.4% | 12.0% | -10.0% |
| Real Estate - Value Add | 153,927,000 | 1.8% | 4.0% | -2.2% | 4.0% | -2.2% |
| Real Estate - Opportunistic & Distressed | 427,825,000 | 5.1% | 4.0% | 1.1% | 4.0% | 1.1% |
| Real Estate - REIT (Adelante) | 63,817,999 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| High Yield (Allianz) | 349,383,894 | 4.2% | 4.3% | -0.1% | | |
| Total Other Growth Assets | 2,010,096,893 | 24.1% | 25.3% | -1.2% | 33.0% | -8.9% |
| Total Growth Assets | 5,935,735,148 | 71.2% | 69.0% | 2.2% | 61.0% | 10.2% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 317,804,261 | 3.8% | 3.5% | 0.3% | 3.0% | 0.8% |
| Diversifying Strategies (Wellington) | 187,450,002 | 2.2% | 2.5% | -0.3% | 9.0% | -6.8% |
| Total Risk Diversifying | 505,254,263 | 6.1% | 6.0% | 0.1% | 12.0% | -5.9% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 50,987,132 | 0.6% | 0.0% | 0.6% | | |
| Cash | 270,864,707 | 3.2% | 0.0% | 3.2% | 0.0% | 3.2% |
| Total Cash and Overlay | 321,851,839 | 3.9% | 0.0% | 3.9% | 0.0% | 3.9% |
| Total Fund | 8,341,652,178 | 100% | 100% | 0% | 100% | 0% |

*Phase 2b targets and ranges reflect Phase 2b asset allocation targets accepted by the Board on July 12, 2017 (BOR Resolution 2017-6)

Contra Costa County Employees' Retirement Association
Asset Allocation as of May 31, 2018

| | Market Value | Percentage of Total Fund | Phase 2b Target Percentage | Phase 2b Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|----------------------|--------------------------|----------------------------|-----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 720,896,787 | 8.7% | 12.6% | -3.9% | | |
| Sit | 483,734,622 | 5.8% | 6.2% | -0.4% | | |
| Dimensional Fund Advisors | 342,746,913 | 4.1% | 6.2% | -2.1% | | |
| Total Liquidity | 1,547,378,322 | 18.6% | 25.0% | -6.4% | 27.0% | -8.4% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 398,621,571 | 4.8% | 4.5% | 0.3% | | |
| Jackson Square | 419,108,272 | 5.0% | 4.5% | 0.5% | | |
| BlackRock Index Fund | 122,604,734 | 1.5% | 1.3% | 0.2% | | |
| Emerald Advisors | 306,361,951 | 3.7% | 3.0% | 0.7% | | |
| Ceredex | 268,536,524 | 3.2% | 3.0% | 0.2% | | |
| Total Domestic Equity | 1,515,233,052 | 18.2% | 16.3% | 1.9% | 6.0% | 12.2% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 446,094,650 | 5.4% | 5.2% | 0.2% | 6.0% | -0.6% |
| William Blair | 502,379,224 | 6.0% | 5.2% | 0.8% | 6.0% | 0.0% |
| First Eagle | 364,361,442 | 4.4% | 4.3% | 0.1% | | |
| Artisan Global Opportunities | 399,659,805 | 4.8% | 4.3% | 0.5% | | |
| PIMCO/RAE Emerging Markets | 364,674,432 | 4.4% | 4.2% | 0.2% | 5.0% | -0.6% |
| TT Emerging Markets | 340,178,759 | 4.1% | 4.2% | -0.1% | 5.0% | -0.9% |
| Total Global & International Equity | 2,417,348,312 | 29.0% | 27.4% | 1.6% | 22.0% | 7.0% |
| Private Equity | 863,130,000 | 10.4% | 9.6% | 0.8% | 12.0% | -1.6% |
| Private Credit | 136,606,000 | 1.6% | 2.4% | -0.8% | 12.0% | -10.4% |
| Real Estate - Value Add | 155,983,000 | 1.9% | 4.0% | -2.1% | 4.0% | -2.1% |
| Real Estate - Opportunistic & Distressed | 421,262,000 | 5.1% | 4.0% | 1.1% | 4.0% | 1.1% |
| Real Estate - REIT (Adelante) | 65,223,377 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| High Yield (Allianz) | 346,725,980 | 4.2% | 4.3% | -0.1% | | |
| Total Other Growth Assets | 1,988,930,357 | 23.9% | 25.3% | -1.4% | 33.0% | -9.1% |
| Total Growth Assets | 5,921,511,721 | 71.1% | 69.0% | 2.1% | 61.0% | 10.1% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 318,789,471 | 3.8% | 3.5% | 0.3% | 3.0% | 0.8% |
| Diversifying Strategies (Wellington) | 190,478,530 | 2.3% | 2.5% | -0.2% | 9.0% | -6.7% |
| Total Risk Diversifying | 509,268,002 | 6.1% | 6.0% | 0.1% | 12.0% | -5.9% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 49,235,132 | 0.6% | 0.0% | 0.6% | | |
| Cash | 299,004,247 | 3.6% | 0.0% | 3.6% | 0.0% | 3.6% |
| Total Cash and Overlay | 348,239,379 | 4.2% | 0.0% | 4.2% | 0.0% | 4.2% |
| Total Fund | 8,326,397,424 | 100% | 100% | 0% | 100% | 0% |

*Phase 2b targets and ranges reflect Phase 2b asset allocation targets accepted by the Board on July 12, 2017 (BOR Resolution 2017-6)

Contra Costa County Employees' Retirement Association
Asset Allocation as of June 30, 2018

| | Market Value | Percentage of Total Fund | Phase 3 Target Percentage | Phase 3 Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|----------------------|--------------------------|---------------------------|----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 697,455,828 | 8.5% | 12.0% | -3.5% | | |
| Sit | 482,786,680 | 5.9% | 5.5% | 0.4% | | |
| Dimensional Fund Advisors | 329,410,558 | 4.0% | 5.5% | -1.5% | | |
| Total Liquidity | 1,509,653,066 | 18.3% | 23.0% | -4.7% | 23.0% | -4.7% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 395,079,843 | 4.8% | 3.0% | 1.8% | | |
| Jackson Square | 423,687,946 | 5.1% | 3.0% | 2.1% | | |
| BlackRock Index Fund | 123,396,474 | 1.5% | 1.0% | 0.5% | | |
| Emerald Advisors | 310,233,552 | 3.8% | 2.0% | 1.8% | | |
| Ceredex | 273,911,563 | 3.3% | 2.0% | 1.3% | | |
| Total Domestic Equity | 1,526,309,378 | 18.5% | 11.0% | 7.5% | 5.0% | 13.5% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 443,155,210 | 5.4% | 5.5% | -0.1% | | |
| William Blair | 490,712,598 | 5.9% | 5.5% | 0.4% | | |
| First Eagle | 360,330,728 | 4.4% | 4.0% | 0.4% | | |
| Artisan Global Opportunities | 397,147,350 | 4.8% | 4.0% | 0.8% | | |
| PIMCO/RAE Emerging Markets | 344,791,961 | 4.2% | 4.0% | 0.2% | | |
| TT Emerging Markets | 323,528,055 | 3.9% | 4.0% | -0.1% | | |
| Total Global & International Equity | 2,359,665,903 | 28.6% | 27.0% | 1.6% | 24.0% | 4.6% |
| Private Equity | 856,237,000 | 10.4% | 10.0% | 0.4% | 11.0% | -0.6% |
| Private Credit | 235,606,000 | 2.9% | 4.0% | -1.1% | 12.0% | -9.1% |
| Real Estate - Value Add | 159,437,000 | 1.9% | 5.0% | -3.1% | 5.0% | -3.1% |
| Real Estate - Opportunistic & Distressed | 411,930,000 | 5.0% | 4.0% | 1.0% | 4.0% | 1.0% |
| Real Estate - REIT (Adelante) | 67,542,607 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| High Yield (Allianz) | 346,773,913 | 4.2% | 2.0% | 2.2% | 0.0% | 4.2% |
| Risk Parity | 0 | 0.0% | 5.0% | -5.0% | 5.0% | -5.0% |
| Total Other Growth Assets | 2,077,526,520 | 25.2% | 31.0% | -5.8% | 38.0% | -12.8% |
| Total Growth Assets | 5,963,501,801 | 72.3% | 69.0% | 3.3% | 67.0% | 5.3% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 317,519,384 | 3.8% | 3.5% | 0.3% | 3.0% | 0.8% |
| Diversifying Strategies (Wellington) | 187,389,994 | 2.3% | 4.5% | -2.2% | 7.0% | -4.7% |
| Total Risk Diversifying | 504,909,379 | 6.1% | 8.0% | -1.9% | 10.0% | -3.9% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 44,967,111 | 0.5% | | 0.5% | | |
| Cash | 229,721,551 | 2.8% | | 2.8% | | |
| Total Cash and Overlay | 274,688,663 | 3.3% | 0.0% | 3.3% | 0.0% | 3.3% |
| Total Fund | 8,252,752,908 | 100% | 100% | 0% | 100% | 0% |

*Phase 3 targets and ranges reflect Phase 3 asset allocation targets accepted by the Board on June 27, 2018 (BOR Resolution 2018-2)

Contra Costa County Employees' Retirement Association
Asset Allocation as of July 31, 2018

| | Market Value | Percentage of Total Fund | Phase 3 Target Percentage | Phase 3 Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|-------------------------|--------------------------|---------------------------|----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 963,743,359 | 11.1% | 12.0% | -0.9% | | |
| Sit | 524,210,435 | 6.1% | 5.5% | 0.6% | | |
| Dimensional Fund Advisors | 456,274,281 | 5.3% | 5.5% | -0.2% | | |
| Total Liquidity | 1,944,228,075 | 22.5% | 23.0% | -0.5% | 23.0% | -0.5% |
| | | | Range | | | |
| | | | 16% - 28% | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 307,387,605 | 3.6% | 3.0% | 0.6% | | |
| Jackson Square | 341,178,770 | 3.9% | 3.0% | 0.9% | | |
| BlackRock Index Fund | 132,052,199 | 1.5% | 1.0% | 0.5% | | |
| Emerald Advisors | 256,861,602 | 3.0% | 2.0% | 1.0% | | |
| Ceredex | 216,032,900 | 2.5% | 2.0% | 0.5% | | |
| Total Domestic Equity | 1,253,513,076 | 14.5% | 11.0% | 3.5% | 5.0% | 9.5% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 455,673,259 | 5.3% | 5.5% | -0.2% | | |
| William Blair | 494,284,014 | 5.7% | 5.5% | 0.2% | | |
| First Eagle | 363,161,425 | 4.2% | 4.0% | 0.2% | | |
| Artisan Global Opportunities | 413,298,846 | 4.8% | 4.0% | 0.8% | | |
| PIMCO/RAE Emerging Markets | 344,096,837 | 4.0% | 4.0% | -0.0% | | |
| TT Emerging Markets | 314,113,234 | 3.6% | 4.0% | -0.4% | | |
| Total Global & International Equity | 2,384,627,615 | 27.6% | 27.0% | 0.6% | 24.0% | 3.6% |
| Private Equity | | | | | | |
| Private Credit | 858,548,000 | 9.9% | 10.0% | -0.1% | 11.0% | -1.1% |
| Real Estate - Value Add | 213,820,000 | 2.5% | 4.0% | -1.5% | 12.0% | -9.5% |
| Real Estate - Opportunistic & Distressed | 163,914,000 | 1.9% | 5.0% | -3.1% | 5.0% | -3.1% |
| Real Estate - REIT (Adelante) | 409,477,000 | 4.7% | 4.0% | 0.7% | 4.0% | 0.7% |
| High Yield (Allianz) | 69,184,397 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| Risk Parity | 349,288,028 | 4.0% | 2.0% | 2.0% | 0.0% | 4.0% |
| Total Other Growth Assets | 0 | 0.0% | 5.0% | -5.0% | 5.0% | -5.0% |
| Total Growth Assets | 2,064,231,425 | 23.9% | 31.0% | -7.1% | 38.0% | -14.1% |
| | | | Range | | | |
| | | | 60% - 80% | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 317,083,725 | 3.7% | 3.5% | 0.2% | 3.0% | 0.7% |
| Parametric Defensive Equity | 200,802,009 | 2.3% | 2.5% | -0.2% | 3.5% | -1.2% |
| Wellington Real Total Return | 186,155,251 | 2.2% | 2.0% | 0.2% | 3.5% | -1.3% |
| Total Risk Diversifying | 704,040,985 | 8.1% | 8.0% | 0.1% | 10.0% | -1.9% |
| | | | Range | | | |
| | | | 0% - 10% | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 48,445,919 | 0.6% | | 0.6% | | |
| Cash | 249,112,666 | 2.9% | | 2.9% | | |
| Total Cash and Overlay | 297,558,585 | 3.4% | 0.0% | 3.4% | 0.0% | 3.4% |
| Total Fund | 8,648,199,761.00 | 100% | 100% | 0% | 100% | 0% |

*Phase 3 targets and ranges reflect Phase 3 asset allocation targets accepted by the Board on June 27, 2018 (BOR Resolution 2018-2)

Contra Costa County Employees' Retirement Association
Asset Allocation as of August 31, 2018

| | Market Value | Percentage of Total Fund | Phase 3 Target Percentage | Phase 3 Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|-------------------------|--------------------------|---------------------------|----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 963,743,359 | 11.1% | 12.0% | -0.9% | | |
| Sit | 524,210,435 | 6.1% | 5.5% | 0.6% | | |
| Dimensional Fund Advisors | 456,274,281 | 5.3% | 5.5% | -0.2% | | |
| Total Liquidity | 1,944,228,075 | 22.5% | 23.0% | -0.5% | 23.0% | -0.5% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 307,387,605 | 3.6% | 3.0% | 0.6% | | |
| Jackson Square | 341,178,770 | 3.9% | 3.0% | 0.9% | | |
| BlackRock Index Fund | 132,052,199 | 1.5% | 1.0% | 0.5% | | |
| Emerald Advisors | 256,861,602 | 3.0% | 2.0% | 1.0% | | |
| Ceredex | 216,032,900 | 2.5% | 2.0% | 0.5% | | |
| Total Domestic Equity | 1,253,513,076 | 14.5% | 11.0% | 3.5% | 5.0% | 9.5% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 455,673,259 | 5.3% | 5.5% | -0.2% | | |
| William Blair | 494,284,014 | 5.7% | 5.5% | 0.2% | | |
| First Eagle | 363,161,425 | 4.2% | 4.0% | 0.2% | | |
| Artisan Global Opportunities | 413,298,846 | 4.8% | 4.0% | 0.8% | | |
| PIMCO/RAE Emerging Markets | 344,096,837 | 4.0% | 4.0% | -0.0% | | |
| TT Emerging Markets | 314,113,234 | 3.6% | 4.0% | -0.4% | | |
| Total Global & International Equity | 2,384,627,615 | 27.6% | 27.0% | 0.6% | 24.0% | 3.6% |
| Private Equity | 858,548,000 | 9.9% | 10.0% | -0.1% | 11.0% | -1.1% |
| Private Credit | 213,820,000 | 2.5% | 4.0% | -1.5% | 12.0% | -9.5% |
| Real Estate - Value Add | 163,914,000 | 1.9% | 5.0% | -3.1% | 5.0% | -3.1% |
| Real Estate - Opportunistic & Distressed | 409,477,000 | 4.7% | 4.0% | 0.7% | 4.0% | 0.7% |
| Real Estate - REIT (Adelante) | 69,184,397 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| High Yield (Allianz) | 349,288,028 | 4.0% | 2.0% | 2.0% | 0.0% | 4.0% |
| Risk Parity | 0 | 0.0% | 5.0% | -5.0% | 5.0% | -5.0% |
| Total Other Growth Assets | 2,064,231,425 | 23.9% | 31.0% | -7.1% | 38.0% | -14.1% |
| Total Growth Assets | 5,702,372,116 | 65.9% | 69.0% | -3.1% | 67.0% | -1.1% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 317,083,725 | 3.7% | 3.5% | 0.2% | 3.0% | 0.7% |
| Parametric Defensive Equity | 200,802,009 | 2.3% | 2.5% | -0.2% | 3.5% | -1.2% |
| Wellington Real Total Return | 186,155,251 | 2.2% | 2.0% | 0.2% | 3.5% | -1.3% |
| Total Risk Diversifying | 704,040,985 | 8.1% | 8.0% | 0.1% | 10.0% | -1.9% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 48,445,919 | 0.6% | | 0.6% | | |
| Cash | 249,112,666 | 2.9% | | 2.9% | | |
| Total Cash and Overlay | 297,558,585 | 3.4% | 0.0% | 3.4% | 0.0% | 3.4% |
| Total Fund | 8,648,199,761.00 | 100% | 100% | 0% | 100% | 0% |

*Phase 3 targets and ranges reflect Phase 3 asset allocation targets accepted by the Board on June 27, 2018 (BOR Resolution 2018-2)

Contra Costa County Employees' Retirement Association
Asset Allocation as of September 30, 2018

| | Market Value | Percentage of Total Fund | Phase 3 Target Percentage | Phase 3 Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|-------------------------|--------------------------|---------------------------|----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 940,109,107 | 10.9% | 12.0% | -1.1% | | |
| Sit | 521,745,670 | 6.1% | 5.5% | 0.6% | | |
| Dimensional Fund Advisors | 442,518,917 | 5.1% | 5.5% | -0.4% | | |
| Total Liquidity | 1,904,373,694 | 22.1% | 23.0% | -0.9% | 23.0% | -0.9% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 309,138,715 | 3.6% | 3.0% | 0.6% | | |
| Jackson Square | 341,398,816 | 4.0% | 3.0% | 1.0% | | |
| BlackRock Index Fund | 132,550,519 | 1.5% | 1.0% | 0.5% | | |
| Emerald Advisors | 250,301,015 | 2.9% | 2.0% | 0.9% | | |
| Ceredex | 207,467,922 | 2.4% | 2.0% | 0.4% | | |
| Total Domestic Equity | 1,240,856,987 | 14.4% | 11.0% | 3.4% | 5.0% | 9.4% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 459,027,031 | 5.3% | 5.5% | -0.2% | | |
| William Blair | 490,236,409 | 5.7% | 5.5% | 0.2% | | |
| First Eagle | 364,295,113 | 4.2% | 4.0% | 0.2% | | |
| Artisan Global Opportunities | 411,145,313 | 4.8% | 4.0% | 0.8% | | |
| PIMCO/RAE Emerging Markets | 348,136,428 | 4.0% | 4.0% | 0.0% | | |
| TT Emerging Markets | 311,665,621 | 3.6% | 4.0% | -0.4% | | |
| Total Global & International Equity | 2,384,505,915 | 27.7% | 27.0% | 0.7% | 24.0% | 3.7% |
| Private Equity | | | | | | |
| Private Credit | 865,267,000 | 10.1% | 10.0% | 0.1% | 11.0% | -0.9% |
| Real Estate - Value Add | 261,778,000 | 3.0% | 4.0% | -1.0% | 12.0% | -9.0% |
| Real Estate - Opportunistic & Distressed | 163,914,000 | 1.9% | 5.0% | -3.1% | 5.0% | -3.1% |
| Real Estate - REIT (Adelante) | 403,134,000 | 4.7% | 4.0% | 0.7% | 4.0% | 0.7% |
| High Yield (Allianz) | 67,577,089 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| Risk Parity | 349,380,629 | 4.1% | 2.0% | 2.1% | 0.0% | 4.1% |
| Risk Parity | 0 | 0.0% | 5.0% | -5.0% | 5.0% | -5.0% |
| Total Other Growth Assets | 2,111,050,718 | 24.5% | 31.0% | -6.5% | 38.0% | -13.5% |
| Total Growth Assets | 5,736,413,619 | 66.7% | 69.0% | -2.3% | 67.0% | -0.3% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 314,654,516 | 3.7% | 3.5% | 0.2% | 3.0% | 0.7% |
| Parametric Defensive Equity | 202,889,997 | 2.4% | 2.5% | -0.1% | 3.5% | -1.1% |
| Wellington Real Total Return | 185,411,446 | 2.2% | 2.0% | 0.2% | 3.5% | -1.3% |
| Total Risk Diversifying | 702,955,959 | 8.2% | 8.0% | 0.2% | 10.0% | -1.8% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 47,295,036 | 0.5% | | 0.5% | | |
| Cash | 213,868,717 | 2.5% | | 2.5% | | |
| Total Cash and Overlay | 261,163,753 | 3.0% | 0.0% | 3.0% | 0.0% | 3.0% |
| Total Fund | 8,604,907,025.57 | 100% | 100% | 0% | 100% | 0% |

*Phase 3 targets and ranges reflect Phase 3 asset allocation targets accepted by the Board on June 27, 2018 (BOR Resolution 2018-2)

Contra Costa County Employees' Retirement Association
Asset Allocation as of October 31, 2018

| | Market Value | Percentage of Total Fund | Phase 3 Target Percentage | Phase 3 Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|----------------------|--------------------------|----------------------------|----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 916,701,070 | 10.9% | 12.0% | -1.1% | | |
| Sit | 520,711,659 | 6.2% | 5.5% | 0.7% | | |
| Dimensional Fund Advisors | 429,235,234 | 5.1% | 5.5% | -0.4% | | |
| Total Liquidity | 1,866,647,963 | 22.2% | 23.0% | -0.8% | 23.0% | -0.8% |
| | | | Range 16% - 28% | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 289,692,973 | 3.4% | 3.0% | 0.4% | | |
| Jackson Square | 313,095,208 | 3.7% | 3.0% | 0.7% | | |
| BlackRock Index Fund | 123,171,363 | 1.5% | 1.0% | 0.5% | | |
| Emerald Advisors | 217,293,724 | 2.6% | 2.0% | 0.6% | | |
| Ceredex | 189,864,252 | 2.3% | 2.0% | 0.3% | | |
| Total Domestic Equity | 1,133,117,521 | 13.5% | 11.0% | 2.5% | 5.0% | 8.5% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 432,565,395 | 5.1% | 5.5% | -0.4% | | |
| William Blair | 435,712,787 | 5.2% | 5.5% | -0.3% | | |
| First Eagle | 348,068,819 | 4.1% | 4.0% | 0.1% | | |
| Artisan Global Opportunities | 367,895,195 | 4.4% | 4.0% | 0.4% | | |
| PIMCO/RAE Emerging Markets | 321,484,081 | 3.8% | 4.0% | -0.2% | | |
| TT Emerging Markets | 290,892,205 | 3.5% | 4.0% | -0.5% | | |
| Total Global & International Equity | 2,196,618,482 | 26.1% | 27.0% | -0.9% | 24.0% | 2.1% |
| Private Equity | | | | | | |
| Private Credit | 951,020,311 | 11.3% | 10.0% | 1.3% | 11.0% | 0.3% |
| Real Estate - Value Add | 274,256,547 | 3.3% | 4.0% | -0.7% | 12.0% | -8.7% |
| Real Estate - Opportunistic & Distressed | 182,558,839 | 2.2% | 5.0% | -2.8% | 5.0% | -2.8% |
| Real Estate - REIT (Adelante) | 465,682,978 | 5.5% | 4.0% | 1.5% | 4.0% | 1.5% |
| Real Estate - REIT (Adelante) | 65,758,183 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| High Yield (Allianz) | 341,952,459 | 4.1% | 2.0% | 2.1% | 0.0% | 4.1% |
| Risk Parity | 0 | 0.0% | 5.0% | -5.0% | 5.0% | -5.0% |
| Total Other Growth Assets | 2,281,229,316 | 27.2% | 31.0% | -3.8% | 38.0% | -10.8% |
| Total Growth Assets | 5,610,965,319 | 66.8% | 69.0% | -2.2% | 67.0% | -0.2% |
| | | | Range 60% - 80% | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 312,316,361 | 3.7% | 3.5% | 0.2% | 3.0% | 0.7% |
| Parametric Defensive Equity | 197,591,758 | 2.4% | 2.5% | -0.1% | 3.5% | -1.1% |
| Wellington Real Total Return | 180,828,872 | 2.2% | 2.0% | 0.2% | 3.5% | -1.3% |
| Total Risk Diversifying | 690,736,991 | 8.2% | 8.0% | 0.2% | 10.0% | -1.8% |
| | | | Range 0% - 10% | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 26,847,282 | 0.3% | | 0.3% | | |
| Cash | 204,874,865 | 2.4% | | 2.4% | | |
| Total Cash and Overlay | 231,722,147 | 2.8% | 0.0% | 2.8% | 0.0% | 2.8% |
| Total Fund | 8,400,072,420 | 100% | 100% | 0% | 100% | 0% |

*Phase 3 targets and ranges reflect Phase 3 asset allocation targets accepted by the Board on June 27, 2018 (BOR Resolution 2018-2)

Contra Costa County Employees' Retirement Association
Asset Allocation as of November 30, 2018

| | Market Value | Percentage of Total Fund | Phase 3 Target Percentage | Phase 3 Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|-------------------------|--------------------------|---------------------------|----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 893,692,721 | 10.6% | 12.0% | -1.4% | | |
| Sit | 523,504,330 | 6.2% | 5.5% | 0.7% | | |
| Dimensional Fund Advisors | 417,009,858 | 5.0% | 5.5% | -0.5% | | |
| Total Liquidity | 1,834,206,909 | 21.8% | 23.0% | -1.2% | 23.0% | -1.2% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 295,991,632 | 3.5% | 3.0% | 0.5% | | |
| Jackson Square | 323,356,267 | 3.9% | 3.0% | 0.9% | | |
| BlackRock Index Fund | 106,005,642 | 1.3% | 1.0% | 0.3% | | |
| Emerald Advisors | 216,128,354 | 2.6% | 2.0% | 0.6% | | |
| Ceredex | 191,639,891 | 2.3% | 2.0% | 0.3% | | |
| Total Domestic Equity | 1,133,121,786 | 13.5% | 11.0% | 2.5% | 5.0% | 8.5% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 430,914,594 | 5.1% | 5.5% | -0.4% | | |
| William Blair | 434,998,503 | 5.2% | 5.5% | -0.3% | | |
| First Eagle | 349,655,696 | 4.2% | 4.0% | 0.2% | | |
| Artisan Global Opportunities | 371,484,416 | 4.4% | 4.0% | 0.4% | | |
| PIMCO/RAE Emerging Markets | 332,830,522 | 4.0% | 4.0% | -0.0% | | |
| TT Emerging Markets | 301,950,061 | 3.6% | 4.0% | -0.4% | | |
| Total Global & International Equity | 2,221,833,792 | 26.5% | 27.0% | -0.5% | 24.0% | 2.5% |
| Private Equity | | | | | | |
| Private Credit | | | | | | |
| Real Estate - Value Add | | | | | | |
| Real Estate - Opportunistic & Distressed | | | | | | |
| Real Estate - REIT (Adelante) | | | | | | |
| High Yield (Allianz) | | | | | | |
| Risk Parity | | | | | | |
| Total Other Growth Assets | | | | | | |
| Private Equity | 932,872,574 | 11.1% | 10.0% | 1.1% | 11.0% | 0.1% |
| Private Credit | 274,256,547 | 3.3% | 4.0% | -0.7% | 12.0% | -8.7% |
| Real Estate - Value Add | 192,291,527 | 2.3% | 5.0% | -2.7% | 5.0% | -2.7% |
| Real Estate - Opportunistic & Distressed | 465,683,363 | 5.5% | 4.0% | 1.5% | 4.0% | 1.5% |
| Real Estate - REIT (Adelante) | 68,735,808 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| High Yield (Allianz) | 335,632,193 | 4.0% | 2.0% | 2.0% | 0.0% | 4.0% |
| Risk Parity | 0 | 0.0% | 5.0% | -5.0% | 5.0% | -5.0% |
| Total Other Growth Assets | 2,269,472,011 | 27.0% | 31.0% | -4.0% | 38.0% | -11.0% |
| Total Growth Assets | 5,624,427,589 | 67.0% | 69.0% | -2.0% | 67.0% | -0.0% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 314,262,188 | 3.7% | 3.5% | 0.2% | 3.0% | 0.7% |
| Parametric Defensive Equity | 200,225,528 | 2.4% | 2.5% | -0.1% | 3.5% | -1.1% |
| Wellington Real Total Return | 177,527,831 | 2.1% | 2.0% | 0.1% | 3.5% | -1.4% |
| Total Risk Diversifying | 692,015,547 | 8.2% | 8.0% | 0.2% | 10.0% | -1.8% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 31,638,640 | 0.4% | | 0.4% | | |
| Cash | 212,446,455 | 2.5% | | 2.5% | | |
| Total Cash and Overlay | 244,085,095 | 2.9% | 0.0% | 2.9% | 0.0% | 2.9% |
| Total Fund | 8,394,735,139.67 | 100% | 100% | 0% | 100% | 0% |

*Phase 3 targets and ranges reflect Phase 3 asset allocation targets accepted by the Board on June 27, 2018 (BOR Resolution 2018-2)

Contra Costa County Employees' Retirement Association
Asset Allocation as of December 31, 2018

| | Market Value | Percentage of Total Fund | Phase 3 Target Percentage | Phase 3 Over/(Under) | Long Term Target | Long Term Over/(Under) |
|---|-------------------------|--------------------------|---------------------------|----------------------|------------------|------------------------|
| Liquidity | | | | | | |
| Insight | 874,572,034 | 10.6% | 12.0% | -1.4% | | |
| Sit | 528,630,126 | 6.4% | 5.5% | 0.9% | | |
| Dimensional Fund Advisors | 407,716,214 | 4.9% | 5.5% | -0.6% | | |
| Total Liquidity | 1,810,918,374 | 22.0% | 23.0% | -1.0% | 23.0% | -1.0% |
| | | Range | | | | |
| | | 16% - 28% | | | | |
| Growth | | | | | | |
| Domestic Equity | | | | | | |
| Boston Partners | 265,438,078 | 3.2% | 3.0% | 0.2% | | |
| Jackson Square | 294,082,588 | 3.6% | 3.0% | 0.6% | | |
| BlackRock Index Fund | 114,251,243 | 1.4% | 1.0% | 0.4% | | |
| Emerald Advisors | 194,396,033 | 2.4% | 2.0% | 0.4% | | |
| Ceredex | 172,032,560 | 2.1% | 2.0% | 0.1% | | |
| Total Domestic Equity | 1,040,200,501 | 12.6% | 11.0% | 1.6% | 5.0% | 7.6% |
| Global & International Equity | | | | | | |
| Pyrford (BMO) | 415,515,408 | 5.0% | 5.5% | -0.5% | | |
| William Blair | 412,141,439 | 5.0% | 5.5% | -0.5% | | |
| First Eagle | 333,004,273 | 4.0% | 4.0% | 0.0% | | |
| Artisan Global Opportunities | 347,975,016 | 4.2% | 4.0% | 0.2% | | |
| PIMCO/RAE Emerging Markets | 323,920,700 | 3.9% | 4.0% | -0.1% | | |
| TT Emerging Markets | 291,101,194 | 3.5% | 4.0% | -0.5% | | |
| Total Global & International Equity | 2,123,658,030 | 25.8% | 27.0% | -1.2% | 24.0% | 1.8% |
| Private Equity | 945,163,700 | 11.5% | 10.0% | 1.5% | 11.0% | 0.5% |
| Private Credit | 307,881,710 | 3.7% | 4.0% | -0.3% | 12.0% | -8.3% |
| Real Estate - Value Add | 181,887,351 | 2.2% | 5.0% | -2.8% | 5.0% | -2.8% |
| Real Estate - Opportunistic & Distressed | 447,337,777 | 5.4% | 4.0% | 1.4% | 4.0% | 1.4% |
| Real Estate - REIT (Adelante) | 62,941,501 | 0.8% | 1.0% | -0.2% | 1.0% | -0.2% |
| High Yield (Allianz) | 327,878,586 | 4.0% | 2.0% | 2.0% | 0.0% | 4.0% |
| Risk Parity | 0 | 0.0% | 5.0% | -5.0% | 5.0% | -5.0% |
| Total Other Growth Assets | 2,273,090,626 | 27.6% | 31.0% | -3.4% | 38.0% | -10.4% |
| Total Growth Assets | 5,436,949,157 | 66.0% | 69.0% | -3.0% | 67.0% | -1.0% |
| | | Range | | | | |
| | | 60% - 80% | | | | |
| Risk Diversifying | | | | | | |
| AFL-CIO | 318,502,545 | 3.9% | 3.5% | 0.4% | 3.0% | 0.9% |
| Parametric Defensive Equity | 197,871,979 | 2.4% | 2.5% | -0.1% | 3.5% | -1.1% |
| Wellington Real Total Return | 177,035,366 | 2.1% | 2.0% | 0.1% | 3.5% | -1.4% |
| Total Risk Diversifying | 693,409,890 | 8.4% | 8.0% | 0.4% | 10.0% | -1.6% |
| | | Range | | | | |
| | | 0% - 10% | | | | |
| Cash and Overlay | | | | | | |
| Overlay (Parametric) | 33,015,985 | 0.4% | | 0.4% | | |
| Cash | 267,139,335 | 3.2% | | 3.2% | | |
| Total Cash and Overlay | 300,155,321 | 3.6% | 0.0% | 3.6% | 0.0% | 3.6% |
| Total Fund | 8,241,432,742.21 | 100% | 100% | 0% | 100% | 0% |

*Phase 3 targets and ranges reflect Phase 3 asset allocation targets accepted by the Board on June 27, 2018 (BOR Resolution 2018-2)

CRCEA SPRING 2019 CONFERENCE

APRIL 14-17, 2019

HOSTED BY RETIRED EMPLOYEES OF SAN DIEGO COUNTY, INC.

Meeting Date
02/27/19
Agenda Item
#12a.



HOTEL

DOUBLETREE SAN DIEGO — HOTEL CIRCLE
1515 HOTEL CIRCLE SOUTH, SAN DIEGO, CA, 92108

Hotel Reservation Deadline: March 15, 2019



2 Queen Room or 1 King Room

\$155 per night + taxes

Includes self-parking, breakfast, & in-room WiFi.

Book online at www.resdc.net/crcea or call (800) 486-5315 and reference California Retired County Employees Association.

The conference rate is available the nights of Thursday, April 11 through Friday, April 19 (check out on Saturday, April 20), subject to availability. Please note that the hotel does not provide shuttle service from San Diego International Airport.

CONFERENCE INFORMATION

WWW.RESDC.NET/CRCEA

Visit the conference website for the following information:

- Registration instructions and printable form
- Hotel details and reservation link
- Schedule
- Driving directions & transit options
- Sponsors
- Things to do around San Diego



QUESTIONS

For questions, contact the RESDC Office at (619) 688-9229, toll-free at (866) 688-9229, or by email at resdc@resdc.net. Office hours are Monday - Friday, 9:00 am - 2:00 pm.

CRCEA SPRING 2019 CONFERENCE
APRIL 14 - 17, 2019
Conference Agenda

| SUNDAY, APRIL 14 | |
|-------------------------|---|
| 2:00 – 5:00 p.m. | Early Conference Registration (Grand View Ballroom) |
| 4:00 – 6:00 p.m. | RESDC Roundup at Stone Brewing in Liberty Station Free shuttle service will run between the hotel and event approximately every half hour from 3:30 – 8:30 p.m. See Activities flyer for event details. |

| MONDAY, APRIL 15 | |
|-------------------------|---|
| 6:00 a.m. – 10:00 a.m. | Breakfast (included in room rate; Solana Room) |
| 9:00 a.m. – 4:30 p.m. | Registration (outside Grand View Ballroom) |
| 1:00 – 1:30 p.m. | Opening Session (Grand View Ballroom) Call to Order: Skip Murphy, President, CRCEA Invocation: Sheriff's Dept Chaplain Presentation of Colors: Sheriff's Dept Color Guard Pledge of Allegiance: RESDC Board Member Welcome: John McTighe, President, RESDC Roll Call of Counties: Virginia Adams, Secretary, CRCEA Introduction of First-Time Attendees: Skip Murphy, President, CRCEA |
| 1:30 – 1:45 p.m. | Welcome Address Speaker: Dianne Jacob, San Diego County Supervisor District 2 Introduction: John McTighe, President, RESDC |
| 1:45 – 2:30 p.m. | Keynote Address by Dr. Paul Aisen , Professor of Neurology, Director USC Alzheimer's Therapeutic Research Institute (ATRI) |
| 2:30 – 3:30 p.m. | Presentation: Retirement Security Coalition Speakers: <ul style="list-style-type: none"> - Chris Brewster, Board Member, City of San Diego Retired Employees' Association (CSDREA) - Mark Nanzer, Executive Director, Retired Employees of San Diego County (RESDC) - Gaspar Luna, Director, District G, California State Retirees Introduction: George Shoemaker |
| 3:30 – 3:45 p.m. | Afternoon Break |
| 3:45 – 4:30 p.m. | Presentation: Avoiding Scams & Preventing Elder Abuse Speaker: Paul Greenwood, former Deputy District Attorney and Lead Elder Abuse Prosecutor at San Diego County DA's Office Introduction: Chris Heiserman |
| 4:30 – 5:15 p.m. | Round Table Session Moderator: Skip Murphy |
| 5:30 – 7:00 p.m. | Hospitality Reception (Poolside Patio) Hosted by Steve Pettee, Affiliate Pacific Group Agencies, Inc. All attendees are invited for complimentary wine, beer, soft drinks, and light appetizers. |
| 7:00 p.m. | Dinner on your own |
| 7:15 p.m. | Optional Activity: Padres vs. Rockies Baseball Game at Petco Park See Activities flyer for details. More info will be on the conference website. |

| TUESDAY, APRIL 16 | |
|--------------------------|--|
| 6:00 a.m. – 10:00 a.m. | Breakfast (included in room rate; Solana Room) |
| 8:00 – 12:00 p.m. | Registration (outside Grand View Ballroom) |
| 8:30 – 8:45 a.m. | Morning General Session (Grand View Ballroom) Call to Order: Skip Murphy Announcements: Skip Murphy & John McTighe |
| 8:45 – 9:45 a.m. | Presentation: The Future of Retirement Speaker: Hank Kim, Executive Director and Counsel, National Conference on Public Employee Retirement Systems (NCPERS) Introduction: George Shoemaker |

**CRCEA SPRING 2019 CONFERENCE
APRIL 14 - 17, 2019
Conference Agenda (continued)**

| | |
|----------------------|--|
| 9:45 – 10:45 a.m. | Presentation: Enrichment Activities for Seniors Speakers: <ul style="list-style-type: none"> - Jolyn Parker, VP of Programs, Oasis - Eddie Baca, Advisory Board member, Osher Lifelong Learning Institute (OLLI) - Pat Mosteller, Department Chair of Emeritus Program, San Diego Continuing Education (SDCE) Moderator: Chris Heiserman |
| 10:45 – 11:00 a.m. | Morning Break |
| 11:00 – 11:15 a.m. | Introduction of Affiliates by Mike Sloan, CRCEA Affiliate Chair |
| 11:15–12:00 p.m. | Presentation: Disaster Recovery Speaker: Julie Jeakle, Senior Emergency Service Coordinator, Office of Emergency Services (OES) Introduction: Janel Pehau |
| 12:00 p.m. 1:30 p.m. | Lunch (Poolside Patio) Sponsored by: My Senior Health Plan Introduction: John McTighe |
| 1:30 – 2:30 p.m. | Legislative Report – Sacramento Scene Moderator: Art Goulet, Chair CRCEA Legislative Committee Introduction: Skip Murphy |
| 2:30 – 2:45 p.m. | Afternoon Break |
| 2:45 – 3:30 p.m. | Presentation: Communication with Members Speaker: Liz Silverman, Technology Manager, Retired Employees of San Diego County (RESDC) Introduction: Mark Nanzer |
| 3:30 – 4:45 p.m. | Standing Committee Breakout Sessions (If you are not a member of a Committee, please sit in on the Session of your choice.) |
| 5:30 – 7:00 p.m. | Hospitality Reception (Poolside Patio) Hosted by Steve Pettee, Affiliate Pacific Group Agencies, Inc. All attendees are invited for complimentary wine, beer, soft drinks, and light appetizers. |
| 7:00 – 10:00 p.m. | Banquet Dinner (Grand View Ballroom) Entertainment: Sundance Band No Host Bar Opportunity Drawings Masters of Ceremonies: Chris Heiserman & Mark Nanzer |

| WEDNESDAY, APRIL 17 | |
|----------------------------|--|
| 6:00 a.m. – 10:00 a.m. | Breakfast (included in room rate; Solana Room) |
| 8:00 – 11:00 a.m. | Business Session (Grand View Ballroom) Call to Order: Skip Murphy Approval of Minutes of the 2018 Fall Conference: Virginia Adams Executive Committee Report: Skip Murphy Financial Report: Carlos Gonzalez Committee Reports by Committee Chairs Affiliate: Mike Sloan Bylaws: David Muir, LA Communications: Virginia Adams Audit/Finance: Jerry Jacobs Legislation: Art Goulet Membership/Benefits: Rhonda Bieseimer Nominating: Will Hoag Conference Committee: Mike Sloan Invitation to 2019 Fall Conference: Sonoma County - Alix Shor Closing Remarks: Skip Murphy |

CRCEA SPRING 2019 CONFERENCE REGISTRATION FORM
 April 14-17, 2019 at Doubletree Hotel Circle, 1515 Hotel Circle South, San Diego, CA 92108
 Hosted by: Retired Employees of San Diego County, Inc. (RESDC)

Please complete this form and mail with check payable to RESDC, or register online at www.resdc.net/crcea.

NAME _____

Please check appropriate box for your preferred name badge designation:

- Delegate Alternate Delegate Retirement Board Member
 Member Affiliate (pay only banquet fee) CRCEA Officer (Title): _____

ADDRESS _____

CITY _____ **STATE** _____ **ZIP** _____

PHONE _____ **E-MAIL** _____

AFFILIATE OR ASSOCIATION NAME _____

EMERGENCY CONTACT (full name & phone) _____

CONFERENCE REGISTRATION DEADLINE: MARCH 22, 2019

RESERVATION DEADLINE FOR DOUBLETREE HOTEL CIRCLE: MARCH 15, 2019

For hotel reservations, please go online to www.resdc.net/crcea and click the link to reserve your room. Or call the hotel directly at (800) 486-5315, and request the CRCEA Conference rate, which is \$155 per night plus taxes (includes daily breakfast & parking). If there are any questions or issues, please contact RESDC Executive Director Mark Nanzer at (619) 325-1901.

REGISTRATION FEES

| | | |
|---|------|----------|
| Attendee (<i>Entitles bearer to attend entire conference.</i>) | \$75 | \$ _____ |
|---|------|----------|

| | | |
|--|------|----------|
| Spouse/Significant Other (<i>Entitles bearer to attend entire conference. May only be purchased in combination with Attendee registration.</i>) | \$30 | \$ _____ |
|--|------|----------|

Name: _____

| | |
|---|-------------------|
| Sunday No-Host Social Mixer at Stone Brewing | # of people: ____ |
|---|-------------------|

Experience a "RESDC Roundup" Social Mixer from 4:00 - 6:00pm on Sunday at Stone Brewing in Liberty Station. Meet and mingle with retirees from across the state, as well as members of the local association. This is a no-host event. Food and beverages are available for purchase from the restaurant. RSVP requested. Free shuttle service will run between the hotel and event approximately every half hour from 3:30-8:30 p.m. See Activities flyer for more event details.

| | |
|---|-------------|
| Tuesday BBQ Buffet Lunch - sponsored by My Senior Health Plan <i>Free for Attendees and Spouse/Significant Others; RSVP required.</i> | FREE X ____ |
|---|-------------|

| | |
|--------------------------------|---------------------------|
| Tuesday Evening Banquet | \$50 ea X ____ = \$ _____ |
|--------------------------------|---------------------------|

Meal: Chardonnay Chicken #____ Blackened Salmon #____
 Grilled Sirloin #____ Vegetable Napoleon #____

TOTAL \$ _____

Discounts on Additional Activities (See Activities flyer for details and how to purchase.)

- Monday Night Padres vs. Rockies Baseball Game at Petco Park
- Anytime Sightseeing Activity: Old Town Trolley Tour
- Select Performances of the American Premiere Musical *Life After* at The Old Globe

Mail CHECK payable to RESDC along with this FORM to:

RESDC, Attn: CRCEA Conference, 8825 Aero Drive, Suite 205, San Diego, CA 92123

Getting to the Conference

CRCEA Spring 2019 Conference • April 14-17, 2019 • <https://www.resdc.net/crcea>

DRIVING DIRECTIONS

Rental Cars at San Diego International Airport

There are numerous car rental companies to choose from at San Diego International Airport. All car rental pick-ups and drop-offs for companies serving the airport occur at the Consolidated Rental Car Center, located at 3355 Admiral Boland Way, San Diego, CA 92101. Free dedicated shuttle buses run continually to ferry customers between the airport terminals and the Rental Car Center.

Driving Directions to Hotel

From Rental Car Center at San Diego International Airport:

- Turn right on Admiral Boland Way (heading north).
- Turn right onto W Washington St.
- Turn left onto San Diego Ave.
- Take the ramp on the left onto I-5 North.
- Take I-8 East and exit Taylor Street.
- Left on Hotel Circle South, hotel is 1/4 mile on right hand side.

From San Diego International Airport:

- Head east on Harbor Drive.
- Turn left onto Laurel Street.
- Turn left onto India Street.
- Take the ramp on the left onto I-5 North.
- Take I-8 East and exit Taylor Street.
- Left on Hotel Circle South, hotel is 1/4 mile on right hand side.

From East:

- Take I-8 West. Exit Taylor Street.
- Follow exit to left over the interstate.
- Make left onto Hotel Circle South, hotel 1/4 mile on right hand side.

From North:

- Take I-5 South to I-8 East.
- Exit Taylor Street and make left onto Hotel Circle South at stoplight.
- Hotel is 1/4 mile on right hand side.

From South:

- Take I-5 North to I-8 East.
- Exit Taylor Street and make left onto Hotel Circle South at stoplight.
- Hotel is 1/4 mile on right hand side.

AIRPORT SHUTTLES

Please note that the hotel does NOT provide shuttle service to and from the airport, however, shuttle vans and buses operated by other companies are available at the Transportation Plazas across from Terminals 1 and 2 at the San Diego International Airport. The guide below lists shuttle companies frequently used by travelers. For more information, visit the airport website (<http://www.san.org/to-from/Shuttles>), or contact the shuttle companies directly at the phone numbers listed below.

| <u>SHUTTLE COMPANY</u> | <u>PHONE NUMBER</u> |
|---------------------------------|--------------------------|
| Advanced Shuttle | 800.719.3499 |
| Cloud 9 Shuttle / Super Shuttle | 800.9.SHUTTLE (974.8885) |
| EZ Ride | 800.777.0585 |
| Sea Breeze Shuttle | 619.297.7463 |

PUBLIC TRANSIT

Amtrak Pacific Surfliner • <http://www.pacificsurfliner.com>

Train serving San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange County, and San Diego. The Old Town stop is closest to the hotel.

San Diego Metropolitan Transit System (MTS) • <https://www.sdmts.com>
Bus and trolley lines serving San Diego County. Bus Route 88 serves Old Town Transit Center, Hotel Circle, and Fashion Valley.

TAXIS & RIDESHARE

Many companies provide **taxicab** service at San Diego International Airport. If you need a taxi, simply follow the signs leading to the Transportation Plazas. A Customer Service Representative will place you with the first available taxi, unless you specify a particular taxicab company. For more information and a listing of taxi services, please visit the airport website: <http://www.san.org/to-from/Taxis>. If you arrive by train, taxis are also available at the Old Town Transit Center.

If you have a smartphone and are familiar with installing and using apps on it, then utilizing a **rideshare** service such as **lyft** (<https://www.lyft.com/airports/san>) or **Uber** (<https://www.uber.com/airports/san/>) can be a convenient and cost-effective way to travel around San Diego. Note that there is a designated pickup area for rideshare services at the airport. Drivers are not allowed to wait in the pick-up area, so ensure you've collected your baggage before requesting a ride.



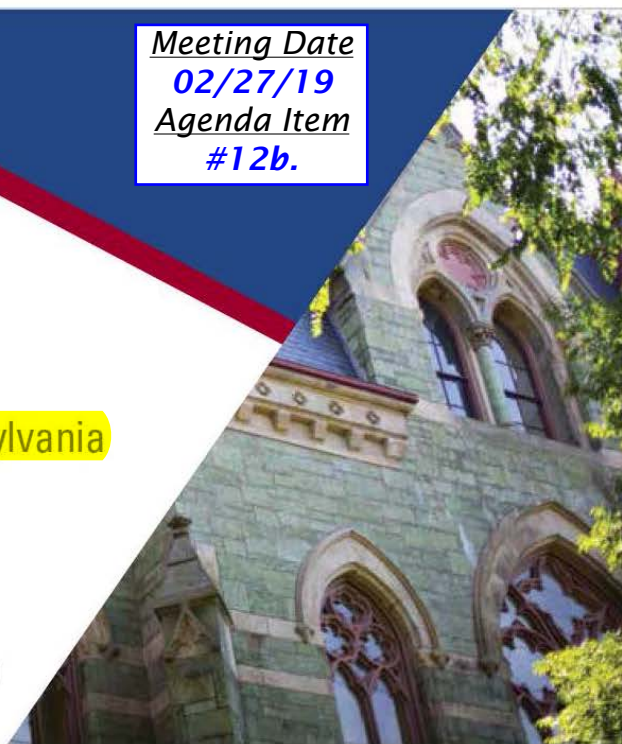
Meeting Date
02/27/19
Agenda Item
#12b.

Advanced Investments Management

April 29-May 2, 2019 | Philadelphia, Pennsylvania

International and Emerging Market Investing

July 22-24, 2019 | San Francisco, California



www.ifebp.org/wharton

International Foundation
OF EMPLOYEE BENEFIT PLANS 
Education | Research | Leadership

Annually, two or three high-quality investment programs are offered on Wharton campuses. Skilled educators and researchers, award-winning authors and leading authorities in the investment management field teach and/or oversee the curriculum. The programs are independent units that may be completed in any sequence, although we strongly encourage individuals with little investment programs experience to complete the Portfolio Concepts and Management program as a foundation prior to attending others.

2019 Schedule

Advanced Investments Management

The Advanced Investments Management program is a thorough and rigorous 3½-day program designed to build upon what is learned in the Portfolio Concepts and Management program or upon participants' existing knowledge base and experience.

International and Emerging Market Investing

This program is designed to provide insight into the global marketplace and how it impacts your fund's investment strategy. Discover investment opportunities and risks of international and emerging countries.

Additional Wharton Courses

Portfolio Concepts and Management*

This 3½-day program lays the groundwork for the core principles of portfolio theory and investment performance measurement, offering practical tools and experiences needed to make sound investment management decisions.

Alternative Investment Strategies*

This program provides practical education to help you understand the complexities of alternative investments. Focused on hedge funds and real estate investment, this advanced-level program will provide you with the tools to make effective investment decisions.

**Held in 2020.*

PROGRAM AT-A-GLANCE

Advanced Investments Management

April 29-May 2, 2019 | Philadelphia, Pennsylvania

www.ifebp.com/advinv

Preconference: Sunday, April 28

- Refresher Workshop in Core Investment Concepts (Optional)

Monday, April 29

- Introduction and Performance Analysis
- Advanced Bond Management
- Advanced Asset Allocation

Tuesday, April 30

- Evaluation of Managers
- Real Estate in a Pension Fund Portfolio
- Alternative Investments: A Discussion and Overview of Hedge Funds
- Introduction to Case Study and Case Study Discussion with Groups

Wednesday, May 1

- International Investing
- Pension Fund Valuation in the New World of Risk
- Macroeconomy
- Wrap-Up and Case Study

Thursday, May 2

- Investment Policy
- Case Study Discussion

DAY ONE

Introduction, Performance Analysis and Advanced Bond Management

Introduction and Performance Analysis

Learning to decipher good investment decisions from bad ones takes time and education. In our opening session, we dive right into performance analysis. Review the structure and design of benchmarks, how to use benchmarks to measure fund performance and evaluate investment managers, and more.

Advanced Bond Management and Asset Allocation

No portfolio is complete without bonds. But what management techniques do you need to adopt in order to ensure that your fund is selecting the right options? In Advanced Bond Management, we discuss bond pricing, interest rate risk, risks faced by bond portfolios, duration and convexity, and portfolio immunization and dedicated portfolios. But asset allocation also plays a role in your fund's investment practices, and we conclude the day with asset allocation strategies, asset allocation and financial crisis, and weighting strategies.

DAY TWO

Evaluation of Managers and a Discussion on Alternative Investments

Evaluation of Managers and Real Estate in a Pension Fund Portfolio

It seems like it should be easy to evaluate the performance of our investment managers and consultants but, in reality, it is a lot harder to determine their efficiency than you would think. In this session, we discuss the general risk-adjusted and style-based measures of managers, the latest trends in performance analysis, and possible strengths, weaknesses, and misuses of evaluation measures. We then switch gears to cover the importance of real estate in your pension fund portfolio, where you will learn about the risks and returns of different types of real estate investments, how much of your portfolio allocation should be in real estate and the growth of the REIT market.

Alternative Investments: A Discussion and Overview of Hedge Funds

Understanding different types of alternative investments is no easy task. Day Two continues with a discussion of hedge funds. Discover the pros and cons of hedge funds, the overall outlook for alternative investments, and tips for selecting the right managers for this type of investment and how to monitor their performance over time.

Introduction to Case Study

An important part of the Advanced Investments Management program is the interactive case study. At the end of Day Two, you will be directed to meet with your small group to introduce yourselves and discuss the case study you will be working on for the remainder of the week.

DAY THREE

International Investing, Valuation and the Macroeconomy

International Investing

How do we measure the performance of our international investments and foreign assets? In this session, we cover that and more, including international diversification and currency risk, risks and returns on international bonds for a pension fund, and strategies to invest internationally with an exchange rate view.

Pension Fund Valuation in the New World of Risk and Macroeconomy

New types of investments have led to new risks. Discuss how your pension fund valuation will be affected by the economics approach to discounting, the case for bonds vs. stocks, and matching assets and liabilities. Later, we discuss the macroeconomy and the impact it has on the environment in which financial markets operate as well as key macroeconomic indicators and financial market responses.

Case Study Group Work

At the end of Day Three, you will be directed to meet with your small group to continue working on the case study.

DAY FOUR

The Conclusion

Investment Policy

Explore the issues related to investment policies in this last lecture.

Case Study Discussion

Our final session will discuss our case study and the various answers received by the small groups.

*Attendance at this session is required
to earn a certificate.*

Refresher Workshop in Core Investment Concepts

Optional workshop

Sunday, April 28, 2019 | 1:00-5:00 p.m.

The Inn at Penn | Philadelphia, Pennsylvania

If it has been some time since you participated in investment-related coursework, we strongly encourage you to also register for the refresher workshop, scheduled Sunday afternoon immediately preceding the Advanced Investments Management program, held at The Inn at Penn. In this refresher workshop, you will review

- Basic principles of portfolio theory
- Basic benchmarks used for measuring fund performance
- Styles of management used by fund managers for achieving investment objectives
- How bonds and stocks are evaluated
- Benefits of global diversification
- Types of real estate investments
- Alternative investments
- The efficient market principle.

Separate registration required

Program Structure

The Advanced Investments Management program is a thorough and rigorous 3½-day program designed to build upon what is learned in the Portfolio Concepts and Management program or upon participants' existing knowledge base and experience.

DATES

April 29-May 2, 2019

LOCATION

**The Wharton School, University of Pennsylvania
255 South 38th Street | Philadelphia, Pennsylvania**

COST

Through March 18, 2019 **Member: \$5,495 | Nonmember: \$5,935**

After March 18, 2019 **Member: \$5,795 | Nonmember: \$6,235**

HOTEL INFORMATION AND REGISTRATION: www.ifebp.org/advinv

Space is extremely limited for this advanced-level program to allow for extensive discussion and optimal comprehension.

REGISTRATION/2019 Wharton Investment Programs

International Foundation
OF EMPLOYEE BENEFIT PLANS 

Attendee Information (Please print clearly)

Source code **19WHAR B**

Individual ID# or CEBS® ID# _____
 Full first name _____ M.I. _____ Last name _____
 Employer _____
 Title _____
 Address _____ Business Home
 City _____ State/Province _____ Country _____ ZIP/Postal code _____
 Phone _____ Business Home Mobile
 E-mail _____
 Form completed by _____ Phone _____

Not a Member? Join Now and Save!

Join to receive member rates and more at www.ifebp.org/join.

Registration Information

Bill to organization name _____
 Bill to organization ID # _____
 Badge name _____ Badge title _____
 Special assistance—specify _____
 Special dietary requirements—specify _____

Advanced Investments Management—

Refresher Workshop | Early fee until March 18

April 28, 2019 | The Wharton School, University of Pennsylvania | Philadelphia, Pennsylvania

(63-PCW1)

| | | | |
|---------------------|----------------------------------|---------------|----------------------------------|
| Early member fee | <input type="checkbox"/> US\$455 | Member fee | <input type="checkbox"/> US\$605 |
| Early nonmember fee | <input type="checkbox"/> US\$565 | Nonmember fee | <input type="checkbox"/> US\$715 |

Advanced Investments Management | Early fee until March 18

April 29-May 2, 2019 | The Wharton School, University of Pennsylvania | Philadelphia, Pennsylvania

(63-1963)

| | | | |
|---------------------|------------------------------------|---------------|------------------------------------|
| Early member fee | <input type="checkbox"/> US\$5,495 | Member fee | <input type="checkbox"/> US\$5,795 |
| Early nonmember fee | <input type="checkbox"/> US\$5,935 | Nonmember fee | <input type="checkbox"/> US\$6,235 |

International and Emerging Market Investments | Early fee until June 10

July 22-24, 2019 | Wharton West | San Francisco, California

(16-1916)

| | | | |
|---------------------|------------------------------------|---------------|------------------------------------|
| Early member fee | <input type="checkbox"/> US\$4,155 | Member fee | <input type="checkbox"/> US\$4,455 |
| Early nonmember fee | <input type="checkbox"/> US\$4,485 | Nonmember fee | <input type="checkbox"/> US\$4,785 |

Hotel

Mention the International Foundation for special rate. (Taxes are subject to change.) After the deadline, reservations and rate will be based on availability (credit card will be required).

- April—The Inn at Penn, a Hilton Hotel, Philadelphia, Pennsylvania** • Reservation deadline: **March 25**
Reservations phone: (215) 222-0200 Rate: US\$249 single/double (16.25% tax)
- July—Hyatt Regency San Francisco, San Francisco, California** • Reservation deadline: **June 17**
Reservations phone: (415) 788-1234 Rate: US\$299 single/double (16.25% + \$1 tax)

Continuing Education Credit

The International Foundation will apply for CE credit based on requests indicated below.

- Actuary Attorney CFP CIMA CPA HRCI Insurance producer*
 SHRM Other, specify _____

CEBS Compliance—Visit
www.cebs.org/compliance
TOP ADDITIONAL INFORMATION

Licensed in the state(s) of _____ License/NPN/BAR/CPA # _____

*Approval of programs/seminars is required in ALL insurance states. This process can take up to 90 days. Late requests could preclude insurance producers from earning credit. **NOTE: Requests made for CE credit on this form do not guarantee administration of credit.**

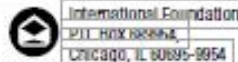
Payment Must Accompany Order

Registration/Order Summary

NEW! Policies have changed. See www.ifebp.org/policies.
Make check payable to International Foundation.

Check # _____ US\$ _____
 Credit card # _____
 Exp. date _____
 Cardholder's name (print) _____

Membership fee US\$ _____
 Conference fee US\$ _____
 Preconference fee US\$ _____
Total (U.S. funds) US\$ _____



SACRS 2019 SPRING CONFERENCE

MAY 7-10

RESORT AT SQUAW CREEK • LAKE TAHOE, CA



Meeting Date

02/27/19

Agenda Item

#12c.

REGISTER TODAY!

Visit **SACRS.ORG**
to register online

TUESDAY, MAY 7, 2019

| | | |
|-----------------|--|---|
| 1:00PM – 6:30PM | Registration | |
| 3:00PM – 5:00PM | Disability | TBD |
| 3:00PM – 5:00PM | Sexual Harassment Prevention Training for Local Agency Officials (AB1661) | Speakers: John Kennedy and Allison Callaghan, Nossaman |
| 3:00PM – 5:00PM | Ethics Training for Trustees and Staff | Speaker: Ashley Dunning, Nossaman |
| 5:30PM – 6:30PM | SACRS Welcome Reception | |

WEDNESDAY, MAY 8, 2019

| | | |
|-------------------|--|---|
| 6:45AM – 7:45AM | SACRS Yoga Fitting in fitness when away from home is often difficult, but not during SACRS 2019 Spring Conference! We bring a yoga class onsite to start your day the right way. This class, led by a certified yoga instructor, is intended for everyone, beginner to expert. Yoga mats, water, and towels provided. Pre-registration is required, and the costs is \$10 per person. This session is open to all registered conference attendees. | |
| 7:30AM – 8:30AM | SACRS Breakfast | |
| 7:30AM – 6:00PM | SACRS Registration | |
| 8:30 – 9:00AM | General Session Welcome | Speaker: Dan McAllister, SACRS President |
| 9:00 – 10:00AM | General Session | Speaker: Don Ezra, Russell Investments |
| 10:00AM – 10:30AM | SACRS Networking Break | |
| 10:30AM – 11:30AM | General Session | Speaker: Kristina Hooper, Invesco |

Preliminary Agenda - Please Check SACRS.ORG for Updates

SACRS

2019 SPRING CONFERENCE

MAY 7-10

RESORT AT SQUAW CREEK • LAKE TAHOE, CA



REGISTER TODAY!
Visit SACRS.ORG
to register online

| | | |
|-------------------|--|--|
| 11:30AM – 12:30PM | General Session | Speakers: Yu Ming, Nikko Asset Management and Xiangrong Jin, Goldman Sachs |
| 12:30PM – 1:45PM | SACRS Lunch | |
| 2:00PM – 3:00PM | General Session | TBD |
| 3:15PM – 5:00PM | Ops/Benefits & Disability Breakout | Moderator: Arlene Owens, Los Angeles CERA |
| 3:15PM – 5:00PM | Affiliate Breakout Many CIOs and investment staff from across the SACRS plans will participate in a session to describe their investment challenges, opportunities, and key strategies in need to meet their long-term investment goals. This will be a 90-minute session in a speed dating type format. | Moderator: Ben Lazarus, Parametric |
| 3:15PM – 5:00PM | Attorney Breakout | TBD |
| 3:15PM – 5:00PM | Internal Auditors Breakout | Moderator: Harsh Jadhav, Alameda CERA |
| 3:15PM – 5:00PM | Administrators Breakout | Moderator: Eric Stern, Sacramento CERS |
| 3:15PM – 5:00PM | Investment Breakout | Moderator: Tim Price, Contra Costa CERA |
| 3:15PM – 5:00PM | Trustee Breakout | Speakers: Rich White, SACRS Past President and Gabe Rodrigues, SACRS Past Vice President Moderator: Kathryn Cavness, Mendocino CERA |
| 3:15PM – 5:00PM | Safety Breakout | TBD |
| 3:15PM – 5:00PM | Admin Staff Breakout | Moderator: Aimee Morton, Kern CERA |

Preliminary Agenda - Please Check SACRS.ORG for Updates



| | | |
|-----------------|---|---|
| 4:30PM – 5:30PM | SACRS Legislative Committee Meeting | Moderator: Eric Stern, Sacramento CERS & Dave Nelsen, Alameda CERA |
| 6:30PM – 9:30PM | SACRS Annual Wednesday Night Event – CASINO ROYALE - Feeling Lucky? SACRS invites you to enjoy a night at the CASINO ROYALE! Enjoy a night of fun, dinner and casino games. All registered conference attendees are invited to this hosted event. Dress to impress, evening cocktail attire requested. | |

Thursday, May 9, 2019

| | | |
|-------------------|--|--|
| 7:00AM – 8:00AM | SACRS 5K Fun Run/Walk Your morning starts off with an additional opportunity for teambuilding and networking, while enjoying the early morning mountain air. A SACRS tradition, the 5K (3.1 miles) Fun Run course is the perfect way to get energized for the conference day ahead. Designed for the walker, jogger, or runner, the course is slightly elevated and paved. Pre-registration is required and costs \$10 per person. Pocket maps, Fun Run t-shirt, water, and snack at the end of the course will be provided. | |
| 7:30AM – 8:30AM | SACRS Breakfast | |
| 7:30AM – 5:00PM | SACRS Registration | |
| 8:45AM – 9:00AM | General Session Welcome, Volunteer Awards | Speaker: Dan McAllister, SACRS President |
| 9:00AM – 10:00AM | General Session | Speaker: General Wesley Clark |
| 10:00AM – 10:30AM | SACRS Networking Break | |
| 10:30AM – 11:30AM | General Session | TBD |
| 11:30AM – 12:30PM | General Session – Greying of America | Speaker: Stanley Lezman, American Realty Advisors |

Preliminary Agenda - Please Check SACRS.ORG for Updates

SACRS

2019 SPRING CONFERENCE

MAY 7-10

RESORT AT SQUAW CREEK • LAKE TAHOE, CA



REGISTER TODAY!
Visit SACRS.ORG
to register online

| | | |
|------------------|---|---|
| 12:30PM – 1:45PM | SACRS Lunch | |
| 2:00PM – 3:00PM | Concurrent Session A – The Case for Non-US Equities | Speaker: Robert Failla, Lazard Asset Management |
| 2:00PM – 3:00PM | Concurrent Session B – OPEN | TBD |
| 2:00PM – 3:00PM | Concurrent Session C – PEPRA – What’s Next for the ‘California Rule’? Public Employee Pensions as Vested Rights The California Supreme Court will issue its decision CalFIRE v. CalPERS by March 4. At least four other vested rights cases will be decided next. This panel includes lead counsel on several of the pending cases and can provide a balanced and thoughtful presentation of topics that are, are not, being addressed by the California Supreme Court. | TBD |
| 3:00PM – 3:30PM | SACRS Networking Break | |
| 3:30PM – 4:30PM | Concurrent Session A - Why Public Fund Investors Should Consider Renewable Energy Wind and solar energy are now competitive with traditional power generation, even without subsidies. The U.S. energy mix is undergoing a massive transformation, through the buildout of renewable energy infrastructure. We believe this creates an opportunity too big for investors to ignore. | Speaker: Armin Sandhoevel, PhD, CIO, Allianz Global Investors |
| 3:30PM – 4:30PM | Concurrent Session B – Legislative Update 2019 | Speakers: Trent Smith and Mike Robson, SACRS Lobbyists Moderators: Eric Stern, Sacramento CERS and Dave Nelsen, Alameda CERA |
| 3:30PM – 4:30PM | Concurrent Session C – Private Equity: Primary Investment Opportunities and Considerations Whether currently invested or considering new allocations, access to the best private equity funds isn’t everything. Some of the most | Speaker: Jay Nayak, Callan LLC |

Preliminary Agenda - Please Check SACRS.ORG for Updates



| | | |
|-----------------|---|--|
| | important decisions are made prior to the first capital commitment. | |
| 4:30PM – 5:30PM | SACRS Education Committee Meeting | Moderator: JJ Popowich, SACRS Education Committee Chair |
| 4:30PM – 5:30PM | SACRS Nominating Committee Meeting | Moderator: Ray McCray, SACRS Nominating Committee Chair |
| 5:30PM – 6:30PM | SACRS Reception | |

Friday, May 10, 2019

| | | |
|------------------|--------------------------------|---|
| 7:30AM – 8:30AM | SACRS Breakfast | |
| 8:30AM – 8:45AM | General Session Welcome | Speaker: Dan McAllister, SACRS President |
| 8:45AM – 9:45AM | General Session | TBD |
| 9:45AM – 10:00AM | SACRS Networking Break | |
| 10:00AM – Adj | SACRS Business Meeting | Speakers: SACRS Board of Directors |

Preliminary Agenda - Please Check SACRS.ORG for Updates



Meeting Date
02/27/19
Agenda Item
#12d.

NATIONAL CONFERENCE ON PUBLIC EMPLOYEE RETIREMENT SYSTEMS

ADVOCACY

RESEARCH

EDUCATION

ACE 2019 AUSTIN

MAY 18 - 22
Hilton Austin Hotel
Austin, TX

FUND MEMBER/STAKEHOLDER REGISTRATION BROCHURE

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INTRODUCING NCPERS UNIVERSITY



Trustee Educational Seminar (TEDS)

Program for Advanced Trustees Studies (PATS)

NCPERS Accredited Fiduciary (NAF) Program

Much is expected today of pension fund trustees. In addition to providing pension systems with strategic direction and oversight of critical functions, trustees are expected to demonstrate professionalism and undertake continuing education. In response to input from members, NCPERS is consistently expanding its educational offerings to provide trustees and other pension professionals with the most relevant, up-to-date learning opportunities.



As part of NCPERS' drive to foster excellence in public pension systems, we are unveiling a new, consolidated educational program: NCPERS University!

NCPERS University is where trustees can turn to find the educational offerings they need to be successful in carrying out their duties. Each program is tailored to the training needs of trustees at different levels on their journeys, with differentiated offerings for new trustees, advanced trustees, and those who wish to demonstrate their mastery by pursuing a challenging credential. Three distinct programs are available under NCPERS University, which takes place in person at a two-day session that precedes the NCPERS Annual Conference & Exhibition.



For updates or to register online, visit www.NCPERS.org/ACE. Question? Call 202-624-1456 or e-mail registration@ncpers.org.

TRUSTEE EDUCATIONAL SEMINAR (TEDS)

MAY 18 – 19
8:00 AM – 1:30 PM

Trustees who start with this program can build and strengthen their foundational knowledge of pensions and governance. This two-day program is designed with a clear focus on the educational needs of trustees who are relatively new to a pension plan board. The focus is on investing principles, board policies, and fundamental concepts that every trustee should know.

The second day of the program features the Asset Allocation Challenge, an interactive computer-based investment training exercise. Members are placed in groups and asked to select assets based on the given economic environment presented to them. This program is ideal for new trustees and can be repeated.

WHO SHOULD ATTEND?

- New trustees – get started with a solid foundation of knowledge so you'll be prepared to fulfill your obligations to your retirees.
- Experienced trustees – get updated on the most recent trends and developments in the public pension fund industry to ensure your continued success.
- Administrators and pension staff – be better prepared to do your job as a key implementer of policies and critical fund initiatives.

REGISTRATION FEE:

\$460 (early-bird rate through April 15)

\$665 (after April 15 or onsite)

REGISTRATION FEE INCLUDES:

- Program materials
- Breakfast and coffee breaks
- Certificate of completion

Attendance at TEDS provides trustees with eight (8) HOURS of continuing education credit.



TEDS PRELIMINARY AGENDA

SATURDAY, MAY 18

- | | |
|-------------------|--|
| 6:30 AM – 8:00 AM | Breakfast |
| 6:30 AM – 1:00 PM | Registration |
| 8:00 AM – 1:00 PM | GENERAL SESSION I <ul style="list-style-type: none">■ History and Mechanics of the Defined Benefit Plan■ Fund Structure: Investment Policy Statement, Asset Allocation & Benchmarking■ Investments 101: Fixed Income & Public Equities■ Investments 201: Alternatives |
| 5:00 PM – 6:00 PM | President's Reception |

SUNDAY, MAY 19

- | | |
|-------------------|---|
| 6:30 AM – 8:00 AM | Breakfast |
| 6:30 AM – 1:00 PM | Registration |
| 8:00 AM – 1:00 PM | GENERAL SESSION II <ul style="list-style-type: none">■ Time Value of Money■ A Pension Trustee's Guide to the Actuarial Valuation■ Asset Allocation Challenge■ Legal Implications and Ethics of Trustee Communications – When Talk is NOT Cheap |
| 1:00 PM | Presentation of Certificates |

PROGRAM FOR ADVANCED TRUSTEE STUDIES (PATS)

MAY 18 – 19
8:00 AM – 1:30 PM

The two-day PATS program is designed for advanced trustees who seek a more intensive, in-depth learning experience. Each year's program will focus on two topics of particular importance to pension plan trustees, enabling participants to dig deeper and fully explore issues with their counterparts from around the nation. Topics change from year to year and may include ethics, legal developments, and alternative investments, among other timely themes.

This unique program, developed more than a decade ago in consultation with Harvard Law School, is formatted to foster dialogue and interaction among attendees.

WHO SHOULD ATTEND?

Pension plan trustees and staff who have served in their role for five years or more and who are ready to step up to more advanced training.

REGISTRATION FEE:

\$460 (early-bird rate through April 15)

\$665 (after April 15 or onsite)

REGISTRATION FEE INCLUDES:

- Program materials
- Breakfast and coffee breaks
- Certificate of completion

Attendance at PATS provides trustees with eight (8) HOURS of continuing education credit.

PATS PRELIMINARY AGENDA

SATURDAY, MAY 18

| | |
|-------------------|--------------------------------------|
| 6:30 AM – 8:00 AM | Breakfast |
| 6:30 AM – 1:00 PM | Registration |
| 8:00 AM – 1:00 PM | DAY I – Investment in Private Equity |
| 5:00 PM – 6:00 PM | President's Reception |

SUNDAY, MAY 19

| | |
|-------------------|---|
| 6:30 AM – 8:00 AM | Breakfast |
| 6:30 AM – 1:00 PM | Registration |
| 8:00 AM – 1:00 PM | DAY II – Measuring and Accounting for Pension Funding |



For updates or to register online, visit www.NCPERS.org/ACE. Question? Call 202-624-1456 or e-mail registration@ncpers.org.

NCPERS ACCREDITED FIDUCIARY (NAF) PROGRAM

MAY 18 – 19
MODULES 1/2 & 3/4
8:00 AM – 4:00 PM



CLASS SIZE LIMITED TO 45

For trustees who want to take their training to the next level, the NAF program is a challenging program that culminates in a professional credential. To earn the NAF designation, trustees must complete four training modules, take an examination, and receive a passing grade.

All four of the modules required for NAF designation are offered during NCPERS University, in two 6 hour training sessions.

The curriculum covers the key components and strategies necessary for governing a public pension fund: governance and the board's role; investment, finance, and accounting; legal, risk management, and communication; and human capital.

Earning the NAF credential is powerful testimony to the time commitment a trustee has made to continuing education and professionalism.

ELIGIBILITY

Elected or appointed pension trustees and staff interested in pursuing the next level of professional development.

REQUIREMENTS

- It is recommended that candidates first complete the NCPERS Trustee Educational Seminar (TEDS) as a refresher course.
- Candidates are required to complete all four NAF modules (in any order), earning a total of twelve (12) hours of continuing education credits.
- Upon completion of all four NAF modules, candidates must demonstrate mastery of content through an online exam held in June and December every year.

REGISTRATION FEE:

\$815 (early-bird rate through April 15)
\$1,020 (after April 15 or onsite)

REGISTRATION FEE INCLUDES:

- Study materials
- Breakfast, coffee breaks, and lunch
- Exam preparation webinar (upon completion of all four modules)
- Completion certificate and NAF lapel pin



NCPERS ACCREDITED FIDUCIARY (NAF) PROGRAM

MODULES 1 & 2 AGENDA

SATURDAY, MAY 18

| | |
|---------------------|---|
| 6:30 AM – 8:00 AM | BREAKFAST |
| 7:00 AM – 1:00 PM | REGISTRATION |
| 8:00 AM – 3:00 PM | MODULE 1 – GOVERNANCE & THE BOARD'S ROLE |
| 8:00 AM – 8:45 AM | Introduction |
| 8:45 AM – 10:00 AM | Board Governance |
| 10:00 AM – 10:30 AM | Role of the Board (Part 1) |
| 10:30 AM – 10:45 AM | BREAK |
| 10:45 AM – 11:30 AM | Role of the Board (Part 2) |
| 11:30 AM – 12:00 PM | Board Performance (Part 1) |
| 12:00 PM – 1:00 PM | LUNCH |
| 1:00 PM – 2:00 PM | Board Performance (Part 2) |
| 2:00 PM – 3:00 PM | Case Study |

SUNDAY, MAY 19

| | |
|---------------------|--|
| 7:00 AM – 8:00 AM | BREAKFAST |
| 7:00 AM – 1:00 PM | REGISTRATION |
| 8:00 AM – 3:00 PM | MODULE 2 – INVESTMENT & FINANCE |
| 8:00 AM – 8:15 AM | Introduction |
| 8:15 AM – 10:30 AM | Investment Approach & ESG Considerations |
| 10:30 AM – 10:45 AM | BREAK |
| 10:45 AM – 11:30 AM | External Advisors |
| 11:30 AM – 12:00 PM | Financial Reporting and Disclosure |
| 12:00 PM – 1:00 PM | LUNCH |
| 1:00 PM – 2:00 PM | Alternative Investing |
| 2:00 PM – 3:00 PM | Case Study |

MODULES 3 & 4 AGENDA

SATURDAY, MAY 18

| | |
|---------------------|--|
| 6:30 AM – 8:00 AM | BREAKFAST |
| 7:00 AM – 1:00 PM | REGISTRATION |
| 8:00 AM – 3:00 PM | MODULE 3 – LEGAL, RISK MANAGEMENT & COMMUNICATION |
| 8:00 AM – 8:45 AM | Introduction |
| 8:45 AM – 9:45 AM | Legal |
| 9:45 AM – 10:30 AM | Audit Priorities |
| 10:30 AM – 10:45 AM | BREAK |
| 10:45 AM – 11:45 AM | Risk Management and Corporate Reputation |
| 11:45 AM – 12:00 PM | Effective Communication (Part 1) |
| 12:00 PM – 1:00 PM | LUNCH |
| 1:00 PM – 2:00 PM | Effective Communication (Part 2) |
| 2:00 PM – 3:00 PM | Case Study |

SUNDAY, MAY 19

| | |
|---------------------|---------------------------------------|
| 7:00 AM – 8:00 AM | BREAKFAST |
| 7:00 AM – 1:00 PM | REGISTRATION |
| 8:00 AM – 3:00 PM | MODULE 4 – HUMAN CAPITAL |
| 8:00 AM – 8:15 AM | Introduction |
| 8:15 AM – 9:00 PM | Succession Planning |
| 9:00 AM – 9:30 PM | Executive Employment Contracts |
| 9:30 AM – 10:30 AM | Executive Evaluations |
| 10:30 AM – 10:45 AM | BREAK |
| 10:45 AM – 12:00 PM | Executive & Trustee Compensation |
| 12:00 PM – 1:00 PM | LUNCH |
| 1:00 PM – 2:00 PM | Alternative Pension Management Models |
| 2:00 PM – 3:00 PM | Case Study |

ANNUAL CONFERENCE & EXHIBITION (ACE)



ACE provides a multitude of educational offerings for its members at all levels of experience. These opportunities will help you develop the knowledge, skills, and ideas you need to better serve your fund or union, move forward in your professional development, and engage effectively with colleagues across the country and Canada.

NCPERS is recognized as a learning provider and is an accredited sponsor of continuing education in several states.

By attending ACE,
trustees can earn up to **16.5 HOURS**
of continuing education credits.

Educational sessions will include:

- Economic Update
- Pension Law Update
- Portfolio Risk and Performance
- Corporate Governance
- Emerging Markets
- Investment Strategies
- Shareholder Activism
- Pension Actuarial Science
- Healthcare Reform
- Trustee Ethics
- Reform & Regulations
- GASB Update



ACE PRELIMINARY AGENDA*

REGISTRATION FEE
\$815 (early-bird rate through April 15)
\$1,020 (after April 15 or onsite)

SUNDAY, MAY 19

- 2:00 PM – 6:00 PM Registration
3:00 PM – 4:00 PM First Timers Meet & Greet
4:00 PM – 6:00 PM Exhibition
4:00 PM – 6:00 PM Welcome Reception

MONDAY, MAY 20

- 6:30 AM – 7:45 AM Breakfast
6:30 AM – 2:00 PM Registration
8:00 AM – 1:30 PM Exhibition
8:00 AM – 10:30 AM General Session I
- 2019 Market Outlook: Strategic Themes & Tactical Opportunities
 - Legal Panel: Securities Litigation
 - International Trade
- 10:30 AM – 11:00 AM Exhibit Break
11:00 AM – 12:00 PM Concurrent Breakout Sessions
- SESSION A: *Understanding Your Board's Effectiveness and Where Improvements Will Help*
 - SESSION B: *Why and How to Invest in Real Estate*
 - SESSION C: *Adverse Scenarios and Pension Plan Health*
- 12:15 PM – 1:15 PM Concurrent Breakout Sessions
- SESSION A: *Why Private Equity Secondaries Make Sense for Public Pension Plans*
 - SESSION B: *Fee Productivity and Transparency of Pension Plan Assets*
 - SESSION C: *Investing Beyond Borders & Tax Recovery: Are You Leaving Money on the Table?*
- 1:30 PM – 2:30 PM Lunch & Lecture Series (not open to guests)
Responsible Real Estate Investing: A Primer for Public Fund Trustees and Staff
- 2:45 PM – 3:45 PM National Committee Election

TUESDAY, MAY 21

- 6:30 AM – 7:45 AM Breakfast
7:00 AM – 2:00 PM Registration
8:00 AM – 1:30 PM Exhibition
8:00 AM – 10:30 AM General Session II
- Legal Panel: *Benefits, Tax & Regulations*
 - The Future of Public Plans in Post-Janus Decision*
 - Investing in a Low Growth World*
- 10:30 AM – 11:00 AM Exhibit Break

TUESDAY, MAY 21 (CONT'D)

- 11:00 AM – 12:00 PM Concurrent Breakout Sessions
- SESSION A: *Core Fixed Income with an Impact*
 - SESSION B: *Placemaking: How Real Estate is Changing the Way People Live, Work and Play*
 - SESSION C: *It's Much More Than Money*
- 12:15 PM – 1:15 PM Concurrent Breakout Sessions
- SESSION A: *Optimized Opportunities with Multi-Asset Strategies*
 - SESSION B: *Hacked! Are You Protected?*
 - SESSION C: *How a Medicare Marketplace Can Help Future-Proof Retiree Health Care Benefits*
- 1:30 PM – 2:30 PM Lunch & Lecture Series (not open to guests)
Combating Elder Financial Exploitation
- 2:45 PM – 3:30 PM National Committee Executive Board Elections
2:45 PM – 3:45 PM Administrators Forum

WEDNESDAY, MAY 22

- 6:30 AM – 7:45 AM Breakfast
7:00 AM – 12:00 PM Registration
8:00 AM – 10:30 AM General Session III
- ESG Integration: Expanding the Toolkit for Investment Research and Portfolio Management*
 - Guide to Alternatives*
 - A Conversion with Plan CEO's*
- 10:30 AM – 11:00 AM Refreshment Break
11:00 AM – 12:00 PM Concurrent Breakout Sessions
- SESSION A: *Use of Private Market Investments in Portfolios: Opportunities and Risks*
 - SESSION B: *Pension Valuation Forecasts*
 - SESSION C: *Opening China Could Be the Most Transformational Event in Financial Markets for the Next Decade*
- 12:15 PM – 1:15 PM Concurrent Breakout Sessions
- SESSION A: *Public Retirement Systems and Capital Market Developments*
 - SESSION B: *Tax Efficient Retirement Income-Planning for a Secure Financial Future*
- 1:30 PM – 2:30 PM Lunch & Lecture Series (not open to guests)
Social Security and Retirement Planning App
- 2:45 PM – 3:45 PM Small Plans Forum
2:45 PM – 3:45 PM Annual Business Meeting
6:00 PM – 7:00 PM Closing Reception
7:00 PM – 9:00 PM Closing Dinner & Show

*For a complete listing of educational sessions taking place at ACE, visit www.NCPERS.org/ACE.

For updates or to register online, visit www.NCPERS.org/ACE. Question? Call 202-624-1456 or e-mail registration@ncpers.org.



HILTON AUSTIN HOTEL

East 4th Street
Austin, TX 78701

NCPERS Group Rate \$267 single/double occupancy

Call Reservations 1-800-445-8667

Book Online www.ncpers.org

Book your hotel room at the Hilton and receive the discounted conference rate.

The group rate is available until Monday, April 15, or until the group block is sold out, whichever comes first. After April 15, rates will be based on the hotel's prevailing room rates.

**Please be sure to identify yourself to
the Hilton reservation agent
as attending the National Conference on
Public Employee Retirement Systems or PER.**

**RESERVATION
DEADLINE
APRIL 15**



For updates or to register online, visit www.NCPERS.org/ACE. Question? Call 202-624-1456 or e-mail registration@ncpers.org.

GENERAL INFORMATION

MEMBERSHIP REQUIRED

NCPERS Annual Conference & Exhibition is a members-only conference. Your organization must be a current member of NCPERS in order for your registration to be processed.

To verify your organization's membership status, please e-mail your inquiry to membership@ncpers.org.

WHO ARE FUND MEMBERS/STAKEHOLDERS?

NCPERS classifies a pension fund as a retirement plan established by a state or local government where contributions are made by both employers and employees into a pool set aside for employees' future benefit. The pool of assets is professionally managed and invested collectively, and the investments earnings on the contributions generate monthly retirement income to the employees upon retirement.

NCPERS classifies stakeholders as unions, retiree groups, and plan sponsors as defined below:

- **Unions:** Trade unions that represent the interests of state or local government employees.
- **Retiree Group:** Nonprofit state- or local-government-level organizations that represent the interests of public-sector retirees.
- **Plan Sponsor:** State political subdivisions or any agencies or instrumentalities thereof that sponsor a retirement plan.

WHO ATTENDS?

Professionals from all venues of the pension industry, including trustees, administrators and staff, state and local officials, investment and financial consultants, individuals who provide products and services to pension plans, union officers, and regulators from across the United States and Canada.

CONTINUING EDUCATION (CE) CREDITS

NCPERS is recognized as a learning provider in the public pension industry and is an accredited sponsor of continuing education in several states.

- Attending TEDS = up to 8 hours of CE
- Attending PATS = up to 8 hours of CE
- Attending NAF = 6 hours of CE
- Attending ACE = up to 16.5 hours of CE

REGISTRATION FEES

There are no per-day registration rates for ACE. If you register onsite, the full conference rate will apply, regardless of the day you register.

Registration fees include (unless otherwise noted) the following:

- Conference materials
- Three daily breakfasts
- Three daily refreshment breaks

- Sunday and Wednesday night receptions
- Three daily lunches as part of the Lunch & Lecture Series (*lunch not applicable to guests*)
- Closing dinner and show

The registration fees do not include hotel accommodations, airfare, or transportation.

GUEST REGISTRATION

A guest refers to a spouse or personal friend, **not a business associate, staff member, or colleague**. All guests must be registered to attend NCPERS events. No admittance will be given to guests without a registration name badge.

The guest fee includes access to the following functions:

- Breakfast (valued at \$55 per person)
- Exhibit hall refreshment breaks (valued at \$25 per person)
- Welcome reception (valued at \$85 per person)
- Closing reception (valued at \$40 per person)
- Closing dinner & show (valued at \$175 per person)

Note: Guests will not be admitted to the Lunch & Lecture Series lunch as this is an educational event for trustees.

REGISTRATION DEADLINE

Register by Monday, April 15, to receive the early-bird conference rates and be included in the preliminary attendee list (this list is used by our service providers to send invitations to their client events). You may still register for the conference after this date, but higher conference fees will apply.

REGISTRATION CHANGES

All registration changes must be received in writing. Please e-mail all registration changes to registration@ncpers.org or fax to 202-624-1439.

REGISTRATION METHODS



Submit your registration online at www.NCPERS.org. You will need your individual username and password to log in.



E-mail the registration form directly to registration@ncpers.org.



Fax the registration form to 202-624-1439.



Mail the registration form to:

NCPERS
444 North Capitol Street, NW
Suite 630
Washington, DC 20001

FUND MEMBER/STAKEHOLDER REGISTRATION FORM

| ATTENDEE REGISTRATION | Early-Bird Registration Fees (through April 15) | Late Registration Fees (after April 15 or on-site) |
|--|--|---|
| <input type="radio"/> *Trustee Educational Seminar (TEDS) | \$460/person | \$665/person |
| <input type="radio"/> *Program for Advanced Trustee Studies (PATS) | \$460/person | \$665/person |
| <input type="radio"/> *NCPERS Accredited Fiduciary (NAF) Program – Modules 1 & 2 | \$815/person | \$1,020/person |
| <input type="radio"/> *NCPERS Accredited Fiduciary (NAF) Program – Modules 3 & 4 | \$815/person | \$1,020/person |
| <input type="radio"/> Annual Conference & Exhibition (ACE) | \$815/person | \$1,020/person |

* The NCPERS preconference programs will run concurrently. Attendees should register for only one of the programs.

(Please print clearly)

Organization Name: _____

First Name: _____ Last Name: _____

Title: _____

Preferred Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Daytime Phone: _____ E-Mail Address*: _____

*Please provide your e-mail address for conference updates and registration confirmation.

| GUEST REGISTRATION | Early-Bird Registration Fees (through April 15) | Late Registration Fees (after April 15 or onsite) |
|--|--|--|
| <input type="radio"/> TEDS/PATS Guest Registration | \$55/person | \$80/person |
| <input type="radio"/> ACE Guest Registration | \$155/person | \$205/person |
| <input type="radio"/> Children 12 and Under | \$25/person | \$50/person |

There is no guest registration for NAF.

A guest refers to a spouse or personal friend, not a business associate, staff member, or colleague. All guests must be registered to attend NCPERS events. **See general information page for more details.**

First Name: _____ Last Name: _____

First Name: _____ Last Name: _____

QUESTION

Yes No Is this your first time attending the NCPERS Annual Conference & Exhibition?

REGISTRATION/ORDER SUMMARY

TEDS Registration \$ _____

PATS Registration \$ _____

NAF Module 1&2 Registration \$ _____

NAF Module 3&4 Registration \$ _____

ACE Registration \$ _____

Guest Registration \$ _____

GRAND TOTAL (U.S. funds) \$ _____

PAYMENT METHODS (All payments must be in U.S. funds)

Online at www.ncpers.org

You will need your username and password to log in.

Check

Mail to NCPERS | 444 North Capitol Street, NW | Suite 630 | Washington, DC 20001

Credit Card: Fax to 202-624-1439 or e-mail to registration@ncpers.org

American Express  Visa  MasterCard 

Credit Card #: _____

Expiration Date: _____ CC Verification Code: _____

Name (as it appears on the card): _____

CC Billing Address: _____

City: _____ State: _____ Zip: _____

Authorized Amount to Charge: \$ _____

By submitting this form, I certify I have read and understand the terms of this registration. If paying by credit card, I authorize NCPERS to charge my card for the total amount indicated.

Signature: _____

CANCELLATION POLICY

All registration cancellations must be received in writing before April 15 to receive a refund and will be subject to a processing fee: \$100 for TEDS, PATS, NAF, and ACE and \$50 for guest registrations. **No refunds will be given to cancellations after April 15 or to no-shows.** Please e-mail your cancellation request to registration@ncpers.org.