

# **ARKANSAS TEACHER RETIREMENT SYSTEM**

**February 1, 2021**

1400 West Third Street

**BOARD ROOM**

Little Rock, AR 72201

## **Board of Trustees Meeting**

**11:00 a.m.**

### **Trustees**

Danny Knight, Chair

Anita Bell

Lloyd Black

Kathy Clayton

Kelly Davis

Dr. Mike Hernandez

Shawn Higginbotham

Michael Johnson

Bobby G. Lester

Chip Martin

Robin Nichols

### **Ex Officio Trustees**

Susannah Marshall, State Bank Commissioner

Johnny Key, Education Commissioner

Honorable Andrea Lea, State Auditor

Honorable Dennis Milligan, State Treasurer

**AGENDA**  
**ARKANSAS TEACHER RETIREMENT SYSTEM**  
**BOARD OF TRUSTEES**

**February 1, 2021**  
**11:00 a.m.**  
**1400 West Third Street**  
**Little Rock, AR 72201**

- I. **\*Call to Order/Roll Call.** page 1.
  
- II. **\*Adoption of Agenda.** page 2.
  
- III. Executive Summary. (Attachment No. 1) page 6.
  
- IV. **\*Approval of Prior Meeting Minutes.**
  - A. **\*December 7, 2020 Minutes.** (Attachment No. 2) page 15.
  - B. **\*January 20, 2021 Minutes.** (Attachment No. 3) page 23.
  
- V. **\*Staff Empowerment.**
  - A. **\*Authority to Transact Business.**
    - 1. **\*Resolution 2021-01.** (Attachment No. 4) page 25.
  - B. **\*Specific Powers of Executive Director.**
    - 1. **\*Resolution 2021-02.** (Attachment No. 5) page 26.
  - C. **\*Appointment of ATRS as Manager of LLC's.**
    - 1. **\*Resolution 2021-03.** (Attachment No. 6) page 27.
  
- VI. **\*Authority to Reimburse Trustee Expenses for 2021.**
  - A. **\*Resolution 2021-04.** (Attachment No. 7) page 28.
  
- VII. **\*Authorization for Board Travel and Expense Reimbursement for 2021.**
  - A. **\*Resolution 2021-05.** (Attachment No. 8) page 29.
  
- VIII. **\*2021-2022 Employer Contribution Rate.**
  - A. **\*Resolution 2021-06.** (Attachment No. 9) page 34.

\* Action Item

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- IX. **\*2021-2022 Member Contribution Rate.**
  - A. **\*Resolution 2021-07.** (Attachment No. 10) page 35.
  
- X. **\*Adoption of Contribution Rate applied to Outsourced Positions.**
  - A. **\*Resolution 2021-08.** (Attachment No. 11) page 36.
  
- XI. **\*2021 Board of Trustee Election Update.**
  - A. **\*Certification of Dr. Mike Hernandez as Administrator Trustee.**
    - 1. **\*Resolution 2021-14.** (Attachment No. 12) page 37.
  - B. **\*Certification of Mr. Shawn Higginbotham as Administrator Trustee - Superintendent.**
    - 1. **\*Resolution 2021-15.** (Attachment No. 13) page 38.
  - C. **\*Certification of Ms. Anita Bell as Minority Trustee.**
    - 1. **\*Resolution 2021-16.** (Attachment No. 14) page 39.
  
- XII. **\*Actuarial Valuations, June 30, 2020.**
  - A. **\*Active & Inactive Members.** (Attachment No. 15) page 40.
  - B. **\*Retirees & Beneficiaries.** (Attachment No. 16) page 113.
  
- XIII. Report of Member Interest Amount Waived Under A.C.A. Sec. 24-7-205.  
(Attachment No. 17) page 152.
  
- XIV. Report of Employer Penalties and Interest Waived Under A.C.A. Sec. 24-7-411.  
(Attachment No. 18) page 153.
  
- XV. **\*Manifest Injustice for Board Approval.**
  - A. **\*In the Matter of MI Claim #2020-06.** (Attachment No. 19) page 154.
  - B. **\*In the Matter of MI Claim #2020-07.** (Attachment No. 20) page 155.
  
- XVI. **\*Clarification and Reaffirmation of Investment Management Processes under ATRS Policy 4.** *Clint Rhoden, Executive Director and Rod Graves, Deputy Director*
  - A. **\*Resolution 2021-13.** (Attachment No. 21) page 156.
  
- XVII. Audit Committee Report. *Kelly Davis, Audit Committee Chair*
  - A. Internal Audit: Teacher Deferred Retirement Option Plan (T-DROP).  
(Attachment No. 22) page 158.

\* Action Item

XVIII. Investment Committee Report. *Robin Nichols, Investment Committee Chair*

- A. Arkansas Related and Investment Update.
  - 1. List of Fund Closings.
    - a. Kayne Anderson Real Estate Partners VI, L.P. ("KAREP VI"), a Closed-End Opportunistic Real Estate Fund Focused on Senior Housing and Medical Offices, the Board Authorized Commitment of up to \$50 Million Dollars on September 28, 2020 was Accepted and Closed on November 24, 2020.
    - b. PGIM Real Estate Capital VII SCSp, ("PRECap VII"), a Closed-End Real Estate Fund Specializing in Junior and Senior Debt in the European Real Estate Market, the Board Authorized Commitment of up to \$40 Million Dollars on September 28, 2020 was Accepted and Closed on December 18, 2020.
  - 2. American Center Update.
- B. General Investment Consultant.
  - 1. Preliminary Performance Report for the Quarter Ending December 31, 2020. (Attachment No. 23) page 165.
- C. Real Assets Consultant Report.
  - 1. Performance Report for the Quarter Ending September 30, 2020. (Attachment No. 24) page 304.
  - 2. **\*Recommendation to Commit up to \$50 Million Dollars to ISQ Global Infrastructure Fund III, L.P, a Closed End Infrastructure Fund Specializing in Utilities, Transportation, and Power with Imminent Need.** (Attachment No. 25) page 357.
    - a. **\*Resolution 2021-09.** (Attachment No. 26) page 396.
- D. Private Equity Consultant Report.
  - 1. Private Equity Portfolio Review for the Quarter Ending September 30, 2020. (Attachment No. 27) page 398.
  - 2. **\*Recommendation to Make an Additional Commitment of up to \$30 Million Dollars in Franklin Park Corporate Finance Access Fund, L.P., a Fund of Funds Managed by Franklin Park Investing in Smaller Buyout, Growth, and Turnaround Private Equity Funds with Imminent Need.** (Attachment No. 28) page 452.
    - a. **\*Resolution 2021-10.** (Attachment No. 29) page 461.
  - 3. **\*Recommendation to Make an Additional Commitment of up to \$30 Million Dollars in Franklin Park International Fund X, L.P. (formerly Franklin Park International Fund 2019), a Fund of Funds Managed by Franklin Park Investing in International Private Equity Funds with Imminent Need.** (Attachment No. 30) page 463.
    - a. **\*Resolution 2021-11.** (Attachment No. 31) page 476.

\* Action Item

4. **\*Recommendation to Commit up to \$30 Million Dollars in Greenbriar Equity Fund V, L.P., a Buyout Fund that will Invest in Advanced Manufacturing and Business Services Companies Across the Logistics, Aerospace & Defense, and Transportation Sub-sectors with Imminent Need.** (Attachment No. 32) page 478.
  - a. **\*Resolution 2021-12.** (Attachment No. 33) page 481.

- XIX. Operations Committee Report. *Bobby Lester, Operations Committee Chair*
- A. Open Forum for Potential Rule or Law Changes by Committee Members and Board Members Present.
    1. Open Forum.
  - B. Legislaive Update.

- XX. **\*Staff Reports.**
- A. **\*Medical Committee Reports. A Total of 14 Disability Retirement Applications Approved.** (Attachment No. 34) page 483.

XXI. Other Business.

XXII. **\*Adjourn.**

## EXECUTIVE SUMMARY

TO: Board of Trustees  
FROM: ATRS Staff  
RE: Executive Summary  
DATE: February 1, 2021

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### V. Staff Empowerment.

Each year the ATRS Board authorizes ATRS staff to transact certain business to set the specific powers of the executive director and to appoint the executive director to manage and delegate operational duties to the limited liability companies that ATRS uses to manage its investments and Arkansas related property. The three resolutions regarding such actions are attached to this agenda as action items. The resolutions are worded the same as last year.

**A. Authority to Transact Business.** This is the standard Board resolution to authorize staff to take all actions necessary and limit authority of staff with the same authority and restrictions as in previous years. Other than to change the year, this is unchanged from last year.

**1. Resolution 2021-01.**

**B. Specific Powers of Executive Director.** This is the standard Board resolution to authorize specific powers of the Executive Director and to also limit those powers as in previous years. Other than to change the year, this is unchanged from last year.

**1. Resolution 2021-02.**

**C. Appointment of ATRS as Manager of LLC's.** This is the standard Board resolution to authorize staff to transact business as manager of LLCs. Other than to change the year, this is unchanged from last year.

**1. Resolution 2021-03**

**VI. Authority to Reimburse Trustee Expenses for 2021.** This is an action item for the Board to adopt a resolution authorizing reimbursement to Trustees for their

expenses and costs for serving as Trustees. The resolution is the same as last year. Other than to change the year, this is unchanged from last year.

**A. Resolution 2021-04.**

**VII. Authorization for Board Travel and Expense Reimbursement for 2021.** This is a standard Resolution for Board reimbursement. Other than to change the year, this is unchanged from last year. You should note that all travel reimbursement requests for both in-state and out-of-state travel can be found on the Federal General Services Administration website at:

<http://www.gsa.gov/portal/category/100120>

GSA rates are set by fiscal year, effective October 1 each year. For cities not identified or located on the website, the standard lodging rate is \$96 per day and \$55 per day for meals.

**A. Resolution 2021-05.**

**VIII. 2021-2022 Employer Contribution Rate.** This is a standard resolution that has been adopted over the years to establish the employer contribution rate for the upcoming fiscal year. The ATRS Board, on November 13, 2017, adopted an employer contribution rate schedule that established the employee contribution rate for FY2022 should be 14.75%. This resolution sets the employer contribution rate at 14.75%.

**A. Resolution 2021-06.**

**IX. 2021-2022 Member Contribution Rate.** This is a standard resolution that has been adopted over the years to establish the member contribution rate for the upcoming fiscal year. The ATRS Board, on November 13, 2017, adopted a member contribution rate schedule that established the member contribution rate for FY2022 should be 6.75%. This resolution sets the member contribution rate at 6.75%.

**A. Resolution 2021-07.**

**X. Adoption of Contribution Rate applied to Outsourced Positions.** From the 2017 Legislative session, a contribution rate now applies to outsourced salaries that are embedded positions as defined by that law. The law provides a "phased in" rate over several years. In order to process this rate like the employer and

member contribution rate, it is also placed on the agenda for the Board to officially set the rate by Resolution. After the full phased in period, the Board has the authority to adjust the rate to a maximum rate 4%. The authorized rate by law for fiscal year 2022 is 4%.

**A. Resolution 2021-08.**

**XI. 2021 Board of Trustee Election Update.** ATRS Board of Trustees has five (5) positions up for election, Positions 2, 5, 6, 7, and 8. In accordance with the ATRS Board election rules, after appropriate notification and following the election processes, Positions 5, 6 and 8 had one (1) person for each position submitted a petition for election and it was determined that the 3 candidates complied with the election rules and the said Positions were unopposed.

**A. Certification of Dr. Mike Hernandez as Administrator Trustee for Position #5 for the remaining 3 year term on July 1, 2021.** According to the ATRS election rules, the first board meeting after a candidate for the election is unopposed, the Board should certify Dr. Hernandez as an elected, member trustee. **This is an action item.**

**1. Resolution 2021-14.**

**B. Certification of Mr. Shawn Higginbotham as Administrator Trustee - Superintendent for Position #6 for a 6 year term on July 1, 2021.** According to the ATRS election rules, the first board meeting after a candidate for the election is unopposed, the Board should certify Mr. Higginbotham as an elected, member trustee. **This is an action item.**

**1. Resolution 2021-15.**

**C. Certification of Ms. Anita Bell as Minority Trustee for Position #8 for a 6 year term on July 1, 2021.** According to the ATRS election rules, the first board meeting after a candidate for the election is unopposed, the Board should certify Ms. Bell as an elected, member trustee. **This is an action item.**

**1. Resolution 2021-16.**

**XII. Actuarial Valuations, June 30, 2020.** These are the annual reports prepared by the actuaries concerning the valuation of liabilities to active and inactive members along with the valuation of liabilities for annuities being paid to current retirees and current beneficiaries. These reports reflect the future liabilities of ATRS to these two groups. The two groups are: (1) Active and Inactive Members; and (2) Members and Beneficiaries of Members currently receiving a monthly annuity. **This is an action item to approve the reports.** The ATRS

Board has already had a presentation by the actuaries on these reports that are now in final form.

**A. Active & Inactive Members.**

This report reflects the liabilities owed by ATRS to active and inactive members. Active members include all those who are currently employed with an ATRS employer and continue to accrue service credit. Inactive members include those who are vested but no longer active and would be entitled to a benefit at a point in the future when they reach an appropriate age.

**B. Retirees & Beneficiaries.**

This explanation is set forth above. These liabilities reflect the liabilities to ATRS retirees, beneficiaries, survivors, and incapacitated children.

**XIII. Report of Member Interest Amount Waived Under A.C.A. Sec. 24-7-205.**

ATRS waives interest for members when there is a dispute between ATRS and the member as to whether ATRS made a mistake or otherwise did not do all that was required on the member's account. Since ATRS has implemented the actuarial cost method for the purchase of service credit, interest waived is slowly disappearing, as well as the number of members who purchase service credit. No member interest was waived for this reporting period. This is a standard report for information and is not an action item

**XIV. Report of Employer Penalties and Interest Waived Under A.C.A. Sec. 24-7-411.**

ATRS may also waive employer interest and penalties when reports or payments are late or have issues due to a new bookkeeper, inclement weather, sickness and other situations that justify a waiver. Six (6) employer penalties and interest amounts were waived for this reporting period in the amount of \$1,349.83. This is a standard report for information and is not an action item.

**XV. Manifest Injustice For Board Approval**

**A. In the Matter of MI Claim #2020-06.** Since executive staff only has authority to waive up to \$1,000 of interest, ATRS staff has placed this item on the agenda. ATRS has no evidence that the failure to report and remit contributions on this service was the result of an intentional nondisclosure, fraud or misrepresentation. Given that the initial failure to report the service occurred years ago, the amount of interest due could be considered unduly penal and burdensome. Executive Staff recommends the Board find a manifest injustice exists in this case and waive the \$2,498.11 interest due in the effort to finally resolve the errors in this member's record. **This is an action item.**

**B. In the Matter of MI Claim #2020-07.** Since executive staff only has authority to waive up to \$1,000 of interest, ATRS staff has placed this item on the agenda. ATRS has no evidence that the failure to report and remit contributions on this service was the result of an intentional nondisclosure, fraud or misrepresentation. Given that the initial failure to report the service occurred years ago, the amount of interest due could be considered unduly penal and burdensome. Executive Staff recommends the Board find a manifest injustice exists in this case and waive the \$8,448.38 interest due in the effort to finally resolve the errors in this member's record. **This is an action item.**

**XVI. Clarification and Reaffirmation of Investment Management Processes under ATRS Policy 4.** Clint Rhoden and Rod Graves will give a presentation regarding the need for clarification from the Board in this matter.

**XVII. Audit Committee Report. *Kelly Davis, Audit Committee Chair***

**A. Internal Audit: Teacher Deferred Retirement Option Plan (T-DROP)**

**XVIII. Investment Committee Report. *Robin Nichols, Investment Committee Chair***

**A. Arkansas Related and Investment Update**

**1. List of Fund Closings**

**a. Kayne Anderson Real Estate Partners VI, L.P. ("KAREP VI"), a Closed-End Opportunistic Real Estate Fund Focused on Senior Housing and Medical Offices, the Board Authorized Commitment of up to \$50 Million Dollars on September 28, 2020 was Accepted and Closed on November 24, 2020.** The ATRS full commitment of \$50 million dollars was negotiated, accepted, and closed on November 24, 2020.

**b. PGIM Real Estate Capital VII SCSp, ("PRECap VII"), a Closed-End Real Estate Fund Specializing in Junior and Senior Debt in the European Real Estate Market, the Board Authorized Commitment of up to \$40 Million Dollars on September 28, 2020 was Accepted and Closed on December 18, 2020.** The ATRS full commitment of \$40 million dollars was negotiated, accepted, and closed on December 18, 2020.

**2. American Center Update.**

**B. General Investment Consultant. *Aon Hewitt Investment Consulting.***

- 1. Preliminary Performance Report for the Quarter Ending December 31, 2020.** PJ Kelly and Katie Comstock of Aon Hewitt Investment Consulting will provide the Board with a preliminary portfolio update for the quarter ending December 31, 2020.

**C. Real Assets. *Aon Hewitt Investment Consulting.***

- 1. Performance Report for the Quarter Ending September 30, 2020.** Chae Hong of Aon Hewitt Investment Consulting will provide the Board with a portfolio update for the quarter ending September 30, 2020.
- 2. Recommendation to Commit up to \$50 Million Dollars to ISQ Global Infrastructure Fund III, L.P, a Closed End Infrastructure Fund Specializing in Utilities, Transportation, and Power with Imminent Need.** The Fund is sponsored by I Squared Capital (ISQ), an independent infrastructure investment firm focused on core+ / value-add mid-market and large transactions across utilities, transportation, communication, power and renewables, midstream energy and social infrastructure businesses located in North America, Europe and select growth economies, mainly in Asia and Latin America. ISQ was founded by Sadek Wahba (Chairman and Managing Partner), Gautam Bhandari (Managing Partner) and Adil Rahmathulla (Managing Partner) (collectively the “Principals”) in 2012. I Squared Capital is a specialist global infrastructure firm headquartered in Miami with other offices in New York, London, New Delhi, Singapore, and Hong Kong. ISQ has been actively investing capital in its target infrastructure sub-sectors and geographies since 2014. Across its two prior funds, the firm has raised \$10.0 billion in total commitments, invested \$6.6 billion across 26 deals, and realized \$2.3 billion with the remaining portfolio marked at \$7.5 billion, as of March 31, 2020. This reflects a combined net internal rate of return (“IRR”) of 15.9%. Aon Hewitt Investment Consulting recommends an investment of up to \$50 million dollars in ISQ Global Infrastructure Fund III, LP with Imminent Need and ATRS staff concurs.

**D. Private Equity. *Franklin Park.***

1. **Private Equity Portfolio Review for the Quarter Ending September 30, 2020.** Michael Bacine of Franklin Park will provide the Board with a portfolio update for the quarter ending September 30, 2020.
2. **Recommendation to Make an Additional Commitment of up to \$30 Million Dollars in Franklin Park Corporate Finance Access Fund, L.P., a Fund of Funds Managed by Franklin Park Investing in Smaller Buyout, Growth, and Turnaround Private Equity Funds with Imminent Need.** In June 2019, the Board authorized an initial investment of up to \$30 million dollars in Franklin Park Corporate Finance Access Fund (FPCFAC). In September 2020, another allocation of \$30 million dollars was approved as well. This fund of funds was formed to allow other investors to invest in smaller buyout, growth equity and turnaround funds with ATRS as the anchor. Though the fund sizes are smaller, the managers chosen are experienced investors, often having spun-out from a larger successful firm. The managers are usually sector-focused with competitively advantaged domain knowledge. They typically have an operationally intensive value-add approach. Previously, ATRS had invested in these smaller or “next generation” funds through the ATRS/FP Fund. Over the years, the ATRS/FP Fund had become fairly complicated with various types of investments. Investing in these smaller funds through FPCFAC has helped to simplify the monitoring and accounting processes for the ATRS/ FP Fund. As with the Franklin Park venture and international vehicles, ATRS pays no fees or carry for this fund.

At this time, FPCFAC has invested approximately \$85 million dollars in ten investments. Though the investments are young, they are all on track to perform well. A number of high-quality, smaller funds will be coming to market in the next few months, and FPCFAC is looking to make more commitments before the end of the year. As a result, the fund will require an increase in capital commitments from its investors. Since ATRS will likely need to close on this investment before the next meeting of the Arkansas Legislative Council (there are no meetings scheduled at this time due to the legislative session), Imminent Need is requested.

Franklin Park recommends an additional commitment of up to \$30 million dollars in Franklin Park Corporate Finance Access Fund, L.P. with Imminent Need. ATRS staff concurs with the recommendation.

3. **Recommendation to Make an Additional Commitment of up to \$30 Million Dollars in Franklin Park International Fund X, L.P. (formerly Franklin Park International Fund 2019), a Fund of Funds Managed by Franklin Park Investing in International Private Equity Funds with Imminent Need.** Franklin Park International Fund X is the tenth international fund raised by the firm and in December 2019, the Board authorized an initial commitment of \$30 million dollars to the fund. It is a multi-year fund of funds that will invest in high-quality growing and mature consumer companies primarily across Asia and Europe. Since its closing last March, the fund has invested \$40 million dollars in two funds, and is looking to make more investments this year. The fund of funds is used to diversify and reduce risk for ATRS and the other clients of Franklin Park. As with the venture and corporate finance access vehicles, Franklin Park charges no fee to ATRS and only recovers the cost of legal and accounting fees required to properly operate the fund. This provides ATRS with diverse international private equity opportunities that otherwise would be difficult to obtain.

Franklin Park recommends an additional commitment in Franklin Park International Fund X of up to \$30 million dollars, also with Imminent Need. ATRS staff concurs with the recommendation.

4. **Recommendation to Commit up to \$30 Million Dollars in Greenbriar Equity Fund V, L.P., a Buyout Fund that will Invest in Advanced Manufacturing and Business Services Companies Across the Logistics, Aerospace & Defense, and Transportation Sub-sectors with Imminent Need.** Based in Rye, New York, Greenbriar was founded in 1999 by Joel Beckman, Gerald Greenwald, and Reginald Jones. Today, the firm is led Mr. Jones and four senior investment professionals who each average more than seventeen years of private equity experience and have worked together since 2008 at the general partner. The investment team has a deep and attractive track record, having produced a gross IRR of 40% on its 34 prior deals.

The firm primarily makes buyout investments in transportation, logistics, and distribution businesses where there is limited competition with other private equity funds. The general partner has a deep-rooted brand in the space due to its tenure and track record. The established sourcing approach of the firm can position it to acquire companies from outside formal sale processes or through limited auction processes. Over half of its historic deals have been proprietarily sourced and negotiated. The fund is targeting commitments of \$1 billion and will opportunistically employ a

“buy and build” strategy. Franklin Park recommends a commitment of up to \$30 million dollars in Greenbriar Equity Fund V, L.P., again with Imminent Need. ATRS staff concurs with the recommendation.

**XIX. Operations Committee Report. *Bobby Lester, Operations Committee Chair***

**A. Open Forum for Potential Rule or Law Changes by Committee Member and Board Members present.**

**1. Open Forum.**

**B. Legislative Update.**

**XX. Staff Reports.**

**A. Medical Committee Reports. A Total of 14 Disability Retirement Applications Approved.**

The Medical Committee Report is a standard report made by staff on behalf of the Medical Committee approving disability cases. A total of 18 disability applications were received, 14 were approved, 3 were denied, and 1 needed more information. **This is an action item.**

**XXI. Other Business.**

**MINUTES  
ARKANSAS TEACHER RETIREMENT SYSTEM  
BOARD OF TRUSTEES**

**Monday, December 7, 2020  
11:00 a.m.  
1400 West Third Street  
Little Rock, AR 72201**

**ATTENDEES**

**Board Members Present**

Danny Knight, Chair  
Anita Bell\*  
Lloyd Black\*  
Kathy Clayton\*  
Kelly Davis\*  
Dr. Mike Hernandez\*  
Shawn Higginbotham\*  
Michael Johnson\*  
Bobby Lester\*  
Chip Martin\*  
Robin Nichols\*  
Johnny Key, Secretary, Dept. of Ed\*  
Hon. Andrea Lea, State Auditor\*  
Susannah Marshall, State Bank Commissioner\*

**Board Member's Absent**

Hon. Dennis Milligan, State Treasurer

**ATRS Staff Present**

Clint Rhoden, Executive Director  
Rod Graves, Deputy Director\*  
Tammy Porter, Ex. Assistant/Board Secretary  
Curtis Carter, Chief Financial Officer  
Dena Dixson, Int. Audit/Risk Mgmt.\*  
Vicky Fowler, Director, Human Resources\*  
Willie Kincade, Director of Operations\*  
Jerry Meyer, Manager, Real Assets\*  
Martha Miller, General Counsel\*  
Joe Sithong, Information Systems Coordinator\*  
Brenda West, Int. Audit/Risk Mgmt.\*  
Misty Yant, Manager, Reporting

**Guest Present**

Chris Caldwell, Div. of Legislative Audit\*  
Jorge Perez, Div. of Legislative Audit\*  
Emily Tucker, Div. of Legislative Audit\*  
Johnna Staudinger, Div. of Legislative Audit\*  
Duncan Baird, APERS\*  
David Kizzia, AEA\*  
Donna Morey, ARTA\*  
Candace Franks\*  
ID# Capitol 2\*  
Will Muoio, Pageant Media\*  
Gar Chung\*  
Brian Murphy, GRS\*  
Judy Kermans, GRS\*  
Heidi Berry, GRS\*  
Lura Campbell, ARTA\*  
Emilie Monk\*

\* *via ZOOM*

- I. **Call to Order/Roll Call.** Mr. Danny Knight, Chair, called the Board of Trustees meeting to order at 11:10 a.m. Roll call was taken. Hon. Dennis Milligan, State Treasurer was absent.

**II. Adoption of Agenda.**

**Ms. Nichols *moved for adoption of the Agenda. Mr. Martin seconded the motion, and the Board unanimously approved the motion.***

**III. Election of Board Vice Chair.** Mr. Knight, Chair, opened the floor for nominations for the position of Vice Chair. Mr. Lester nominated Mr. Lloyd Black as Vice Chair of the ATRS Board of Trustees. No other nominations were made.

**Mr. Higginbotham *moved to approve Mr. Lloyd Black as Vice Chair of the ATRS Board of Trustees. Ms. Bell seconded the motion and the Board unanimously approved the motion.***

**IV. Executive Summary.** The Executive Summary was provided for reference with no questions or expansions on the written summary.

**V. Approval of Prior Meeting Minutes.**

**A. September 28, 2020, Minutes.**

**Mr. Lester *moved for approval of the Minutes of the Board of Trustees meeting of September 28, 2020. Mr. Higginbotham seconded the motion, and the Board unanimously approved the motion.***

**B. November 9, 2020, Minutes.**

**Ms. Lester *moved for approval of the Minutes of the Board of Trustees meeting of November 9, 2020. Mr. Higginbotham seconded the motion, and the Board unanimously approved the motion.***

**VI. Preliminary Active Actuarial Valuation.** Judy Kermans and Brian Murphy of Gabriel, Roeder, Smith & Co., gave a presentation of the preliminary active actuarial valuation for the 2019-2020 fiscal year.

**VII. Statement of Financial Interest.** Mr. Rhoden, Executive Director, reminded the Board members that their Statement of Financial Interest filings are to be filed with the Secretary of State's office by Monday, February 1, 2021, for financial information for calendar year 2020.

**VIII. Proposed 2021 Board of Trustees Schedule.** The Board reviewed the proposed schedule.

**Mr. Lester moved to approve the 2021 Board of Trustee Schedule. Mr. Black seconded the motion, and the Board unanimously approved the motion.**

- IX. Report of Member Interest Waived Under A. C. A. Section 24-7-205.** Mr. Rhoden presented the member interest amount waived report. ATRS waives interest for members when there is a dispute between ATRS and the member as to whether ATRS made a mistake or otherwise did not do all that was required on the member's account. No member interest was waived this reporting period.
- X. Report of Employer Interest and Penalties Waived Under A. C. A. Sec. 24-7-411.** Mr. Rhoden presented the employer interest and penalties waived report. ATRS may also waive employer interest and penalties when reports or payments are late or have issues due to a new bookkeeper, inclement weather, sickness and other situations that justify a waiver. One (1) employer interest and penalties was waived for this reporting period in the amount of \$164.68.
- XI. Manifest Injustice Report.** Mr. Rhoden presented the Board with the Manifest Injustice Report. Two (2) Manifest Injustice resolutions have occurred since the previous Manifest Injustice Report. The rule on Manifest Injustice requires reports on Manifest Injustice resolutions to the Board at least two times per year. This was the second report of the year.
- XII. Forfeiture Recommendations Pursuant A.C.A 24-7-734(6).** A.C.A. §24-7-734(b) provides that benefits that are not paid within five (5) years of the date they are due may be forfeited if (1) ATRS is unable to contact the person entitled to the benefit by mail addressed to the last known address on record; or (2) if the person entitled to the benefit fails to submit the required paperwork to ATRS to claim the benefit.

ATRS staff reviewed thirty-four (34) member accounts and identified benefits in thirty (30) accounts totaling in the aggregate \$89,193.35 that fall within the provisions of this Code section.

Staff recommends that the Board find these benefits should be forfeited according to A.C.A. §24-7-734(b) and direct the staff to transfer these benefits to the trust assets of ATRS.

**Mr. Lester moved to approved the Forfeiture Recommendations of 30 member accounts and direct staff to transfer these benefits to the**

**trust assets of ATRS. Ms. Bell seconded the motion, and the Board unanimously approved the motion.**

**XIII. Investment Committee Report. Robin Nichols, Investment Committee Chair.**

**A. Arkansas Related and Investment Update.** Rod Graves, Deputy Director, gave an update on the following recent Investment activity.

1. List of Fund Closings.
2. **Recommendation to Change the Legal Structure of Existing Highland Investments.**

**Ms. Nichols moved to adopt Resolution 2020-36, to Change the Legal Structure of Existing Highland Investments. The Board unanimously adopted the Resolution.**

3. American Center Management Update.

**B. General Investment Consultant Report. Aon Hewitt Investment Consulting.**

1. **Performance Report for the Quarter Ending September 30, 2020.** PJ Kelly and Katie Comstock of Aon Hewitt Investment Consulting provided the Committee with a preliminary performance report for the quarter ending September 30, 2020.
2. **AB TALF Opportunity 2020 (Delaware) Fund Update.** PJ Kelly and Katie Comstock of Aon Hewitt Investment Consulting provided the Board with an update of the AB TALF Opportunity 2020 (Delaware) Fund

**C. Real Assets Consultant Report. Aon Hewitt Investment Consulting.**

1. **Performance Report for the Quarter Ended June 30, 2020.** Chae Hong of Aon Hewitt Investment Consulting provided the Committee with a performance report for the quarter ending June 30, 2020.
2. **2021 Real Assets Commitment Pacing (Total Pacing \$330 Million Dollars).** Chae Hong of Aon Hewitt Investment Consulting presented the 2021 Real Assets Commitment

Pacing. For calendar year 2021, Aon Hewitt Investment Consulting and ATRS staff are recommending approximately **\$330 million dollars for 2021 real assets pacing.**

ATRS staff concurs with the recommendation.

**Ms. Nichols moved to approve the 2021 Real Assets Commitment Pacing for a Total of \$330 Million Dollars. The Board unanimously adopted the Motion.**

3. **Recommendation to Commit up to \$40 Million Dollars in Mesa West Real Estate Income Fund V, LP, a Closed-End Value Added Real Estate Fund Focused on Originating Senior Debt on Value Add/Transitional Commercial Real Estate Properties.** Chae Hong of Aon Hewitt Investment Consulting provided the Committee with the recommendation to Commit up to \$40 Million Dollars Mesa West Real Estate Income Fund V, LP, a Closed-End Value Added Real Estate Fund Focused on Originating Senior Debt on Value Add/Transitional Commercial Real Estate Properties.

ATRS staff concurs with the recommendation.

**Ms. Nichols moved to adopt Resolution 2020-37, to Commit up to \$40 Million Dollars in Mesa West Real Estate Income Fund V, LP, a Closed-End Value Added Real Estate Fund Focused on Originating Senior Debt on Value Add/Transitional Commercial Real Estate Properties. The Board unanimously adopted the Resolution.**

4. **Recommendation to Revise Board Policy 6 (Real Assets Investment Policies) and Board Policy 4 (Investment Policy) Related to Performance Benchmarks for Timber and Agriculture and to Change Portfolio Diversification Related to Agriculture, Real Estate and Timber.** Chae Hong of AON Hewitt Investment Consulting will present proposed changes to Board Policy 6 related to performance benchmarks and real asset portfolio diversification.

**Ms. Nichols moved to approve the Recommendation to Revise Board Policy 6 (Real Assets Investment Policies) and Board Policy 4 (Investment Policy) Related to Performance Benchmarks for Timber and**

**Agriculture and to Change Portfolio Diversification Related to Agriculture, Real Estate and Timber. pThe Board *unanimously adopted the Motion.***

**D. Private Equity Consultant Report. *Franklin Park***

- 1. 2021 Private Equity Pacing Schedule (Total Pacing \$300 Million Dollars).** Michael Bacine of Franklin Park provided the 2021 pacing schedule for private equity.

**Ms. Nichols *moved to approve* the 2021 Private Equity Pacing Schedule for a Total Pacing of \$330 Million Dollars. The Board *unanimously adopted the Motion.***

- 2. ATRS/FP Private Equity Fund, L. P., a Multi-Strategy Fund Focused on Co-Investments and Other Strategies That Seeks to Use Accumulated Recallable Distributions to Fund an Investment in Franklin Park Co-Investment Fund V, L.P. and Discussion of Change in Fee Structure.** Michael Bacine of Franklin Park provided the Committee with the recommendation to use accumulate recallable distributions to find an Investment in Franklin Park Co=Investment Fund V, LP, and discussion of Change in Fee Structure.

ATRS staff concurs with the recommendation.

**Ms. Nichols *moved to approve* the ATRS/FP Private Equity Fund, L. P., a Multi-Strategy Fund Focused on Co-Investments and Other Strategies That Seeks to Use Accumulated Recallable Distributions to Fund an Investment in Franklin Park Co-Investment Fund V, L.P. and Change in Fee Structure. The Board *unanimously adopted the Motion.***

**XIV. Operations Committee Report.** Bobby Lester, Chair, gave a report on the Operations Committee meeting.

**A. Open Forum for Potential Rule and Law Changes by Committee Members and Board Members Presents.**

- 1. Open Forum.** None.

- B. ATRS 2021 Legislative Package.** Director Rhoden gave the Committee a report of the potential 2021 Legislative Package. Draft copies for approval were presented to the Committee.

**Mr. Lester *moved to approve the 2021 Legislative Package. The Board unanimously adopted the Motion.***

**XV. Staff Reports.**

- A. Medical Committee Report.** Mr. Kincade reported that a total of 28 disability applications were received. 13 were approved, 14 were denied, and 1 needed more information.

**Ms. Nichols *moved to approve the Medical Committee Report. Ms. Davis seconded the motion and the Board unanimously approved the Motion.***

**B. Financial Report.**

- 1. Financial Statement Report.** Curtis Carter, ATRS Chief Financial Officer gave the Board summary information for the financial reports for the year ending June 30, 2020. Plan net assets were \$17.7 billion dollars in fiscal year 2020.
- 2. Travel Report.** Curtis Carter, ATRS Chief Financial Officer gave the Board a standard travel report showing the expenses for staff and Trustees for fiscal year ending June 30, 2020. Board travel expenses decreased in 2020 as compared to fiscal year 2019. Other staff travel also decreased in fiscal year 2020 as compared to fiscal year 2019

- C. Contracts.** Rod Graves, Deputy Director, gave an update on the ATRS Contracts.

- D. Personnel Report.** The Personnel report was presented to the Board. ATRS currently has 87 appropriated positions with a cap set at 81. Currently, there are 74 positions filled and 13 are vacant

**XVI. Recognition of Retirement of Candace Franks, Ex Officio Trustee. Director Rhoden recognized Ms. Candace Franks on her service to the ATRS Board of Trustees.**

- A. Resolution 2020-38.**

**Ms. Nichols moved to adopt Resolution 2020-38, Recognition of Ms. Candace Franks' service to the ATRS Board of Trustees. Ms. Davis seconded the motion, and the Board *unanimously adopted the Resolution.***

**XVII. Other Business. None.**

**XVIII. Adjourn.**

**Mr. Knight, Chair asked for any further business. With none being heard, Mr. Knight called the Board of Trustee meeting adjourned.**

**Meeting adjourned at 12:40 p.m.**

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Clint Rhoden,  
Executive Director

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Mr. Danny Knight, Chair  
Board of Trustees

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Tammy Porter,  
Recorder

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Date Approved

**ARKANSAS TEACHER RETIREMENT SYSTEM  
BOARD OF TRUSTEE MEETING – CALLED MEETING**

**Wednesday, January 20, 2021**

**4:00 p.m.**

**1400 West Third Street  
Little Rock, AR 72201**

**ATTENDEES**

**Board Members Present**

Danny Knight, Chair  
Lloyd Black, Vice Chair\*  
Anita Bell \*  
Kathy Clayton\*  
Kelly Davis\*  
Dr. Mike Hernandez\*  
Shawn Higginbotham\*  
Michael Johnson\*  
Bobby Lester\*  
Chip Martin\*  
Susannah Marshall, Bank Commissioner\*  
Robin Nichols\*

**ATRS Staff Present**

Clint Rhoden, Executive Director  
Rod Graves, Deputy Director\*  
Tammy Porter, Ex. Asst/Board Secretary\*  
Vicky Fowler, Director, Human Resources\*  
Wille Kincade, Assoc. Director of Operations\*  
Martha Miller, General Counsel\*  
Manju, Director, Information Services\*  
Brenda West, Int. Audit/Risk. Mgmt.\*

**Guest Present**

Duncan Baird, APERS

**Board Members Absent**

Johnny Key, Secretary, Dept. of Education  
Hon. Andrea Lea, State Auditor  
Hon. Dennis Milligan, State Treasurer

\* *via telephone*

- I. **Call to Order/Roll Call.** Mr. Danny Knight, called the Board of Trustees meeting to order at 4:26 p.m. Roll call was taken. Mr. Johnny Key, Hon. Andrea Lea, and Hon. Dennis Milligan were absent.
  
- II. **Adoption of Agenda.**  
  
**Mr. Black moved for adoption of the Agenda. Ms. Bell seconded the motion, and the Committee unanimously approved the motion.**
  
- III. **Executive Summary.** The Executive Summary was provided for reference with no questions or expansions on the written summary.
  
- IV. **2021 Board Election Update.** Director Clint Rhoden gave the Board an update on the upcoming Board Election.

V. **Operations Committee Report.** Bobby Lester, Chair, gave a report on the Operations Committee meeting.

A. **Proposed Modifications to ATRS 2021 Legislative Package.**

1. **Disability Retirement.**

**Mr. Lester *moved to approve* the proposed Disability Retirement legislation. The Board *unanimously approved the motion.***

2. **Modification to Approved Package.**

**Mr. Lester *moved to approve* the Modification to Approved Package. The Board *unanimously approved the motion.***

VI. **Other Business.** Deputy Director Rod Graves gave the Board an update on the sale of Big River Steel and the redeployment of the proceeds from the sale. Mr. Knight, Chair, asked Mr. Graves to provide the Board with an update on the American Center in Nashville, TN., at the February 1, 2021 meeting.

VII.. **Adjourn.**

**Meeting adjourned at 4:37 p.m.**

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Clint Rhoden  
Executive Director

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Mr. Danny Knight Chair  
Board of Trustees

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Tammy Porter,  
Board Secretary

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Date Approved

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 West Third Street  
Little Rock, Arkansas 72201**

**RESOLUTION  
No. 2021-01**

**Authority to Transact Business**

***BE IT RESOLVED***, That effective this 1<sup>st</sup> day of February, 2021, **CLINT RHODEN**, Executive Director, **ROD GRAVES**, Deputy Director, and **WILLIE KINCADE**, Associate Director of Operations, each are authorized to execute, acknowledge and deliver such agreements, documents, and instruments as might be necessary or appropriate in connection with the purchase, sale, pledge, transfer, or other transaction of any kind whatsoever involving any investment approved by the Arkansas Teacher Retirement System Board of Trustees or approved by the Investment Committee of said Board; and

***WHEREAS***, This authority shall continue until after the first regular scheduled Board meeting in 2022; and

***FURTHER RESOLVED***, That the execution, acknowledgment and/or delivery of such agreement, document, or instrument by any one of the three (3) named persons shall constitute the valid, binding and enforceable act of the Arkansas Teacher Retirement System by its Board of Trustees.

**Adopted this 1<sup>st</sup> day of February 2021.**

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**Mr. Danny Knight, *Chair***  
***Arkansas Teacher Retirement System***

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 West Third Street  
Little Rock, Arkansas 72201**

**RESOLUTION  
No. 2021-02**

**Specific Powers of Executive Director**

**WHEREAS**, The Board of Trustees has determined the policy concerning the specific powers of the Executive Director is not explicitly set forth in policy, and

**WHEREAS**, The Executive Director should be authorized and empowered to perform the usual and customary acts of the Executive Director of the Arkansas Teacher Retirement System as the Executive Director's usual and customary authority has been developed through a course of performance of Executive Directors over the years. However, the Executive Director should notify the Board Chair about any material decision that has usually and customarily been performed by the Executive Director to ensure the Board of Trustees is involved in all material decisions;

**IT IS THEREFORE RESOLVED**, The Executive Director shall be and hereby is authorized and empowered to perform the usual and customary acts of the Executive Director of the Arkansas Teacher Retirement System as the Executive Director's usual and customary authority has been developed through a course of performance of Executive Directors over the years. Provided however, the Executive Director shall notify the Board Chair about any material decision that has usually and customarily been performed by the Executive Director to ensure the Board of Trustees is involved in all material decisions before a final decision is made.

**Adopted this 1<sup>st</sup> day of February 2021.**

---

**Mr. Danny Knight, *Chair***  
***Arkansas Teacher Retirement System***

**ARKANSAS TEACHER RETIREMENT SYSTEM**  
**1400 West Third Street**  
**Little Rock, Arkansas 72201**

**RESOLUTION**  
**No. 2021-03**

**Appointment of ATRS as Manager of LLC's**

**WHEREAS**, The Arkansas Teacher Retirement System (“ATRS”) is the sole member and manager of several LLC's, including: Pinnacle Mountain Holding Company, LLC, Pinnacle Mountain Holding Company II, LLC, Pinnacle Mountain Holding Company III, LLC, Pinnacle Mountain Holding Company IV, LLC, Pinnacle Mountain Holding Company V, LLC, Pinnacle Mountain Holding Company VI, LLC, all Arkansas limited liability companies; and American Timberland, LLC, a Delaware company (collectively, the “Companies”); and

**WHEREAS**, The ATRS Board of Trustees, acting as a prudent investor for the benefit of all ATRS members, and in recognizing ATRS as sole member and manager of the Companies, adopts the following actions and resolution for, and on behalf of the Companies;

**NOW, THEREFORE, BE IT RESOLVED**, That

1. As managing member of the Companies and pursuant to its authority in A.C.A § 24-2-619, ATRS hereby delegates the authority to the ATRS Executive Director to perform all duties related to the respective Companies consistent with the amended Articles of Organization, Operating Agreements, and other applicable laws and policies of ATRS and further the Executive Director may delegate authority to a Deputy Director or to an investment staff member, when proper, to perform needed actions and executions in his absence.

2. That the Executive Director or his delegate will provide regular reports to the ATRS Board on the Companies.

**Adopted this 1<sup>st</sup> day of February 2021.**

---

**Mr. Danny Knight, *Chair***  
***Arkansas Teacher Retirement System***

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 West Third Street  
Little Rock, Arkansas 72201**

**RESOLUTION  
No. 2021-04**

**Authority to Reimburse Trustee Expenses for 2021**

**WHEREAS,** The Board of Trustees may reimburse expenses of the Trustees for performing official Board duties under A.C.A. § 24-7-303 (b) and other laws and policies of the State of Arkansas that may apply; and

**WHEREAS,** The Board must pre-approve any expenses incurred for the calendar year at its first meeting under ATRS Board Policy 1 section VII.A.

**THEREFORE, BE IT RESOLVED,** That the ATRS Board of Trustees hereby authorizes ATRS to reimburse Trustees for losses in salary resulting from attendance of a Board meeting that would otherwise be paid by the employer, including but not limited to, a Trustee's out of pocket cost associated with employing substitute personnel or losses in salary or compensation and any costs of communication, including long distance, postage, internet access, and other communication charges consistent with ATRS Board Policy 1 section VII.A. upon presentation of a written request by a Trustee, with adequate documentation enclosed.

**Adopted this 1<sup>st</sup> day of February 2021.**

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**Mr. Danny Knight, *Chair***  
***Arkansas Teacher Retirement System***

**ARKANSAS TEACHER RETIREMENT SYSTEM**  
**1400 West Third Street**  
**Little Rock, Arkansas 72201**

**RESOLUTION**  
**No. 2021-05**

**Authorization for Board Travel and Expenses for 2021**

**WHEREAS**, Act 1211 of 1995 (A.C.A. § 25-16-901 *et seq.*) provides that every state board may, by a majority vote of the total membership of the board cast during its first regularly scheduled meeting of each calendar year, authorize expense reimbursement for each board member for performing official board duties. Such reimbursement cannot exceed the rate established for state employees by state travel regulations; and

**WHEREAS**, Act 975 of 2011 provides for expense reimbursement for members of the Board of Trustees of the Arkansas Teacher Retirement System; and

**NOW, THEREFORE, BE IT RESOLVED**, That the Board of Trustees of the Arkansas Teacher Retirement System, by a majority vote of its total membership, authorizes expense reimbursement for each Board member for performing official Board duties during the calendar year 2021; and

**FURTHER RESOLVED**, That the expense reimbursement shall not exceed the rate established for state employees by state travel regulations and shall be in compliance with the attached Addendum A to this Resolution, adopted by this Board to reflect changes in state travel regulations; and

**FURTHER RESOLVED**, That Board members who live in the Little Rock area (excluding ex officio trustees) may be reimbursed for mileage and meal expenses incurred while performing official board duties in Little Rock at a rate not exceeding the rate established for state employees; and

**FURTHER RESOLVED**, That the adoption of this resolution authorizes reimbursement for any such expenses including those incurred in 2021 prior to the adoption of this resolution; and

**FURTHER RESOLVED**, That in years in which a Board retreat is held, each Board member shall be reimbursed for up to two (2) out-of-state conferences for the purpose of education; and

**FURTHER RESOLVED**, That in years in which the Board does not have a retreat each Board member shall be reimbursed for up to two (2) out-of-state

conferences for the purpose of education, with one (1) additional out-of-state conference with the approval of the Board Chair.

**Adopted this 1<sup>st</sup> day of February 2021.**

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**Mr. Danny Knight, *Chair***  
***Arkansas Teacher Retirement System***

*Addendum A*

Resolution 2021-05

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The following regulations have been adopted to provide guidance to board members and employees of the Arkansas Teacher Retirement System (ATRS).

For purposes of these rules, the following definitions shall apply:

1. "Official Station" shall be:
  - (a) For board members, the city or town in which a board member has a permanent address.
  - (b) For employees, the city or town of the employee's actual location of work.
2. Travel expenses will be reimbursed when board members or employees are required to travel away from their official station on ATRS business. Minimization of expenses while traveling should be the same, as a prudent person would exercise if traveling on personal business.
3. A Travel Reimbursement Form (TR-1) must be verified and signed by the traveler, accompanied by the proper receipts, and duly signed by the Executive Director, or designee, before reimbursement may be processed.
4. All travel reimbursement requests, whether for in-state or out-of-state travel, must adhere to the reimbursement rates listed in the Federal Travel Directory unless a waiver is granted. Current rates as of the filing of this Resolution for cities not identified or located in listed cities have a Standard rate of \$96 per day for lodging and \$55 per day for meals. All current rates can be found on the Federal General Services Administration Website:  
  
<http://www.gsa.gov/portal/category/100120>
5. Reimbursement may be claimed for actual expenses only, and must not exceed the Federal Directory maximums. In-state meals will not be reimbursed without overnight lodging. There are no exceptions to the maximum meal rates. The tip reimbursement amount shall not exceed fifteen percent (15%) of the meal amount expended. The total reimbursement for meals and tips shall not exceed the maximum rates prescribed by the Financial Management Guide published by the Office of Accounting of the Department of Finance and Administration.
6. Exceptions to lodging maximums may be allowed only with good justification, i.e., when conference hotel rates exceed area maximums, and staying elsewhere would incur transportation charges. The Executive Director, or designee, must approve all requests for exceptions prior to incurring the expense.

*Addendum A*  
Resolution 2021-05

7. Private vehicle mileage is reimbursable at the current rate per mile authorized by the Arkansas Department of Finance and Administration, currently 42 cents per mile. If a traveler's personal vehicle is used for transportation to and from the airport, a mileage reimbursement may be requested.
8. Reimbursable travel expenses are limited to those expenses authorized and essential to conducting official ATRS business. Telephone, Internet access, and facsimile expenses shall be allowed only when necessary for the completion of official business. Incidental amounts not directly related to travel (such as postage, small emergency supplies, etc.) may be allowed, when necessary, if incurred during the performance of official business while traveling. These necessary incidental expenses shall be itemized on the TR-1 form with receipts attached.
9. If one-way travel exceeds 400 miles from the traveler's official station, reimbursement may be requested for no more than one day prior to, and/or after, the official start/end of an approved conference/convention.
10. Travelers shall not be reimbursed for the purchase of alcoholic beverages, entertainment, flowers, valet service, laundry, cleaning, printing items, or other discretionary purchases.
11. Travel expenses shall not be billed to ATRS by a third-party except for lodging, meals, registration fees, and air transportation, duly approved in advance by the Executive Director.
12. Travel may be achieved by plane, train, bus, private or system-owned vehicle, rented vehicle, or taxi, whichever method serves the requirements of ATRS most economically and advantageously. The maximum allowable mileage will be computed by the shortest major highway route. Flights resulting in the lowest available airfare for ATRS should be used for all business trips, unless there are extenuating circumstances, such as unreasonable arrival/departure times or unusually long layovers.
13. When common carriers (airplane, train, or bus) are needed to transport persons on ATRS business, ATRS will make the travel arrangements, if possible, in order for the system to be billed direct. If this is not possible, the traveler may make and pay for arrangements and request reimbursement. Items that are properly purchased by, and invoiced directly to ATRS, are not reimbursable to the traveler.

*Addendum A*

Resolution 2021-05

14. For out-of-state travel, reimbursement shall be the lesser of coach class air, or the current rate per mile authorized by the Arkansas Department of Finance and Administration.
15. If more than one traveler is transported in the same vehicle, only the owner can claim a mileage reimbursement.
16. When attending out-of-state conferences, travelers should choose the most economical mode of transportation between airports and hotels, i.e., rental car, shuttle, or taxi. Consideration must be given to mileage, fuel, and parking fees when selecting a rental. Vehicle rentals are under a mandatory state contract; therefore, board members must contact the ATRS Executive Assistant for assistance with making any rental reservations under the terms of the contract. Employees requiring a vehicle rental must contact the ATRS fiscal department for assistance. If a rental car is obtained, and two (2) or more board members or employees travel to the same location, rentals should be shared, if possible.
17. Board members and employees of ATRS shall be reimbursed for their own travel expenses only. Board members and employees shall not be reimbursed for expenses incurred by their spouse or guest.

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 West Third Street  
Little Rock, Arkansas 72201**

**RESOLUTION  
No. 2021-06**

**2021-2022 Employer Contribution Rate**

**WHEREAS**, A.C.A. § 24-7-401(c) authorize the Board of Trustees of the Teacher Retirement System to establish the employer contribution rate paid into the System prospectively for each year; and

**WHEREAS**, A.C.A. § 24-7-401(c) dictates that the rate shall be set by the Board following consultation with its actuary based on the annual actuarial valuation and that the rate shall be based on the actuary's determination of the rate required to fund the plan in accordance with the financial objectives set forth in A.C.A. § 24-7-401(a); and

**WHEREAS**, Arkansas Teacher Retirement System is 81% funded, with an amortization period to pay off unfunded liabilities of 27 years, which shows that ATRS is in a strong financial position as of the last actuarial valuation at the end of the last fiscal year; and

**WHEREAS**, The ATRS Board, on November 13, 2017, adopted an employer contribution rate schedule that established the employee contribution rate for FY2022 should be 14.75%.

**NOW, THEREFORE, BE IT RESOLVED**, That the Board of Trustees in accordance with the legislative restrictions hereby sets the employer contribution rate for the fiscal year beginning July 1, 2021, at fourteen and three-quarters percent (14.75%).

**Adopted this 1st day of February 2021.**

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**Mr. Danny Knight, Chair**  
**Arkansas Teacher Retirement System Board**

**ARKANSAS TEACHER RETIREMENT SYSTEM**  
**1400 West Third Street**  
**Little Rock, Arkansas 72201**

**RESOLUTION**  
**No. 2021-07**

**2021-2022 Member Contribution Rate**

**WHEREAS**, A.C.A. § 24-7-406, authorizes the Board of Trustees (Board) of the Arkansas Teacher Retirement System (ATRS) to establish and modify the member contribution rate paid into ATRS by contributory members; and

**WHEREAS**, A.C.A. § 24-7-406 dictates that the member contribution rate shall be set by the Board following consultation with its actuary based on the annual actuarial valuation and that the rate shall be set to maintain actuarial soundness;

**WHEREAS**, Arkansas Teacher Retirement System is 81% funded, with an amortization period to pay off unfunded liabilities of 27 years, which shows that ATRS is in a strong financial position as of the last actuarial valuation at the end of the last fiscal year; and

**WHEREAS**, The ATRS Board, on November 13, 2017, adopted an member contribution rate schedule that established the member contribution rate for FY2022 should be 6.75%.

**NOW, THEREFORE, BE IT RESOLVED**, That the Board of Trustees in accordance with the legislative restrictions hereby sets the member contribution rate for the fiscal year beginning July 1, 2021, at six and three-quarters percent (6.75%).

**Adopted this 1<sup>st</sup> day of February, 2021.**

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**Mr. Danny Knight, Chair**  
***Arkansas Teacher Retirement System Board***

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 WEST THIRD STREET  
LITTLE ROCK, ARKANSAS 72201**

**RESOLUTION  
No. 2021-08**

**Adoption of Contribution Rate for Outsourced Positions**

**WHEREAS**, A.C.A. § 24-7-506, authorizes the Board of Trustees (Board) of the Arkansas Teacher Retirement System (ATRS) to collect a surcharge on salary paid to certain embedded positions that are outsourced at certain ATRS employers; and

**WHEREAS**, The contribution rate for outsourced positions is set by law with the option for the ATRS Board to increase the outsourced rate after an implementation period; and

**WHEREAS**, The authorized rate by law for fiscal year 2022 is four percent (4%); and

**WHEREAS**, ATRS should set the contribution rate for outsourced salary as a part of its regular function.

**NOW, THEREFORE, BE IT RESOLVED**, that the Board of Trustees of the Arkansas Teacher Retirement System hereby declares that the contribution rate for applicable outsourced salaries for fiscal year 2022 is four percent (4%) in accordance with Arkansas law.

**Adopted this 1<sup>st</sup> day of February, 2021.**

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**Mr. Danny Knight, Chair**  
***Arkansas Teacher Retirement System Board***

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 WEST THIRD STREET  
LITTLE ROCK, ARKANSAS 72201**

**RESOLUTION  
No. 2021-14**

**Certification of Dr. Mike Hernandez as Administrator Trustee**

**WHEREAS**, Dr. Mike Hernandez, ran unopposed for Position #5 – Administrator Trustee, and ATRS Board policy provides that should only one qualified candidate file a timely and verified petition, that person shall be declared by the Board of Trustees as elected to fill the vacant trustee position; and

**NOW, THEREFORE, BE IT RESOLVED**, that the Board of Trustees of the Arkansas Teacher Retirement System hereby declares and certifies Dr. Mike Hernandez, to be winner for Position #5. This position will become effective July 1, 2021 and shall expire on June 30, 2024.

**Adopted this 1<sup>st</sup> day of February, 2021**

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**Mr. Danny Knight, Chair**  
***Arkansas Teacher Retirement System Board***

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 WEST THIRD STREET  
LITTLE ROCK, ARKANSAS 72201**

**RESOLUTION  
No. 2021-15**

**Certification of Mr. Shawn Higginbotham as Administrator Trustee –  
Superintendent**

**WHEREAS**, Shawn Higginbotham, ran unopposed for Position #6 – Administrator Trustee – Superintendent, and ATRS Board policy provides that should only one qualified candidate file a timely and verified petition, that person shall be declared by the Board of Trustees as elected to fill the vacant trustee position; and

**NOW, THEREFORE, BE IT RESOLVED**, that the Board of Trustees of the Arkansas Teacher Retirement System hereby declares and certifies Mr. Shawn Higginbotham, to be winner for Position #6. This position will become effective July 1, 2021 and shall expire on June 30, 2027.

**Adopted this 1<sup>st</sup> day of February, 2021**

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**Mr. Danny Knight, Chair**  
***Arkansas Teacher Retirement System Board***

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 WEST THIRD STREET  
LITTLE ROCK, ARKANSAS 72201**

**RESOLUTION  
No. 2021-16**

**Certification of Ms. Anita Bell as Minority Trustee**

**WHEREAS**, Anita Bell, ran unopposed for Position #8 – Minority Trustee, and ATRS Board policy provides that should only one qualified candidate file a timely and verified petition, that person shall be declared by the Board of Trustees as elected to fill the vacant trustee position; and

**NOW, THEREFORE, BE IT RESOLVED**, that the Board of Trustees of the Arkansas Teacher Retirement System hereby declares and certifies Ms. Anita Bell, to be winner for Position #8. This position will become effective July 1, 2021 and shall expire on June 30, 2027.

**Adopted this 1<sup>st</sup> day of February, 2021**

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**Mr. Danny Knight, Chair**  
***Arkansas Teacher Retirement System Board***

# Arkansas Teacher Retirement System

Annual Actuarial Valuation of  
Active and Inactive Members  
June 30, 2020



# Report of the June 30, 2020 Actuarial Valuation

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November 24, 2020

Board of Trustees  
Arkansas Teacher Retirement System  
Little Rock, Arkansas

Dear Board Members:

Presented in this report are the results of the **Annual Actuarial Valuation of non-retired members as of June 30, 2020**. The June 30<sup>th</sup> annual valuation of retired lives receiving monthly benefits indicates the liabilities for future benefit payments to existing retirees. These liabilities are covered in detail in a separate report. They are also covered briefly in this report on page B-4.

The purposes of the valuation are to measure the System's funding progress and to determine the amortization period that results from the statutory employer and employee rates and the actuarial assumptions that the Board has adopted. This report should not be relied on for any purpose other than the purposes described herein. Financial results associated with the benefits described in this report that are developed for purposes other than those identified above may be significantly different than those in this report.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the Retirement System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

This valuation was based upon census data and financial information provided by the System's administrative staff. Preparation of this data requires considerable staff time. The helpful cooperation of the Arkansas Teacher Retirement System (ATRS) staff in furnishing the data is acknowledged with appreciation. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of any data provided by ATRS.

This report was prepared using certain assumptions approved by the Board. The actuarial assumptions used for valuation purposes are summarized in Section G. These assumptions reflect experience during the period July 1, 2010 to June 30, 2015 and expectations for the future.

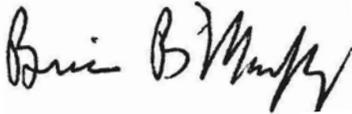
This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

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; and changes in plan provisions or applicable law. The scope of an actuarial valuation does not contain an analysis of the potential range of such future measurements.

To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice promulgated by the Actuarial Standards Board. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. Brian B. Murphy, Judith A. Kermans and Heidi G. Barry are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The individuals submitting this report are independent of the plan sponsor.

Respectfully submitted,



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD



Judith A. Kermans, EA, FCA, MAAA



Heidi G. Barry, ASA, FCA, MAAA

BBM/JAK/HGB:sc

## SECTION A

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### EXECUTIVE SUMMARY

## Executive Summary

**General Financial Objective.** Section 24-7-401 (a) of the Arkansas Code provides as follows (emphasis added):

- (1) The financial objective of the Arkansas Teacher Retirement System is to establish and receive contributions that expressed as percentages of active member payroll will **remain approximately level from generation to generation of Arkansas citizens.**
- (2) Contributions received each year shall be sufficient:
  - (A) To **fully cover the costs of benefit commitments** being made to members for their service being rendered **in that year**; and
  - (B) To **make a level payment** that if paid annually over a reasonable period of future years will **fully cover the unfunded costs** of benefit commitments for service previously rendered.

**Arkansas Teacher Retirement System Status:** Based upon the results of the June 30, 2020 actuarial valuations, **ATRS is satisfying the financial objective of level-contribution-percent financing.**

This report contains the results of the June 30, 2020 valuation. The table below shows a summary of the data used in the valuation. This data was the basis for determining valuation results and recommended employer contribution rates.

	Number	Average	Type of Average
Active not in T-DROP	66,900	\$40,709	Pay
Active in T-DROP	3,639	63,477	Pay
Deferred Vested	13,338	5,464	Annual Projected Benefit
Retired	50,133	23,833	Annual Current Benefit
<b>Total Members</b>	<b>134,010</b>		

Included in the 2020 valuation were 4,019 reemployed retirees (included in the Retired data file) with total earnings of \$123.1 million. ATRS receives full employer contributions on these individuals per Arkansas Code Section 24-7-708. The actuarial valuation assumes the number of working members will remain constant at the current level. In some recent years the total number of working members has decreased. A decreasing population means less contribution income for the retirement system than expected and can lead to funding difficulty in extreme cases. ATRS receives employer contributions on behalf of all working members.

**Actuarial Assumptions:** There were no assumption changes in the June 30, 2020 valuation. In our judgement the actuarial assumptions in use, and in particular the 7.50% investment return assumption, are reasonable for the purposes described in this report. However, it is possible that the 7.50% assumption may not satisfy actuarial standards for purposes of the June 30, 2021 valuation.

**Benefit Changes:** There were no benefit provision changes adopted for consideration in the June 30, 2020 valuation.

## Executive Summary - (Continued)

### Contribution Rate Changes

Employer and member contribution rates will change in the future according to the following schedule. This schedule of changes has been incorporated into the results shown in this report.

Fiscal Year	Contribution Rate	
	Member	Employer
2021	6.50%	14.50%
2022	6.75%	14.75%
2023 and Later	7.00%	15.00%

### Results of the Valuation

**The amortization period this year is 27 years**, a decrease from last year's period of 28 years. This result is heavily dependent upon member and employer rates increasing in accordance with the schedule above. While 27 years is a reasonable period that meets statutory requirements, use of such a period will result in unfunded liabilities that are projected to increase in dollar amount for approximately the next 10 years. This condition is called "negative amortization" and is falling out of favor. The ATRS has targeted 18 years in recent legislation as the amortization period that would eliminate negative amortization. The contribution rate based upon the target amortization period (18 years) would be approximately 17.6% of payroll. On a market value basis, the amortization period is 47 years and the contribution rate based upon the market value and the target amortization period (18 years) would be approximately 20.7% of payroll.

**The Arkansas Teacher Retirement System remains stable with an 80.6% funded position** as of June 30, 2020. However, unless there is a large investment gain in Fiscal Year 2021, the amortization period is likely to increase in the next valuation due to the scheduled phase-in of net investment losses.

**The rate of investment return was (1.00)%<sup>#</sup>** this year. As of June 30, 2020, the actuarial value of assets exceeded the market value of assets by approximately \$1,105 million. (Please refer to page D-3 for details.) Investment gains and losses that occur each year are smoothed in over a 4-year period. After considering smoothing, the recognized return this year was 7.38%, compared to an assumed 7.50% return for Fiscal 2020.

<sup>#</sup> *The actuary calculated this return figure which may not exactly match the investment consultant's figure.*

### Experience Study

Every five years we typically perform a study that reviews the demographic and economic experience of the Arkansas Teacher Retirement System and then recommend changes in assumptions as appropriate and necessary to comply with Actuarial Standards of Practice. The last study covered the experience during the period July 1, 2010 to June 30, 2015. The next study will cover experience during the period July 1, 2015 to June 30, 2020. We would expect this study to be completed late in Fiscal 2021 and to affect the June 30, 2021 valuation.

## Executive Summary - (Continued)

### Other Observations

#### **General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status**

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.50% on the actuarial value of assets), it is expected that:

- 1) The unfunded actuarial accrued liabilities will be fully amortized after 27 years;
- 2) The funded status of the plan will increase gradually towards a 100% funded ratio; and
- 3) The unfunded accrued liability will increase for an extended period before beginning to decline.

#### **Limitations of Funded Status Measurements**

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

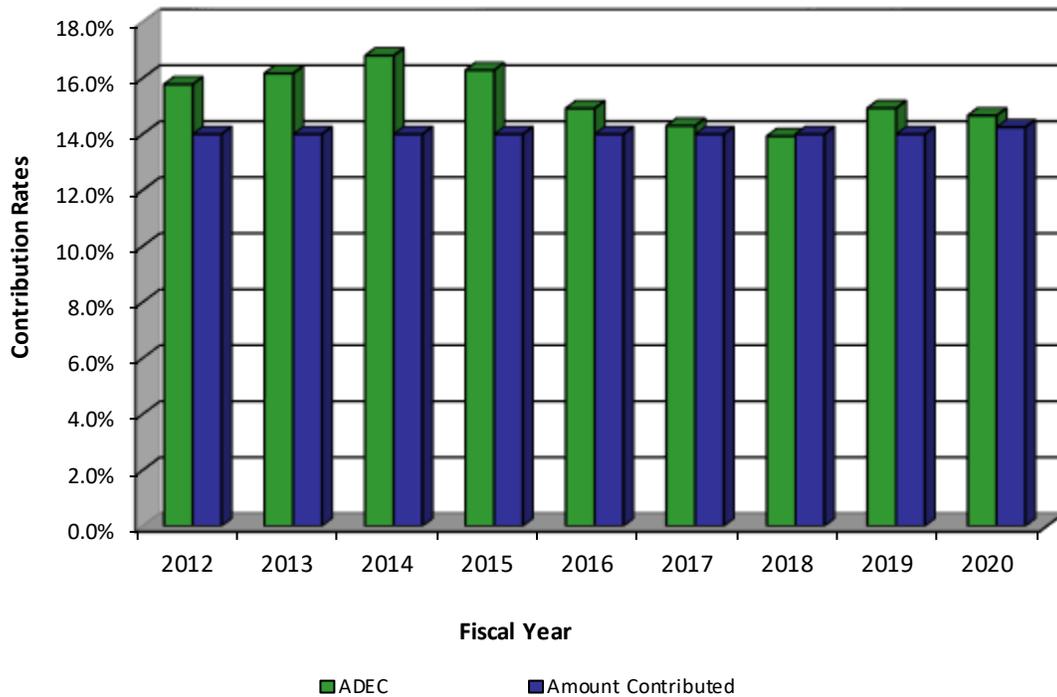
- 1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction;
- 2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit); and
- 3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

#### **Limitations of Project Scope**

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

## Executive Summary - (Concluded)

The following graph shows a history of the amounts contributed vs. the employer contributions, based on a maximum amortization period of 30 years. The results would look different if the Actuarially Determined Employer Contribution (ADEC) were calculated according to the Board's target of 18 years.



The amount contributed is less than the 30-year contribution in FY 2012-2017 and FY 2019-2020. In FY 2018 (June 30, 2016 valuation), the amount contributed exceeded the 30-year contribution.

The calculated amortization period was 28 years in the June 30, 2018 valuation, which determined the FY 2020 ADEC, and was based on anticipated increases in the employer and member contribution rates. The employer and member rates are scheduled to increase by 0.25% increments through FY 2023. The ultimate employer and member contribution rates will be 15% and 7%, respectively. The FY 2020 employer contribution rate was 14.25% which was less than the 30-year contribution ADEC.

## **SECTION B**

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### **VALUATION RESULTS**

## Determination of Amortization Period Computed as of June 30, 2020 and June 30, 2019

Computed Contributions for	Percents of Active Member Payroll			
	June 30, 2020			June 30, 2019
	Teachers	Support	Combined	Combined
Normal Cost				
Age & Service Annuities	10.47%	7.01%	<b>9.52%</b>	9.40%
Deferred Annuities	1.19%	2.10%	<b>1.44%</b>	1.44%
Survivor Benefits	0.36%	0.27%	<b>0.34%</b>	0.33%
Disability Benefits	0.48%	0.38%	<b>0.45%</b>	0.45%
Refunds of Member Contributions	0.47%	1.15%	<b>0.66%</b>	0.65%
<b>Total</b>	<b>12.97%</b>	<b>10.91%</b>	<b>12.41%</b>	<b>12.27%</b>
Average Member Contributions	6.54%	5.08%	<b>6.14%</b>	6.01%
Net Employer Normal Cost	6.43%	5.83%	<b>6.27%</b>	6.26%
Unfunded Actuarial Accrued Liabilities			<b>8.73%</b>	8.74%
<b>Employer Contribution Rate (FY 2023 and later)</b>			<b>15.00%</b>	15.00%
<b>Amortization Years</b>			<b>27</b>	28

The calculated amortization period of 27 years is based on anticipated increases in the employer and member contribution rates. The FY 2020 employer and member contribution rates were 14.25% and 6.25%, respectively. The employer and member rates are scheduled to increase by 0.25% increments ending in FY 2023. The ultimate employer and member contribution rates will be 15% and 7%, respectively, which are reflected in the above schedule.

The amortization period is the number of years it will take to pay off the unfunded liability of \$4.3 billion, assuming that the employer contribution rate increases to 15% according to the schedule described above. Since 2000, the period has varied from a low of 19 years to a high of over 100 years. Unless there is a large investment gain in FY 2021, the amortization period is likely to increase in the next valuation. Please see additional comments regarding the amortization period on page A-2.

## Computed Employer Contribution Rates 10-Year Comparative Statement

Valuation Date June 30	Active Members in Valuation **		Average Annual Pay		Consumer Price (Inflation) Index		Employer Contributions	
	Number	Annual Payroll (\$ Millions)			Value	% Change	Computed Financing Period (Years)	Total Employer Rate
			Amount	% Change				
2011#*	76,780	\$ 2,728	\$ 35,534	7.7 %	\$ 225.7	3.6 %	66	14.00 %
2012	75,627	2,714	35,891	1.0 %	229.5	1.7 %	over 100	14.00 %
2013#	74,925	2,727	36,400	1.4 %	233.5	1.8 %	70	14.00 %
2014	74,352	2,758	37,092	1.9 %	238.3	2.1 %	39	14.00 %
2015	72,919	2,777	38,088	2.7 %	238.6	0.1 %	33	14.00 %
2016	72,232	2,785	38,557	1.2 %	241.0	1.0 %	29	14.00 %
2017#*	72,148	2,814	38,997	1.1 %	245.0	1.6 %	29	14.00 %
2018#	72,341	2,872	39,702	1.8 %	252.0	2.9 %	28	14.00 %
2019#	72,164	2,907	40,285	1.5 %	256.1	1.6 %	28	14.00 %
2020#	70,539	2,954	41,884	4.0 %	257.8	0.6 %	27	14.25 %

\* Revised assumptions.

# Legislated benefit or contribution rate changes; employer and employee rates scheduled to increase to 15% and 7%, respectively, in 4 steps beginning in FY 2020.

\*\* Beginning with the June 30, 2011 valuation, active members include T-DROP members and payroll. ATRS also receives contributions on return to work retirees, but they are not included on this schedule.

## Computed Actuarial Liabilities as of June 30, 2020

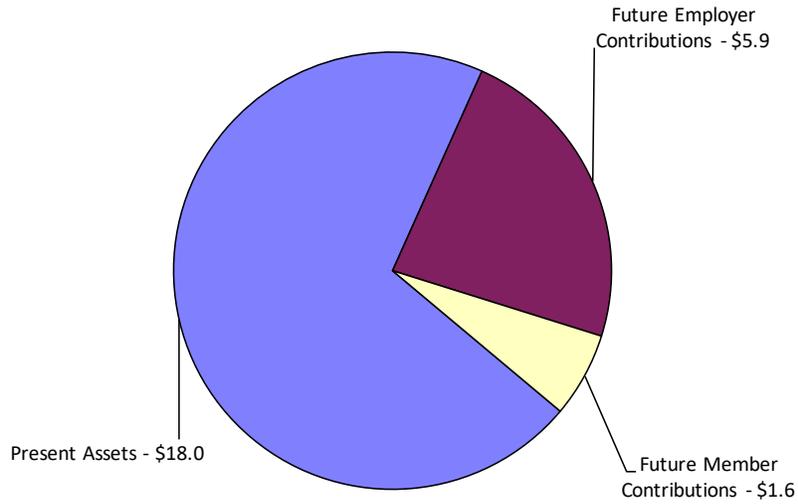
Actuarial Present Value of	(1) Total Present Value	Entry Age Actuarial Cost Method	
		(2) Portion Covered by Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1)-(2)
Age and service retirement allowances based on total service likely to be rendered by present active members.	\$ 8,809,878,956	\$2,366,508,382	\$ 6,443,370,574
Age and service retirement allowances based on total service likely to be rendered by present T-DROP members.	2,094,965,082	37,463,553	2,057,501,529
Vested deferred benefits likely to be paid present active and inactive members.	1,200,745,155	363,293,400	837,451,755
Survivor benefits expected to be paid on behalf of present active members.	227,351,121	83,651,519	143,699,602
Disability benefits expected to be paid on behalf of present active members.	223,891,916	110,542,993	113,348,923
Refunds of Member contributions expected to be paid on behalf of present active members.	20,994,586	154,718,473	(133,723,887)
Benefits payable to present retirees and beneficiaries.	12,890,407,230	0	12,890,407,230
<b>Total</b>	<b>\$25,468,234,046</b>	<b>\$3,116,178,320</b>	<b>\$22,352,055,726</b>
Funding Value of Assets	18,007,255,143	0	18,007,255,143
Liabilities to be Covered by Future Contributions	\$ 7,460,978,903	\$3,116,178,320	\$ 4,344,800,583

## Liabilities for Retirees July 1, 2020 Tabulated by Type of Benefit Being Paid

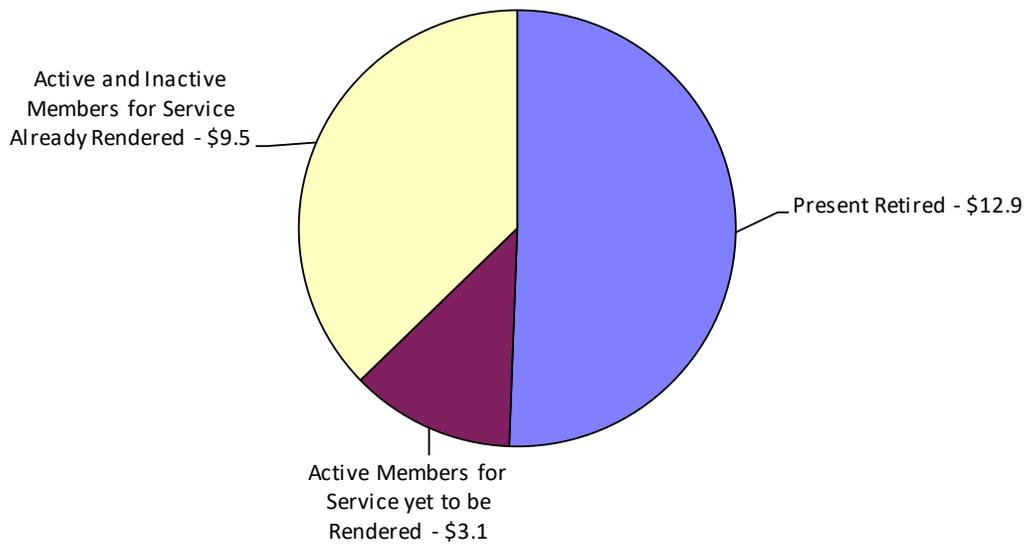
Type of Annuity	Liabilities July 1, 2020		
	Male	Female	Totals
<b>RETIREMENT RESERVE ACCOUNT</b>			
Age & Service Annuities			
Option 1 (Straight Life)	\$ 1,477,891,132	\$ 7,226,228,002	\$ 8,704,119,134
Option A (100% Joint & Survivor)	862,169,701	942,271,791	1,804,441,492
Option B (50% Joint & Survivor)	417,157,271	669,272,830	1,086,430,101
Option C (10 Years Certain & Life)	32,055,250	139,692,971	171,748,221
Beneficiaries	62,673,177	176,688,851	239,362,028
Total Age & Service	2,851,946,531	9,154,154,445	12,006,100,976
Disability Annuities			
Option 1	48,829,970	278,936,507	327,766,477
Option A	28,000,427	45,204,019	73,204,446
Option B	5,957,969	13,034,930	18,992,899
Option C	-	1,238,758	1,238,758
Beneficiaries	20,033,099	23,381,962	43,415,061
Total Disability	102,821,465	361,796,176	464,617,641
Act 793	8,622,387	5,461,516	14,083,903
Retirement Reserve Account	2,963,390,383	9,521,412,137	12,484,802,520
Act 808 Retirement Reserve Account	6,822,070	2,806,135	9,628,205
Total Retirement Reserve Account	2,970,212,453	9,524,218,272	12,494,430,725
<b>SURVIVORS' BENEFIT ACCOUNT</b>			
Beneficiaries of Deceased Members	\$ 48,892,768	\$ 59,636,161	\$ 108,528,929
<b>RETIREMENT SYSTEM TOTALS</b>			
Total Annuity Liabilities	\$ 3,019,105,221	\$ 9,583,854,433	\$ 12,602,959,654
Cash Benefit Account Liabilities			158,330,186
Liabilities for Lump Sum Death Benefits			129,117,390
Total	\$ 3,019,105,221	\$ 9,583,854,433	\$ 12,890,407,230

# Financing \$25.5 Billion of Benefit Promises for Present Active and Retired Members June 30, 2020

Sources of Funds  
(\$ Billions)



Uses of Funds



## Short Condition Test

ATRS' funding objective is to meet long-term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will **pay all promised benefits when due -- the ultimate test of financial soundness**. Testing for level contribution rates is the long-term test.

**A short condition test** is one means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with: 1) Member contributions on deposit; 2) The liabilities for future benefits to present retired lives; and 3) The liabilities for service already rendered by members. In a system that has been following the discipline of level percent-of-payroll financing, the liabilities for member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the system. Liability 3 being fully funded is unusual, but highly desired.

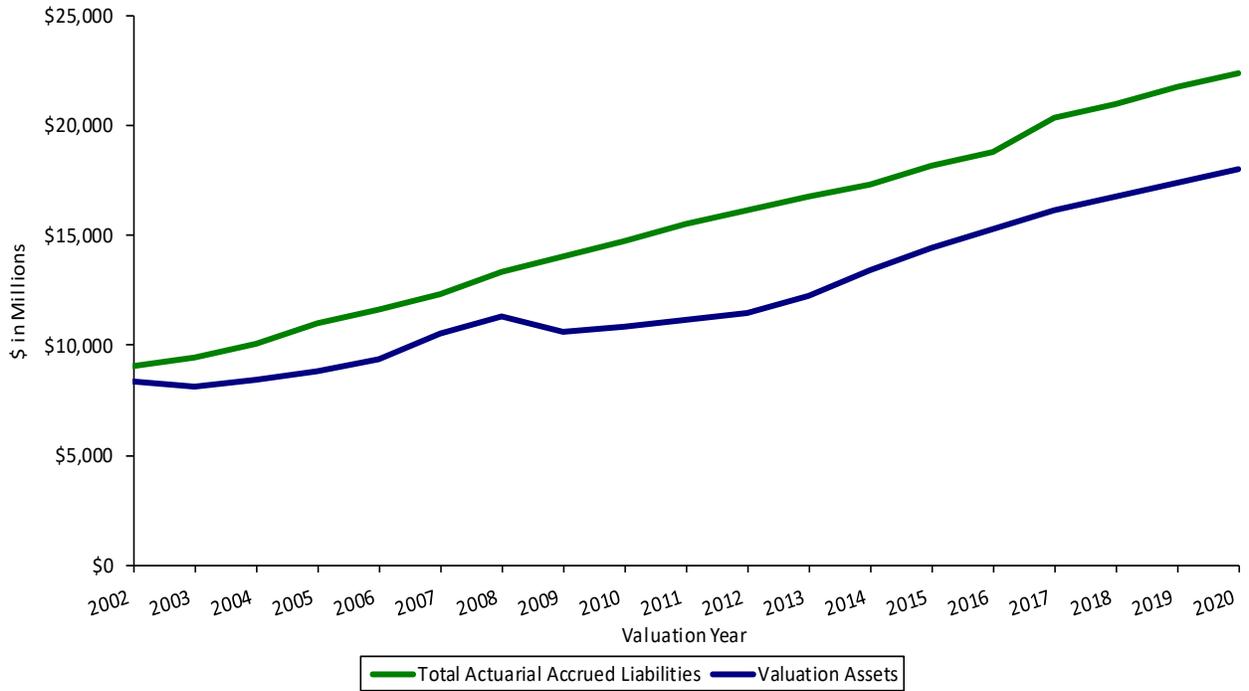
The schedule below illustrates the history of Liability 3 of the System and is indicative of the ATRS' objective of following the discipline of level percent-of-payroll financing.

Val. Date June 30	(1) Member Contrib.	(2) Retirees and Benef.	(3) Active and Inactive Members (Employer Financed Portion)	Present Valuation Assets	Portion of Present Values Covered by Present Assets			
					(1)	(2)	(3)	Total
-----\$ Millions-----								
2011#*	\$ 929	\$ 7,132	\$ 7,460	\$ 11,146	100%	100%	41%	72%
2012	981	7,649	7,509	11,484	100%	100%	38%	71%
2013#	1,027	8,181	7,510	12,247	100%	100%	40%	73%
2014	1,077	8,777	7,456	13,375	100%	100%	47%	77%
2015	1,128	9,778	7,230	14,434	100%	100%	49%	80%
2016	1,184	10,430	7,198	15,239	100%	100%	50%	81%
2017#*	1,254	11,337	7,707	16,131	100%	100%	46%	79%
2018	1,312	11,851	7,772	16,756	100%	100%	46%	80%
2019	1,377	12,460	7,872	17,413	100%	100%	45%	80%
2020	1,455	12,890	8,007	18,007	100%	100%	46%	81%

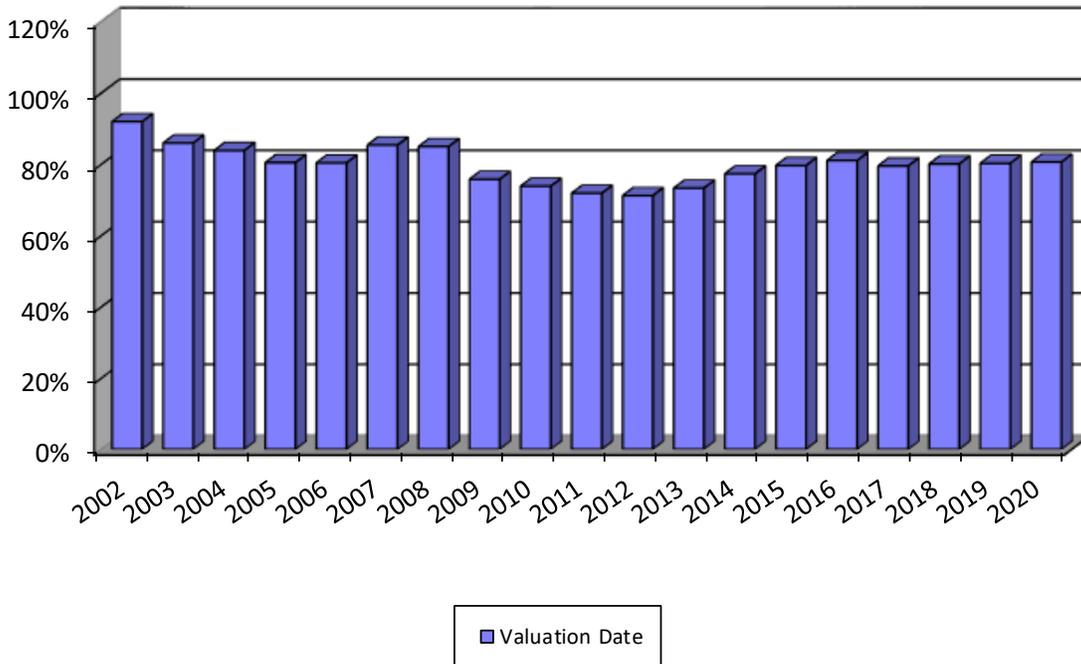
\* Revised actuarial assumptions or methods.

# Legislated benefit or contribution rate change.

## Actuarial Accrued Liabilities and Valuation Assets

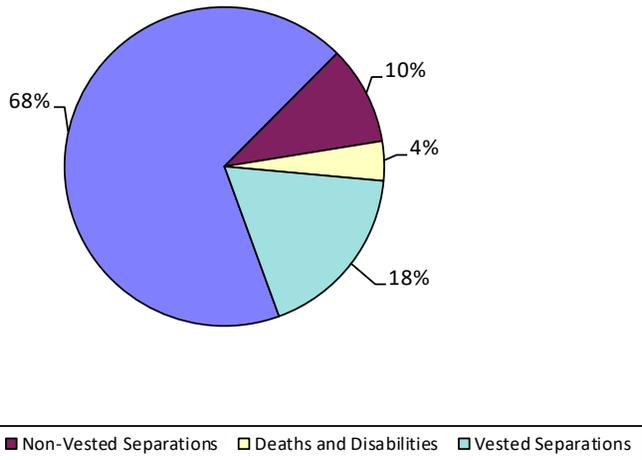
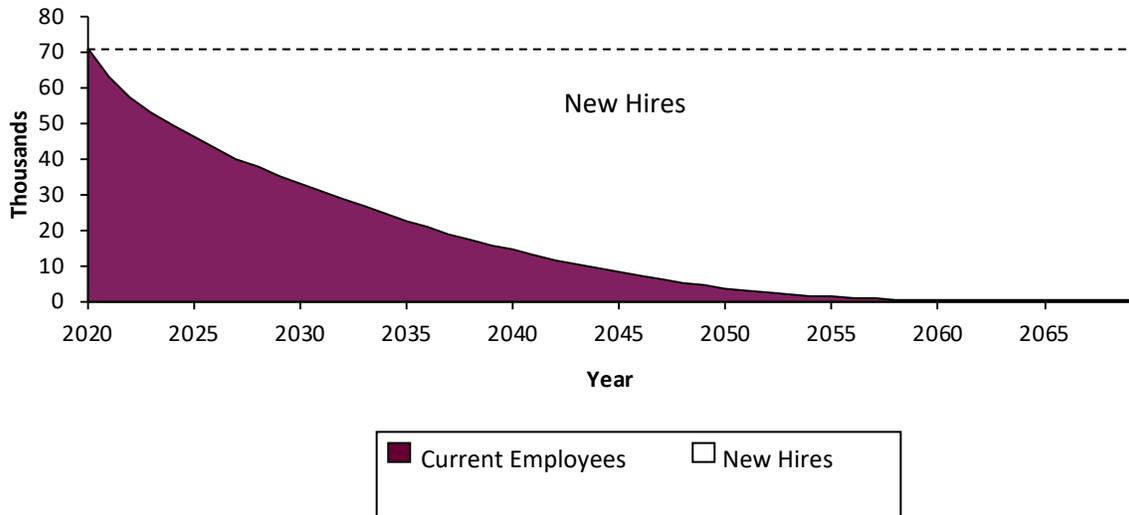


## Valuation Assets as a Percent of Accrued Liabilities (Funded Ratio)



# Expected Development of Present Population June 30, 2020 (Excludes Rehired Retirees)

## Population Projection



The charts show the expected future development of the present population in simplified terms. The Retirement System presently covers 70,539 active members (includes T-DROP). Eventually, 10% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. Approximately 86% of the present population is expected to receive monthly retirement benefits. Approximately 4% of the present population is expected to become eligible for death-in-service or disability benefits. Within nine years, over half of the covered membership is expected to consist of new hires.

## SECTION C

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### SUMMARY OF BENEFITS

# Summary of Provisions

## June 30, 2020

1. **Voluntary Retirement – A.C.A. § 24-7-701.** A member may retire at age 60 with 5 or more years of credited service, or after 28 years of credited service regardless of age.
2. **Early Retirement – A.C.A. § 24-7-702.** A member who has more than 25 but less than 28 years of credited service and has not attained age 60 years may retire and receive an immediate early retirement annuity. The early annuity is an age & service annuity reduced by the lesser of (i) and (ii) below:
  - (i) 10/12 of 1% multiplied by the number of months by which early retirement precedes completion of 28 years of service, or
  - (ii) 10/12 of 1% multiplied by the number of months by which early retirement precedes the attainment of age 60 years.

Act 750 of 2017 allows the ATRS Board to set by resolution the early annuity reduction at a rate between 5% and 15% per year, to be prorated monthly if the System's actuary certifies that the amortization period to pay the unfunded liabilities exceeds 18 years. The Board adjusted the reduction to 10% per year beginning August 1, 2017 by Resolution 2017-14 on April 17, 2017.

3. **Deferred Retirement – A.C.A. § 24-7-707.** An inactive member who has 5 or more years of credited ATRS service will be entitled to an age & service annuity beginning at age 60, provided accumulated contributions are on deposit with the retirement system.
4. **Disability Retirement – A.C.A. § 24-7-704.** An active member with 5 or more years of actual and reciprocal service, who becomes totally and permanently disabled may be retired and receive a disability annuity computed in the same manner as an age & service annuity. In order to qualify for disability retirement, the member must exhibit symptoms of physical or mental incapacitation while the member is an active member (Act 973 of 2011). A member who is eligible for age and service retirement (age 60 and 5 years of service or 28 years of service at any age) is no longer eligible to apply for disability retirement. Act 219 of 2015 requires an ATRS disability retiree to obtain a Social Security Administration determination letter finding that the retiree is disabled within 36 months of the effective date of disability retirement. If a member cannot provide the SSA determination letter within the 36-month period, benefits will be terminated, the member will be returned to active service, and all member history will be restored. The requirement to qualify for SSA disability shall not apply to a disability retiree who was age 57 or older before July 1, 2015, because that member would qualify for age & service benefits prior to requiring the SSA determination of disability. Additionally, the retiree may apply for an extension of the 36-month deadline if the retiree can demonstrate the SSA determination is in progress. Act 549 of 2017 allows a disabled retiree to return to work for an ATRS covered employer as a part-time employee or in a lesser position than held previously and not be disqualified from disability retirement.

## Summary of Provisions

### June 30, 2020

4. **Disability Retirement – A.C.A. § 24-7-704 (Cont.)** If a retiree tries to return to full time employment, and fails, the suspended disability benefit will be restored to what it would have been had they not tried to return to work, or a recomputed benefit using the additional service, whichever is higher. Additionally, this act allows a retiree who was unable to secure a fully favorable Social Security disability determination letter to seek the ATRS medical committee's review of the case and its findings, which may find that the member is still disabled according to the ATRS definition of “disabled”, shall be ruled as a final disposition in the matter.
5. **Final Average Salary (FAS) – A.C.A. § 24-7-736.** The ATRS Board made changes to the final average salary by Resolution 2017-33 on November 13, 2017. Effective in Fiscal Year 2019, a member’s final average salary is the average of the annual salaries paid during the period of 5 years of credited service producing the highest annual average. A benchmark 3-year FAS as of 6/30/2018 is established as a minimum FAS. Beginning July 1, 2009, no salary paid in any year which is utilized in the computation of the members’ final average salary, shall exceed the percentage increase of the base year, unless the difference in value between the next-highest year and the base year is within the amount of the salary differential (defined below). (Act 611 of 2017). If a member has a break in covered employment for eight years or more between any of the member's highest salary years used in the calculation of final average salary, then anti-spiking checking does not apply to the next highest year in the formula (Act 225 of 2011 – effective date of law July 27, 2011). There will no longer be any stacking of part-time college/teaching work for school district employees (Act 513 of 2011). Act 555 of 2013 limits the use of a reciprocal system's calculation of FAS if the ATRS member's reciprocal service credit is less than the number of years used to calculate the FAS for ATRS. Beginning July 1, 2014, if a member has less than three years of reciprocal service (the number of years used to calculate ATRS' FAS), then ATRS will obtain the salary and service credit from the reciprocal system, and use that salary and service as if it had all been earned in ATRS to calculate a FAS for retirement. Act 720 of 2013 made a minor change to final average salary for members who stop work during their last year of employment immediately before retirement. The Board may adjust the final average salary calculation by board resolution provided that the percentage range is no lower than 105% nor higher than 120% per year; and the salary differential is no lower than \$1,250 nor higher than \$5,000. Act 611 of 2017. The ATRS Board adjusted the percentage lower to 110% and salary differential allowance to \$5,000 by Resolution 2017-13 on April 17, 2017.
6. **Age & Service Annuity and Disability Annuity – A.C.A. §§ 24-7-705, 24-7-727 (stipend).** The annuity payable will not be less than the total of: years of contributory service times 2.15% of FAS; plus years of noncontributory service times 1.39% of FAS (1.25% for service earned after 2019); plus stipend for all members with 10 or more years of ATRS actual service. Act 966 of 2013 allows the ATRS Board to set the contributory multiplier for service credit earned after June 30, 2013, within a range of 1.75% to 2.15%. The noncontributory multiplier for service credit earned after June 30, 2013, may be set within a range of 0.5% and 1.39%. In addition, this act would allow the Board to set special multiplier rates for the first 10 years of ATRS service earned after June 30, 2013, for both contributory and noncontributory service. This act is dependent upon the actuary's certification that the amortization period is in excess of 18 (Act 551 of 2017) years to pay unfunded liabilities prior to any reduction to the multipliers.

## Summary of Provisions

### June 30, 2020

6. **Age & Service Annuity and Disability Annuity – A.C.A. §§ 24-7-705, 24-7-727 (stipend) Cont. By Board Resolution 2017-31 on November 13, 2017, the noncontributory multiplier will become 1.25% beginning in FY 2020. By Board Resolution 2017-32 on November 13, 2017, the contributory multiplier and noncontributory multiplier for the first 10 years of service has been reduced to 1.75% and 1.0% respectively beginning July 1, 2018. Once a member accrues 10 years of service, all service including the first 10 years is then credited at the standard rate in place at the time the service was earned.**
7. **T-DROP – A.C.A. §§ 24-7-1301–1316.** A member with 28 or more years of service may participate in the Teacher Deferred Retirement Option Plan (T-DROP, Act 1096 of 1995). T-DROP participants do not make member contributions. A T-DROP deposit is made monthly to the participant's T-DROP account. The T-DROP deposit is the amount that would have been paid had the member retired, reduced by 1% for each year of contributory, noncontributory, and reciprocal service (Act 605 of 2013). Members who enter T-DROP with less than 30 years of service are subject to an additional 6% reduction for each year less than 30 years. Act 750 of 2017 allows the Board to adjust the additional T-DROP reduction factor between  $\frac{1}{2}\%$  and 1% of the plan benefit for each month the member begins participating in the plan prior to having 30 years of credited service. T-DROP deposits are increased each year by 3% of the member's initial T-DROP deposit. T-DROP deposits cease at the earlier of 10 years of T-DROP participation or separation from service. T-DROP participants may continue in covered employment after 10 years of T-DROP participation, but do not accumulate additional T-DROP deposits. T-DROP participants receive interest annually on the balance of the T-DROP account. Regular T-DROP interest is credited for 10 or less years of participation. Post 10-year T-DROP interest is credited for more than 10 years of participation.

Regular T-DROP interest is a combination of a fixed interest rate and an incentive interest rate. An incentive rate may be approved by the Board to encourage continued participation in T-DROP, if the estimated ATRS rate of return is 2% greater than the ATRS actuarial assumed rate of return in the preceding calendar year. Beginning in fiscal year 2019, the Board has set the Regular T-DROP fixed interest rate at 3% and the maximum incentive rate at 3% by Resolution 2017-35 on November 13, 2017. The fixed and incentive interest rates may be adopted by board resolution prior to the beginning of the fiscal year and would apply to subsequent fiscal years unless modified by the Board. For fiscal year 2020, the Board set the Regular T-DROP fixed interest rate at 3% and the incentive interest rate at 0%, resulting in a total interest rate of 3%, by Resolution 2019-09 on February 4, 2019.

Post 10-year T-DROP interest has been in effect since July 1, 2010. Act 1049 of 2017 allows the Post 10-year T-DROP interest rate (24-7-1307) to be determined as appropriate by the Board and adopted by the resolution prior to the beginning of the fiscal year in which the interest rate shall apply. Post 10-year T-DROP interest is a combination of a variable interest rate and an incentive interest rate, to encourage continued participation in T-DROP. The Post 10-year T-DROP variable interest rate formula is based on investment returns and other factors. On November 13, 2017, the ATRS Board by Resolution 2017-36 set the formula for the variable interest rate and the maximum combined variable and incentive interest rate for fiscal year 2019 and beyond. The Post 10-year T-DROP variable interest rate is calculated as 2% less than the system's rate of return, but not less than 4%, nor greater than 6%. The maximum Post 10-year T-DROP combined interest rate including the incentive interest rate is 7.5%. The Post 10-year T-DROP incentive interest rate can be awarded if the estimated ATRS rate of

## Summary of Provisions

### June 30, 2020

**T-DROP – A.C.A. § 24-7-1301-1316 (Cont).** return is 2% greater than the ATRS actuarial assumed rate of return in the preceding calendar year. For fiscal year 2020, the Board set the Post 10-year T-DROP variable interest rate at 4% and the incentive interest rate at 0%, resulting in a combined interest rate of 4%, by Resolution 2019-10 on February 4, 2019.

Upon actual retirement, the member may receive the T-DROP account balance in the form of a lump sum, a Cash Balance Account (CBA), or as an additional annuity. The T-DROP distribution may be a combination of lump sum, CBA, and additional annuity.

8. **Post-Retirement Increases – A.C.A. §§ 24-7-713, 24-7-727 (compound COLA).** Each July 1, annuities are adjusted to be equal to the base annuity times 100% plus 3% for each full year in the period from the effective date of the base annuity to the current July 1. The base annuity is the amount of the member's annuity on the later of July 1, 2001 or the effective date of retirement, as re-determined by Acts 396 of 1999 and 992 of 1997. The July 1, 2009 cost of living adjustment for retirees was compounded. The annuity was set to 103% of the June 30, 2009 retirement benefit amount. After it was calculated on July 1, 2009, the base amount was reset to be the July 1, 2009 benefit amount. Future cost of living raises will be established by the new updated base amount. Future cost of living adjustments will be evaluated on an annual basis to determine if a simple or compound cost of living increase will be given, depending on the financial condition of the System. Act 967 of 2013 gives the ATRS Board authority to reverse the compounding of a benefit and reset the base amount to the pre-compounding amount. If this reversal were to occur, it would include participants in the T-DROP plan. The future benefits of a member would not be reduced to recover any benefits paid to a member as a result of the compounding. In addition, the member's benefit on the date of the reversal would not be impacted, but future COLA's would be based upon the reset base amount. This act is dependent upon the actuary's certification that the amortization period is in excess of 30 years to pay unfunded liabilities prior to any reversal of the compounding of the COLA. Act 780 of 2017 allows the right to reverse the 2009 compound COLA when unfunded liabilities exceed an 18 year amortization. The act also allows a phase in of the change during months in which a COLA raise is given to prevent any retiree or option beneficiary from having an actual reduction in monthly benefit payments.
9. **Survivor Benefits – A.C.A. § 24-7-710.** Upon the death of an active member, who has 5 or more years of actual and reciprocal service, the following annuities are payable:
  - (a) The surviving spouse receives an annuity computed in the same manner as if the member had (i) retired the date of his death with entitlement to an annuity, (ii) elected Option A - 100% Survivor Annuity, and (iii) nominated the spouse as joint beneficiary. If the member has attained age 60 and has acquired 5 years of credited service or has acquired 25 years of credited service regardless of age, the annuity begins immediately; otherwise the annuity begins the month following the date the member would have attained age 60. Under certain circumstances, a lump sum distribution may be made to the beneficiary(ies) of the deceased member.

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## June 30, 2020

### **Survivor Benefits – A.C.A. § 24-7-710. Cont.**

(b) A surviving child's benefit is prorated to an amount equal to 1% of the member's highest salary year for each quarter of a year credited as actual service in the system, up to 20% or up to a maximum of \$20,000 per year. If there is more than 1 surviving dependent, the benefits are capped to the lesser of 60% of the member highest salary or \$60,000 per year to be divided equally among the dependents. Act 505 of 2017. A child is dependent until the child's death, marriage, or attainment of age 18 (age 23 if the child is a full-time student).

10. **Lump Sum Death Benefit – A.C.A. § 24-7-720.** Beneficiaries of deceased active members or retirees with 10 or more years of ATRS credited service are eligible to receive a lump sum death benefit of up to \$10,000 (\$6,667 for noncontributory service-benefit). The amount will be prorated for members who have both contributory service and noncontributory service. Members with 15 or more years of contributory service will receive the full \$10,000 (Act 977 of 2011).
11. **Member Contributions – A.C.A. § 24-7-406.** Through FY 2019, contributory members contribute 6% of their salaries. Members that are participating in the T-DROP program or are working retirees do not make member contributions. If a member leaves service prior to becoming eligible to retire, the accumulated member contributions are returned upon request. No interest is credited to a member's contributions for the first year of membership; after 1 year, interest is credited. The ATRS Board set the interest rate on refunded contributions to 0.08% for fiscal year 2017 and beyond by Resolution 2017-17 on April 17, 2017. Act 550 of 2017 allows the ATRS Board to increase the employee contribution rate beyond 6% if the amortization period to pay the unfunded liabilities of the system exceeds 18 years. The Board set the member contribution rate to 6.25%, 6.50%, 6.75%, and 7.00% for FY 2020, FY 2021, FY2022, and FY 2023 and thereafter, respectively, by Resolution 2017-30 on November 13, 2017.

Effective July 1, 1986, a noncontributory plan was created. Effective July 1, 1999 the default choice for new members is contributory. Effective July 1, 1997, all future member contributions are tax-deferred in accordance with §414(h) of the Internal Revenue Code of the United States. Effective July 1, 2005, all noncontributory members whose status changes from support to teacher (contracted for more than 181 days), will become contributory. Each July 1, members who previously elected to be noncontributory may elect to change to contributory status under Act 385 of 2005. The election is irrevocable.

12. **Act 808 Retirement – A.C.A. § 24-4-732.** Any employee of a state agency who was an active member of the Arkansas Teacher Retirement System on April 8, 1987, and who qualified for retirement before January 1, 1988, could become a member of the Arkansas Public Employees Retirement System and retire from that system. All credited service was transferred to that system but the member's contributions were retained by the Arkansas Teacher Retirement System and the benefit amount is transferred monthly to the Arkansas Public Employees Retirement System. Each July 1, annuities are adjusted by 3% (compound escalator).



## Summary of Provisions

### June 30, 2020

13. **Act 793 Retirement – A.C.A. § 24-4-522.** Any employee who was a member of the rehabilitation services in 1977 was permitted to become a member of the Arkansas Public Employees Retirement System. Liabilities associated with prior service earned through June 30, 1978 remain in the Arkansas Teacher Retirement System. Future service is allocated to the Arkansas Public Employees Retirement System. Each July 1, annuities are adjusted by 3% (compound escalator).
14. **Retiree Benefit Stipend – A.C.A. § 24-7-713.** Each retired member as of June 30, 2008, with 5 or more years of ATRS credited service receives a \$75 per month stipend. Members in T-DROP do not receive the \$75 per month stipend until actual retirement. For all members retiring on or after July 1, 2008, a minimum of 10 years of ATRS credited service is required to receive the \$75 per month stipend. Act 603 of 2013 allows the ATRS Board to increase or decrease the stipend to a minimum of \$1 per month and a maximum of \$75 per month. This act is dependent upon the actuary's certification that the amortization period is in excess of 18 years to pay unfunded liabilities prior to any reduction in the current stipend. The stipend for fiscal year 2018 remains at \$75 per month. **By Board Resolution 2017-34 on November 13, 2017 the benefit stipend is removed from the base amount for all retirees and beneficiaries beginning in fiscal year 2019 and the benefit stipend will be reduced to \$50.00 for fiscal year 2020 and beyond. The Resolution contains a “hold harmless” provision that prevents the lowering of the stipend if it would actually reduce the total monthly benefit. This would only affect retirees when the COLA is less than \$25 per month.**

15. **Optional Forms of Benefits – A.C.A. § 24-7-706:**

**Option 1 (Straight Life Annuity)**

A member will receive the maximum monthly benefit for which he/she qualifies, throughout his/her lifetime. No monthly benefits will be paid to his/her beneficiary after the member's death. Should a member die before he/she has drawn in benefits an amount equal to his/her contributions plus earned interest, the balance will be paid to a designated beneficiary. The designated beneficiary may be anyone chosen by the member.

**Option A (100% Survivor Annuity)**

Under this option a member will receive a reduced annuity throughout his/her lifetime. Upon the member's death, the designated beneficiary will receive the same annuity for the balance of his/her lifetime.

**Option B (50% Survivor Annuity)**

Under this option a member will receive a reduced annuity throughout his/her lifetime. Upon the member's death, the designated beneficiary will receive one-half (1/2) of this annuity for the balance of his/her lifetime.

**Option C (Annuity for Ten Years Certain and Life Thereafter)**

A reduced monthly benefit payable for 120 months. After that time, a member's monthly allowance will revert to the amount he/she would have received under the regular plan and continue for life. If the member dies before receiving 120 payments, the designated beneficiary will receive a monthly benefit in the same amount until monthly benefits to both the member and the beneficiary equal 120 monthly payments. No further benefits are then payable to the beneficiary.

# Summary of Provisions

## June 30, 2020

### Pop-Up Election

Following the death of or a divorce from the member's designated beneficiary, his or her benefit reverts (pops-up) to the straight life annuity amount from the elected optional annuity amount. The member may then elect new beneficiaries in accordance with Arkansas Code and rules adopted by the ATRS board.

Option Factors are based upon a 5.0% interest rate and the RP-2014/MP2017 tables (static projection to 2022) adjusted with a 50% unisex mix.

16. **Refund of Member Contributions – A.C.A. § 24-7-711.** Any termination refund made to a member or a lump sum payout made to a surviving spouse after July 1, 2011, cancels all service credit, including noncontributory service credit (Act 976 of 2011); any repurchase of refunded service will be as contributory years at actuarial cost (Act 69 of 2011). Act 140 of 2013 specifies that all membership rights (including noncontributory service credit) and beneficiary designations to the ATRS are cancelled when a member gets a refund of his or her contributions.
17. **Contract Buyout – A.C.A. § 24-7-735.** During periods of contract buyout/litigation/termination, members will not receive service credit if no on-call service or on-site work is performed. ATRS will not allow the purchase of the time between actual work and the settlement (Act 163 of 2011) unless the settlement was made to resolve a claim of wrongful termination (Act 436 of 2017).
18. **Actuarial Cost of Service – A.C.A. §§ 24-1-107, 24-2-502, 24-7-202, 24-7-406, 24-7-501, 24-7-502, 24-7-612, 24-7-602, 24-7-603, 24-7-604, 24-7-606, 24-7-607, 24-7-610, 24-7-611.** Effective July 1, 2011, all service purchases will be at actuarial cost (Act 69 of 2011).
19. **Deceased Member Refund of Contributions – § 24-7-711.** Effective July 1, 2011, if a beneficiary is not eligible for survivor benefits, or if a surviving spouse is eligible and chooses a contribution refund, the interest on the refund stops the July 1 following the member's death (Act 136 of 2011).
20. **Limit Lookback to Five Years – A.C.A. §§ 24-7-202, 24-7-205.** Effective July 1, 2011, absent intentional nondisclosure, fraud, misrepresentation, criminal act, or obvious/documentated error by an employer of ATRS members can no longer establish old service previously unreported unless such service is acquired by purchase at actuarial cost (Act 138 of 2011). Act 241 of 2017 allows ATRS to correct an understated service credit error upon which all required contributions have been paid, even if beyond the 5-year look-back period.
21. **Service Credit Requirements – A.C.A. §§ 24-7-501, 24-7-502, 24-7-601, 24-7-603, 24-7-604, 24-7-606, 24-7-607, 24-7-611.** Effective July 1, 2011, members must receive 160 days of service to be credited with a year of service credit (Act 974 of 2011).
22. **T-DROP Cash Balance Account.** Effective July 1, 2012, a T-DROP cash balance account was established that allows members exiting (retiring) from T-DROP to place all or a portion of their T-DROP proceeds into a Cash Balance Account (CBA) at ATRS. On November 13, 2017, by Resolution 2017-38 the Board set the CBA interest rate schedule based on years of participation as follows: 2.50% for year one, 2.75% for year two, 3.00% for year three, 3.25% for year four, 3.50% for year five, and 4.00% for year



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six and beyond. Each fiscal year, the Board can grant an incentive interest rate to encourage continued participation in the CBA program. For fiscal year 2020, the Board did not grant CBA participants an incentive rate.

23. **Delinquent Member Contributions – A.C.A. § 24-7-205.** Act 336 of 2013 allows members to forfeit service credit for any contributory fiscal year for which there is a balance due to the system.
24. **Purchase of “Air Time” as a Result of Wrongful Termination – A.C.A. §§ 24-7-702, 24-7-735, 6-17-413.** Act 521 of 2013 allows a member to purchase service credit under a settlement agreement or court order to resolve a claim of wrong termination if the service credit is purchased from the date of termination by an ATRS employer to the date of the resolution of the dispute. This service credit would be purchased at actuarial cost.
25. **Buyout of Inactive Members—A.C.A. § 24-7-505.** Act 606 of 2013 allows the ATRS Board to create a voluntary "buyout plan" for inactive vested members. The System will make a one-time lump sum payment to a member, a surviving spouse, or an alternate payee in exchange for a member, surviving spouse, or alternate payee's cancellation of membership and retirement benefit rights. The buyout plan will be established by Board rules. The rule is 16-1 Cash and Savings Help Program for Members (CASH). This particular plan offering ended June 30, 2015. Depending upon the success of the plan, it may be extended by the Board. Act 647 of 2017 allows the buyout plan to be extended, modified, or expanded by board resolution. The ATRS Board expanded the CASH program to include all inactive vested members, regardless of service type by Resolution 2017-18 on May 10, 2017. The ATRS Board offered the FY 2020 CASH program for all inactive vested members to end on June 30, 2020 by Resolution 2019-30 on June 3, 2019.
26. **Private School Service—A.C.A. § 24-7-607.** Prior to Act 90 of 2015, private school service had to be recognized by the Arkansas Department of Education as positions that required the issuance of teaching licenses. The certification of this service credit was performed by one employee of the Arkansas Department of Education, and that one employee retired. Upon that employee's retirement, the Arkansas Department of Education no longer certified private school service credit. No certifications occurred for approximately a year until legislation could be passed to allow ATRS to make this determination. In addition, a distinction was made between certified and noncertified private school service credit. Certified private school service (basically administrative and teaching) could be purchased at actuarial cost, up to 15 years. Noncertified private school service could be purchased at actuarial cost, up to 5 years.
27. **Military Service Credit—A.C.A. § 24-7-602.** Act 301 of 2015 made technical corrections to the ATRS laws. In the military service credit section, ATRS was not in compliance with a state law that was passed in 2009, Act 295, which repealed the requirement for free military service credit to be granted only if the service was not credited under any other plan except Social Security and the requirement that receipt of a pension from the federal military retirement system paid solely for disability shall not be considered as having service with another retirement plan. The military technical corrections bill raised questions by some of the legislators, and Act 558 of 2015 was passed to further clarify military service credit. Compulsory military service was changed throughout the law to read: "federal military

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### June 30, 2020

draft". The word "honorable" was inserted before discharge in order for the member to obtain free military service credit throughout the law.

28. **Lump-Sum Payment of Reserve Value of Small Annuity—A.C.A. 24-7-716.** Prior to passage of Act 225 of 2015, ATRS would pay out a reserve value to a member whose monthly benefit was less than \$20 per month. This was optional for the member. The reserve value was calculated by multiplying the annual annuity by the reserve factor for the member's age. Act 225 of 2015 repealed this law.
29. **Pension Advance Prohibition – A.C.A. § 24-7-715.** Prohibits a pension advance company from obtaining a retiree's benefit to repay a loan. Act 199 of 2017.
30. **Accrued Sick Leave – A.C.A. § 24-7-601.** Allows unused accrued sick leave, whether paid or unpaid, to count as service credit to determine retirement eligibility for survivor benefits and lump sum death benefits. One day of service shall be added to the service credit for the fiscal year of the member's death for each day of unused sick leave. This does not include catastrophic leave and other unused donated leave. Act 200 of 2017.
31. **Spousal Survivor Benefit – A.C.A. § 24-7-710.** Members may direct an alternative residual beneficiary to receive a lump sum payment of the member's residue amount or T-DROP balance. No spousal survivor benefits will be payable if an alternative beneficiary who is not the surviving spouse is designated by the member. Act 243 of 2017.
32. **Settlement Agreements – A.C.A. § 24-7-202, § 24-7-735.** Salary or service credit may be purchased as part of a settlement agreement between a member and his/her employer. Salary will be added to the salary at the time of purchase and will be determined using the same factors used to calculate an additional monthly benefit in the annuitization of a T-DROP distribution. It is assumed the member would have retired immediately at the time of the purchase. Act 436 of 2017.
33. **Outsourcing – A.C.A. § 24-7-506.** This Act defines outsourcing to mean employment for an ATRS covered employer through a third party, private employer, independent contractor, or other contractual relationship. This Act defines that a person who performs services that are necessary for the normal daily operation for an ATRS covered employer is considered an Embedded Employee. This Act gives the ATRS covered employer a one-time decision to choose between two options for handling their Embedded Employees. The decision must be made within 60 days after the effective date of this Act or that first outsourcing. The first option for the ATRS covered employer is to become a participating employer and make embedded employees participating members of ATRS. The second option for the ATRS covered employer is to become a Surcharge Employer and opt to pay a surcharge on the Embedded Employee's salary to ATRS to help cover the actuarial cost. The surcharge starts at ½% the first year and slowly rises to 3% over 4 years with a hard cap of 4%. The Embedded Employees of a Surcharge Employer will not be members of ATRS. The services necessary for normal daily operations include: substitute teaching, teacher's aides, food service, transportation service, custodial service, security services, and school nursing. Only those working on the premises are subject to the surcharge. The surcharge is ONLY on SALARY of embedded employees. All salary is reported in the aggregate with the contractor's salary amount being the final word unless it is clearly in error. The Division of Youth Services shall be a participating Employer and may designate any or all

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## June 30, 2020

Embedded Employees as members of ATRS. The law shall not apply to post-secondary higher education institutions. Act 575 of 2017.

34. **Concurrent Reciprocal Service Credit – A.C.A. § 24-7-601.** This act allows ATRS members with the option of waiving their ATRS service in the event the member had concurrent service in two (2) state-supported retirement systems. This Act gives the member the option to surrender either ATRS service or the reciprocal plan service. If a member worked full time under a reciprocal retirement system and only part-time under ATRS, this Act will allow the member to waive the ATRS service to obtain a higher benefit based upon the full-time service in the other system. This act will allow concurrent reciprocal members the option to voluntarily elect to waive service in ATRS. The member's employer-accrued contributions and employee-accrued contributions in the system remain with the system. Act 612 of 2017.
35. **Employer Contribution Rate – A.C.A. § 24-7-401.** Employer contributions are collected on active members, T-DROP participants (even those who work beyond the 10-year participation period), and working retirees (Act 743 of 2009). Through fiscal year 2019, the employer contribution rate is 14%. For the fiscal year beginning July 1, 2018, the Board may modify the employer contribution rate for future fiscal years above 14% in increments of 0.25% per fiscal year provided the system has a greater than 18-year amortization period to pay unfunded liabilities without an employer contribution rate of more than 14% limited to a maximum employer contribution rate of 15%. Act 821 of 2017. The Board set the employer contribution rate to 14.25%, 14.50%, 14.75%, and 15.00% for FY 2020, FY 2021, FY2022, and FY 2023 and thereafter, respectively, by Resolution 2017-40 on November 13, 2017.
36. **Forfeiture of Benefits by Certain Persons – A.C.A. §§ 24-1-301, 302, 303, 304, 305.** Act 756 of 2017 provides for a beneficiary's forfeiture of benefits under a public retirement system when the beneficiary unlawfully kills a member or retiree.
37. **Socially responsible investments – A.C.A. § 24-7-105.** Act 767 of 2017 provides that a decision on whether to invest, not invest, or withdraw from investment the funds of the Arkansas Teacher Retirement System or an alternate retirement plan of the system shall not be based on a consideration that the location of the investment, fund, company, or any other type of investment vehicle is in the State of Israel.

## Sample Benefit Computations for a Member Retiring June 30, 2020

The data for the Example member is shown below:

A.	\$35,000	Final Average Compensation
B.	32	Total Service Credit
C.	27	Contributory Service Credit
D.	60	Age of Retiree
E.	55	Age of Spouse
F.	100%	Percentage of Retirement Allowance to Continue to Spouse after Retiree's Death (Retiree Chooses this Percentage)

The computations that would be made for this case are:

	<b>Annual</b>
G. Non-Contributory Base: $1.39\% \times A \times B$	\$15,568
H. Extra for Contributory: $0.76\% \times A \times C$	<u>7,182</u>
I. Subtotal Benefit: G + H	22,750
J. Health Stipend	<u>600</u>
K. Total Benefit: I + J	23,350
L. Adjustment for Line F election: $(1 - 0.78571) \times I$	<u>4,875</u>
M. Annual Amount Payable	\$18,475

Projected Benefits, taking into account increases after retirement would be:

Year Ended June 30	Annual Amount
2021	\$18,475
2022	19,011
2023	19,547
2024	20,083
2025	20,619

Thereafter, the amount would increase by \$536 annually for life.

## Sample T-DROP Benefit Computations for a Member Entering T-DROP June 30, 2020

The data for the Example member is shown below:

A.	\$35,000	Final Average Compensation
B.	28	Total Service Credit
C.	28	Contributory Service Credit
D.	55	Age of Retiree

The computations that would be made for this case are:

		<b>Annual Amount</b>
E.	Non-Contributory Base: $1.39\% \times A \times B$	\$13,622
F.	Extra for Contributory: $0.76\% \times A \times C$	7,448
G.	Reduction for T-DROP Plan: (1% for each year of service) $0.28 \times (E+F)$	5,900
H.	Reduction for Entering T-DROP with less than 30 years of service (6% for each year less than 30): $0.12 \times (E + F - G)$	<u>1,820</u>
I.	Annual Deposit $E + F - G - H$	\$13,350

Projected Deposits, taking into account increases after DROP, and 5 years duration would be:

<b>Year Ended June 30</b>	<b>Amount Deposited</b>
2021	\$13,350
2022	13,751
2023	14,151
2024	14,552
2025	14,952
Total	\$70,756

The amount deposited, plus credited interest, can be paid as a lump sum or as an annuity. A portion of the deposits can also be placed into a Cash Balance account.

## SECTION D

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### **FINANCIAL INFORMATION**

This information is presented in draft form for review by the System's auditor. Please let us know if there are any items the auditor changes so that we may maintain consistency with the System's financial statements.

## Asset Valuation Method

An essential step in the valuation process is comparing valuation assets with computed liabilities. Valuation assets are those assets that are recognized for funding purposes.

Asset valuation methods are distinguished by the timing of the recognition of investment income. Total investment income is the sum of ordinary income and capital value changes. Under a pure market value approach, ordinary investment income and all capital value changes would be recognized immediately. Because of market volatility, use of pure market values in retirement funding can result in volatile contribution rates and unstable financial ratios, contrary to ATRS' objectives.

Under the ATRS asset valuation method (see page D-3), assumed investment return is recognized fully each year. Differences between actual and assumed investment return are phased-in over a closed four-year period. During periods when investment performance exceeds the assumed rate, the funding value will tend to be less than the market value. Conversely, during periods when investment performance is less than the assumed rate, funding value will tend to be greater than market value. If assumed rates are exactly realized for three consecutive years, funding value will become equal to market value.

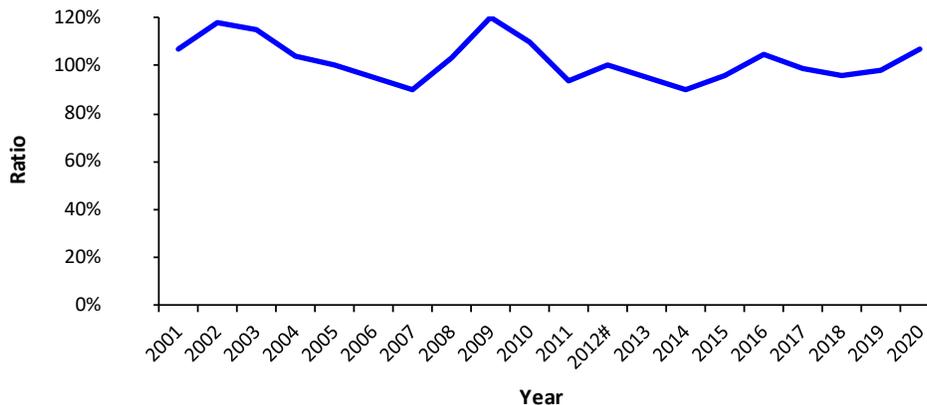
A multi-year comparison of market value to funding (actuarial) value is on the following page.

## Asset Valuation Method

Valuation Date June 30	Market Value of Assets (1)	Actuarial Value of Assets (2)	Ratio of AV to MV (2) / (1)
2001	\$ 7,643	\$ 8,166	107%
2002	7,084	8,328	118%
2003	7,050	8,113	115%
2004	8,122	8,424	104%
2005	8,811	8,817	100%
2006	9,868	9,332	95%
2007	11,637	10,519	90%
2008	11,018	11,319	103%
2009	8,847	10,617	120%
2010	9,884	10,845	110%
2011	11,895	11,146	94%
2012#	11,484	11,484	100%
2013	12,830	12,247	95%
2014	14,856	13,375	90%
2015	15,036	14,434	96%
2016	14,559	15,239	105%
2017	16,285	16,131	99%
2018	17,493	16,756	96%
2019	17,742	17,413	98%
2020	16,902	18,007	107%

# Actuarial Value set equal to Market Value.

**Ratio of Actuarial Value to Market Value**



This year the market value of assets is less than the actuarial value (see page A-2 for a more detailed explanation). To prevent unreasonably large differences between market value and actuarial value, there is a requirement that the recognized assets must always be between 80% and 120% of the market value (see page D-3).

## Development of Funding Value of Assets

Year Ended June 30:	2017	2018	2019	2020	2021	2022	2023
A. Funding Value Beginning of Year	\$ 15,238,522,015	\$ 16,131,466,927	\$ 16,756,062,928	\$ 17,412,534,651			
B. Market Value End of Year	16,284,808,245	17,492,627,740	17,741,621,773	16,902,076,224			
C. Market Value Beginning of Year	14,558,576,729	16,284,808,245	17,492,627,740	17,741,621,773			
D. Non-Investment Net Cash Flow	(555,761,481)	(606,938,770)	(642,256,050)	(665,324,622)			
E. Investment Return							
E1. Market Total: B - C - D	2,281,992,997	1,814,758,265	891,250,083	(174,220,927)			
E2. Assumed Rate	8.00%	7.50%	7.50%	7.50%	7.50%		
E3. Amount for Immediate Recognition	1,196,851,302	1,187,099,816	1,232,620,118	1,280,990,426			
E4. Amount for Phased-In Recognition: E1-E3	1,085,141,695	627,658,449	(341,370,035)	(1,455,211,353)			
F. Phased-In Recognition of Investment Return							
F1. Current Year: 0.25 x E4	271,285,424	156,914,612	(85,342,509)	(363,802,838)	Unknown	Unknown	Unknown
F2. First Prior Year	(276,749,871)	271,285,424	156,914,612	(85,342,509)	\$ (363,802,838)	Unknown	Unknown
F3. Second Prior Year	(107,015,212)	(276,749,871)	271,285,424	156,914,612	(85,342,509)	\$ (363,802,838)	Unknown
F4. Third Prior Year	364,334,750	(107,015,210)	(276,749,872)	271,285,423	156,914,613	(85,342,508)	\$ (363,802,839)
<b>F5. Total Recognized Investment Gain</b>	<b>251,855,091</b>	<b>44,434,955</b>	<b>66,107,655</b>	<b>(20,945,312)</b>	(292,230,734)	(449,145,346)	(363,802,839)
<b>G. Funding Value End of Year:</b>							
G1. Preliminary Funding Value End of Year: A+D+E3+F5	<b>16,131,466,927</b>	<b>16,756,062,928</b>	<b>17,412,534,651</b>	<b>18,007,255,143</b>			
G2. Upper Corridor Limit: 120% x B	<b>19,541,769,894</b>	<b>20,991,153,288</b>	<b>21,289,946,128</b>	<b>20,282,491,469</b>			
G3. Lower Corridor Limit: 80% x B	<b>13,027,846,596</b>	<b>13,994,102,192</b>	<b>14,193,297,418</b>	<b>13,521,660,979</b>			
<b>G4. Funding Value End of Year</b>	<b>16,131,466,927</b>	<b>16,756,062,928</b>	<b>17,412,534,651</b>	<b>18,007,255,143</b>			
H. Actual/Projected Difference between Market and Funding Value	153,341,318	736,564,812	329,087,122	(1,105,178,919)	(812,948,185)	(363,802,839)	-
I. Market Rate of Return	15.98 %	11.36 %	5.19 %	(1.00)%			
J. Funding Rate of Return	9.68 %	7.78 %	7.90 %	7.38 %			
K. Ratio of Funding Value to Market Value	99.06 %	95.79 %	98.15 %	106.54 %			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased-in over a closed four-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. ***The Funding Value of Assets is unbiased with respect to Market Value.*** At any time, it may be either greater or less than Market Value. If assumed rates (applied to the funding value of assets) are exactly realized for three consecutive years, it will become equal to Market Value.

**The assets** of the Retirement System, as of June 30, 2020, were reported to your actuary to be \$16,902,076,224. This amount, increased by a funding value adjustment of \$1,105,178,919 this year, is used to finance the Retirement System liability.

Accounts	Assets at June 30	
	2020	2019
Regular Accounts		
Members' Deposit Accounts		
Contributions	\$ 1,427,360,668	\$ 1,348,149,014
Interest	8,609,929,516	9,669,786,261
Total	10,037,290,184	11,017,935,275
T-DROP Member Deposit Accounts		
Contributions	27,540,642	28,594,336
Interest	24,666,395	26,900,241
Total	52,207,037	55,494,577
Cash Balance Account	158,330,186	133,829,621
Employer's Accumulation Account	(6,237,130,081)	(5,848,501,337)
Retirement Reserve Account	12,379,405,139	11,844,778,384
Act 808 Retirement Reserve Account	9,635,773	11,497,384
T-Lump Payable	390,184,585	411,492,155
Survivors Benefit Account	102,904,403	105,863,197
Total Regular Accounts	16,892,827,226	17,732,389,256
Other Accounts		
Income Expense Account	9,248,998	9,232,517
Other Special Reserves	-	-
Miscellaneous	-	-
Total Other Accounts	9,248,998	9,232,517
Total Accounting Value of Assets	16,902,076,224	17,741,621,773
Funding Value Adjustment	1,105,178,919	(329,087,122)
Funding Value of Assets	\$ 18,007,255,143	\$ 17,412,534,651

## Market Value of Assets

The net market value of assets at year-end was \$16,902,076,224 and was invested as shown below:

	Market Value at June 30	
	2020	2019
Cash	\$ 348,737,178	\$ 256,387,142
Receivables		
Unsettled Trades and Accrued Return	35,276,529	60,000,798
Member Contributions	8,758,853	8,667,210
Employer Contributions	28,268,436	28,253,478
Other	607,309	571,587
Total Receivables	72,911,127	97,493,073
Investments		
Government Securities	28,245,622	50,473,001
Domestic Equities	2,517,950,607	2,472,540,708
International Equities	1,165,199,715	1,073,645,442
Commingled Funds	5,929,317,712	7,233,968,477
Corporate Bonds	925,185,002	1,076,593,959
Asset and Mortgage-backed Securities	23,104,762	39,156,489
Mortgages (CMO's)	-	-
Promissory Notes (BRS / Highland)	257,463,572	-
Alternative Investments	5,431,816,034	5,386,398,892
Limited Partnerships	28,276,070	72,122,080
Real Estate	52,674,001	52,354,702
Other Investments	176,000,000	-
Investment Derivative Instruments	(41,081)	(93,525)
Total Investments	16,535,192,016	17,457,160,225
Invested Securities Lending	315,851,510	469,822,525
Net Equipment	186,820	222,647
Deferred Outflows Related to OPEB	1,310,404	-
Total Assets	17,274,189,055	18,281,085,612
Liabilities		
Survivor Benefits for Minors	256,126	227,543
Other Payables	10,032,955	8,569,746
Securities Related Payables	45,253,144	60,879,610
Securities Lending Collateral	315,851,510	469,786,940
Deferred Inflows Related to OPEB	719,096	-
Total Liabilities	372,112,831	539,463,839
Net Market Value	\$ 16,902,076,224	\$ 17,741,621,773
Change from Prior Year	(839,545,549)	248,994,033

## Market Value Reconciliation

Assets developed during the year as follows:

	Year Ended June 30	
	2020	2019
Net Market Value July 1	\$ 17,741,621,773	\$ 17,492,627,740
<b>Additions</b>		
Employer Contributions	446,228,128	430,864,656
Employee Contributions	153,105,134	141,885,632
Appreciation	(269,255,966)	806,983,870
Interest	34,095,691	38,632,142
Dividends	101,648,812	92,234,448
Real Estate	7,545,561	7,671,704
Other	1,662,896	1,182,214
Securities Lending Activity	3,072,879	4,421,291
<b>Total Additions</b>	<b>478,103,135</b>	<b>1,523,875,957</b>
<b>Deductions</b>		
Age & Service Benefits	1,046,397,991	1,008,092,044
Disability Benefits	40,420,225	40,330,710
Option Benefits	31,767,042	30,013,681
Survivor Benefits	11,555,653	11,267,137
Reciprocal Service	58,429,113	55,891,519
Act 808	2,215,262	2,439,111
Refunds	9,592,091	9,679,783
Active Member Death	338,189	278,972
T-DROP Benefits	47,978,202	41,550,591
CBA Benefits	13,241,312	13,318,361
CASH Benefit Program	2,722,804	2,144,429
Investment Expense	44,536,364	52,740,802
Administrative Expense	8,454,436	7,134,784
<b>Total Deductions</b>	<b>1,317,648,684</b>	<b>1,274,881,924</b>
Miscellaneous	-	-
<b>Net Market Value June 30</b>	<b>\$ 16,902,076,224</b>	<b>\$ 17,741,621,773</b>

## Schedule of Funding Progress (Dollar Amounts in Millions)

Valuation Date June 30	(1) Actuarial Value of Assets	(2) Entry Age AAL	(3) UAAL (2)-(1)	(4) Funding Ratio (1)/(2)	(5) Annual Payroll	Liabilities as a % of Payroll		
						Unfunded (3)/(5)	Funded (1)/(5)	Total (2)/(5)
2000+	\$ 7,620	\$ 7,879	\$ 259	96.7%	\$ 1,485	17.4%	513.2%	530.6%
2001+	8,166	8,561	395	95.4%	1,557	25.4%	524.4%	549.8%
2002*	8,328	9,062	734	91.9%	1,628	45.1%	511.5%	556.6%
2003+	8,113	9,445	1,332	85.9%	1,683	79.1%	482.1%	561.2%
2004	8,424	10,050	1,626	83.8%	1,748	93.0%	481.9%	574.9%
2005	8,817	10,973	2,156	80.4%	1,962	109.9%	449.4%	559.3%
2006	9,332	11,623	2,291	80.3%	2,080	110.1%	448.7%	558.8%
2007+	10,519	12,329	1,810	85.3%	2,191	82.6%	480.1%	562.7%
2008+	11,319	13,334	2,015	84.9%	2,268	88.8%	499.1%	587.9%
2009	10,617	14,019	3,402	75.7%	2,318	146.8%	458.0%	604.8%
2010+	10,845	14,697	3,852	73.8%	2,381	161.8%	455.5%	617.3%
2011+*	11,146	15,521	4,375	71.8%	2,728	160.4%	408.6%	569.0%
2012	11,484	16,139	4,655	71.2%	2,714	171.5%	423.2%	594.7%
2013+*	12,247	16,718	4,471	73.3%	2,727	164.0%	449.1%	613.1%
2014	13,375	17,310	3,935	77.3%	2,758	142.7%	484.9%	627.6%
2015	14,434	18,136	3,702	79.6%	2,777	133.3%	519.8%	653.1%
2016	15,239	18,812	3,573	81.0%	2,785	128.3%	547.2%	675.5%
2017+*	16,131	20,298	4,167	79.5%	2,814	148.1%	573.2%	721.3%
2018+*	16,756	20,935	4,179	80.0%	2,872	145.5%	583.4%	728.9%
2019	17,413	21,709	4,296	80.2%	2,907	147.8%	599.0%	746.8%
2020	18,007	22,352	4,345	80.6%	2,954	147.1%	609.6%	756.7%

+ Legislated benefit or contribution rate change.

\* Revised actuarial assumptions.

A system with a high ratio of assets or liabilities to payroll will tend to experience more volatility than a system with a lesser ratio, assuming a similar asset allocation.

## Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

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 due to changing conditions; 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, or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

# Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures are discussed below and on the following pages. An additional historical summary of plan maturity measures can be found on page D-11.

	2020	2019	2018	2017	2016
Ratio of the Market Value of Assets to Total Payroll	5.7	6.1	6.1	5.8	5.2
Ratio of Actuarial Accrued Liability to Payroll	7.6	7.5	7.3	7.2	6.8
Ratio of Actives to Retirees and Beneficiaries	1.4	1.5	1.5	1.6	1.7
Ratio of Net Cash Flow to Market Value of Assets	-3.9%	-3.6%	-3.5%	-3.4%	-3.5%
Duration of the Present Value of Future Benefits	13.83	13.82	13.86	13.88	13.39

## Ratio of the Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. The market value of assets is currently 5.7 times the payroll indicating that a return on assets 2% different from assumed would equal approximately 11% of payroll. Such a change could affect the amortization period by approximately five years based on 2020 results. While asset smoothing would reduce the effect, asset gains and losses much larger than 2% are common. An increasing level of this maturity measure generally indicates an increasing volatility in the amortization period.

## Ratio of Actuarial Accrued Liability to Payroll

As the ratio of actuarial accrued liability to payroll increases, the amortization period becomes increasingly sensitive to the effects of demographic gains and losses, and assumption changes. For example, a 1% demographic gain or loss would correspond to 7.6% of payroll and would affect the amortization period by three years based on the 2020 results.

## Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

## Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means benefits and expenses exceed contributions, and existing funds may be used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

# Plan Maturity Measures (Concluded)

## **Duration of Present Value of Future Benefits**

The duration of the present value of future benefits may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, the current duration of 13.8 (which is based on a 7.5% discount rate) indicates that the present value of future benefits would increase approximately 13.8% if the assumed rate of return were lowered 1%. Such a change could affect the amortization period by 20 years or more.

## **Funded Ratio**

The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

## **Ratio of Unfunded Actuarial Accrued Liability to Payroll**

The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A value above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

## **Standard Deviation of Investment Return to Payroll**

This measure illustrates the impact of a one standard deviation change in investment return as a percent of payroll. Investment return experience other than expected ultimately affects the employer contribution rates. The higher the ratio of this risk metric, the greater the expected volatility in employer contribution rates. Absent changes in investment policy, this metric is expected to increase as the assets grow to 100% of the AAL.

## **Additional Risk Assessment**

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

## Plan Maturity Measures (Based on Market Value of Assets)

Valuation Date June 30	(1) Accrued Liabilities (AAL)	(2) Market Value of Assets	(3) Unfunded AAL (1)-(2)	(4) Valuation Payroll	(5) % Change in Payroll	(6) Funded Ratio (2)/(1)	(7) Annuitant Liabilities (AnnLiab)	(8) AnnLiab/AAL (7)/(1)	(9) Liability/Payroll (1)/(4)	(10) Assets/Payroll (2)/(4)	(11) Est. Portfolio Std. Dev.	(12) Std. Dev. % of Pay (10)x(11)	(13) Unfunded/Payroll (3)/(4)	(14) Net External Cash Flow (NECF)	(15) NECF/Assets (9)/(2)	(16) Portfolio Rate of Return	(17) 10-year Trailing Average
2010#	\$ 14,697	\$ 9,884	\$ 4,813	\$ 2,381	2.7%	67.2%	\$ 6,516	44.3%	617.3%	415.1%			202.2%	\$ (203)	-2.1%	14.2%	3.6%
2011#*	15,521	11,895	3,626	2,728	14.6%	76.6%	7,132	46.0%	569.0%	436.1%			132.9%	(201)	-1.7%	22.6%	6.1%
2012	16,139	11,484	4,655	2,714	-0.5%	71.2%	7,649	47.4%	594.7%	423.2%			171.5%	(285)	-2.5%	-1.1%	6.6%
2013#	16,718	12,830	3,888	2,727	0.5%	76.7%	8,181	48.9%	613.1%	470.5%			142.6%	(337)	-2.6%	14.9%	8.0%
2014	17,310	14,856	2,454	2,758	1.1%	85.8%	8,777	50.7%	627.6%	538.6%			89.0%	(395)	-2.7%	19.2%	8.2%
2015	18,136	15,036	3,100	2,777	0.7%	82.9%	9,778	53.9%	653.1%	541.5%			111.6%	(445)	-3.0%	4.3%	7.7%
2016	18,812	14,559	4,253	2,785	0.3%	77.4%	10,430	55.4%	675.5%	522.8%			152.7%	(505)	-3.5%	0.2%	6.3%
2017#*	20,298	16,285	4,013	2,814	1.0%	80.2%	11,337	55.9%	721.3%	578.7%			142.6%	(556)	-3.4%	16.0%	6.0%
2018	20,935	17,493	3,442	2,872	2.1%	83.6%	11,851	56.6%	728.9%	609.0%	12.7%	77.3%	119.9%	(607)	-3.5%	11.4%	7.6%
2019	21,709	17,742	3,967	2,907	1.2%	81.7%	12,460	57.4%	746.8%	610.3%	12.5%	76.3%	136.5%	(642)	-3.6%	5.2%	10.4%
2020	22,352	16,902	5,450	2,954	1.6%	75.6%	12,890	57.7%	756.7%	572.2%	12.5%	71.5%	184.5%	(665)	-3.9%	-1.0%	8.8%

(\*) ATRS had experience studies in these years leading to a change or "true up" in actuarial assumptions. A pattern of periodic studies is a sign of a well-run system and suggests the extent to which the liability measures the actuary provides are likely to be realistic.

(#) ATRS had benefit changes in these years. Benefit increases cause liabilities to rise; benefit decreases cause liabilities to fall. In either case benefit changes affect the year by year comparability of the measures on this page.

(6). The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

(9) and (10) The ratios of liabilities and assets to payroll gives an indication of both maturity and volatility. Many systems have values between 500% and 700%. Values significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

(13) The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A value above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

(14) and (15) The ratio of Net External Cash Flow to assets is an important measure of sustainability. Negative ratios are common and expected for a maturing system. In the longer term, this ratio should be on the order of approximately -4%. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.

(16) and (17) Investment return is probably the largest single risk that most systems face. The year by year return and the 10-year geometric average give an indicator of the past performance of the investment program. Of course, past performance is not a guarantee of future results. Some of the trailing averaged are distorted by the extraordinary events of 2008.

## SECTION E

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### COVERED MEMBER DATA

**Active Members in Valuation June 30, 2020**  
**by Attained Age and Years of Service**  
**(Excludes T-DROP and Rehired Retirees)**

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	420							420	\$ 1,233,927
20-24	1,925	14						1,939	44,041,521
25-29	4,751	1,185	5					5,941	216,090,222
30-34	3,146	3,448	770	8				7,372	288,566,882
35-39	2,837	2,319	2,730	814	8			8,708	363,024,974
40-44	2,307	1,985	1,910	2,377	575	3		9,157	407,660,363
45-49	1,761	1,694	1,808	1,790	2,335	507		9,895	466,981,273
50-54	1,449	1,331	1,440	1,613	1,579	1,499	47	8,958	406,228,791
55-59	1,311	1,030	1,166	1,376	1,398	999	78	7,358	292,080,522
60	209	166	189	223	246	185	17	1,235	46,547,664
61	203	194	162	181	223	164	16	1,143	42,360,093
62	172	160	166	195	183	155	15	1,046	39,189,522
63	167	124	116	123	134	124	16	804	29,146,009
64	163	133	111	107	109	99	10	732	27,142,669
65	119	92	85	87	96	73	6	558	19,088,244
66	105	69	50	27	22	18	8	299	7,577,676
67	91	50	42	14	7	14	6	224	5,807,932
68	92	51	28	11	10	4	3	199	4,455,885
69	75	46	25	8	5	5	3	167	3,409,470
70 & Up	388	233	88	13	12	3	8	745	12,827,534
<b>Totals</b>	<b>21,691</b>	<b>14,324</b>	<b>10,891</b>	<b>8,967</b>	<b>6,942</b>	<b>3,852</b>	<b>233</b>	<b>66,900</b>	<b>\$2,723,461,173</b>

Group Averages:

Age: 44.3 years

Service: 10.4 years



**FEMALE Active Members in Valuation June 30, 2020**  
**by Attained Age and Years of Service**  
**(Excludes T-DROP and Rehired Retirees)**

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	145							145	\$ 445,062
20-24	1,418	8						1,426	33,289,113
25-29	3,602	926	2					4,530	161,437,125
30-34	2,459	2,599	595	1				5,654	210,973,953
35-39	2,341	1,834	2,104	640	4			6,923	274,674,315
40-44	1,874	1,604	1,505	1,872	454	2		7,311	310,269,285
45-49	1,346	1,359	1,492	1,464	1,783	406		7,850	352,688,092
50-54	1,088	1,012	1,174	1,389	1,292	1,168	28	7,151	310,761,804
55-59	879	725	907	1,149	1,203	810	54	5,727	220,582,701
60	136	117	139	181	207	150	15	945	33,801,606
61	130	138	119	149	191	146	13	886	32,087,708
62	110	108	127	153	158	137	13	806	29,709,783
63	104	75	76	97	108	101	10	571	20,005,552
64	88	85	87	84	92	86	8	530	19,451,865
65	60	54	62	65	81	58	6	386	13,084,658
66	60	40	40	18	19	16	6	199	5,273,622
67	53	32	24	12	5	13	3	142	3,835,917
68	50	23	17	8	7	3	2	110	2,611,677
69	39	21	14	6	3	4	3	90	1,808,023
70 & Up	185	112	40	9	7	3	6	362	6,078,669
<b>Totals</b>	<b>16,167</b>	<b>10,872</b>	<b>8,524</b>	<b>7,297</b>	<b>5,614</b>	<b>3,103</b>	<b>167</b>	<b>51,744</b>	<b>\$ 2,042,870,530</b>

Group Averages:

Age: 44.2 years

Service: 10.7 years



**MALE Active Members in Valuation June 30, 2020**  
**by Attained Age and Years of Service**  
**(Excludes T-DROP and Rehired Retirees)**

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	275							275	\$ 788,865
20-24	507	6						513	10,752,408
25-29	1,149	259	3					1,411	54,653,097
30-34	687	849	175	7				1,718	77,592,929
35-39	496	485	626	174	4			1,785	88,350,659
40-44	433	381	405	505	121	1		1,846	97,391,078
45-49	415	335	316	326	552	101		2,045	114,293,181
50-54	361	319	266	224	287	331	19	1,807	95,466,987
55-59	432	305	259	227	195	189	24	1,631	71,497,821
60	73	49	50	42	39	35	2	290	12,746,058
61	73	56	43	32	32	18	3	257	10,272,385
62	62	52	39	42	25	18	2	240	9,479,739
63	63	49	40	26	26	23	6	233	9,140,457
64	75	48	24	23	17	13	2	202	7,690,804
65	59	38	23	22	15	15		172	6,003,586
66	45	29	10	9	3	2	2	100	2,304,054
67	38	18	18	2	2	1	3	82	1,972,015
68	42	28	11	3	3	1	1	89	1,844,208
69	36	25	11	2	2	1		77	1,601,447
70 & Up	203	121	48	4	5		2	383	6,748,865
<b>Totals</b>	<b>5,524</b>	<b>3,452</b>	<b>2,367</b>	<b>1,670</b>	<b>1,328</b>	<b>749</b>	<b>66</b>	<b>15,156</b>	<b>\$ 680,590,643</b>

Group Averages:

Age: 44.5 years

Service: 9.5 years



## Summary of Active Members (Excludes T-DROP and Rehired Retirees)

	Teachers		Support		Total Active Members	
	No.	Valuation Payroll	No.	Valuation Payroll	No.	Valuation Payroll
Female	28,101	\$ 1,448,310,780	23,643	\$ 594,559,750	51,744	\$ 2,042,870,530
Male	7,993	466,438,106	7,163	214,152,537	15,156	680,590,643
All	36,094	\$ 1,914,748,886	30,806	\$ 808,712,287	66,900	\$ 2,723,461,173

	Teachers	Support	Total
Members Contributing Now	34,117	18,210	52,327
Members Not Contributing	1,977	12,596	14,573
All	36,094	30,806	66,900

June 30	Number	Group Averages			Active Member Payroll (\$ Millions)
		Age	Service	Annual Earnings	
2003	62,432	44.0	9.5	\$26,963	\$1,683
2004	63,185	44.2	9.5	27,660	1,748
2005	65,793	44.2	9.4	29,826	1,962
2006	67,710	44.3	9.3	30,714	2,080
2007	69,226	44.4	9.3	31,645	2,191
2008	70,172	44.5	9.4	32,319	2,268
2009	70,655	44.7	9.5	32,804	2,318
2010	72,208	44.7	9.7	32,980	2,381
2011	72,293	44.8	9.9	33,995	2,458
2012	71,195	45.0	10.1	34,362	2,446
2013	70,660	45.0	10.2	34,920	2,467
2014	70,225	44.7	10.2	35,673	2,505
2015	68,945	44.6	10.3	36,717	2,531
2016	68,368	44.4	10.2	37,235	2,546
2017	68,337	44.3	10.2	37,707	2,577
2018	68,645	44.2	10.2	38,477	2,641
2019	68,457	44.1	10.1	39,065	2,674
2020	66,900	44.3	10.3	40,709	2,723

## Deferred Vested Members at June 30, 2020 by Attained Age

Age	Number	Estimated Annual Benefits	Contribution Balance
Below 40	1,780	\$ 9,839,221	\$ 23,828,981
40	273	1,818,250	4,496,751
41	317	1,899,683	4,650,955
42	268	1,789,950	4,262,479
43	313	2,182,753	5,384,060
44	308	2,000,517	4,627,945
45	318	2,357,725	5,355,878
46	388	2,407,425	5,321,589
47	340	2,213,022	4,691,081
48	370	2,328,433	5,153,121
49	435	2,544,656	4,797,690
50	462	2,708,538	5,255,233
51	438	2,872,243	5,823,552
52	452	2,764,998	5,103,754
53	492	2,781,438	5,006,541
54	478	2,719,235	4,938,726
55	548	3,165,348	5,775,212
56	594	3,186,482	5,591,038
57	588	3,332,116	5,849,048
58	599	3,361,076	6,133,982
59	651	4,199,921	8,203,353
60 & Up	2,859	9,972,985	18,594,963
Future Beneficiaries #	67	428,118	0
<b>Totals</b>	<b>13,338</b>	<b>\$ 72,874,132</b>	<b>\$ 148,845,932</b>

# These are beneficiaries of deceased active members who are eligible for a pension at age 62.

An inactive member is no longer actively working but has sufficient service credit to qualify for a monthly benefit at retirement age.



## All Members Participating in T-DROP at June 30, 2020 by Attained Age

Age	Number	Current T-DROP Contribution	Original T-DROP Contribution	T-DROP Account Balance	Pay
48	4	\$ 80,328	\$ 77,989	\$ 79,256	\$ 239,074
49	5	59,769	57,095	93,042	228,492
50	38	828,893	799,885	1,001,332	2,498,123
51	109	2,431,253	2,325,262	3,686,296	7,139,965
52	158	3,433,265	3,247,365	6,597,610	9,921,525
53	218	4,802,002	4,500,248	10,783,867	14,130,918
54	247	5,614,889	5,187,272	15,885,472	16,393,424
55	286	6,415,308	5,849,600	21,890,554	18,562,495
56	321	7,064,703	6,359,247	28,280,642	20,477,943
57	342	7,869,756	6,957,505	36,650,614	22,011,996
58	343	7,882,128	6,930,823	44,680,653	21,955,666
59	343	7,505,935	6,732,095	48,957,530	21,605,075
60	320	6,378,901	6,297,122	47,210,402	20,348,329
61	268	4,668,679	5,245,077	41,093,817	16,980,787
62	239	3,860,288	4,354,738	34,458,284	14,411,824
63	175	3,053,351	3,306,338	24,416,425	10,652,280
64	131	2,294,478	2,393,004	18,384,458	7,867,970
65	34	497,964	556,611	3,868,616	1,908,838
66	21	453,137	404,461	3,323,446	1,307,066
67	12	123,993	198,894	2,429,287	760,675
68	11	184,471	178,708	1,496,111	657,435
69	6	92,982	108,679	1,017,132	373,661
70	3	74,750	61,195	595,218	195,764
71	1	-	23,788	336,662	76,462
72	4	65,799	75,996	707,098	285,758
<b>Totals</b>	<b>3,639</b>	<b>\$ 75,737,022</b>	<b>\$ 72,228,997</b>	<b>\$ 397,923,824</b>	<b>\$ 230,991,545</b>

A T-DROP member continues to work, but does not accrue additional retirement benefits and does not make member contributions. A reduced benefit is paid into the T-DROP account (see pages C-3 and C-4) during T-DROP participation. Deposits to T-DROP cease at 10 years of T-DROP participation. ATRS receives full employer contributions on behalf of T-DROP participants.

## Active, T-DROP and Return to Work Members as of June 30, 2020

June 30	Number				Total Payroll
	Active	T-DROP	RTW	Total	\$ Millions
2011	72,293	4,487	4,093	80,873	\$ 2,818
2012	71,195	4,432	4,001	79,628	2,803
2013	70,660	4,265	4,025	78,950	2,819
2014	70,225	4,127	3,845	78,197	2,851
2015	68,945	3,974	3,741	76,660	2,874
2016	68,368	3,864	3,829	76,061	2,888
2017	68,337	3,811	3,881	76,029	2,922
2018	68,645	3,696	4,029	76,370	2,986
2019	68,457	3,707	4,077	76,241	3,027
2020	66,900	3,639	4,019	74,558	3,078

The actuarial valuation assumes the number of working members will remain constant at the current level. In some recent years the total number of working members has decreased. A decreasing population means less contribution income for the Retirement System than expected and can lead to funding difficulties in extreme cases.

## Annuities Being Paid Retirees and Beneficiaries July 1, 2020 by Type of Annuity Being Paid

Type of Annuity	No.	Annual Amounts		
		Original Annuities	Base Annuities	Current Annuities
<b>RETIREMENT RESERVE ACCOUNT</b>				
Age & Service				
Option 1 (Basic single life)	36,096	\$ 562,170,863	\$ 657,267,408	\$ 856,909,819
Option A (Joint & 100% Survivor)	5,435	92,594,901	106,418,914	138,900,072
Option B (Joint & 50% Survivor)	2,684	60,704,168	72,554,882	94,895,106
Option C (10 year certain)	665	10,851,647	11,130,056	13,737,562
Beneficiaries	1,262	22,629,384	21,085,688	28,526,682
Totals	46,142	748,950,963	868,456,948	1,132,969,241
Disability				
Option 1	2,300	23,851,050	26,102,619	34,354,117
Option A	366	4,089,826	4,152,941	5,370,715
Option B	83	1,224,993	1,313,002	1,692,701
Option C	7	82,353	76,953	101,918
Beneficiaries	270	3,107,084	3,288,217	4,530,582
Totals	3,026	32,355,306	34,933,732	46,050,033
Act 793	158	\$ 877,159	\$ 1,784,395	1,784,395
Retirement Reserve Account	49,326	782,183,428	905,175,075	1,180,803,669
Act 808 Retirement Reserve Account	39	738,032	2,176,872	2,176,872
Total Retirement Reserve Account	49,365	782,921,460	907,351,947	1,182,980,541
<b>SURVIVOR'S BENEFIT ACCOUNT</b>				
Beneficiaries of Deceased Members	768	\$ 8,185,296	\$ 9,210,035	\$ 11,843,667
<b>RETIREMENT SYSTEM TOTALS</b>				
Total Annuities Being Paid	50,133	\$ 791,106,756	\$ 916,561,982	\$ 1,194,824,208

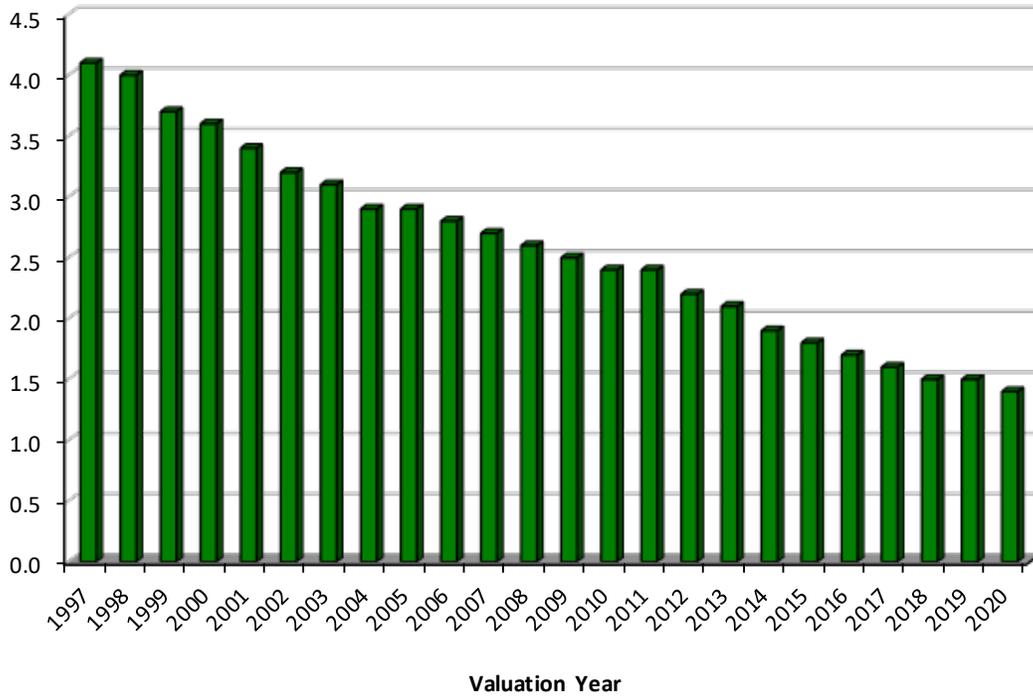
**The Original Annuity** is the annuity at the date of retirement.

**The Base Annuity** is the amount from which the 3.0% COLA is calculated.

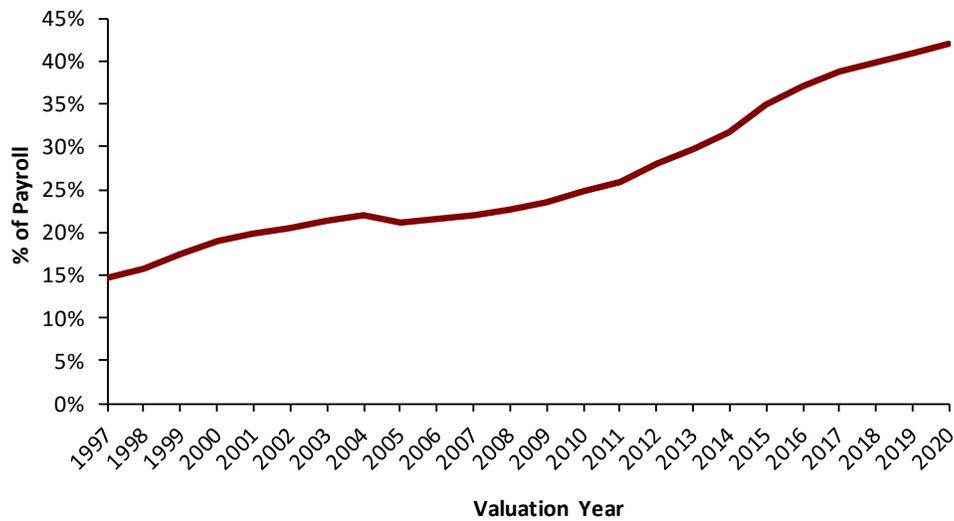
**The Current Annuity** is the annuity payable at July 1, 2020 (Includes July 1 COLA).

# Historical Graphs

## Active Members Per Retired Life \*



## Retirement Benefits Being Paid as a Percent of Member Payroll \*



\* Beginning with the June 30, 2011 valuation, active members include T-DROP participants in payroll.

## Benefit Changes During Recent Years of Retirement and Related Changes in Purchasing Power (1990 \$)

Year Ended June 30	Increase Beginning of Year+	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				1990 \$	% of 1990
1990	\$ - - - -	\$ 11,000	- - - -	\$ 11,000	100%
1991	330	11,330	(4.7)%	10,822	98%
1992	1,005	12,335	(3.1)%	11,429	104%
1993	1,045	13,380	(3.0)%	12,036	109%
1994	1,082	14,462	(2.5)%	12,693	115%
1995	400	14,862	(3.0)%	12,660	115%
1996	400	15,262	(2.8)%	12,652	115%
1997	772	16,034	(2.3)%	12,993	118%
1998	481	16,515	(1.7)%	13,161	120%
1999	1,383	17,898	(2.0)%	13,989	127%
2000	1,129	19,027	(3.7)%	14,336	130%
2001	1,406	20,433	(3.2)%	14,911	136%
2002	807	21,240	(1.1)%	15,337	139%
2003	562	21,802	(2.1)%	15,417	140%
2004	562	22,364	(3.3)%	15,314	139%
2005	562	22,926	(2.5)%	15,312	139%
2006	562	23,488	(4.3)%	15,037	137%
2007	562	24,050	(2.7)%	14,994	136%
2008	562	24,612	(5.0)%	14,611	133%
2009	562	25,174	1.4 %	15,161	138%
2010	755	25,929	(1.1)%	15,453	140%
2011	778	26,707	(3.6)%	15,370	140%
2012	778	27,485	(1.7)%	15,558	141%
2013	778	28,263	(1.8)%	15,723	143%
2014	778	29,041	(2.1)%	15,828	144%
2015	778	29,819	(0.1)%	16,232	148%
2016	778	30,597	(1.0)%	16,491	150%
2017	778	31,375	(1.6)%	16,638	151%
2018	778	32,153	(2.9)%	16,575	151%
2019	751	32,904	(1.6)%	16,687	152%
2020	451	33,355	(0.6)%	16,807	153%
2021	751	34,106			

\* The \$11,000 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount could show a smaller purchasing power loss in percent loss.

# Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).



## Benefit Changes During Recent Years of Retirement and Related Changes in Purchasing Power (2000 \$)

Year Ended June 30	Increase Beginning of Year+	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				2000 \$	% of 2000
2000	\$ ----	\$ 11,600	----	\$ 11,600	100%
2001	1,003	12,603	(3.2)%	12,207	105%
2002	523	13,126	(1.1)%	12,579	108%
2003	372	13,498	(2.1)%	12,668	109%
2004	372	13,870	(3.3)%	12,605	109%
2005	372	14,242	(2.5)%	12,624	109%
2006	372	14,614	(4.3)%	12,417	107%
2007	372	14,986	(2.7)%	12,400	107%
2008	372	15,358	(5.0)%	12,100	104%
2009	372	15,730	1.4 %	12,573	108%
2010	472	16,202	(1.1)%	12,815	110%
2011	486	16,688	(3.6)%	12,746	110%
2012	486	17,174	(1.7)%	12,902	111%
2013	486	17,660	(1.8)%	13,039	112%
2014	486	18,146	(2.1)%	13,125	113%
2015	486	18,632	(0.1)%	13,460	116%
2016	486	19,118	(1.0)%	13,675	118%
2017	486	19,604	(1.6)%	13,797	119%
2018	486	20,090	(2.9)%	13,745	118%
2019	459	20,549	(1.6)%	13,831	119%
2020	159	20,708	(0.6)%	13,848	119%
2021	459	21,167			

\* The \$11,600 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount could show a smaller purchasing power loss in percent loss.

# Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).

## Benefit Changes During Recent Years of Retirement and Related Changes in Purchasing Power (2010 \$)

Year Ended June 30	Increase Beginning of Year+	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				2010 \$	% of 2010
2010	\$ ----	\$ 11,900	----	\$ 11,900	100%
2011	357	12,257	(3.6)%	11,836	99%
2012	357	12,614	(1.7)%	11,981	101%
2013	357	12,971	(1.8)%	12,108	102%
2014	357	13,328	(2.1)%	12,188	102%
2015	357	13,685	(0.1)%	12,499	105%
2016	357	14,042	(1.0)%	12,699	107%
2017	357	14,399	(1.6)%	12,812	108%
2018	357	14,756	(2.9)%	12,764	107%
2019	330	15,086	(1.6)%	12,837	108%
2020	30	15,116	(0.6)%	12,780	107%
2021	330	15,446			

\* The \$11,900 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount could show a smaller purchasing power loss in percent loss.

# Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).

## **SECTION F**

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### **FINANCIAL PRINCIPLES**

## Financial Principles and Operational Techniques

**Promises Made and To Be Paid For.** As each year is completed, the System, in effect, hands an “IOU” to each member then acquiring a year of service credit. The “IOU” says: “The Arkansas Teacher Retirement System owes you one year’s worth of retirement benefits, payments in cash commencing when you qualify for retirement.”

The related **key financial questions** are:

**Which generation of taxpayers contributes the money to cover the IOU?**

**The present taxpayers**, who receive the benefit of the member’s present year of service?

**Or the future taxpayers**, who happen to be in Arkansas at the time the IOU becomes a cash demand?

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The financial objective of the ATRS is that this year’s taxpayers contribute the money to cover the IOUs being handed out this year so that **the employer contribution rate will remain approximately level from generation to generation** -- our children and our grandchildren will not have to contribute greater percents of pay than we contribute now. This objective was set forth in Act 793 of 1977.

(There are systems which have **a design for deferring contributions to future taxpayers**, lured by a lower contribution rate now and putting aside the fact that the contribution rate must then relentlessly grow much greater over decades of time -- consume now, and let your children face higher contribution rates after you retire.)

An inevitable byproduct of the level-cost design is the accumulation of reserve assets for decades and the income produced when the assets are invested. **Investment income** becomes the **third and largest contributor** for benefits to employees, and is interlocked with the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

Normal Cost (the cost of members’ service being rendered this year)

... plus ...

Interest on Unfunded Actuarial Accrued Liabilities (unfunded accrued liabilities are the difference between (i) liabilities for service already rendered and (ii) the accrued assets of the plan).

**Computing Contributions to Support System Benefits.** From a given schedule of benefits and from the employee data and asset data furnished, the actuary determines the contribution rates to support the benefits, by means of **an actuarial valuation**. An actuarial valuation has a number of ingredients such as: the rate of investment income which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of pay increases; and the assumed age or ages at actual retirement. In an actuarial valuation, assumptions must be made as to what the above rates will be, for the next year and for decades in the future. Only the subsequent actual experience of the System can indicate the degree of accuracy of the assumptions.

**Reconciling Differences Between Assumed Experience and Actual Experience.** Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the accuracy of the various financial assumptions or the skill of the actuary and the precision of the calculations made. The System copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is continual adjustments in financial position.



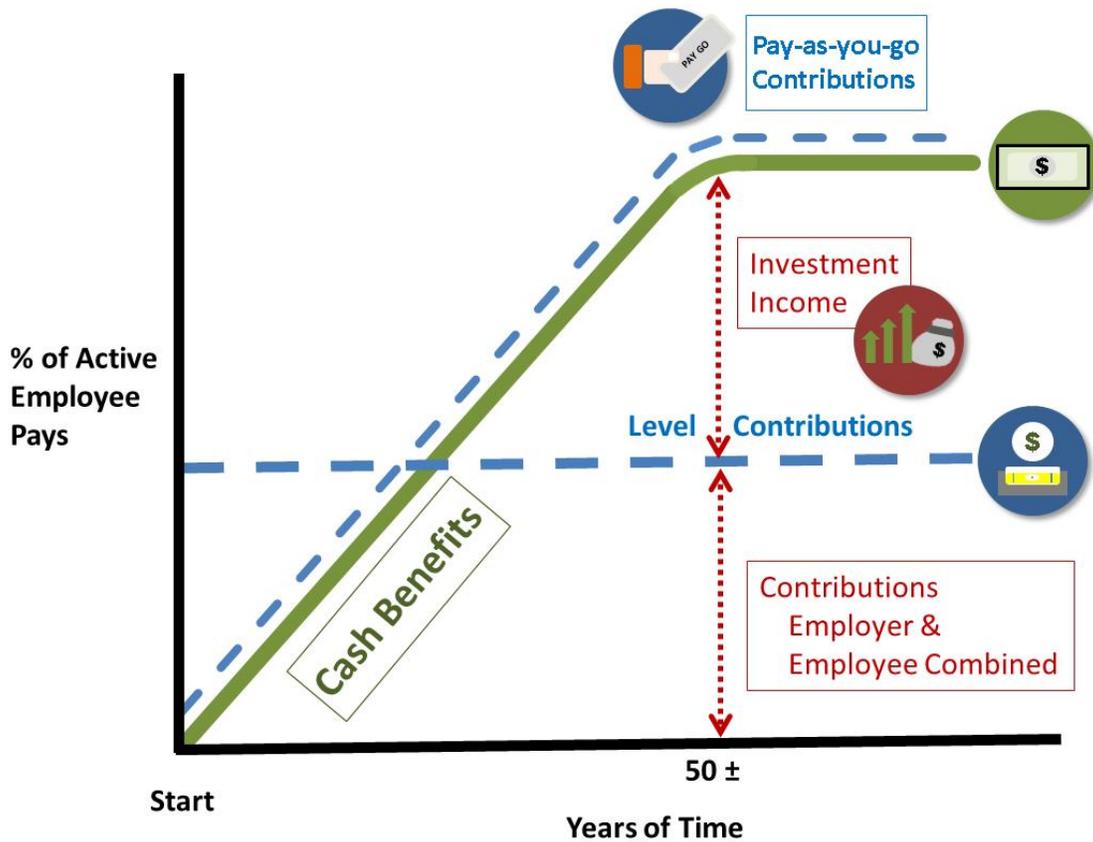
## Actuarial Valuation Process

*The financing diagram* on the next page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program), and is thus an *increasing contribution method*; and the *level contribution method* which equalizes contributions between the generations.

---

*The actuarial valuation* is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

- A. **Census Data**, furnished by plan administrator
  - Retired lives now receiving benefits
  - Former employees with vested benefits not yet payable
  - Active employees
  
- B. + **Asset data** (cash & investments), furnished by plan administrator
  
- C. + **Benefit provisions** that establish eligibility and amounts of payments to members
  
- D. + **Assumptions concerning future financial experiences in various risk areas**, which assumptions are established by the Board of Trustees after consulting with the actuary.
  
- E. + **The funding method** for employer contributions (the long-term planned pattern for employer contributions)
  
- F. + **Mathematically combining the assumptions, the funding method, and the data**
  
- G. = Determination of:
  - Plan financial position**, and/or
  - New Employer Contribution Rate**



**CASH BENEFITS LINE.** This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

**LEVEL CONTRIBUTION LINE.** Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Risk Areas**
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- **Non-Economic Risk Areas**
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

## **SECTION G**

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### **ACTUARIAL ASSUMPTIONS**

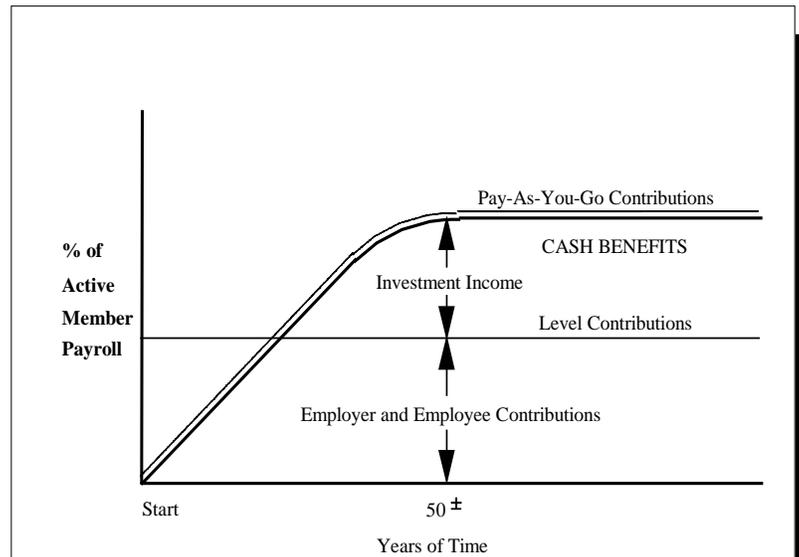
# Selection of Assumptions Used in Actuarial Valuations

## Economic Assumptions

Investment return  
Pay increases to individual employees:  
the portion for economic changes  
Active member group size and  
total payroll growth

## Demographic Assumptions

Actual ages at service retirement  
Pay increases to individual members:  
the portion for merit & seniority  
Disability while actively employed  
Separations before retirement  
Mortality after retirement  
Mortality before retirement



## Relationship Between Plan Governing Body and the Actuary

The actuary should have the primary responsibility for choosing the **demographic** assumptions used in the actuarial valuation, making use of specialized training and experience.

The actuary and other professionals can provide guidance concerning the choice of suitable economic assumptions.

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. The standard requires that the selected economic assumptions be consistent with each other. That is, the selection of the investment return assumption should be consistent with the selection of the payroll growth and inflation assumptions.

ASOP No. 27 defines a reasonable economic assumption as an assumption that has the following characteristics: (a) It is appropriate for the purpose of the measurement; (b) It reflects the actuary's professional judgment; (c) It takes into account historical and current economic data that is relevant as of the valuation date; (d) It reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and (e) It has no significant bias (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation or plan provisions that are difficult to measure are included and disclosed under Section 3.5.1, or when alternative assumptions are used for the assessment of risk.

# Summary of Assumptions Used in Actuarial Valuations for the Arkansas Teacher Retirement System Assumptions Adopted by the Board of Trustees After Consulting with Actuary

The actuarial assumptions used in the valuation are shown in this section. The rationale for the assumptions is provided in the Experience Study covering the period July 1, 2010 through June 30, 2015. The Board of Trustees adopts the actuarial assumptions used for actuarial valuation purposes after consulting with the actuary. The actuarial assumptions represent estimates of future experience.

## Economic Assumptions

The **price inflation** assumption is 2.50% although no specific Price Inflation is needed for this valuation. It is assumed that the 3% COLA will always be paid.

**The investment return rate** used in the valuation was 7.50% per year, compounded annually (net after administrative expenses). This rate was first used for the **June 30, 2017** valuation. The assumed real rate of return over price inflation is 5%.

**Pay increase assumptions** for individual active members are shown on pages G-7 and G-8. Part of the assumption for each age is for a merit and/or seniority increase, and the other 2.75% recognizes wage inflation. These rates were first used for the **June 30, 2017** valuation.

The Active Member Group (Active, T-DROP, RTW) size is assumed to remain constant at its present level.

The **wage inflation** assumption is 2.75%. This consists of 2.50% related to pure price inflation and 0.25% related to general economic improvements.

**Total active member payroll** is assumed to increase 2.75% per year, which is the portion of the individual pay increase assumptions attributable to wage inflation. This rate was first used for the **June 30, 2017** valuation.

## Non-Economic Assumptions

**The mortality tables** used were the RP-2014 Healthy Annuitant, Disabled Annuitant and Employee Mortality headcount weighted tables for males and females. Mortality rates were adjusted for future mortality improvements using projection scale MP-2017 from 2006. Related values are shown on page G-4. These tables were first used for the **June 30, 2017** valuation.

A limited fluctuation credibility procedure was used to determine the appropriate scaling factor of each gender and each member classification (see the 2010-2015 Experience Study), and are shown below:

	<b>Scaling Factor</b>
Healthy Male Retirees	<b>101%</b>
Healthy Female Retirees	<b>91%</b>
Disabled Male Retirees	<b>99%</b>
Disabled Female Retirees	<b>107%</b>
Male Active Members	<b>94%</b>
Female Active Members	<b>84%</b>

**The probabilities of retirement** for members eligible to retire are shown on pages G-5 and G-6. The rates for full retirement and reduced retirement were first used in the **June 30, 2017** valuation.

**The probabilities of withdrawal from service, death-in-service and disability** are shown for sample ages on pages G-7 and G-8. These rates were first used in the **June 30, 2017** valuation.

**The entry age actuarial cost method of valuation** was used in determining accrued liabilities and normal cost.

Differences in the past between assumed experience and actual experience (“actuarial gains and losses”) become part of actuarial accrued liabilities.

Unfunded actuarial accrued liabilities are amortized to produce contribution amounts (the total of principal & interest) which are level percents of payroll contributions.

These cost methods were first used in the June 30, 1986 valuation.

The Fiscal Year 2020 employer and member contribution rates were 14.25% and 6.25%, respectively. The employer and member rates are scheduled to increase by 0.25% increments ending in Fiscal Year 2023. The ultimate employer and member contribution rates will be 15% and 7%, respectively. The projected unfunded actuarial accrued liabilities were increased when developing the amortization period to account for the temporary shortfalls in the employer and employee contribution rates.

**Asset Valuation Method.** A market value related asset method is used as described on page D-1. This method was first used in the June 30, 1995 valuation. It was modified following the 1997-2002 Experience Study to include an 80% - 120% market value corridor.

**The data about persons now covered and about present assets** was furnished by the System’s administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary. Members whose dates of birth were not supplied were assumed to be 40 years old on the valuation date. Members whose salaries were not supplied and that entered T-DROP were assumed to have the group average pay of those with salary data as of the valuation date that entered T-DROP.

## Single Life Retirement Values\*

Sample Attained Ages in 2020	Present Value of \$1.00 Monthly for Life		Present Value of \$1 Monthly for Life Increasing 3.0% Annually		Future Life Expectancy (Years)		Percent Dying within Next Year	
	Male	Female	Male	Female	Male	Female	Male	Female
	40	\$150.86	\$154.28	\$198.83	\$205.26	42.75	47.01	0.33 %
45	146.93	151.53	191.45	199.63	37.96	42.19	0.41 %	0.32 %
50	141.81	147.68	182.25	192.21	33.25	37.38	0.53 %	0.36 %
55	135.20	142.30	170.95	182.48	28.67	32.58	0.70 %	0.44 %
60	126.90	135.25	157.44	170.40	24.25	27.89	0.97 %	0.60 %
65	116.81	126.22	141.80	155.77	20.07	23.36	1.36 %	0.82 %
70	104.59	114.70	123.92	138.24	16.15	19.02	1.96 %	1.23 %
75	90.13	100.68	103.98	118.20	12.52	14.95	3.05 %	2.03 %
80	74.03	84.67	83.07	96.67	9.29	11.30	5.05 %	3.45 %
85	57.74	67.75	63.07	75.22	6.61	8.19	8.67 %	6.07 %
Base	2635 x 1.01	2636 x 0.91	2635 x 1.01	2636 x 0.91				
Projection	939	940	939	940				

\* Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the MP-2017 projection scale.

Sample Attained Ages in 2020	Benefit Increasing 3.0% Yearly	Portion of Age 60 Lives Still Alive	
		Male	Female
60	\$100.00	100%	100%
65	115.00	95%	97%
70	130.00	88%	92%
75	145.00	79%	86%
80	160.00	67%	77%
Ref		2635 x 1.01	2636 x 0.91

## Probabilities of Retirement for Members

Retirement Ages	% of Active Participants Retiring with Unreduced Benefits			
	Education		Support	
	Male	Female	Male	Female
48	8%	7%	8%	6%
49	8%	7%	8%	6%
50	8%	7%	8%	6%
51	8%	7%	8%	6%
52	8%	7%	8%	6%
53	8%	7%	8%	6%
54	8%	7%	8%	6%
55	8%	9%	8%	6%
56	8%	9%	8%	6%
57	8%	11%	8%	11%
58	8%	11%	8%	11%
59	17%	14%	8%	15%
60	17%	17%	13%	13%
61	24%	17%	13%	15%
62	24%	29%	28%	23%
63	27%	26%	25%	19%
64	27%	24%	25%	23%
65	54%	50%	47%	50%
66	54%	53%	47%	44%
67	54%	39%	47%	38%
68	54%	39%	47%	38%
69	54%	39%	47%	38%
70	54%	39%	47%	38%
71	54%	39%	47%	38%
72	54%	39%	47%	38%
73	54%	39%	47%	38%
74	54%	39%	47%	38%
75	100%	100%	100%	100%
Ref	2634	2635	2636	2637

These rates are based upon data presented in the 2010-2015 experience study and were first used in the 2017 valuation.

## Probabilities of Reduced Retirement for Members

Retirement Ages	% of Active Participants Retiring with Reduced Benefits			
	Education		Support	
	Male	Female	Male	Female
50	1.5%	1.0%	0.5%	1.5%
51	1.5%	1.0%	1.0%	1.5%
52	1.5%	1.5%	1.5%	2.0%
53	1.5%	2.0%	2.0%	2.0%
54	2.0%	2.0%	2.5%	2.0%
55	2.5%	2.5%	3.0%	2.0%
56	3.0%	2.5%	3.5%	2.0%
57	5.0%	2.5%	4.5%	2.5%
58	5.0%	2.5%	4.5%	2.5%
59	3.5%	2.5%	4.5%	2.5%
Ref	2640	2638	2641	2639

These are 50% of the rates presented in the 2010-2015 experience study and were first used in the 2017 valuation. These rates anticipate reduced election of early retirement due to the increase in the early retirement reduction from 5% to 10%.

## Duration of T-DROP for Members

Present T-DROP members are assumed to remain in T-DROP according to the following table:

Entry Age	Assumed Duration Years
50-56	7
57	6
58	5
59+	4

## Teachers

### Separations from Active Employment Before Age and Service Retirement and Individual Pay Increases

Sample Ages in 2020	Years of Service	Percent of Active Members Separating within the Next Year					
		Death *		Disability		Other	
		Male	Female	Male	Female	Male	Female
	0					17.80%	12.60%
	1					13.10%	11.10%
	2					12.10%	10.10%
	3					8.60%	8.70%
	4					5.70%	6.50%
25	5 & Up	0.06%	0.02%	0.03%	0.03%	4.50%	5.40%
30		0.06%	0.02%	0.03%	0.03%	3.60%	4.30%
35		0.07%	0.03%	0.03%	0.04%	2.70%	2.90%
40		0.08%	0.05%	0.05%	0.09%	2.00%	2.00%
45		0.12%	0.07%	0.16%	0.19%	1.60%	1.60%
50		0.19%	0.11%	0.40%	0.43%	1.30%	1.40%
55		0.32%	0.18%	0.86%	0.73%	1.10%	1.20%
60		0.55%	0.28%	1.15%	1.00%	0.90%	1.00%
65		0.97%	0.39%	1.15%	1.00%	0.70%	0.80%
Ref:		2633 x 0.94	2634 x 0.84	747 x 1	748 x 1	1029 1381	1030 1382

\* Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the MP-2017 projection scale.

Age	Pay Increase Assumptions for an Individual Member		
	Merit & Seniority	Base (Economic)	Increase Next Year
20	5.00%	2.75%	7.75%
25	2.90%	2.75%	5.65%
30	2.40%	2.75%	5.15%
35	1.90%	2.75%	4.65%
40	1.40%	2.75%	4.15%
45	0.70%	2.75%	3.45%
50	0.30%	2.75%	3.05%
55	0.00%	2.75%	2.75%
60	0.00%	2.75%	2.75%
65	0.00%	2.75%	2.75%
Ref:	472		

## Support Employees

### Separations From Active Employment Before Age and Service Retirement and Individual Pay Increases

Sample Ages in 2020	Percent of Active Members Separating within the Next Year						
	Years of Service	Death *		Disability		Other	
		Male	Female	Male	Female	Male	Female
	0					49.90%	47.50%
	1					30.10%	28.30%
	2					19.40%	19.10%
	3					15.30%	14.90%
	4					11.80%	12.10%
25	5 & Up	0.06%	0.02%	0.03%	0.02%	9.20%	9.70%
30		0.06%	0.02%	0.09%	0.04%	7.30%	6.90%
35		0.07%	0.03%	0.09%	0.05%	5.60%	5.00%
40		0.08%	0.05%	0.10%	0.07%	4.50%	4.40%
45		0.12%	0.07%	0.22%	0.16%	3.70%	4.00%
50		0.19%	0.11%	0.51%	0.34%	3.30%	3.60%
55		0.32%	0.18%	0.86%	0.59%	3.30%	3.30%
60		0.55%	0.28%	1.11%	0.76%	3.30%	2.80%
65		0.97%	0.39%	1.11%	0.80%	2.80%	2.10%
Ref:		2633 x 0.94	2634 x 0.84	749 x 1	750 x 1	1031 1383	1032 1384

\* Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the MP-2017 projection scale.

Age	Pay Increase Assumptions for an Individual Member		
	Merit & Seniority	Base (Economic)	Increase Next Year
20	5.00%	2.75%	7.75%
25	3.75%	2.75%	6.50%
30	2.60%	2.75%	5.35%
35	2.40%	2.75%	5.15%
40	2.10%	2.75%	4.85%
45	1.00%	2.75%	3.75%
50	0.50%	2.75%	3.25%
55	0.00%	2.75%	2.75%
60	0.00%	2.75%	2.75%
65	0.00%	2.75%	2.75%
Ref:	473		

## Miscellaneous and Technical Assumptions

### June 30, 2020

<b>Marriage Assumption:</b>	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
<b>Pay Increase Timing:</b>	Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
<b>Decrement Timing:</b>	Decrements are assumed to occur mid-year, with the exception of normal and early retirement, which are assumed to occur at the beginning of the year. This implies that people who worked the entire school year are reported as active members even if they retired at the end of the year.
<b>Eligibility Testing:</b>	Eligibility for benefits is determined based upon the age nearest birthday and the service nearest whole year on the date of the valuation.
<b>Decrement Relativity:</b>	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
<b>Decrement Operation:</b>	Disability does not operate during the first 5 years of service. Disability and turnover do not operate during retirement eligibility.
<b>Normal Form of Benefit:</b>	The assumed normal form of benefit is the straight life form.
<b>Incidence of Contributions:</b>	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. The payroll used for this purpose is payroll for all active members plus payroll for members in the T-DROP and retirees who returned to work.
<b>Liability Adjustments:</b>	The liability calculations assume that the non-contributory and contributory multipliers for the first ten years of service are at the standard rate at the time the service is earned.
<b>Data Adjustments:</b>	Members whose dates of birth were not supplied were assumed to be 40 years old on the valuation date.  Members whose salaries were not supplied and that entered the T-DROP were assumed to have the group average pay of those with salary data as of the valuation that entered the T-DROP.

## **SECTION H**

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### **GLOSSARY**

## Glossary

**Accrued Service.** The service credited under the plan which was rendered before the date of the actuarial valuation.

**Accumulated Benefit Obligation.** The actuarial present value of vested and non-vested benefits based on service to date and past and current salary levels.

**Actuarial Accrued Liability.** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.”

**Actuarial Assumptions.** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**Actuarial Equivalent.** A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

**Actuarial Present Value.** The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

**Actuarial Present Value of Credited Projected Benefits or Pension Benefit Obligation.** The present value of future benefits based on service to date and the effect projected salary increases.

**Actuary.** A person who is trained in the applications of probability and compound interest to solve problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries. The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation A.S.A. and ultimately to Fellowship with the designation F.S.A. The federal government certifies actuaries to practice under ERISA with the designation of E.A.

**Amortization.** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

## Glossary

**Experience Gain (Loss).** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

**Normal Cost.** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Plan Termination Liability.** The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a “going concern” basis and is not normally determined in a routine actuarial valuation.

**Reserve Account.** An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

**Unfunded Actuarial Accrued Liability.** The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”

**Valuation Assets.** The value of current plan assets recognized for valuation purposes. Generally based on book value plus a portion of unrealized appreciation or depreciation.

# Arkansas Teacher Retirement System

Annual Actuarial Valuation of Annuities Being Paid to  
Retirees and Beneficiaries  
June 30, 2020



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December 1, 2020

Board of Trustees  
Arkansas Teacher Retirement System  
Little Rock, Arkansas

Dear Board Members:

Presented in this report are the results of the ***Annual Actuarial Valuation of annuities being paid to retirees and beneficiaries*** of the Arkansas Teacher Retirement System.

***The date of the valuation*** was June 30, 2020 (using amounts payable as of July 1, 2020).

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the Retirement System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The valuation was based upon census data and financial information provided by the System's administrative staff. Preparation of this data requires considerable staff time. The helpful cooperation of the Arkansas Teacher Retirement System staff in furnishing the data is acknowledged with appreciation. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the data provided by ATRS.

This report was prepared using certain assumptions approved by the Board. The actuarial assumptions used for valuation purposes are summarized in the Appendix. These assumptions reflect experience during the period July 1, 2010 to June 30, 2015 and expectations for the future.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

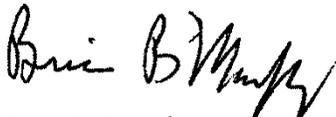
Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law. The scope of an actuarial valuation does not contain an analysis of the potential range of such future measurements.

This is one of multiple documents comprising the actuarial results. The other documents include the active and inactive valuation dated November 24, 2020, and the presentation dated December 7, 2020.

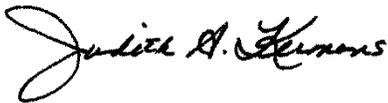
To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice promulgated by the Actuarial Standards Board. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. Brian B. Murphy, Judith A. Kermans and Heidi G. Barry are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The actuaries submitting this report are independent of the plan sponsor.

Respectfully submitted,



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD



Judith A. Kermans, EA, FCA, MAAA



Heidi G. Barry, ASA, FCA, MAAA

BBM/JAK/HGB:ah

## Comments

As expected, during the year ended June 30, 2020 the number of retired lives increased, as did the total amount being paid monthly to retired lives.

**The financing diagram** on page 7 shows the general pattern in which cash benefits increase (the green line). The schedule below shows how ATRS history illustrates the general pattern.

June 30	Retired Lives Receiving Benefits		
	No.	Annual Rates (millions)	% of Active Payroll#
1967	3,846	\$ 6.27	
1972	5,453	11.08	
1977	7,524	23.96	
1982	8,828	36.64	
1987	10,526	66.45	10.0%
1992	12,033	115.50	10.7%
1997	14,233	194.90	15.0%
1998	14,802	220.38	16.1%
1999	15,887	248.75	17.4%
2000	16,657	280.14	18.9%
2001	17,778	309.03	19.8%
2002	19,199	334.15	20.5%
2003	20,271	359.98	21.4%
2004	21,428	386.23	22.1%
2005	22,680	415.04	21.2%
2006	24,153	449.77	21.6%
2007	25,611	484.55	21.1%
2008	26,801	515.56	21.5%
2009	28,818	564.59	22.8%
2010	30,587	612.77	23.1%
2011	32,099	657.08	24.1%
2012	34,160	709.17	26.1%
2013	36,254	763.76	28.0%
2014	38,478	822.19	29.8%
2015	40,748	916.62	33.0%
2016	43,095	983.87	35.3%
2017	45,092	1,044.74	37.1%
2018	46,824	1,099.35	38.3%
2019	48,677	1,146.74	39.4%
2020	50,133	1,194.82	40.4%

# Does not include payroll for retirees who have returned to work.

**A significant financial goal** for the Teacher Retirement System was to reach a point in time where System assets fully covered the liabilities for future benefit payments to retirees and beneficiaries then on rolls. This goal was achieved in 1980 and retired life liabilities continue to be 100% funded.

## Other Observations

### General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.50% on the actuarial value of assets), it is expected that:

- 1) The unfunded actuarial accrued liabilities will be fully amortized after 27 years;
- 2) The funded status of the plan will increase gradually towards a 100% funded ratio; and
- 3) The unfunded accrued liability will increase for an extended period before beginning to decline.

### Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- 1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
- 2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- 3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

### Limitations of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

## **FINANCIAL PRINCIPLES**

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## Annual Reserve Transfers

The annual accounting transfers listed below are recommended so that retired life accounts will be fully funded as of the valuation date.

Reserve Account	June 30, 2020 Balance Reported	Transfer Amount	June 30, 2020 Balance After Transfer
Retiree Accounts			
RRA	\$ 12,379,405,139	\$ 105,397,381	\$ 12,484,802,520
808 RRA	9,635,773	(7,568)	9,628,205
SBA	102,904,403	5,624,526	108,528,929
Total Retiree Accounts	12,491,945,315	111,014,339	12,602,959,654
EAA	(6,237,130,081)	(111,014,339)	(6,348,144,420)
<b>Total</b>	<b>\$ 6,254,815,234</b>	<b>\$ -</b>	<b>\$ 6,254,815,234</b>

Lump sum death benefits for retirees are paid from the Employer Accumulation Account and are not included in the figures shown in this report. The liabilities for lump sum death benefits for retirees are currently \$129.1 million.

# Financial Principles and Operational Techniques

**Promises Made and To Be Paid For.** As each year is completed, the System in effect hands an “IOU” to each member then acquiring a year of service credit. The “IOU” says: “The Arkansas Teacher Retirement System owes you one year’s worth of retirement benefits, payments in cash commencing when you qualify for retirement.”

The related *key financial questions* are:

**Which generation of taxpayers contributes the money to cover the IOU?**

**The present taxpayers**, who receive the benefit of the member’s present year of service?

**Or the future taxpayers**, who happen to be in Arkansas at the time the IOU becomes a cash demand?

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The financial objective of the ATRS is that this year’s taxpayers contribute the money to cover the IOUs being handed out this year so that **the employer contribution rate will remain approximately level from generation to generation** -- our children and our grandchildren will not have to contribute greater percents of pay than we contribute now. This objective was set forth in Act 793 of 1977.

(There are systems which have **a design for deferring contributions to future taxpayers**, lured by a lower contribution rate now and putting aside the fact that the contribution rate must then relentlessly grow much greater over decades of time -- consume now, and let your children face higher contribution rates after you retire.)

An inevitable byproduct of the level-cost design is the accumulation of reserve assets for decades and the income produced when the assets are invested. **Investment income** becomes the **third and largest contributor** for benefits to employees, and is interlocked with the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

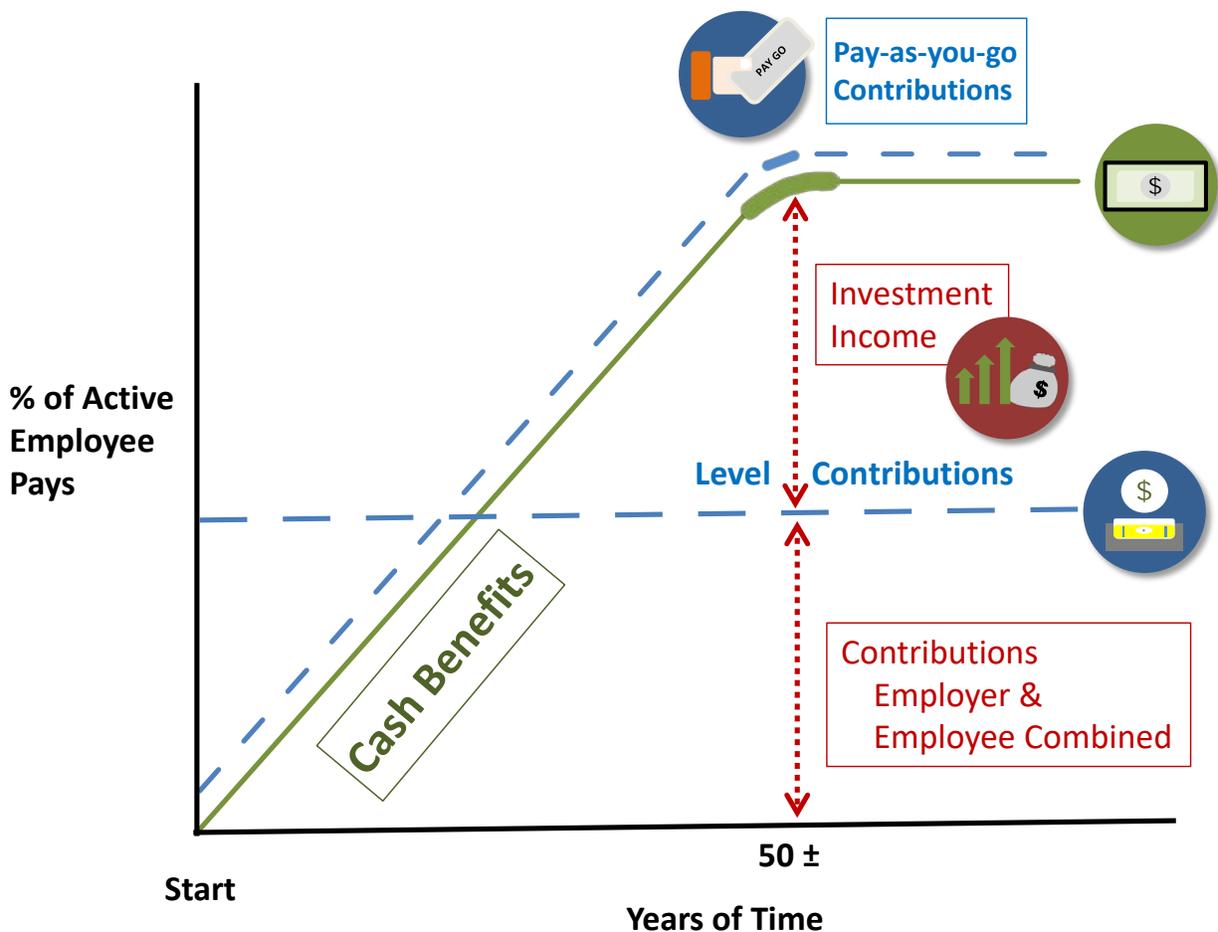
Normal Cost (the cost of members’ service being rendered this year)

... plus ...

Interest on Unfunded Actuarial Accrued Liabilities (unfunded accrued liabilities are the difference between (i) liabilities for service already rendered and (ii) the accrued assets of the plan).

**Computing Contributions to Support System Benefits.** From a given schedule of benefits and from the employee data and asset data furnished, the actuary determines the contribution rates to support the benefits, by means of **an actuarial valuation**. An actuarial valuation has a number of ingredients such as: the rate of investment income which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of pay increases; and the assumed age or ages at actual retirement. In an actuarial valuation, assumptions must be made as to what the above rates will be, for the next year and for decades in the future. Only the subsequent actual experience of the System can indicate the degree of accuracy of the assumptions.

**Reconciling Differences Between Assumed Experience and Actual Experience.** Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the accuracy of the assumptions or the skill of the actuary and the precision of the calculations made. The future can be predicted with considerable but not complete precision. ATRS copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is continual adjustments in financial position.



**CASH BENEFITS LINE.** This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

**LEVEL CONTRIBUTION LINE.** Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Risk Areas**
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- **Non-Economic Risk Areas**
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

## The Actuarial Valuation Process

*The financing diagram* on the preceding page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program), and is thus an *increasing contribution method*; and the *level contribution method* which equalizes contributions between the generations.

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*The actuarial valuation* is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. **Census data**, furnished by plan administrator

Retired lives now receiving benefits  
Former employees with vested benefits not yet payable  
Active employees

B. + **Asset data** (cash & investments), furnished by plan administrator

C. + **Benefit provisions** that establish eligibility and amounts of payments to members

D. + **Assumptions concerning future financial experience in various risk areas**, which assumptions are established by the Board of Trustees after consulting with the actuary

E. + **The funding method** for employer contributions (the long-term planned pattern for employer contributions)

F. + **Mathematically combining the assumptions, the funding method, and the data**

G. = Determination of:

**Plan financial position**, and/or  
**New Employer Contribution Rate**

# **BENEFIT PROVISIONS**

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# Summary of Benefit Provisions

## June 30, 2020

- 1. Post-Retirement Increases – A.C.A. §§ 24-7-713, 24-7-727 (compound COLA).** Each July 1, annuities are adjusted to be equal to the base annuity times 100% plus 3% for each full year in the period from the effective date of the base annuity to the current July 1. The base annuity is the amount of the member's annuity on the later of July 1, 2001 or the effective date of retirement, as re-determined by Acts 396 of 1999 and 992 of 1997. The July 1, 2009 cost of living adjustment for retirees was compounded. The annuity was set to 103% of the June 30, 2009 retirement benefit amount. After it was calculated on July 1, 2009, the base amount was reset to be the July 1, 2009 benefit amount. Future cost of living raises will be established by the new updated base amount. Future cost of living adjustments will be evaluated on an annual basis to determine if a simple or compound cost of living increase will be given, depending on the financial condition of the System. Act 967 of 2013 gives the ATRS Board authority to reverse the compounding of a benefit and reset the base amount to the pre-compounding amount. If this reversal were to occur, it would include participants in the T-DROP plan. The future benefits of a member would not be reduced to recover any benefits paid to a member as a result of the compounding. In addition, the member's benefit on the date of the reversal would not be impacted, but future COLA's would be based upon the reset base amount. This act is dependent upon the actuary's certification that the amortization period is in excess of 30 years to pay unfunded liabilities prior to any reversal of the compounding of the COLA. Act 780 of 2017 allows the right to reverse the 2009 compound COLA when unfunded liabilities exceed an 18-year amortization. The act also allows a phase in of the change during months in which a COLA raise is given to prevent any retiree or option beneficiary from having an actual reduction in monthly benefit payments.
- 2. Lump Sum Death Benefit – A.C.A. § 24-7-720.** Beneficiaries of deceased active members or retirees with 10 or more years of ATRS credited service are eligible to receive a lump sum death benefit of up to \$10,000 (\$6,667 for noncontributory service-benefit). The amount will be prorated for members who have both contributory service and noncontributory service. Members with 15 or more years of contributory service will receive the full \$10,000 (Act 977 of 2011).
- 3. Act 808 Retirement – A.C.A. § 24-4-732.** Any employee of a state agency who was an active member of the Arkansas Teacher Retirement System on April 8, 1987, and who qualified for retirement before January 1, 1988, could become a member of the Arkansas Public Employees Retirement System and retire from that system. All credited service was transferred to that system but the member's contributions were retained by the Arkansas Teacher Retirement System and the benefit amount is transferred monthly to the Arkansas Public Employees Retirement System. Each July 1, annuities are adjusted by 3% (compound escalator).
- 4. Act 793 Retirement – A.C.A § 24-4-522.** Any employee who was a member of the rehabilitation services in 1977 was permitted to become a member of the Arkansas Public Employees Retirement System. Liabilities associated with prior service earned through June 30, 1978 remain in the Arkansas Teacher Retirement System. Future service is allocated to the Arkansas Public Employees Retirement System. Each July 1, annuities are adjusted by 3% (compound escalator).

## Summary of Benefit Provisions

### June 30, 2020

5. **Retiree Benefit Stipend – A.C.A. § 24-7-713.** Each retired member as of June 30, 2008, with 5 or more years of ATRS credited service receives a \$75 per month stipend. Members in T-DROP do not receive the \$75 per month stipend until actual retirement. For all members retiring on or after July 1, 2008, a minimum of 10 years of ATRS credited service is required to receive the \$75 per month stipend. Act 603 of 2013 allows the ATRS Board to increase or decrease the stipend to a minimum of \$1 per month and a maximum of \$75 per month. This act is dependent upon the actuary's certification that the amortization period is in excess of 18 years to pay unfunded liabilities prior to any reduction in the current stipend. The stipend for fiscal year 2018 remains at \$75 per month. **By Board Resolution 2017-34 on November 13, 2017 the benefit stipend is removed from the base amount for all retirees and beneficiaries beginning fiscal year 2019 and the benefit stipend will be reduced to \$50.00 for fiscal year 2020 and beyond. The Resolution contains a “hold harmless” provision that prevents the lowering of the stipend if it would actually reduce the total monthly benefit. This would only affect retirees when the COLA is less than \$25 per month.**
  
6. **T-DROP Cash Balance Account.** Effective July 1, 2012, a T-DROP cash balance account was established that allows members exiting (retiring) from T-DROP to place all or a portion of their T-DROP proceeds into a Cash Balance Account (CBA) at ATRS. The interest rate credited will be between 2.5% and 4.0%, increasing 25 basis points for each year on deposit through the 5th year, and then 4% for the 6th and subsequent years. Each fiscal year, the Board can grant an incentive interest rate to encourage continued participation in the CBA program. For fiscal year 2020, the Board did not grant CBA participants an incentive rate.
  
7. **Optional Forms of Benefits – A.C.A. § 24-7-706:**
  - Option 1 (Straight Life Annuity)**

A member will receive the maximum monthly benefit for which he/she qualifies, throughout his/her lifetime. No monthly benefits will be paid to his/her beneficiary after the member's death. Should a member die before he/she has drawn benefits in an amount equal to his/her contributions plus earned interest, the balance will be paid to a designated beneficiary. The designated beneficiary may be anyone chosen by the member.
  - Option A (100% Survivor Annuity)**

Under this option a member will receive a reduced annuity throughout his/her lifetime. Upon the member's death, the designated beneficiary will receive the same annuity for the balance of his/her lifetime.
  - Option B (50% Survivor Annuity)**

Under this option a member will receive a reduced annuity throughout his/her lifetime. Upon the member's death, the designated beneficiary will receive one-half (1/2) of this annuity for the balance of his/her lifetime.

## Summary of Benefit Provisions June 30, 2020

### **Option C (Annuity for Ten Years Certain and Life Thereafter)**

A reduced monthly benefit payable for 120 months. After that time, or if the beneficiary dies prior to 120 months, a member's monthly allowance will revert to the amount he/she would have received under the regular plan and continue for life. If the member dies before receiving 120 payments, the designated beneficiary will receive a monthly benefit in the same amount until monthly benefits to both the member and the beneficiary equal 120 monthly payments. No further benefits are then payable to the beneficiary.

### **Pop-Up Election**

Following the death of or a divorce from the member's designated beneficiary, his or her benefit reverts (pops-up) to the straight life annuity amount from the elected optional annuity amount. The member may then elect new beneficiaries in accordance with Arkansas Code and rules adopted by the ATRS board.

Option Factors are based upon a 5.0% interest rate and the RP-2014/MP2017 tables (static projection to 2022) adjusted with a 50% unisex mix.

## Sample Benefit Computations for a Member Retiring July 1, 2020 with a Simple 3% COLA

Data for an example member is shown below.

Annual retirement benefit as of July 1, 2020 (excluding stipend): \$30,000

Projected benefits, taking into account increases after retirement would be:

Year Ended June 30	Annual Amount		\$ Increase
	Base	Current	
2021	\$30,000	\$30,000	\$ 0
2022	30,000	30,900	900
2023	30,000	31,800	900
2024	30,000	32,700	900
2025	30,000	33,600	900

Thereafter, the amount would increase by \$900 annually for life. Act 793 members and Act 808 members receive compound COLAs.

## **CHANGES IN PURCHASING POWER**

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## Benefit Changes During Recent Years of Retirement & Related Changes in Purchasing Power (1990 \$)

Year Ended June 30	Increase Beginning of Year	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				1990 \$	% of 1990
1990	\$ - - - -	\$ 11,000	- - - -	\$11,000	100%
1991	330	11,330	(4.7)%	10,822	98%
1992	1,005	12,335	(3.1)%	11,429	104%
1993	1,045	13,380	(3.0)%	12,036	109%
1994	1,082	14,462	(2.5)%	12,693	115%
1995	400	14,862	(3.0)%	12,660	115%
1996	400	15,262	(2.8)%	12,652	115%
1997	772	16,034	(2.3)%	12,993	118%
1998	481	16,515	(1.7)%	13,161	120%
1999	1,383	17,898	(2.0)%	13,989	127%
2000	1,129	19,027	(3.7)%	14,336	130%
2001	1,406	20,433	(3.2)%	14,911	136%
2002	807	21,240	(1.1)%	15,337	139%
2003	562	21,802	(2.1)%	15,417	140%
2004	562	22,364	(3.3)%	15,314	139%
2005	562	22,926	(2.5)%	15,312	139%
2006	562	23,488	(4.3)%	15,037	137%
2007	562	24,050	(2.7)%	14,994	136%
2008	562	24,612	(5.0)%	14,611	133%
2009	562	25,174	1.4 %	15,161	138%
2010	755	25,929	(1.1)%	15,453	140%
2011	778	26,707	(3.6)%	15,370	140%
2012	778	27,485	(1.7)%	15,558	141%
2013	778	28,263	(1.8)%	15,723	143%
2014	778	29,041	(2.1)%	15,828	144%
2015	778	29,819	(0.1)%	16,232	148%
2016	778	30,597	(1.0)%	16,491	150%
2017	778	31,375	(1.6)%	16,638	151%
2018	778	32,153	(2.9)%	16,575	151%
2019	751	32,904	(1.6)%	16,687	152%
2020+	451	33,355	(0.6)%	16,807	153%
2021	751	34,106			

\* The \$11,000 benefit used to begin this schedule is an arbitrary amount. A different beginning amount could show a different purchasing power amount, but the same in percent loss.

# Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).

+ The Retiree Benefit Stipend was reduced by \$300 in FY 2020.

## Benefit Changes During Recent Years of Retirement & Related Changes in Purchasing Power (2000 \$)

Year Ended June 30	Increase Beginning of Year	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				2000 \$	% of 2000
2000	\$ - - - -	\$ 11,600	- - - -	\$11,600	100%
2001	1,003	12,603	(3.2)%	12,207	105%
2002	523	13,126	(1.1)%	12,579	108%
2003	372	13,498	(2.1)%	12,668	109%
2004	372	13,870	(3.3)%	12,605	109%
2005	372	14,242	(2.5)%	12,624	109%
2006	372	14,614	(4.3)%	12,417	107%
2007	372	14,986	(2.7)%	12,400	107%
2008	372	15,358	(5.0)%	12,100	104%
2009	372	15,730	1.4 %	12,573	108%
2010	472	16,202	(1.1)%	12,815	110%
2011	486	16,688	(3.6)%	12,746	110%
2012	486	17,174	(1.7)%	12,902	111%
2013	486	17,660	(1.8)%	13,039	112%
2014	486	18,146	(2.1)%	13,125	113%
2015	486	18,632	(0.1)%	13,460	116%
2016	486	19,118	(1.0)%	13,675	118%
2017	486	19,604	(1.6)%	13,797	119%
2018	486	20,090	(2.9)%	13,745	118%
2019	459	20,549	(1.6)%	13,831	119%
2020+	159	20,708	(0.6)%	13,848	119%
2021	459	21,167			

\* The \$11,600 benefit used to begin this schedule is an arbitrary amount. A different beginning amount could show a different purchasing power amount, but the same in percent loss.

# Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).

+ The Retiree Benefit Stipend was reduced by \$300 in FY 2020.

## Benefit Changes During Recent Years of Retirement & Related Changes in Purchasing Power (2010 \$)

Year Ended June 30	Increase Beginning of Year	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				2010 \$	% of 2010
2010	\$ - - - -	\$ 11,900	- - - -	\$11,900	100%
2011	357	12,257	(3.6)%	11,836	99%
2012	357	12,614	(1.7)%	11,981	101%
2013	357	12,971	(1.8)%	12,108	102%
2014	357	13,328	(2.1)%	12,188	102%
2015	357	13,685	(0.1)%	12,499	105%
2016	357	14,042	(1.0)%	12,699	107%
2017	357	14,399	(1.6)%	12,812	108%
2018	357	14,756	(2.9)%	12,764	107%
2019	330	15,086	(1.6)%	12,837	108%
2020+	30	15,116	(0.6)%	12,780	107%
2021	330	15,446			

\* The \$11,900 benefit used to begin this schedule is an arbitrary amount. A different beginning amount could show a different purchasing power amount, but the same in percent loss.

# Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).

+ The Retiree Benefit Stipend was reduced by \$300 in FY 2020.

## VALUATION DATA

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## Summary of Annuities Being Paid Retirees and Beneficiaries July 1, 2020 by Disbursing Account and Gender

Disbursing Account	Men		Women		Totals	
	No.	Annual Annuities	No.	Annual Annuities	No.	Annual Annuities
<b>RETIREMENT RESERVE ACCOUNT</b>						
Age & Service Annuities						
Retirees	10,094	\$271,593,907	34,786	\$832,848,652	44,880	\$1,104,442,559
Beneficiaries	381	8,018,268	881	20,508,414	1,262	28,526,682
Totals	10,475	279,612,175	35,667	853,357,066	46,142	1,132,969,241
Disability						
Retirees	542	8,175,148	2,214	33,344,303	2,756	41,519,451
Beneficiaries	137	2,179,271	133	2,351,311	270	4,530,582
Totals	679	10,354,419	2,347	35,695,614	3,026	46,050,033
Act 793	81	1,151,504	77	632,891	158	1,784,395
Retirement Reserve Account	11,235	291,118,098	38,091	889,685,571	49,326	1,180,803,669
Act 808 Retirement Reserve Account	23	1,529,489	16	647,383	39	2,176,872
<b>Total Retirement Reserve Account</b>	<b>11,258</b>	<b>292,647,587</b>	<b>38,107</b>	<b>890,332,954</b>	<b>49,365</b>	<b>1,182,980,541</b>
<b>SURVIVOR'S BENEFIT ACCOUNT</b>						
Beneficiaries of Deceased Members	380	5,497,883	388	6,345,784	768	11,843,667
<b>RETIREMENT SYSTEM TOTALS</b>						
<b>Total Annuities Being Paid</b>	<b>11,638</b>	<b>\$298,145,470</b>	<b>38,495</b>	<b>\$896,678,738</b>	<b>50,133</b>	<b>\$1,194,824,208</b>
Prior Year Totals	11,441	\$289,310,444	37,236	\$857,429,522	48,677	\$1,146,739,966

## Summary of Annuities Being Paid Retirees and Beneficiaries July 1, 2020 by Disbursing Account and Source of Financing

Disbursing Account	Annual Annuities		Total	
	Employee Financed	Employer Financed	No.	Annual Annuities
<b>RETIREMENT RESERVE ACCOUNT</b>				
Age & Service Annuities				
Retirees	\$ 71,085,946	\$ 1,033,356,613	44,880	\$ 1,104,442,559
Beneficiaries	424,887	28,101,795	1,262	28,526,682
Totals	71,510,833	1,061,458,408	46,142	1,132,969,241
Disability				
Retirees	1,718,303	39,801,148	2,756	41,519,451
Beneficiaries	162,593	4,367,989	270	4,530,582
Totals	1,880,896	44,169,137	3,026	46,050,033
Act 793	128,362	1,656,033	158	1,784,395
Retirement Reserve Account	73,520,091	1,107,283,578	49,326	1,180,803,669
Act 808 Retirement Reserve Account	88,691	2,088,181	39	2,176,872
Total Retirement Reserve Account	73,608,782	1,109,371,759	49,365	1,182,980,541
<b>SURVIVOR'S BENEFIT ACCOUNT</b>				
Beneficiaries of Deceased Members	452,243	11,391,424	768	11,843,667
<b>RETIREMENT SYSTEM TOTALS</b>				
<b>Total Annuities Being Paid</b>	<b>\$ 74,061,025</b>	<b>\$ 1,120,763,183</b>	<b>50,133</b>	<b>\$ 1,194,824,208</b>
Prior Year Totals	\$ 76,090,498	\$ 1,070,649,468	48,677	\$ 1,146,739,966

## Annuities Being Paid Retirees and Beneficiaries July 1, 2020 by Type of Annuity Being Paid

Type of Annuity	No.	Annual Amounts		
		Original Annuities	Base Annuities	Current Annuities
<b>RETIREMENT RESERVE ACCOUNT</b>				
Age & Service				
Option 1 (Basic single life)	36,096	\$ 562,170,863	\$ 657,267,408	\$ 856,909,819
Option A (Joint & 100% Survivor)	5,435	92,594,901	106,418,914	138,900,072
Option B (Joint & 50% Survivor)	2,684	60,704,168	72,554,882	94,895,106
Option C (10-year certain)	665	10,851,647	11,130,056	13,737,562
Beneficiaries	1,262	22,629,384	21,085,688	28,526,682
Totals	46,142	748,950,963	868,456,948	1,132,969,241
Disability				
Option 1	2,300	23,851,050	26,102,619	34,354,117
Option A	366	4,089,826	4,152,941	5,370,715
Option B	83	1,224,993	1,313,002	1,692,701
Option C	7	82,353	76,953	101,918
Beneficiaries	270	3,107,084	3,288,217	4,530,582
Totals	3,026	32,355,306	34,933,732	46,050,033
Act 793	158	877,159	1,784,395	1,784,395
Retirement Reserve Account	49,326	782,183,428	905,175,075	1,180,803,669
Act 808 Retirement Reserve Account	39	738,032	2,176,872	2,176,872
Total Retirement Reserve Account	49,365	782,921,460	907,351,947	1,182,980,541
<b>SURVIVOR'S BENEFIT ACCOUNT</b>				
Beneficiaries of Deceased Members	768	8,185,296	9,210,035	11,843,667
<b>RETIREMENT SYSTEM TOTALS</b>				
Total Annuities Being Paid	50,133	\$ 791,106,756	\$ 916,561,982	\$ 1,194,824,208

**The Original Annuity** is the annuity at the date of retirement (includes stipend).

**The Base Annuity** is the amount from which the 3.0% COLA is calculated.

**The Current Annuity** is the annuity payable at July 1, 2020 including the COLA granted on July 1.

**Annuities Being Paid July 1, 2020  
from the Retirement Reserve Account to  
AGE AND SERVICE Retirees and Beneficiaries  
by Attained Ages**

Attained Age	Annual Amounts			
	No.	Original Annuities	Base Annuities	Current Annuities
Under 40	8	\$ 183,835	\$ 161,661	\$ 209,534
40-44	8	89,221	81,250	95,678
45-49	25	403,382	377,799	424,944
50-54	302	7,547,194	7,335,393	8,154,135
55-59	1,352	35,845,766	36,039,748	42,738,465
60-64	6,622	125,320,484	129,562,497	158,580,952
65-69	12,027	208,221,730	224,796,401	285,158,183
70-74	11,713	189,864,563	218,936,858	292,606,206
75-79	7,090	100,324,437	126,397,062	173,269,131
80-84	3,954	49,901,160	70,077,698	96,479,708
85-89	2,011	22,247,059	35,711,333	49,154,397
90-94	821	7,471,148	14,994,906	20,625,020
95 & Up	209	1,530,984	3,984,342	5,472,888
<b>Totals</b>	<b>46,142</b>	<b>\$748,950,963</b>	<b>\$868,456,948</b>	<b>\$1,132,969,241</b>

Amounts in the Original Annuities column include the original \$900 Retiree Benefit Stipend. Amounts in the Base Annuities column exclude this amount for purposes of determining the COLA. Amounts in the Current Annuities column include the current \$600 Retiree Benefit Stipend.

**Annuities Being Paid July 1, 2020  
from the Retirement Reserve Account to  
DISABILITY Retirees and Beneficiaries by Attained Ages**

Attained Age	Annual Amounts			
	No.	Original Annuities	Base Annuities	Current Annuities
Under 40	14	\$ 120,936	\$ 113,271	\$ 130,528
40-44	38	390,083	365,239	427,825
45-49	113	1,258,606	1,188,566	1,365,399
50-54	212	2,802,057	2,649,993	3,145,729
55-59	466	5,225,026	4,962,477	6,097,647
60-64	639	7,119,944	6,847,080	8,819,484
65-69	576	5,781,347	5,916,048	8,149,140
70-74	512	5,328,003	6,258,321	8,717,469
75-79	279	2,814,175	3,773,303	5,247,622
80-84	97	1,000,651	1,619,697	2,234,939
85-89	49	374,064	792,480	1,093,969
90-94	21	94,796	294,430	408,861
95 & Up	10	45,618	152,827	211,421
<b>Totals</b>	<b>3,026</b>	<b>\$32,355,306</b>	<b>\$34,933,732</b>	<b>\$46,050,033</b>

Amounts in the Original Annuities column include the original \$900 Retiree Benefit Stipend. Amounts in the Base Annuities column exclude this amount for purposes of determining the COLA. Amounts in the Current Annuities column include the current \$600 Retiree Benefit Stipend.

**Annuities Being Paid July 1, 2020  
from the Retirement Reserve Account to  
ACT 793 Retirees and Beneficiaries by Attained Ages**

Attained Age	Annual Amounts		
	No.	Original Annuities	Current Annuities
Under 40	-	\$ -	\$ -
40-44	-	-	-
45-49	-	-	-
50-54	-	-	-
55-59	-	-	-
60-64	1	290	443
65-69	19	55,107	89,593
70-74	42	199,600	361,853
75-79	37	250,418	494,639
80-84	28	183,632	363,598
85-89	21	154,313	369,289
90-94	9	29,096	89,696
95 & Up	1	4,703	15,284
<b>Totals</b>	<b>158</b>	<b>\$877,159</b>	<b>\$1,784,395</b>

Base annuities are equal to current annuities since the COLA is compound.

**Annuities Being Paid July 1, 2020  
from the Retirement Reserve Account to  
SURVIVOR BENEFICIARIES by Attained Ages**

Attained Age	Annual Amounts			
	No.	Original Annuities	Base Annuities	Current Annuities
Under 40	196	\$1,646,034	\$1,629,448	\$ 1,852,212
40-44	3	23,784	24,839	31,821
45-49	9	66,749	66,296	81,455
50-54	22	250,235	247,296	300,608
55-59	45	588,845	569,770	681,297
60-64	99	1,340,653	1,334,258	1,687,317
65-69	128	1,431,968	1,495,583	1,954,630
70-74	104	1,414,563	1,578,127	2,119,637
75-79	73	790,108	1,020,498	1,405,548
80-84	49	404,761	678,984	944,016
85-89	28	183,263	429,226	594,219
90-94	10	39,600	114,148	160,598
95 & Up	2	4,733	21,562	30,309
<b>Totals</b>	<b>768</b>	<b>\$8,185,296</b>	<b>\$9,210,035</b>	<b>\$11,843,667</b>

Amounts in the Original Annuities column include the original \$900 Retiree Benefit Stipend. Amounts in the Base Annuities column exclude this amount for purposes of determining the COLA. Amounts in the Current Annuities column include the current \$600 Retiree Benefit Stipend.

**Annuities Being Paid July 1, 2020  
from the Act 808 Retirement Reserve Account to  
ACT 808 Retirees and Beneficiaries by Attained Ages**

Attained Age	Annual Amounts		
	No.	Original Annuities	Current Annuities
Under 40	-	\$ -	\$ -
40-44	-	-	-
45-49	-	-	-
50-54	-	-	-
55-59	-	-	-
60-64	-	-	-
65-69	-	-	-
70-74	-	-	-
75-79	-	-	-
80-84	5	68,922	219,428
85-89	19	375,337	1,096,253
90-94	10	205,999	629,120
95 & Up	5	87,774	232,071
<b>Totals</b>	<b>39</b>	<b>\$738,032</b>	<b>\$2,176,872</b>

Base annuities are the same as current annuities since the COLA is compound.

## Retiree and Beneficiary Data as of June 30

Year	Estimated Number		Total Retirees*	Annual Allowances (Millions)	% Increase in Annual Allowances@	Average Annual Allowances
	Added	Removed				
1990	588	337	11,654	\$ 92.69	7.0%	\$ 7,954
1991	489	253	11,890	104.60	12.8%	8,797
1992	455	312	12,033	115.50	10.4%	9,599
1993	589	316	12,306	129.71	12.3%	10,540
1994	846	512	12,640	141.87	9.4%	11,224
1995	908	342	13,206	156.59	10.4%	11,857
1996	1,107	654	13,659	170.59	8.9%	12,489
1997	1,049	475	14,233	194.90	14.3%	13,694
1998	809	240	14,802	220.38	13.1%	14,888
1999	1,582	497	15,887	248.75	12.9%	15,658
2000	1,249	479	16,657	280.14	12.6%	16,818
2001	1,571	450	17,778	309.03	10.3%	17,383
2002	1,989	568	19,199	334.15	8.1%	17,404
2003	1,621	549	20,271	359.98	7.7%	17,758
2004	1,685	528	21,428	386.23	7.3%	18,025
2005	1,822	570	22,680	415.04	7.5%	18,300
2006	1,958	485	24,153	449.77	8.4%	18,622
2007	2,017	559	25,611	484.55	7.7%	18,920
2008	1,703	513	26,801	515.56	6.4%	19,237
2009	2,721	704	28,818	564.59	9.5%	19,591
2010	2,588	819	30,587	612.77	8.5%	20,034
2011	2,394	882	32,099	657.08	7.2%	20,470
2012	2,932	871	34,160	709.17	7.9%	20,760
2013	3,039	945	36,254	763.76	7.7%	21,067
2014	3,156	932	38,478	822.19	7.7%	21,368
2015	3,326	1,056	40,748	916.62	11.5%	22,495
2016	3,272	925	43,095	983.87	7.3%	22,830
2017	2,996	999	45,092	1,044.74	6.2%	23,169
2018	2,927	1,195	46,824	1,099.35	5.2%	23,478
2019	2,849	996	48,677	1,146.74	4.3%	23,558
2020	2,811	1,355	50,133	1,194.82	4.2%	23,833

\* T-DROP participants are classified as active members for purposes of the valuation and are not included in this schedule.

@ T-DROP annuities for retired members included 2015 and later.

**REPORTED ASSETS**

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**The assets** of the Retirement System, as of June 30, 2020, were reported to your actuary to be \$16,902,076,224. This amount, increased by a funding value adjustment of \$1,105,178,919 this year, is used to finance the Retirement System liability.

Accounts	Assets at June 30	
	2020	2019
Regular Accounts		
Members' Deposit Accounts		
Contributions	\$ 1,427,360,668	\$ 1,348,149,014
Interest	8,609,929,516	9,669,786,261
Total	10,037,290,184	11,017,935,275
T-DROP Member Deposit Accounts		
Contributions	27,540,642	28,594,336
Interest	24,666,395	26,900,241
Total	52,207,037	55,494,577
Cash Balance Account	158,330,186	133,829,621
Employer's Accumulation Account	(6,237,130,081)	(5,848,501,337)
Retirement Reserve Account	12,379,405,139	11,844,778,384
Act 808 Retirement Reserve Account	9,635,773	11,497,384
T-Lump Payable	390,184,585	411,492,155
Survivors Benefit Account	102,904,403	105,863,197
Total Regular Accounts	16,892,827,226	17,732,389,256
Other Accounts		
Income Expense Account	9,248,998	9,232,517
Other Special Reserves	-	-
Miscellaneous	-	-
Total Other Accounts	9,248,998	9,232,517
Total Market Value of Assets	16,902,076,224	17,741,621,773
Funding Value Adjustment	1,105,178,919	(329,087,122)
<b>Funding Value of Assets</b>	<b>\$18,007,255,143</b>	<b>\$17,412,534,651</b>

## VALUATION RESULTS

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## Liabilities for Annuities Being Paid July 1, 2020 Tabulated by Type of Annuity Being Paid

Type of Annuity	Liabilities July 1, 2020		
	Men	Women	Totals
<b>RETIREMENT RESERVE ACCOUNT</b>			
Age & Service Annuities			
Option 1 (Straight Life)	\$ 1,477,891,132	\$ 7,226,228,002	\$ 8,704,119,134
Option A (100% Joint & Survivor)	862,169,701	942,271,791	1,804,441,492
Option B ( 50% Joint & Survivor)	417,157,271	669,272,830	1,086,430,101
Option C (10 Years Certain & Life)	32,055,250	139,692,971	171,748,221
Beneficiaries	62,673,177	176,688,851	239,362,028
Total Age & Service	2,851,946,531	9,154,154,445	12,006,100,976
Disability Annuities			
Option 1	48,829,970	278,936,507	327,766,477
Option A	28,000,427	45,204,019	73,204,446
Option B	5,957,969	13,034,930	18,992,899
Option C	-	1,238,758	1,238,758
Beneficiaries	20,033,099	23,381,962	43,415,061
Total Disability	102,821,465	361,796,176	464,617,641
Act 793	8,622,387	5,461,516	14,083,903
Retirement Reserve Account	2,963,390,383	9,521,412,137	12,484,802,520
Act 808 Retirement Reserve Account	6,822,070	2,806,135	9,628,205
Total Retirement Reserve Account	2,970,212,453	9,524,218,272	12,494,430,725
<b>SURVIVORS' BENEFIT ACCOUNT</b>			
Beneficiaries of Deceased Members	48,892,768	59,636,161	108,528,929
<b>RETIREMENT SYSTEM TOTALS</b>			
Total Annuity Liabilities	3,019,105,221	9,583,854,433	12,602,959,654
Cash Benefit Account Liabilities			158,330,186
Liabilities for Lump Sum Death Benefits			129,117,390
Total	\$ 3,019,105,221	\$ 9,583,854,433	\$ 12,890,407,230

## Retirement Reserve Account

### Comparative Statement of Annuities, Accrued Liabilities and Assets

(\$ Millions)

Valuation Date June 30	Annual Annuities Being Paid			Average	Computed Liabilities	Applicable Assets	Unfunded Retired Life Liabilities	Ratio of Assets to Liabilities
	No.	Amount	% Incr.					
1980*#	8,001	\$ 30.10	3.5%	\$ 3,761	\$ 280.70	\$ 280.7	none	100.0%
1985*+	9,331	51.49	13.6%	5,518	479.9	479.9	none	100.0%
1990	11,054	87.84	7.2%	7,946	847.7	847.7	none	100.0%
1995	12,622	150.45	10.8%	11,920	1,428.6	1,428.6	none	100.0%
2000* ##	16,172	275.65	14.6%	17,045	2,828.8	2,828.8	none	100.0%
2005	22,147	409.42	7.5%	18,486	4,148.1	4,148.1	none	100.0%
2006	23,606	443.98	8.4%	18,808	4,483.4	4,483.4	none	100.0%
2007	25,038	478.30	7.7%	19,103	4,816.4	4,816.4	none	100.0%
2008	26,258	509.29	6.5%	19,396	5,391.3	5,391.3	none	100.0%
2009	28,228	557.83	9.5%	19,762	5,891.9	5,891.9	none	100.0%
2010	29,969	605.55	8.6%	20,206	6,358.0	6,358.0	none	100.0%
2011^	31,498	649.47	7.3%	20,619	6,972.6	6,972.6	none	100.0%
2012	33,533	701.09	7.9%	20,907	7,481.0	7,481.0	none	100.0%
2013	35,622	755.26	7.7%	21,202	8,004.8	8,004.8	none	100.0%
2014	37,824	813.33	7.7%	21,503	8,561.9	8,561.9	none	100.0%
2015@	40,070	907.09	11.5%	22,638	9,515.7	9,515.7	none	100.0%
2016	42,395	973.78	7.4%	22,969	10,157.2	10,157.2	none	100.0%
2017* ^	44,394	1,034.17	6.2%	23,295	11,026.4	11,026.4	none	100.0%
2018	46,108	1,088.30	5.2%	23,603	11,515.7	11,515.7	none	100.0%
2019	47,979	1,137.79	4.5%	23,714	12,094.6	12,094.6	none	100.0%
2020	49,365	1,182.98	4.0%	23,964	12,494.4	12,494.4	none	100.0%

\* After plan amendments.

# After change in interest assumption from 6.0% to 7.0%, change in post-retirement adjustments from 1.5% to 3.0% and recommended reserve transfer.

+ After redetermination of base, retroactive application of new minimum benefit formula and reserve transfers.

## Includes Act 808 and Act 793 retirees beginning in 2000.

^ After changes in assumptions.

@ T-DROP annuities for retired members included 2015 and later.

## Survivors' Benefit Account Accrued Liabilities and Assets Comparative Statement

Valuation Date June 30	Annual Annuities Being Paid		Computed Liabilities	Applicable Assets	Unfunded Accrued Liabilities	Ratio of Assets to Liabilities
	No.	Amount				
1980*#	393	\$ 772,631	\$ 7,042,644	\$ 7,042,644	none	100.0%
1985*+	421	1,240,399	12,411,800	12,411,800	none	100.0%
1990	424	1,830,743	18,117,244	18,117,244	none	100.0%
1995	416	2,723,940	26,220,218	26,220,218	none	100.0%
2000*	485	4,487,519	43,701,138	43,701,138	none	100.0%
2005	533	5,619,675	56,257,745	56,257,745	none	100.0%
2006	547	5,791,974	57,605,939	57,605,939	none	100.0%
2007	573	6,250,603	63,481,565	63,481,565	none	100.0%
2008	543	6,269,551	66,496,539	66,496,539	none	100.0%
2009	590	6,761,034	70,857,161	70,857,161	none	100.0%
2010	618	7,224,585	75,108,334	75,108,334	none	100.0%
2011^	601	7,605,212	81,150,385	81,150,385	none	100.0%
2012	627	8,081,913	84,930,745	84,930,745	none	100.0%
2013	632	8,491,667	88,139,802	88,139,802	none	100.0%
2014	654	8,861,734	89,793,996	89,793,996	none	100.0%
2015	678	9,530,889	95,272,795	95,272,795	none	100.0%
2016	700	10,084,359	98,960,258	98,960,258	none	100.0%
2017* ^	698	10,574,602	104,668,995	104,668,995	none	100.0%
2018	716	11,042,074	107,043,067	107,043,067	none	100.0%
2019	741	11,313,962	106,306,434	106,306,434	none	100.0%
2020	768	11,843,667	108,528,929	108,528,929	none	100.0%

\* Includes plan amendments.

# After change in interest assumption from 6.0% to 7.0%, change in post-retirement adjustments from 1.5% to 3.0% and recommended reserve transfer.

+ After redetermination of base annuity, retroactive application of new minimum benefit formula and recommended reserve transfer.

^ After changes in assumptions.

## Annual Allowances of Retired Lives by Year of Retirement as of June 30, 2020

Calendar Year of Retirement	No.	Annual Amount Being Paid			Average
		Original	Total Increase	Current	
2020*	592	\$ 6,721,010	\$ 543,526	\$ 7,264,536	\$12,271
2019	2,787	44,961,609	6,510,385	51,471,994	18,469
2018	2,793	46,201,833	7,794,070	53,995,903	19,333
2017	2,801	45,802,767	10,245,506	56,048,273	20,010
2016	2,861	46,550,314	12,029,832	58,580,146	20,475
2015	3,064	49,935,975	14,717,858	64,653,833	21,101
2014	3,010	50,458,979	16,396,326	66,855,305	22,211
2013	2,744	46,044,105	17,150,408	63,194,513	23,030
2012	2,698	43,623,367	17,850,750	61,474,117	22,785
2011	2,427	39,586,602	17,275,114	56,861,716	23,429
2010	2,066	33,645,308	16,905,059	50,550,367	24,468
2009	2,141	35,431,088	19,057,840	54,488,928	25,450
2008	2,059	32,374,697	17,341,046	49,715,743	24,146
2007	1,896	29,703,697	16,261,319	45,965,016	24,243
2006	1,689	26,774,218	16,074,718	42,848,936	25,369
2005	1,683	26,981,966	18,240,467	45,222,433	26,870
2004	1,473	22,546,064	15,037,292	37,583,356	25,515
2003	1,320	19,953,501	14,073,425	34,026,926	25,778
2002	1,276	19,864,144	14,297,297	34,161,441	26,772
2001	1,263	17,756,773	13,034,849	30,791,622	24,380
2000	1,090	17,329,893	13,837,095	31,166,988	28,594
1999	940	13,728,110	12,285,663	26,013,773	27,674
1998	904	12,447,205	11,776,557	24,223,762	26,796
1997	678	10,571,130	11,011,542	21,582,672	31,833
1996	533	8,629,758	9,176,735	17,806,493	33,408
1995	577	9,276,956	10,087,912	19,364,868	33,561
1994	575	9,175,228	11,117,825	20,293,053	35,292
1993	404	6,624,516	8,480,865	15,105,381	37,390
1992	278	3,545,872	5,161,712	8,707,584	31,322
1991	197	2,257,613	3,436,493	5,694,106	28,904
1990	225	2,414,957	4,172,849	6,587,806	29,279
1989	217	2,367,454	4,487,526	6,854,980	31,590
1988	204	2,219,108	4,429,721	6,648,829	32,592
1987	198	2,103,437	4,657,770	6,761,207	34,148
1986	119	1,121,445	2,527,755	3,649,200	30,666
Before 1985	351	2,376,057	6,232,345	8,608,402	24,525
<b>TOTAL</b>	<b>50,133</b>	<b>\$791,106,756</b>	<b>\$403,717,452</b>	<b>\$1,194,824,208</b>	<b>\$23,833</b>

\* Reporting for calendar year 2020 is not yet complete. The July 1<sup>st</sup> retirees are not included in the schedule.



## APPENDIX

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## APPENDIX

### Single Life Retirement Values Based on RP-2014 Mortality Headcount Weighted Tables Adjusted Using MP-2017 Projection Scale & 7.5% Interest

Sample Attained Ages in 2020*	Present Value of \$1.00 Monthly for Life		Present Value of \$1 Monthly for Life Increasing 3.0% Annually		Future Life Expectancy (Years)		Percent Dying within Next Year	
	Men	Women	Men	Women	Men	Women	Men	Women
40	\$150.86	\$154.28	\$198.83	\$205.26	42.75	47.01	0.33 %	0.29 %
45	146.93	151.53	191.45	199.63	37.96	42.19	0.41 %	0.32 %
50	141.81	147.68	182.25	192.21	33.25	37.38	0.53 %	0.36 %
55	135.20	142.30	170.95	182.48	28.67	32.58	0.70 %	0.44 %
60	126.90	135.25	157.44	170.40	24.25	27.89	0.97 %	0.60 %
65	116.81	126.22	141.80	155.77	20.07	23.36	1.36 %	0.82 %
70	104.59	114.70	123.92	138.24	16.15	19.02	1.96 %	1.23 %
75	90.13	100.68	103.98	118.20	12.52	14.95	3.05 %	2.03 %
80	74.03	84.67	83.07	96.67	9.29	11.30	5.05 %	3.45 %
85	57.74	67.75	63.07	75.22	6.61	8.19	8.67 %	6.07 %
Base	2635 x 1.01	2636 x 0.91	2635 x 1.01	2636 x 0.91				
Projection	939	940 x 0.91	939	940				

\* Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the MP-2017 projection scale.

Sample Attained Ages in 2020	Benefit Increasing 3.0% Yearly	Portion of Age 60 Lives Still Alive	
		Men	Women
60	\$100.00	100%	100%
65	115.00	95%	97%
70	130.00	88%	92%
75	145.00	79%	86%
80	160.00	67%	77%
Ref		2635 x 1.01	2636 x 0.91

**Waiver of Member Interest 2021**  
**February 1, 2021, Board Meeting**  
**A.C.A. Sec. 24-7-205**

**Amount**            **Reason to Waive Interest**

**None this reporting period.**

**Waiver of Employer Report Penalties 2021**  
**February 1, 2021, Board Meeting**  
**A.C.A. Sec. 24-7-411**

These are typical reports of employer penalties and interest waived by ATRS during a reporting period.

<b>Employer Penalties Waived</b>	
ASU - Three Rivers Malvern, AR	\$300.00
Midland School District Pleasant Plains, AR	\$300.00
<b>Total Employer Penalties Waived</b>	<b>\$600.00</b>
<b>Employer Interest Waived</b>	
ASU - Three Rivers Malvern, AR	\$4.78
ASU - Newport Newport, AR	\$73.76
North Arkansas College Harrison, AR	\$639.21
Wester Yell County School District Havana, AR	\$32.08
<b>Total Employer Waived</b>	<b>\$749.83</b>
<b>Total Employer Penalties &amp; Interest Waived</b>	<b>\$1,349.83</b>

**Manifest Injustice Committee Recommendation**  
**January 21, 2021**

In the Matter of C. R. C., MI Claim #2020-006

This matter involves under reported service that occurred more than 5 years ago.

C. R. C. became a member of ATRS in the fall of 1987 and is currently inactive with 23.25 years of credited service. His current ATRS member history shows that during the 2005-06 school year he was paid \$29,855.00 and received 0.25 years of credited service. In 2019, ATRS received a Salary Statement for Service from the Pulaski County Special School District correcting the previously reported information for the 2005-06: Mr. C. actually worked 244 days---a full year---during the 2005-06 school year and earned a salary of \$39,055.00. ATRS staff did not complete a history adjustment for the information received from PCSSD because the error falls outside the five-year look-back period. Member was advised that the missing three quarters of a year could be purchased at the actuarial cost of \$7,768.30 (if paid by October, 2020).

Staff has filed this Claim of Manifest Injustice on behalf of the member, asking for permission to correct the 2005-06 service credit in his record.

After reviewing the member's file and comparing his situation to recent similar cases of unreported service, the MI Committee recommends that you find that a Manifest Injustice exists in this case with the following remedy:

Allow member's history to be updated with corrected information for the 2005-06 school year upon receipt of employer contributions of \$1,288.00, and waiver of interest in the amount of \$2,498.11. Employer contributions may be paid by the member, at member's option.

This recommended remedy requires Board approval since implementation involves setting aside the five-year look-back limitation which would otherwise bar correction of member's history or sending an invoice to the covered employer for back contributions. If the Board finds that a manifest injustice exists, then the Executive Director has authority under ATRS Rule 17 to implement a resolution of up to \$10,000 of direct financial impact to ATRS, with written notice to the Chair of the Board if the direct financial impact exceeds \$5,000.00.

**Manifest Injustice Committee Recommendation**  
**January 21, 2021**

In the Matter of A. W., MI Claim #2020-007

This matter involves unreported service that occurred more than 5 years ago.

A. S. W. became a Member of ATRS in September, 2005, when she went to work as a substitute teacher for Arkadelphia School District. She later worked for the Pulaski County Special School District (2008), and currently is employed by the Little Rock School District (8-27-2009 to present). Her ATRS Member History reflects eleven (11) years of credited service, with the 2009-2010 school year as her first recorded year of credited service.

Last fall, ATRS received a Salary Statement for Service from the Pulaski County Special School District indicating that Ms. W. worked 192 days and earned salary of \$31,721.74 for the 2008-09 school year that had not been reported previously and is not reflected in her ATRS service history. ATRS staff did not complete a history adjustment for the information received from PCSSD because the error falls outside the five-year look-back period. Member was advised that the missing year could be purchased at the actuarial cost of \$15,438.76 (if paid by October, 2019). \*

Staff has filed this Claim of Manifest Injustice on behalf of the member, asking for permission to add the 2008-09 service credit to her record.

After reviewing the member's file and comparing her situation to recent similar cases of unreported service, the MI Committee recommends that you find that a Manifest Injustice exists in this case with the following remedy:

Allow member's history to be updated with recently reported information for the 2008-09 school year (one year of contributory service with salary of \$31,721.74) upon receipt of employer contributions of \$4,441.04 and employee contributions of \$1,903.30. The Committee further recommends that interest on both employer and employee contributions be waived in the aggregate amount \$8,448.38 (\$5,913.87 on employer contributions and \$2,534.51 on employee contributions). Employer contributions may be paid by the member, at member's option. We also recommend that member be given the option of waiving contributory credit and accepting non-contributory service credit upon the receipt of employer contributions only.

This recommended remedy requires Board approval since implementation involves setting aside the five-year look-back limitation which would otherwise bar correction of member's history or sending an invoice to the covered employer for back contributions. If the Board finds that a manifest injustice exists, then the Executive Director has authority under ATRS Rule 17 to implement a resolution of up to \$10,000 of direct financial impact to ATRS, with written notice to the Chair of the Board if the direct financial impact to the System exceeds \$5,000.00.

\*Current actuarial cost has not been calculated.

**ARKANSAS TEACHER RETIREMENT SYSTEM**  
**1400 West Third Street**  
**Little Rock, Arkansas 72201**

**RESOLUTION**  
**No. 2021-13**

**Clarification and Reaffirmation of Investment Management  
Processes  
under ATRS Policy 4**

**WHEREAS**, the Board of Trustees (Board) of the Arkansas Teacher Retirement System (ATRS or the System) is authorized to invest and manage trust assets for the benefit of its plan participants; and

**WHEREAS**, ATRS Policy 4, consistent with A.C.A. §24-7-303(e), states in part: "The System shall manage those assets not specifically allocated to investment managers. No investment shall be made without an investment consultant's recommendation."; and

**WHEREAS**, from time to time, ATRS makes direct investments which are managed by the System; and

**WHEREAS**, these direct investments are reviewed and recommended by investment consultants and approved by the Board, in compliance with A.S.A. §24-7-303(e) and ATRS Policy 4; and

**WHEREAS**, during the management of direct investments, ATRS may receive distributions, dividends, return of capital, and tax credits that arise from direct investments which are recallable distributions; and

**WHEREAS**, the ATRS Board has well-established processes to manage certain ongoing investments and reinvestment of recallable distributions in certain ongoing investments; and

**WHEREAS** The Board, having authorized by resolution the redeployment of recallable distributions, continues to monitor redeployment through regular updates to the Investment Committee and Board, as well as affirmative notice to the Board Chair regarding redeployment of recallable distributions or other management items of direct investments including capital restructuring, extension of debt or equity investments, changes in terms of debt or equity investments, unwinding of direct investments, transfer of direct investments, sale of direct investments or other

management functions deemed necessary to maintain and manage the ongoing investment, and

**WHEREAS**, the ATRS Board has approved numerous Resolutions through the years that authorized the redeployment of recallable distributions in certain investments including Resolutions 2014-41, 2014-42, 2015-31, 2016-29, 2017-23, 2018-33; and

**WHEREAS**, the sufficiency of these protocols and Board approved management processes have recently been called into question; and

**WHEREAS**, the ATRS Executive Director requests clarification and reaffirmation from the Board concerning redeployment of recallable distributions in managing investments not specifically assigned to an investment manager; and

**WHEREAS**, the ATRS Executive Director requests clarification and reaffirmation from the Board that references and requirements related to the term “investments” in Policy 4 apply to new investments and not the management of certain ongoing investments;

**NOW, THEREFORE, BE IT RESOLVED**, the ATRS Board clarifies and reaffirms the established processes used for recallable distributions in ongoing direct investments and the well-established processes for System management of ongoing direct investments including capital restructuring, extension of debt or equity investments, changes in terms of debt or equity investments, unwinding of direct investments, transfer of direct investments, sale of direct investments or other management functions deemed necessary to maintain and manage the ongoing investment in the best interest of the System, and

**FURTHER, BE IT RESOLVED**, the ATRS Board clarifies and reaffirms that references and requirements related to the term “investments” in Board Policy 4 apply to new investments and not ongoing investments.

**Adopted this 1<sup>st</sup> day of February 2021.**

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**Mr. Danny Knight, Chair**  
**Arkansas Teacher Retirement System**

**INTERNAL AUDIT REPORT:**  
**Teacher Deferred Retirement Option Plan (T-Drop)**  
July 1, 2019 – June 30, 2020

**February 1, 2021**

## Introduction

Act 1096 of 1995 established the Arkansas Teacher Retirement System (ATRS) Teacher Deferred Retirement Option Plan (T-Drop). T-Drop is governed by A.C.A. §24-7-1301 et. Seq. The intent of T-Drop is to recruit, retain and reward quality educators in Arkansas schools. T-Drop incentivizes members with 28-30 years of service credit to continue to work in the public schools by allowing the member to build a savings account for when they are ready to leave the workforce.

T-Drop participation begins on the first day of each fiscal year, July 1. A member must have thirty (30) years of service for full participation in the T-Drop plan. A member with twenty-eight (28) years of service can enter the T-Drop program and receive a reduced T-Drop benefit. T-Drop deposits are a percentage of a member's full retirement benefit. A member's retirement benefit is calculated at the time the member enters the T-Drop program, then reduced one percent (1%) for each credited year of ATRS service and one percent (1%) for each reciprocal year of service. A member with thirty (30) years of service would receive seventy percent (70%) of their retirement benefit as their T-Drop deposit. Early participation reduces the T-Drop deposit by an additional six percent (6%) for every year below thirty (30) years of credited service. Board Resolution 2017-35 set the T-Drop fixed annual interest rate at three percent (3%) paid on the mean balance each June 30<sup>th</sup>. ATRS Board of Trustees (BOT) can provide an increased incentive interest rate up to three percent (3%) for a total of six (6%) interest if ATRS rate of return on investments is two percent (2%) greater than ATRS actuarial assumed rate of return. T-Drop participants received a three percent (3%) interest on their mean balance June 30, 2020. T-Drop participants receive a three percent (3%) cost of living increase every July 1<sup>st</sup>.

A member may accrue deposits in their T-Drop account for ten (10) consecutive years. At the completion of a ten-year plan, a T-Drop participant may continue to work and accrue post 10-year interest. Board Resolution 2017-36 set the post 10-year plan interest at a minimum of four percent (4%) and a maximum of six percent (6%). BOT can provide an increased incentive interest rate if ATRS rate of return on investments is two percent (2%) greater than ATRS actuarial assumed rate of return. Post 10-year interest shall not exceed seven and half percent (7.5%). Post 10-year T-Drop participants received a four percent (4%) interest on their balance June 30, 2020.

T-Drop deposits stop if a T-Drop participant separates/terminates employment with an ATRS covered employer. In order to acquire uninterrupted monthly deposits, a T-Drop participant must work five (5) or more days of service credit in first and fourth quarter and fifteen (15) or more days of service credit in second and third quarter. A T-Drop participant that does not meet this requirement in a quarter will not receive their monthly deposits for that quarter.

T-Drop participant may retiree at any time. At retirement, their T-Drop account can be received in a lump sum payment, rolled into another qualified retirement plan, annuitized with their regular retirement benefit, rolled into ATRS Cash Balance Account

(CBA), or combined distribution of annuity and lump sum payment. ATRS guaranteed CBA interest rate starts at two and half (2.5%) and grows to four (4%). BOT can provide an increased incentive interest rate. A CBA participant may withdrawal from their CBA account six (6) times per quarter.

### **Objectives**

Our objectives in conducting this audit were as follows:

1. Determine T-Drop deposits and interest paid were calculated accurately and consistently in accordance with ATRS laws, rules and procedures.
2. Determine benefits paid member retiring out of T-Drop were calculated accurately and consistently in accordance with ATRS laws, rules and procedures.
3. Determine Cash Balance Account deposit, interest and withdrawals are made according to ATRS laws, rules and procedures.
4. Evaluate the adequacy of staff training to calculate T-Drop deposits, interest and benefits. Evaluate the adequacy of staff training to calculate Cash Balance Account deposits, interest and withdrawals.
5. Evaluate internal controls surrounding the calculation of T-Drop, including review procedures.

### **Scope and Methodology**

Our audit covered T-Drop members who entered the T-drop program July 1, 2019, interest paid to active T-Drop members June 30, 2020, and T-Drop members retiring during fiscal year 2019-2020. To accomplish the objective of verifying T-drop deposits, T-Drop interest, and distribution of T-Drop and CBA accounts were calculated according to ATRS laws, policies and procedures, we gathered the following populations and selected samples by random number generator.

In order to verify T-Drop deposits were calculated correctly, Internal Audit (IA) obtained a listing of all T-Drop members who entered the T-Drop program July 1, 2019. There are six hundred forty-one (641) members who entered the T-Drop program July 1, 2019. IA gathered a sample of thirty (30). The selected member's T-Drop deposits was analyzed for accuracy of the deposit amount, the member's eligibility to enter T-Drop, and the member meeting the working day requirement set forth in Board Rule 10 (V) (H) and (I).

In order to verify interest was paid correctly, IA obtained a listing of all T-Drop and Post 10-year T-Drop members active in the T-Drop program on June 30, 2020. There was

three thousand five hundred twenty-five (3,525) T-Drop members and one hundred twelve (112) Post 10-year T-Drop members. IA gathered a sample of thirty (30) from both T-Drop and Post 10-year T-Drop. The selected members interest applied to the T-Drop accounts on June 30, 2020 was analyzed for accuracy.

In order to verify retirement benefits are paid correctly on member's retiring out of the T-Drop program, IA obtained a listing of all T-Drop retirees for fiscal year 2020. There are seven hundred nineteen (719) T-Drop retirees for fiscal year 2020. IA gathered a sample of thirty (30). The selected members benefit and T-Drop distribution were analyzed for accuracy and distributions were made in accordance with United States Internal Revenue (IRS) Code. The selected members files were reviewed for documentation the member met the termination requirement set forth in §24-7-502 and working day requirement set forth in Board Rule 10(V)(H) and (I).

CBA interest is paid monthly. In order to verify CBA deposits, interest and withdrawals are accurate, IA selected February 2020 interest report. There were one thousand three hundred ninety (1,390) CBA members whose CBA account was credited with interest in February 2020. IA gathered a sample of thirty (30). The selected members deposits and interest was analyzed for accuracy, and distributions were made in accordance with IRS code.

In order to evaluate staff training and internal controls over T-Drop, we reviewed procedures and conducted interviews with ATRS staff.

### Findings and Recommendations

**Finding 1:** Board rule 10(V)(H) states, "If a participant earns service credit for one hundred sixty (160) days or greater within a fiscal year and the participant does not terminate employment, retire, or die during the fiscal year, or the ATRS employer does not terminate the employer/employee relationship, then ATRS will allow crediting of twelve (12) monthly T-Drop deposits per fiscal year." Board rule 10(V)(H) does not provide guidance for staff if member does not work the required 160 days. Board rule 10(V)(I) provides days required to receive deposits for part-time employment while in the T-Drop plan. Part-time employment while in the T-Drop plan is not defined.

ATRS has not established or implemented any procedures, testing, programs to monitor the 160 working day requirement. ATRS does monitor the working day requirement for part-time employment for all T-Drop participants. IA reviewed members entering the T-Drop program July 1, 2019 and members who retired out of T-Drop program during FY20. All members met the 160 working day requirement.

**Recommendation:** Board rule 10(V) provide a definition for part-time employment for T-Drop participants. Board rule 10(V) state deposits a T-Drop participant is to receive if the member does not meet the 160 working day requirement.

**Management Response:** *ATRS management will conduct a comprehensive evaluation of potential rule changes upon completion of the 2021 legislative session. The above recommended rule change will be included in the evaluation.*

ATRS report, R7360, T-Drop Deposits and Member History Mismatch currently reviews member history and T-Drop deposits for compliance to Board Rule 10(V)(I). ATRS is receiving from employers the days worked for each T-Drop member. IA recommends R7360 report be amended to review for compliance to Board Rule 10(V)(H). IA recommends procedures be established for reviewing and adjusting member records for non-compliance.

**Finding 2:** Board rule 10(V)(I) requires part time employees to work five (5) days in first and fourth quarter and fifteen (15) days in second and third quarter to receive their quarterly deposits. Six (6) members did not meet this requirement. Two of them are retired. One transferred their T-drop distribution to a CBA, and one annuitized their T-Drop distribution. The deposits for the corresponding quarters that the member did not meet the working day requirement are credited to the member's T-Drop account. Both members are overpaid. The remaining four (4) members are still active T-Drop participants. The deposits for the corresponding quarters that the member did not meet the working day requirement are credited to the member's T-Drop account. Four members files were inadequately documented to determine if they had met the working day requirement.

**Recommendation:** IA recommends deposits for quarters the six members did not meet the working day requirement be removed from the member's T-Drop history. The two retired members benefits adjusted to the correct T-Drop distribution. Information be obtained on the four members to determine if they did meet the working day requirement. Procedures should be established for obtaining and reviewing days member worked for mid-year retirees.

**Management Response:** *ATRS staff is currently reviewing all above mentioned member accounts and making the necessary corrections. Additionally, ATRS staff will review procedures for compliance with ATRS rules and make any necessary changes.*

**Finding 3:** T-Drop member owes contributions on her last year of active service. Member's service credit has been removed until contributions are collected. Member has a choice of forfeiting the service credit or paying the contributions and establishing the service credit. Member's T-drop deposits are based on service credit that includes the year the member owes contributions. Member's file is inadequately documented.

**Recommendation:** IA recommends member T-drop deposits be adjusted to reflect the credited service on member's history. IA recommends the member is informed her T-drop account has been adjusted, contributions are due, she has the right to forfeit the service or pay the contributions, and how her T-Drop account will be affected by paying the contributions. Members file needs to be documented. Administration needs to determine whether member is subject to laws regarding forfeiting service from 2017 or

current forfeiture laws. Forfeiture laws from 2017 allow the member to forfeit their service credit if contributions are due. Current forfeiture laws allow the member to convert the service credit to non-contributory service if contributions are due.

**Management Response:** *ATRS management is reviewing the member's account for appropriate recommended action. ATRS management is also reviewing legislation to determine the appropriate law under which the unpaid contributions apply.*

**Finding 4:** Board Rule 10(IX)(A) states if a member elects to defer only part of their T-Drop distribution into a T-Drop Cash Balance Account (CBA), the remainder of the T-Drop distribution is to be annuitized. ATRS is allowing members to elect to defer part of their T-Drop distribution into a CBA and elect to have the remainder rolled over into another plan or receive the distribution in cash.

**Recommendation:** IA recommends Board rule 10(IX)(A) is modified to allow T-Drop distributions to be paid as rollovers into a qualified plan and member receiving a lump sum payment along with CBA.

**Management Response:** *ATRS management will conduct a comprehensive evaluation of potential rule changes upon completion of the 2021 legislative session. The above recommended rule change will be included in the evaluation.*

**Finding 5:** 26 U. S. Code §402(f) requires written notification to be sent to each individual who is receiving an eligible rollover distribution. IRS provides a model written notification in IRS Notice 2009-68. ATRS has not been sending a written notice to members requesting a T-Drop or CBA distribution.

**Recommendation:** IA recommends ATRS send out the written notification with all distributions that are eligible to be rolled into another retirement plan. Immediately after discussing with IA, the agency implemented a policy of including the written notification with T-drop and CBA applications for distribution. IA also recommends, qualified staff is assigned the responsibility to periodically review and ensure ATRS is compliant to IRS rules and regulations.

**Management Response:** *As noted above, ATRS management concurs and the recommendation has been implemented.*

**Finding 6:** Required Minimum Distributions (RMD), 26 U.S. Code §401(a)(9), CBA Distribution Letter states "If within 60 days of receipt you deposit any portion of this distribution, which was not rolled over in another qualified retirement plan or an IRA, you need not consider this is taxable income at this time." RMDs are not eligible for rollover. RMD must be taxable income in the year distributed.

**Recommendation:** IA recommends a letter is created for RMD that does not include the sentence.

**Management Response:** *ATRS management concurs and a separate letter will be created to correct the oversight.*

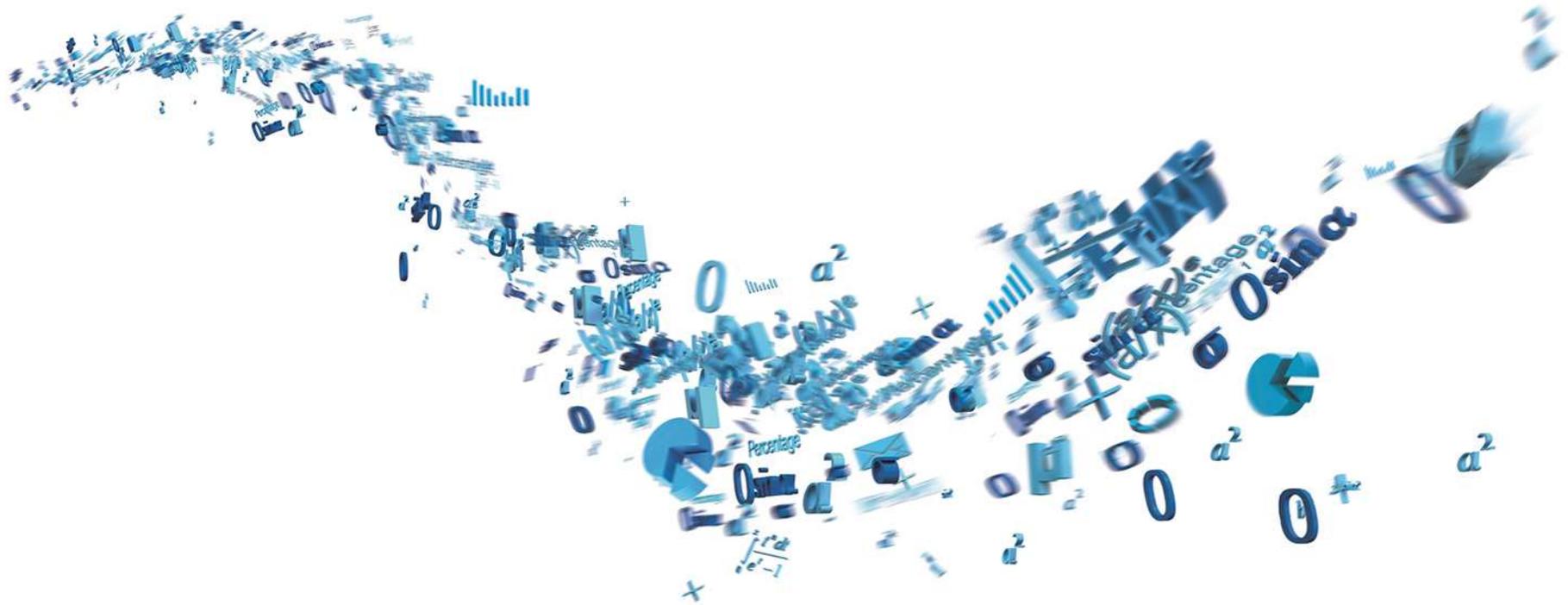
**Finding 7:** ATRS is withholding 20% federal income tax and 5% state income tax from the CBA RMD distributions. IRS §3405(b) requires a withholding of 10% federal income tax on RMD. Arkansas State tax requirement under AR4P is 3% withholding.

**Recommendation:** ATRS withhold 10% federal income tax and 3% state income tax on RMD.

**Management Response:** *ATRS management is aware of the withholding requirements. This change was not initially implemented due to no harm to the member; however, management agrees with the recommendation and will apply the recommended withholding going forward.*

### **Conclusion**

T-Drop deposits, interest, and benefits are being paid accurately and timely. The staff is doing an excellent job in overseeing the T-Drop accounts. We recommend Administration assign a qualified employee with the responsibility for reviewing and ensuring ATRS compliance with United States Internal Revenue Code. ATRS Board Rules need to be reviewed for T-Drop participant's required working days and CBA distributions.



Arkansas Teacher Retirement System | Fourth Quarter 2020

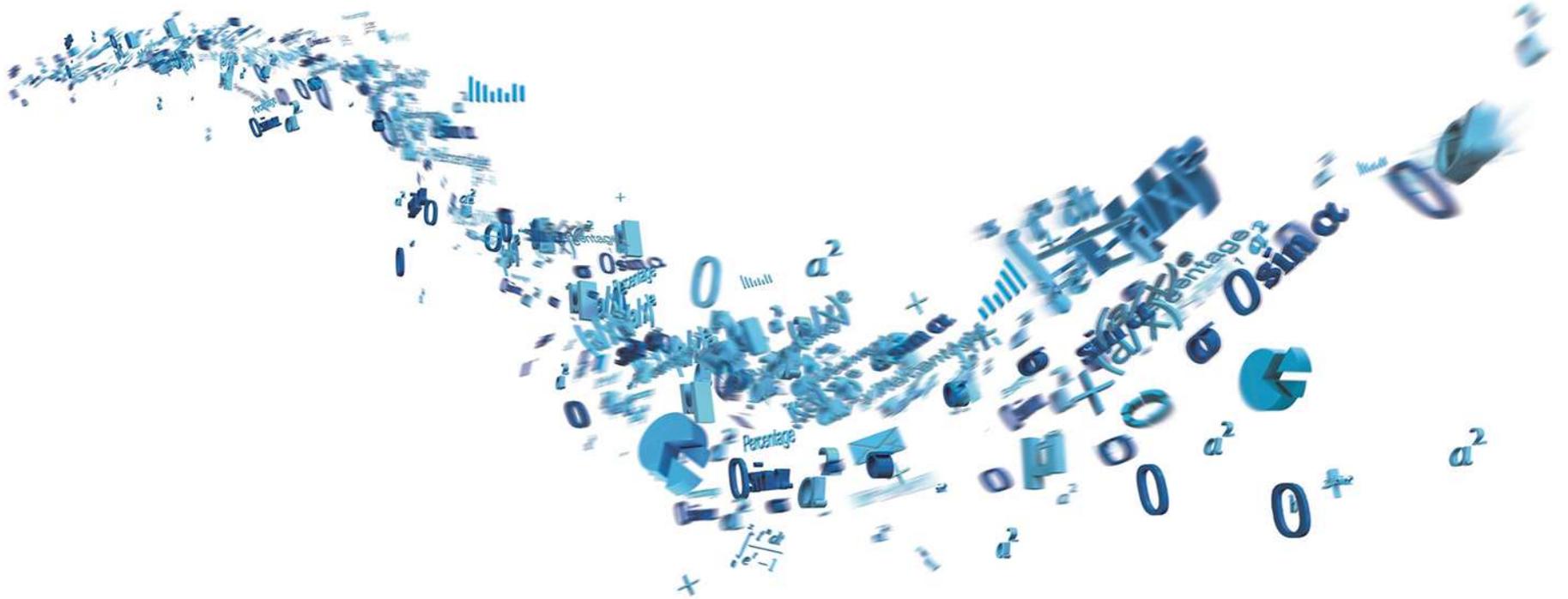
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# Preliminary Quarterly Investment Review

Visit the Investments Thought Leadership Site (<https://insights-north-america.aon.com/investment>); sharing our best thinking.

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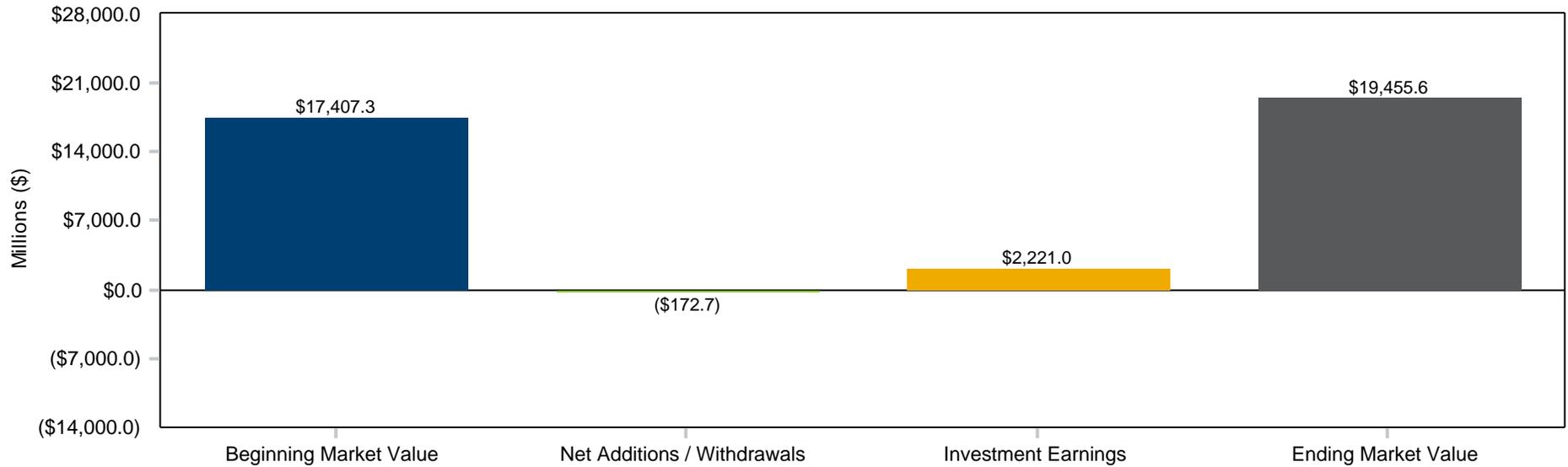


# Total Fund

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**Total Plan Asset Summary**

**Change in Market Value**  
From October 1, 2020 to December 31, 2020

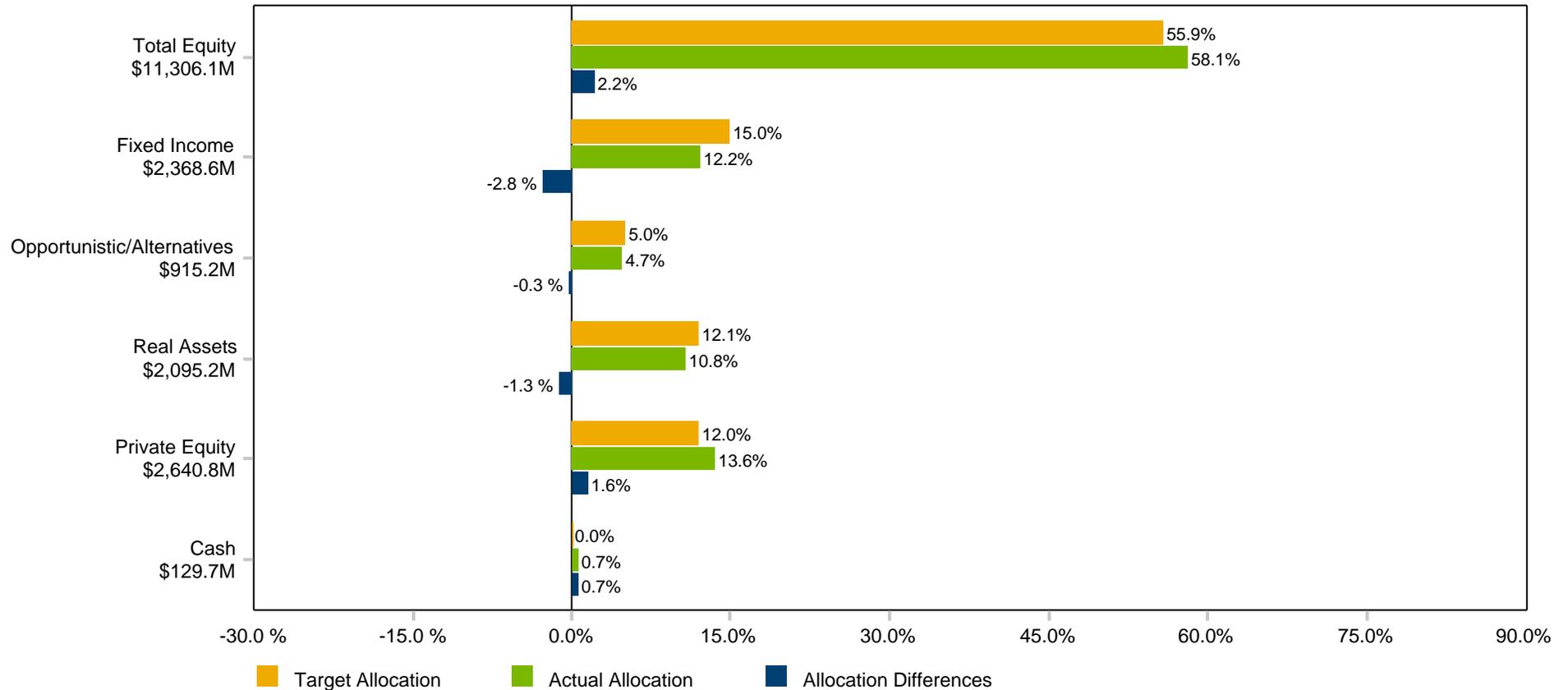


**Summary of Cash Flow**

	1 Quarter	Fiscal YTD	1 Year
Beginning Market Value	17,407,307,250	16,663,156,052	18,317,233,920
+ Additions / Withdrawals	-172,660,493	-430,649,524	-735,456,094
+ Investment Earnings	2,220,958,877	3,223,099,106	1,873,827,808
= Ending Market Value	19,455,605,634	19,455,605,634	19,455,605,634

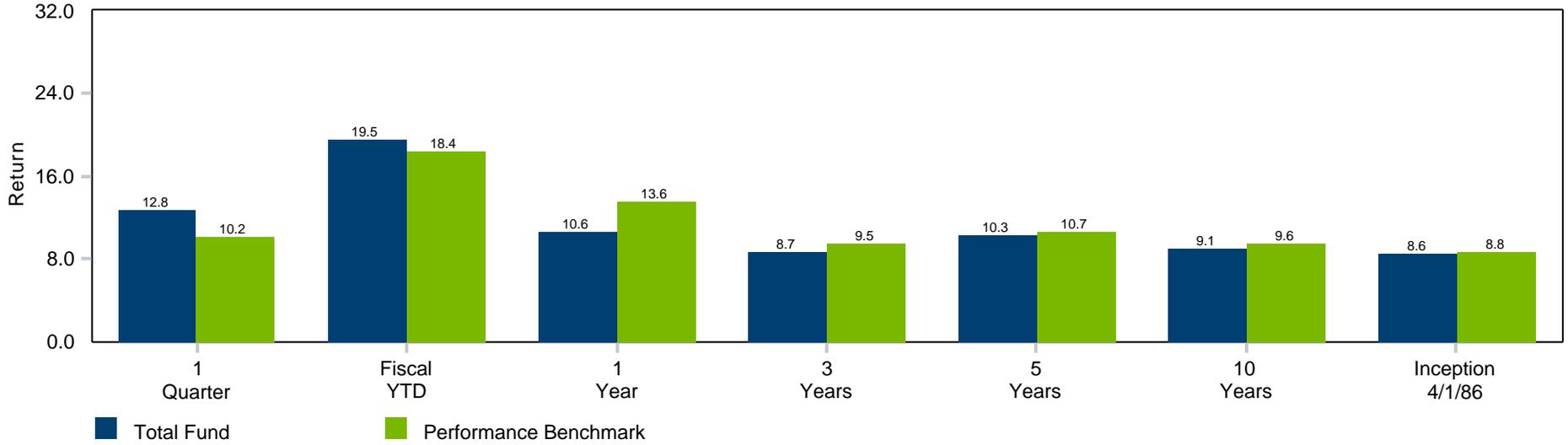
Asset Allocation Compliance

	Market Value (\$M)	Current Allocation (%)	Target Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)
Total Fund	19,455.6	100.00	100.00	N/A	N/A
Total Equity	11,306.1	58.11	55.91	50.00	60.00
Fixed Income	2,368.6	12.17	15.00	13.00	17.00
Opportunistic/Alternatives	915.2	4.70	5.01	0.00	7.00
Real Assets	2,095.2	10.77	12.08	10.00	15.00
Private Equity	2,640.8	13.57	12.00	9.50	14.50
Cash	129.7	0.67	0.00	0.00	5.00

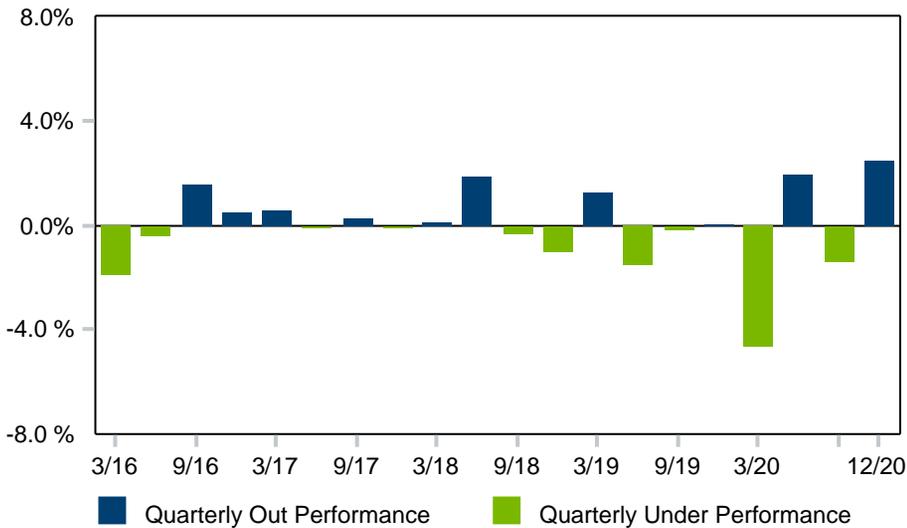


Total Plan Performance Summary

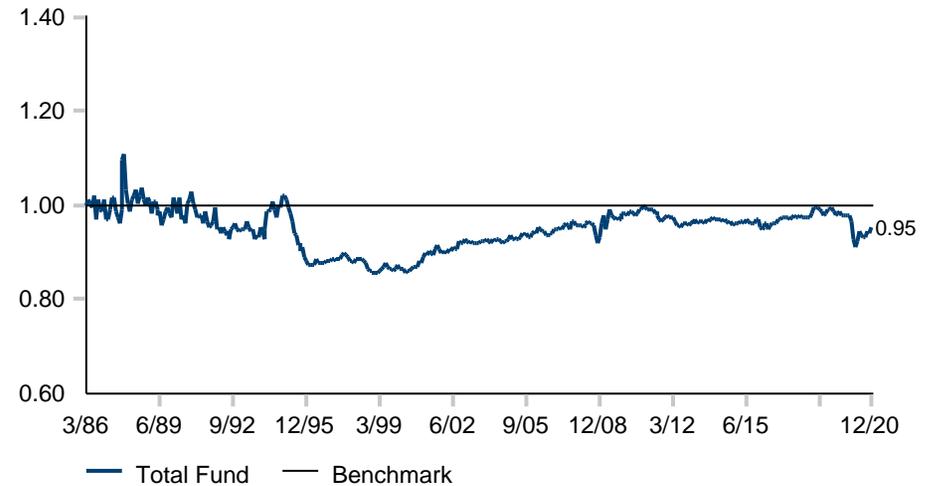
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



As of December 31, 2020

## Asset Allocation & Performance

	Allocation			Performance(%)							
	Market Value (\$)	%	Policy(%)	1 Quarter	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
<b>Total Fund</b>	<b>19,455,605,634</b>	<b>100.0</b>	<b>100.0</b>	<b>12.8</b>	<b>19.5</b>	<b>10.6</b>	<b>8.7</b>	<b>10.3</b>	<b>9.1</b>	<b>8.6</b>	<b>04/01/1986</b>
Performance Benchmark				10.2	18.4	13.6	9.5	10.7	9.6	8.8	
<b>Total Equity</b>	<b>11,306,057,356</b>	<b>58.1</b>	<b>55.9</b>	<b>20.3</b>	<b>31.0</b>	<b>12.4</b>	<b>9.2</b>	<b>12.1</b>	<b>10.0</b>	<b>9.9</b>	<b>07/01/2015</b>
Total Equity Performance Benchmark				15.4	25.1	17.6	11.1	13.2	11.0	11.2	
<b>Fixed Income</b>	<b>2,368,583,725</b>	<b>12.2</b>	<b>15.0</b>	<b>2.0</b>	<b>3.4</b>	<b>7.7</b>	<b>5.3</b>	<b>5.4</b>	<b>4.5</b>	<b>5.5</b>	<b>07/01/1992</b>
Performance Benchmark				1.3	2.3	7.6	5.5	4.9	4.2	5.7	
<b>Opportunistic/Alternatives</b>	<b>915,222,114</b>	<b>4.7</b>	<b>5.0</b>	<b>2.4</b>	<b>4.5</b>	<b>-2.4</b>	<b>-0.1</b>	<b>1.3</b>		<b>3.0</b>	<b>05/01/2011</b>
Custom Alternatives Benchmark				4.1	5.5	0.9	1.7	2.3		1.8	
<b>Real Assets</b>	<b>2,095,224,485</b>	<b>10.8</b>	<b>12.1</b>	<b>1.2</b>	<b>0.0</b>	<b>1.0</b>	<b>4.5</b>	<b>6.1</b>		<b>7.5</b>	<b>07/01/2013</b>
Total Real Assets Benchmark				0.5	-0.4	1.6	4.2	5.3		7.3	
<b>Real Estate</b>	<b>1,323,530,775</b>	<b>6.8</b>		<b>0.3</b>	<b>-2.2</b>	<b>-1.5</b>	<b>3.3</b>	<b>5.6</b>	<b>8.9</b>	<b>8.4</b>	<b>12/01/1998</b>
NFI-ODCE (Net)				0.3	-1.5	0.5	4.2	5.7	9.3	8.6	
<b>Timber</b>	<b>296,475,080</b>	<b>1.5</b>		<b>1.1</b>	<b>-0.4</b>	<b>1.1</b>	<b>4.0</b>	<b>4.1</b>	<b>3.0</b>	<b>6.9</b>	<b>06/01/1998</b>
Timberland Property Benchmark				0.0	0.2	1.3	1.6	2.2	3.3		
<b>Agriculture</b>	<b>210,269,868</b>	<b>1.1</b>		<b>1.0</b>	<b>2.3</b>	<b>2.3</b>	<b>3.0</b>	<b>3.4</b>		<b>5.3</b>	<b>09/01/2011</b>
Agriculture Benchmark				1.0	1.6	3.3	4.1	4.2			
<b>Infrastructure</b>	<b>264,948,762</b>	<b>1.4</b>		<b>5.8</b>	<b>9.7</b>	<b>12.6</b>				<b>12.7</b>	<b>07/01/2018</b>
CPI + 5%				1.3	3.5	6.4				6.4	
<b>Private Equity</b>	<b>2,640,778,939</b>	<b>13.6</b>	<b>12.0</b>	<b>7.7</b>	<b>16.2</b>	<b>14.1</b>	<b>17.2</b>	<b>15.1</b>	<b>14.9</b>	<b>12.5</b>	<b>03/01/1997</b>
Private Equity Policy				9.6	34.5	17.1	13.8	15.9	15.7	10.8	
<b>Cash</b>	<b>129,739,015</b>	<b>0.7</b>	<b>0.0</b>								

\*The Real Assets and Private Equity market values, returns and their benchmark returns are shown on a one-quarter lag. Market values have been adjusted for current quarter cash flows.

\*The inception of the Total Equity asset class was July 1, 2015. Performance prior to July 2015 represents the weighted average of the U.S. Equity and Global Equity asset class monthly returns.

For historical performance of the U.S. Equity and Global Equity asset classes please see page 129 of this report.

\*The inception date above for infrastructure reflects the inception date for the calculation and reporting of time-weighted returns. The Infrastructure program began in July 2014 and the full history of Infrastructure returns are included in Total Real Assets and Total Fund performance.

\*Market values and allocation percentages may not add to the sum total due to rounding.

As of December 31, 2020

## Asset Allocation & Performance

	Allocation		Performance(%)								Inception Date
	Market Value (\$)	%	1 Quarter	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	Since Inception		
<b>Total Fund</b>	<b>19,455,605,634</b>	<b>100.0</b>	<b>12.8</b>	<b>19.5</b>	<b>10.6</b>	<b>8.7</b>	<b>10.3</b>	<b>9.1</b>	<b>8.6</b>	<b>04/01/1986</b>	
Performance Benchmark			10.2	18.4	13.6	9.5	10.7	9.6	8.8		
<b>Total Equity</b>	<b>11,306,057,356</b>	<b>58.1</b>	<b>20.3 (18)</b>	<b>31.0 (17)</b>	<b>12.4 (55)</b>	<b>9.2 (46)</b>	<b>12.1 (41)</b>	<b>10.0 (41)</b>	<b>9.9 (42)</b>	<b>07/01/2015</b>	
Total Equity Performance Benchmark			15.4 (38)	25.1 (39)	17.6 (38)	11.1 (35)	13.2 (31)	11.0 (31)	11.2 (31)		
Jacobs Levy 130/30	771,774,237	4.0	21.5 (42)	24.3 (63)	13.2 (53)	12.0 (43)	15.2 (33)	15.5 (14)	10.7 (28)	01/01/2008	
Russell 3000 Index			14.7 (68)	25.2 (57)	20.9 (36)	14.5 (34)	15.4 (32)	13.8 (29)	9.9 (36)		
Kennedy Capital Management	610,688,734	3.1	31.1 (36)	36.1 (33)	5.4 (43)	2.3 (63)	8.4 (55)	9.5 (37)	12.0 (12)	01/01/1994	
Russell 2000 Value Index			33.4 (22)	36.8 (29)	4.6 (46)	3.7 (46)	9.7 (36)	8.7 (60)	9.5 (89)		
Stephens	598,626,650	3.1	23.3 (83)	27.9 (95)	37.8 (59)	20.8 (52)	18.4 (58)	14.0 (69)	11.6 (64)	08/01/2006	
Russell 2000 Growth Index			29.6 (29)	38.9 (42)	34.6 (63)	16.2 (73)	16.4 (70)	13.5 (77)	11.1 (69)		
Voya Absolute Return	696,474,152	3.6	16.8 (31)	27.3 (27)	16.8 (41)	9.4 (46)	12.2 (39)	12.7 (18)	11.2 (23)	10/01/2008	
Performance Benchmark			14.7 (44)	24.0 (47)	16.3 (43)	10.1 (42)	12.3 (39)	12.4 (20)	11.2 (24)		
Allianz (Nicholas Applegate)	1,003,781,820	5.2	20.9 (44)	39.7 (11)	55.7 (5)	27.0 (5)	20.3 (11)	13.9 (28)	11.8 (11)	12/01/1998	
Performance Benchmark			19.7 (48)	36.3 (17)	46.2 (8)	21.7 (15)	17.7 (21)	12.6 (41)	9.3 (53)		
Pershing Square International	47,646,508	0.2	12.6 (77)	22.9 (71)	48.8 (7)	29.5 (4)	13.6 (44)	10.3 (67)	12.1 (29)	07/01/2008	
Dow Jones U.S. Total Stock Market Index			14.8 (67)	25.2 (58)	20.8 (36)	14.4 (34)	15.4 (32)	13.7 (29)	11.4 (34)		
Pershing Square Holdings	250,652,364	1.3	28.3 (19)	49.9 (3)	85.7 (1)	38.6 (1)	12.5 (51)		9.9 (79)	01/01/2013	
Dow Jones U.S. Total Stock Market Index			14.8 (67)	25.2 (58)	20.8 (36)	14.4 (34)	15.4 (32)		15.1 (30)		
Trian Partners	79,197,627	0.4	8.0	21.2	8.7	9.9	9.6		9.3	11/01/2015	
S&P 500 Index			12.1	22.2	18.4	14.2	15.2		14.4		
Trian Co-Investments	99,099,581	0.5	11.2	26.9	5.0	10.2			7.2	01/01/2017	
S&P 500 Index			12.1	22.2	18.4	14.2			16.0		
SSgA Global Index	1,129,354,633	5.8	15.8 (35)	25.2 (38)	16.7 (41)	10.0 (43)	12.5 (37)	9.5 (50)	7.3 (46)	04/01/2008	
MSCI AC World IMI (Net)			15.7 (35)	25.1 (39)	16.3 (43)	9.7 (44)	12.1 (40)	9.1 (57)	7.0 (54)		

As of December 31, 2020

## Asset Allocation & Performance

	Allocation		Performance(%)								Inception Date
	Market Value (\$)	%	1 Quarter	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	Since Inception		
BlackRock MSCI ACWI IMI Fund	1,141,905,564	5.9	15.8 (35)	25.3 (38)	16.6 (42)	10.0 (43)	12.4 (38)			9.4 (49)	07/01/2011
MSCI AC World IMI (Net)			15.7 (35)	25.1 (39)	16.3 (43)	9.7 (44)	12.1 (40)			9.1 (53)	
Wellington Global Perspectives	654,803,798	3.4	29.8 (6)	38.2 (5)	14.1 (51)	6.2 (66)	11.3 (46)	10.8 (32)	13.8 (24)	07/01/2009	
Performance Benchmark			23.7 (12)	33.5 (11)	16.3 (42)	7.5 (58)	11.4 (44)	8.8 (61)	11.9 (42)		
T. Rowe Price Global Equity	1,524,746,281	7.8	19.7 (20)	37.8 (6)	52.2 (3)	25.5 (2)	23.0 (2)	16.2 (3)	16.4 (5)	09/01/2009	
MSCI AC World Index (Net)			14.7 (44)	24.0 (47)	16.3 (43)	10.1 (42)	12.3 (39)	9.1 (57)	10.0 (55)		
MSCI AC World Index Growth (net)			13.1 (60)	26.7 (32)	33.6 (13)	17.7 (13)	16.9 (13)	12.0 (22)	13.0 (24)		
Lazard	780,821,942	4.0	22.7 (15)	36.4 (7)	28.4 (19)	11.2 (35)	13.7 (29)	9.5 (50)	11.0 (41)	09/01/2009	
MSCI AC World Index (Net)			14.7 (44)	24.0 (47)	16.3 (43)	10.1 (42)	12.3 (39)	9.1 (57)	10.0 (55)		
D.E. Shaw	869,529,967	4.5	17.1 (29)	25.8 (36)	16.1 (44)	9.6 (45)	12.4 (37)	11.3 (29)	11.7 (35)	09/01/2009	
MSCI World Index (Net)			14.0 (48)	23.0 (54)	15.9 (44)	10.5 (36)	12.2 (39)	9.9 (42)	10.5 (48)		
GMO Global All Country Equity	495,604,198	2.5	16.8 (31)	23.4 (53)	9.5 (62)	6.2 (66)	10.3 (54)		5.6 (75)	07/01/2014	
MSCI AC World Index (Net)			14.7 (44)	24.0 (47)	16.3 (43)	10.1 (42)	12.3 (39)		8.6 (42)		
MSCI AC World Index Value (Net)			16.6 (32)	21.3 (63)	-0.3 (87)	2.4 (88)	7.4 (82)		4.0 (87)		
Harris Global Equity	551,272,431	2.8	25.8 (9)	33.0 (13)	12.1 (55)	4.8 (74)	10.7 (51)		7.0 (63)	06/01/2014	
MSCI World Index (Net)			14.0 (48)	23.0 (54)	15.9 (44)	10.5 (36)	12.2 (39)		9.1 (39)		
MSCI World Value (Net)			15.7 (35)	20.2 (69)	-1.2 (90)	2.4 (88)	7.1 (83)		4.4 (86)		
Fixed Income	2,368,583,725	12.2	2.0	3.4	7.7	5.3	5.4	4.5	5.5	07/01/1992	
Performance Benchmark			1.3	2.3	7.6	5.5	4.9	4.2	5.7		
BlackRock	284,939,171	1.5	1.0 (55)	2.4 (53)	8.8 (25)	5.8 (31)	4.9 (42)	4.4 (40)	4.8 (36)	10/01/2003	
Performance Benchmark			1.3 (49)	2.3 (53)	7.6 (38)	5.5 (39)	4.9 (42)	4.2 (46)	4.6 (43)		
Loomis Sayles	494,620,848	2.5	4.8 (16)	8.0 (16)	13.1 (9)	7.2 (13)	8.0 (12)	6.8 (12)	8.6 (7)	09/01/2008	
Performance Benchmark			2.8 (28)	4.9 (29)	8.5 (28)	6.2 (20)	6.3 (23)	5.2 (26)	6.0 (25)		
Putnam	385,900,000	2.0	3.2 (54)	4.4 (65)	0.9 (73)	3.4 (51)	3.7 (54)	2.4 (51)	3.1	08/01/2008	
LIBOR			0.1 (86)	0.1 (89)	1.1 (72)	1.9 (68)	1.5 (76)	0.9 (82)	1.0		
SSgA Aggregate Bond Index	197,151,792	1.0	0.7 (67)	1.3 (71)	7.5 (38)	5.4 (41)	4.5 (50)	3.8 (53)	3.9 (55)	06/01/2010	
Barclays Aggregate Index			0.7 (68)	1.3 (71)	7.5 (38)	5.3 (41)	4.4 (50)	3.8 (53)	3.9 (55)		
Wellington Global Total Return	348,990,539	1.8	0.1 (86)	0.3 (89)	1.4 (72)	3.8 (49)	2.6 (74)		2.0 (68)	05/01/2014	
BofA Merrill Lynch 3 Month US T-Bill			0.0 (87)	0.1 (89)	0.7 (75)	1.6 (70)	1.2 (81)		0.9 (79)		
Reams Core Plus Bond Fund	403,949,767	2.1	1.9 (39)	4.0 (36)	17.2 (5)	8.7 (9)	6.7 (21)		5.2 (19)	05/01/2014	
Barclays Aggregate Index			0.7 (68)	1.3 (71)	7.5 (38)	5.3 (41)	4.4 (50)		3.9 (45)		
BRS Recycling Tax Credit	176,000,000	0.9									
BRS Recycling Tax Credit Phase 2	77,031,608	0.4									

As of December 31, 2020

## Asset Allocation & Performance

	Allocation		Performance(%)							Inception Date
	Market Value (\$)	%	1 Quarter	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	
Opportunistic/Alternatives	915,222,114	4.7	2.4	4.5	-2.4	-0.1	1.3		3.0	05/01/2011
Custom Alternatives Benchmark			4.1	5.5	0.9	1.7	2.3		1.8	
Anchorage	77,280,407	0.4	6.0	5.5	3.8	0.9	2.3		4.7	05/01/2011
Credit Suisse Event Driven			10.4	13.5	4.9	2.9	3.5		2.4	
York	23,826,074	0.1	-8.7	-12.3	-43.4	-22.4	-11.1		-4.2	05/01/2011
Credit Suisse Event Driven			10.4	13.5	4.9	2.9	3.5		2.4	
Capula	90,174,802	0.5	0.7	1.3	6.6	6.5	6.3		6.2	05/01/2011
HFRI Macro (Total) Index			4.8	6.0	5.3	2.5	2.1		0.8	
Graham	66,707,226	0.3	6.8	16.9	6.0	4.3	3.0		2.9	05/01/2011
HFRI Macro (Total) Index			4.8	6.0	5.3	2.5	2.1		0.8	
Circumference Group Core Value	33,091,972	0.2	9.1	11.2	15.2	9.9	11.7		9.5	08/01/2015
Russell 2000 Index			31.4	37.9	20.0	10.2	13.3		10.5	
Aeolus Keystone Fund	237,932,718	1.2	-1.0	3.4	3.2	0.6	-0.6		-0.6	12/01/2015
Citigroup 3 Month T-Bill			0.0	0.1	0.6	1.6	1.2		1.1	
Eurekahedge ILS Advisers Index			0.0	2.5	3.4	0.1	-0.1		-0.1	
Nephila Rubik Holdings	42,359,815	0.2	-4.8	-6.5	-4.6	-3.6			-3.6	06/01/2016
Citigroup 3 Month T-Bill			0.0	0.1	0.6	1.6		1.2		
Eurekahedge ILS Advisers Index			0.0	2.5	3.4	0.1	-0.1		-0.4	
Parametric Global Defensive Equity Fund	179,568,108	0.9	7.3	13.1	2.8	3.9			5.0	05/01/2017
Performance Benchmark			7.3	11.7	9.0	6.2			6.7	
MSCI AC World Index			14.8	24.3	16.8	10.6			12.7	
Man Alternative Risk Premia	88,323,580	0.5	0.2	-3.0	-10.4				-4.4	06/01/2018
SG Multi Alternative Risk Premia Index			-2.0	-2.6	-14.9				-5.7	
CFM ISD Fund 1.5x	75,957,413	0.4	2.7	1.5	-23.0				-9.9	07/01/2018
SG Multi Alternative Risk Premia Index			-2.0	-2.6	-14.9				-5.7	

As of December 31, 2020

## Asset Allocation & Performance

	Allocation		Performance(%)							Inception Date
	Market Value (\$)	%	1 Quarter	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	
Real Assets	2,095,224,485	10.8	1.2	0.0	1.0	4.5	6.1		7.5	07/01/2013
Total Real Assets Benchmark			0.5	-0.4	1.6	4.2	5.3		7.3	
Real Estate	1,323,530,775	6.8	0.3	-2.2	-1.5	3.3	5.6	8.9	8.4	12/01/1998
NFI-ODCE (Net)			0.3	-1.5	0.5	4.2	5.7	9.3	8.6	
Timber	296,475,080	1.5	1.1	-0.4	1.1	4.0	4.1	3.0	6.9	06/01/1998
Timberland Property Benchmark			0.0	0.2	1.3	1.6	2.2	3.3		
BTG Timber Separate Account	107,340,078	0.6								
BTG U.S. Timberland Fund, L.P.	189,135,002	1.0								
Agriculture	210,269,868	1.1	1.0	2.3	2.3	3.0	3.4		5.3	09/01/2011
Agriculture Benchmark			1.0	1.6	3.3	4.1	4.2			
HFMS Farmland	154,926,659	0.8	1.0	2.5	1.9	2.8	3.0		5.3	09/01/2011
HFMS custom NCREIF Farmland Index			1.0	1.9	4.6	4.1	3.9			
UBS Agrivest Core Farmland Fund	55,343,209	0.3	1.1	1.9	3.4	3.7	4.3		4.5	07/01/2015
UBS Agrivest custom NCREIF Farmland Index			1.0	1.7	4.3	5.3	5.6		5.7	
Infrastructure	264,948,762	1.4	5.8	9.7	12.6				12.7	07/01/2018
CPI + 5%			1.3	3.5	6.4				6.4	
Private Equity	2,640,778,939	13.6	7.7	16.2	14.1	17.2	15.1	14.9	12.6	04/01/1997
Private Equity Policy			9.6	34.5	17.1	13.8	15.9	15.7	10.9	
Cash	129,739,015	0.7								

\*The Real Assets and Private Equity market values, returns and their benchmark returns are shown on a one-quarter lag. Market values have been adjusted for current quarter cash flows.

\*The inception of the Total Equity asset class was July 1, 2015. Performance prior to July 2015 represents the weighted average of the U.S. Equity and Global Equity asset class monthly returns. For historical performance of the U.S. Equity and Global Equity asset classes please see page 129 of this report.

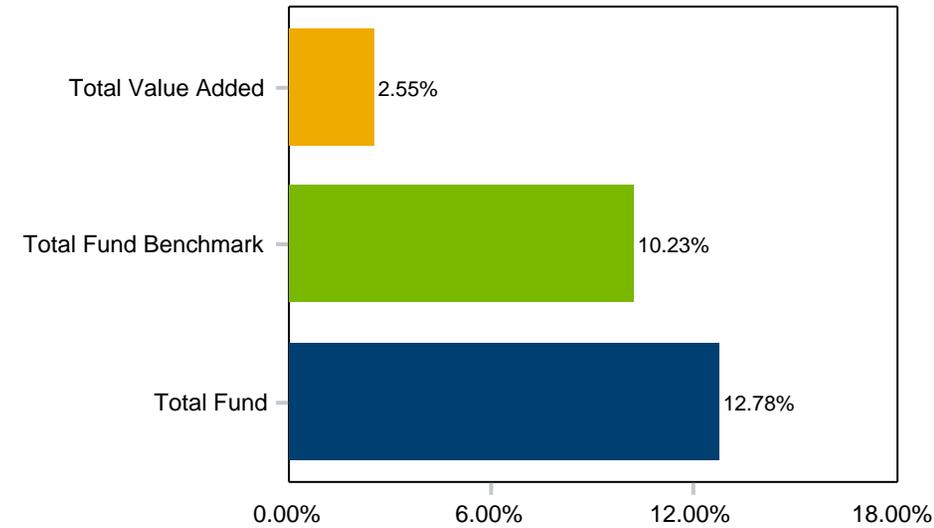
\*The inception date above for infrastructure reflects the inception date for the calculation and reporting of time-weighted returns. The Infrastructure program began in July 2014 and the full history of Infrastructure returns are included in Total Real Assets and Total Fund performance.

\*The BRS Recycling Tax Credit represents an annual income stream of \$16 million dollars over the next 14 years, which ATRS purchased for approximately \$162 million. This represents an approximate 9.9% yield for the 2017 fiscal year. The value shown above represents the year-end market value in accordance with GASB Statement 72, representing the 14 years of annual income, and has been incorporated into Total Fixed Income and Total Fund performance.

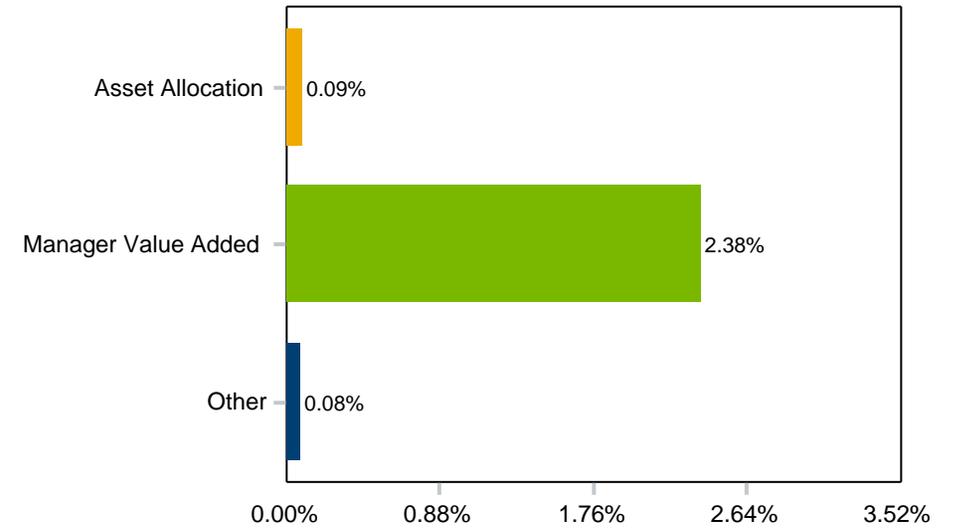
\*ATRS made a total commitment of \$100 million to the Triun Co-Investments Fund. As of 12/31/2020, there was an unfunded commitment value equal to \$18,287,776.

Total Fund Attribution

Total Fund Performance

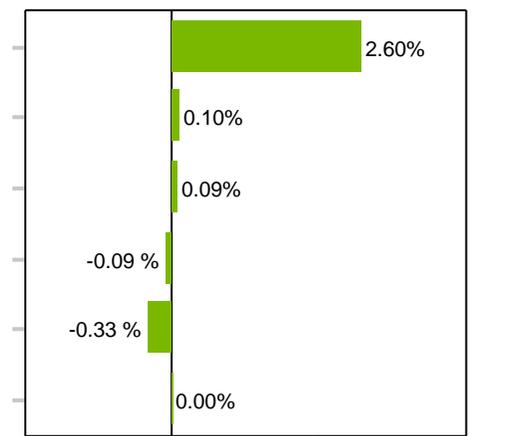
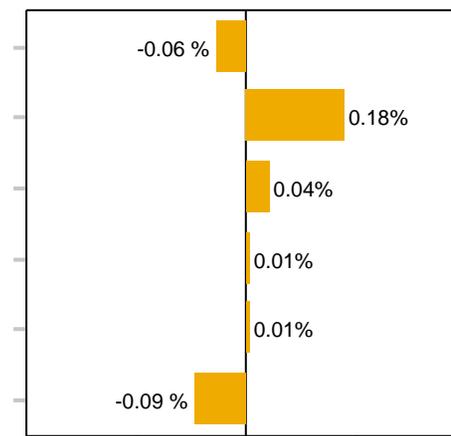
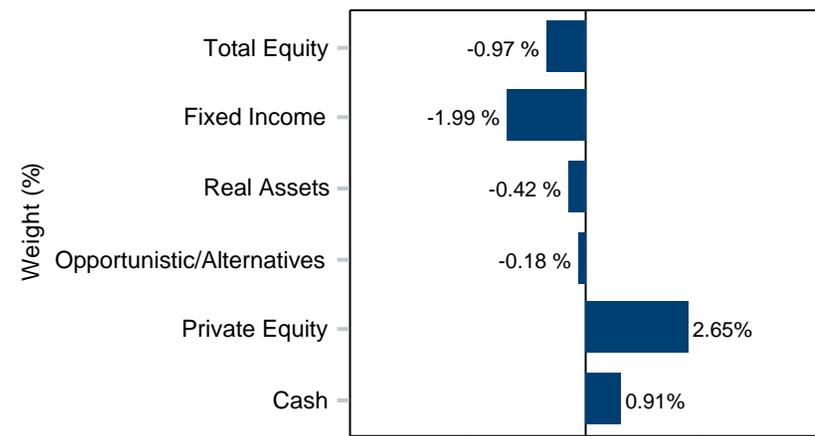


Total Value Added: 2.55%



Total Asset Allocation: 0.09%

Total Manager Value Added: 2.38%



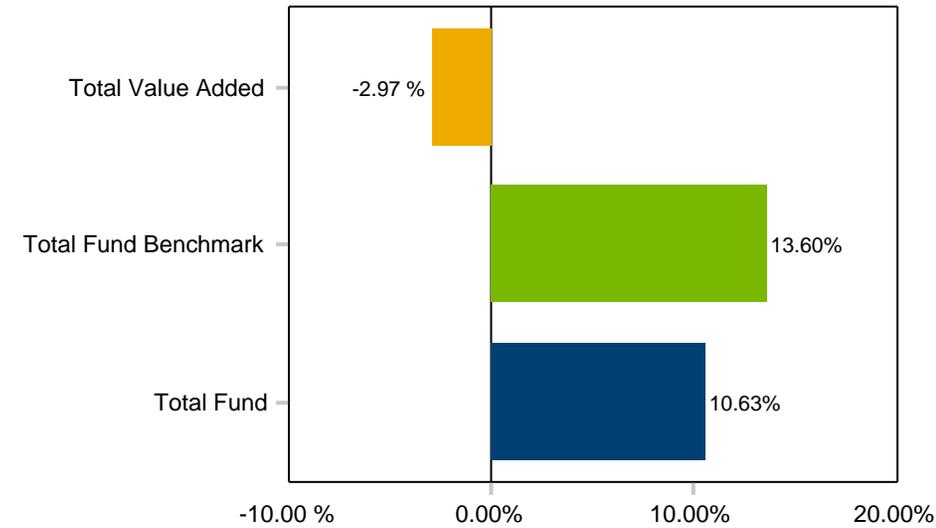
Average Active Weight

Asset Allocation Value Added

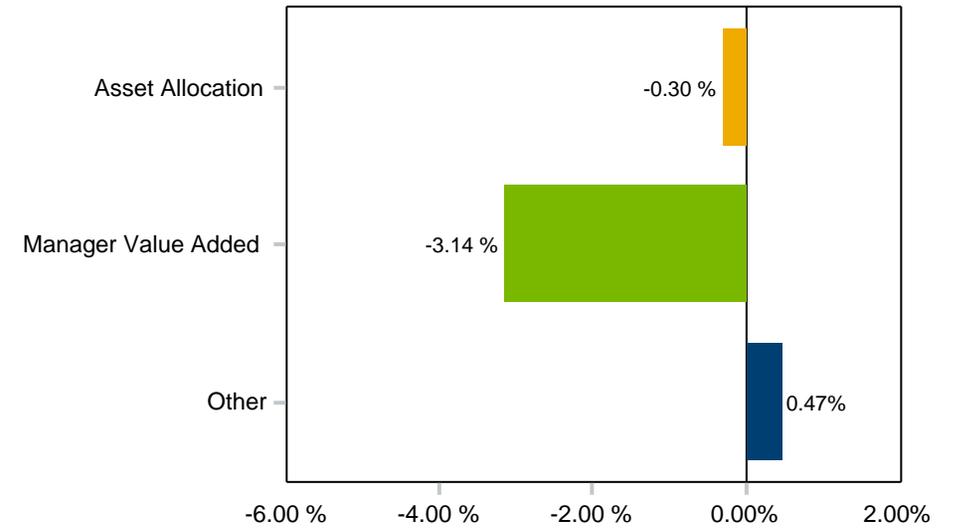
Manager Value Added

Total Fund Attribution

Total Fund Performance

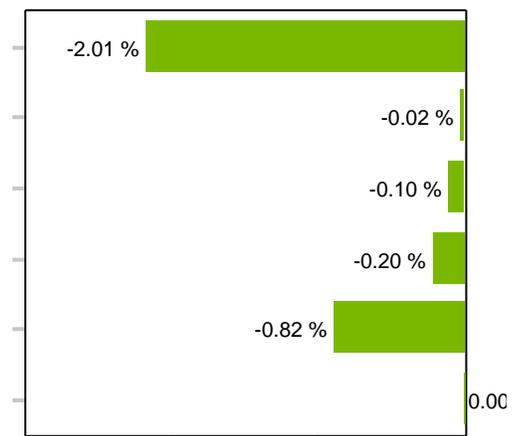
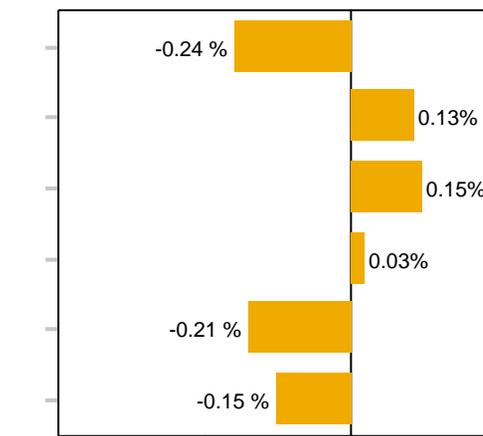
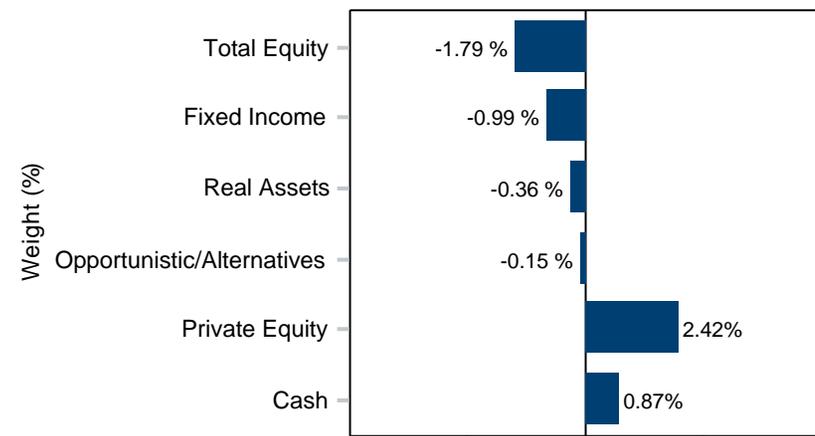


Total Value Added: -2.97 %



Total Asset Allocation: -0.30 %

Total Manager Value Added: -3.14 %



Average Active Weight

Asset Allocation Value Added

Manager Value Added

As of December 31, 2020

## Calendar Year Performance

	Performance(%)									
	Fiscal Year 2020	Fiscal Year 2019	Fiscal Year 2018	Fiscal Year 2017	Fiscal Year 2016	Fiscal Year 2015	Fiscal Year 2014	Fiscal Year 2013	Fiscal Year 2012	Fiscal Year 2011
<b>Total Fund</b>	-1.4 (93)	5.3 (60)	11.7 (1)	16.1 (1)	-0.5 (79)	5.2	19.0	14.3	-1.0	22.4
Performance Benchmark	2.3 (40)	7.0 (8)	9.2 (36)	13.2 (40)	1.8 (6)	5.2	18.3	13.5	2.1	21.9
<b>Total Equity</b>	-6.4 (77)	4.1 (58)	13.4 (31)	22.1 (28)	-4.8 (57)	4.1 (32)	25.5 (34)	20.3 (32)	-6.3 (58)	31.5 (47)
Total Equity Performance Benchmark	2.7 (45)	5.9 (48)	12.2 (37)	19.0 (47)	-1.5 (38)	3.6 (35)	23.9 (48)	18.9 (43)	-1.8 (28)	31.2 (49)
Jacobs Levy 130/30	0.2 (46)	5.5 (50)	19.9 (23)	24.6 (17)	8.3 (4)	14.2 (7)	24.3 (53)	22.4 (49)	1.4 (41)	43.2 (16)
Russell 3000 Index	6.5 (31)	9.0 (32)	14.8 (45)	18.5 (56)	2.1 (22)	7.3 (43)	25.2 (44)	21.5 (56)	3.8 (25)	32.4 (57)
Kennedy Capital Management	-16.2 (52)	-7.8 (67)	12.2 (51)	24.2 (35)	-4.9 (62)	2.7 (52)	29.4 (9)	34.4 (6)	-4.2 (69)	33.9 (55)
Russell 2000 Value Index	-17.5 (61)	-6.2 (58)	13.1 (42)	24.9 (29)	-2.6 (39)	0.8 (66)	22.5 (72)	24.8 (63)	-1.4 (36)	31.4 (72)
Stephens	7.8 (49)	8.4 (32)	29.5 (27)	18.3 (82)	-7.8 (44)	5.1 (88)	18.4 (78)	18.7 (88)	3.0 (11)	46.7 (35)
Russell 2000 Growth Index	3.5 (58)	-0.5 (78)	21.9 (64)	24.4 (46)	-10.8 (61)	12.3 (38)	24.7 (37)	23.7 (58)	-2.7 (41)	43.5 (56)
Voya Absolute Return	0.1 (56)	4.0 (58)	9.9 (55)	20.3 (38)	1.9 (21)	7.8 (10)	26.9 (25)	19.7 (38)	6.0 (8)	30.5 (55)
Performance Benchmark	2.1 (47)	5.7 (49)	10.7 (50)	18.8 (49)	1.1 (24)	7.4 (10)	24.6 (41)	20.6 (30)	5.4 (8)	30.7 (54)
Allianz (Nicholas Applegate)	20.1 (11)	12.5 (15)	16.4 (36)	15.9 (74)	-7.1 (77)	4.4 (67)	23.1 (64)	19.4 (70)	-2.4 (65)	29.7 (74)
Performance Benchmark	15.3 (15)	7.8 (38)	12.0 (63)	16.8 (68)	-4.7 (64)	3.5 (73)	24.4 (52)	18.6 (76)	-3.2 (71)	22.5 (96)
Pershing Square International	28.0 (4)	30.7 (1)	2.8 (97)	8.2 (95)	-33.2 (100)	12.9 (11)	29.1 (16)	17.3 (80)	0.8 (45)	26.8 (87)
Dow Jones U.S. Total Stock Market Index	6.4 (31)	8.9 (32)	14.8 (45)	18.5 (56)	2.0 (22)	7.2 (45)	25.0 (46)	21.5 (56)	4.0 (24)	32.4 (56)
Pershing Square Holdings	36.5 (2)	21.7 (2)	-2.7 (100)	8.3 (95)	-49.1 (100)	15.2 (5)	30.4 (11)			
Dow Jones U.S. Total Stock Market Index	6.4 (31)	8.9 (32)	14.8 (45)	18.5 (56)	2.0 (22)	7.2 (45)	25.0 (46)			
Triam Partners	-2.3	13.1	2.8	9.5						
S&P 500 Index	7.5	10.4	14.4	17.9						
SSgA Global Index	1.6 (49)	4.8 (54)	11.4 (44)	19.4 (43)	-3.4 (48)	1.2 (55)	23.8 (49)	17.5 (52)	-6.6 (59)	31.4 (47)
MSCI AC World IMI (Net)	1.2 (51)	4.6 (56)	11.1 (46)	19.0 (47)	-3.9 (50)	0.8 (59)	23.4 (52)	17.1 (56)	-6.9 (61)	31.0 (51)

As of December 31, 2020

## Calendar Year Performance

	Performance(%)									
	Fiscal Year 2020	Fiscal Year 2019	Fiscal Year 2018	Fiscal Year 2017	Fiscal Year 2016	Fiscal Year 2015	Fiscal Year 2014	Fiscal Year 2013	Fiscal Year 2012	Fiscal Year 2011
BlackRock MSCI ACWI IMI Fund	1.5 (49)	4.5 (56)	11.4 (44)	19.1 (47)	-3.4 (48)	1.2 (55)	23.9 (49)	17.7 (51)	-6.6 (59)	
MSCI AC World IMI (Net)	1.2 (51)	4.6 (56)	11.1 (46)	19.0 (47)	-3.9 (50)	0.8 (59)	23.4 (52)	17.1 (56)	-6.9 (61)	
Wellington Global Perspectives	-11.7 (90)	-3.8 (89)	15.7 (20)	24.8 (16)	-4.2 (52)	-1.4 (72)	33.1 (4)	30.7 (4)	-9.1 (74)	45.8 (4)
Performance Benchmark	-5.5 (75)	-3.0 (87)	13.8 (28)	20.5 (37)	-4.7 (56)	1.5 (53)	26.0 (31)	20.6 (30)	-9.9 (78)	35.8 (21)
T. Rowe Price Global Equity	22.8 (6)	8.0 (35)	21.3 (8)	28.8 (7)	-0.6 (33)	7.5 (10)	32.0 (6)	18.2 (48)	-7.7 (63)	28.2 (71)
MSCI AC World Index (Net)	2.1 (47)	5.7 (49)	10.7 (50)	18.8 (49)	-3.7 (49)	0.7 (59)	22.9 (54)	16.6 (61)	-6.5 (59)	30.1 (57)
MSCI AC World Index Growth (net)	16.6 (11)	7.2 (41)	16.1 (19)	18.6 (50)	-2.7 (44)	4.9 (25)	23.1 (53)	15.4 (68)	-5.3 (50)	32.0 (43)
Lazard	1.6 (49)	2.7 (66)	9.8 (55)	26.2 (13)	-10.7 (89)	7.3 (11)	23.3 (52)	15.8 (66)	-11.4 (84)	29.6 (60)
MSCI AC World Index (Net)	2.1 (47)	5.7 (49)	10.7 (50)	18.8 (49)	-3.7 (49)	0.7 (59)	22.9 (54)	16.6 (61)	-6.5 (59)	30.1 (57)
D.E. Shaw	0.1 (55)	2.6 (67)	15.8 (20)	19.2 (46)	0.0 (28)	3.9 (33)	25.6 (33)	19.3 (41)	-1.9 (29)	31.1 (50)
MSCI World Index (Net)	2.8 (45)	6.3 (46)	11.1 (47)	18.2 (52)	-2.8 (45)	1.4 (53)	24.0 (47)	18.6 (45)	-5.0 (48)	30.5 (55)
GMO Global All Country Equity	-2.3	3.5	6.8	20.0	-6.5	-4.5				
MSCI AC World Index (Net)	2.1	5.7	10.7	18.8	-3.7	0.7				
MSCI AC World Index Value (Net)	-11.8	4.3	5.4	19.0	-4.8	-3.4				
Harris Global Equity	-6.6	-2.0	5.0	38.9	-12.8	0.7				
MSCI World Index (Net)	2.8	6.3	11.1	18.2	-2.8	1.4				
MSCI World Value (Net)	-11.3	4.2	5.6	18.7	-3.7	-2.9				
Fixed Income	6.4	6.4	1.3	5.2	3.5	1.0	6.1	3.8	5.2	7.3
Performance Benchmark	7.9	8.1	-0.3	0.9	5.8	1.6	5.2	0.2	7.4	4.8
BlackRock	9.0 (17)	8.0 (25)	-0.3 (77)	0.3 (68)	6.0 (23)	2.4 (15)	5.2 (50)	0.3 (63)	8.0 (28)	6.3 (37)
Performance Benchmark	7.9 (27)	8.1 (23)	-0.3 (74)	0.9 (54)	5.8 (24)	1.6 (36)	5.2 (50)	0.2 (67)	7.4 (38)	4.8 (52)
Loomis Sayles	7.6 (30)	7.4 (36)	1.8 (25)	8.1 (16)	1.9 (69)	1.1 (54)	12.0 (9)	10.7 (7)	4.4 (70)	15.7 (10)
Performance Benchmark	6.6 (38)	8.2 (20)	0.5 (48)	4.0 (26)	5.0 (35)	1.0 (60)	6.8 (34)	2.8 (30)	8.4 (23)	7.8 (28)
Putnam	0.1 (55)	3.7 (32)	4.1 (36)	7.9 (29)	-3.6 (70)	-0.7 (53)	3.7 (71)	5.5 (29)	-1.8 (62)	4.6 (55)
LIBOR	2.1 (35)	2.6 (41)	1.5 (59)	0.8 (83)	0.4 (42)	0.2 (42)	0.3 (85)	0.4 (83)	0.4 (49)	0.4 (88)
SSgA Aggregate Bond Index	8.7 (20)	7.9 (26)	-0.4 (78)	-0.3 (82)	6.0 (23)	1.9 (27)	4.3 (61)	-0.6 (84)	7.4 (36)	3.9 (65)
Barclays Aggregate Index	8.7 (19)	7.9 (26)	-0.4 (78)	-0.3 (83)	6.0 (23)	1.9 (28)	4.4 (60)	-0.7 (86)	7.5 (36)	3.9 (65)
Wellington Global Total Return	2.1 (36)	5.3 (14)	5.1 (32)	-0.7 (85)	1.3 (32)	0.5 (38)				
BofA Merrill Lynch 3 Month US T-Bill	1.6 (41)	2.3 (45)	1.4 (60)	0.5 (83)	0.2 (42)	0.0 (45)				
Reams Core Plus Bond Fund	15.3	8.6	0.0	0.0	6.1	1.5				
Barclays Aggregate Index	8.7	7.9	-0.4	-0.3	6.0	1.9				
BRS Recycling Tax Credit										
BRS Recycling Tax Credit Phase 2										

As of December 31, 2020

## Calendar Year Performance

	Performance(%)									
	Fiscal Year 2020	Fiscal Year 2019	Fiscal Year 2018	Fiscal Year 2017	Fiscal Year 2016	Fiscal Year 2015	Fiscal Year 2014	Fiscal Year 2013	Fiscal Year 2012	Fiscal Year 2011
Opportunistic/Alternatives	-5.3	-0.2	0.6	6.8	-1.7	5.8	10.2	12.9	-1.0	
Custom Alternatives Benchmark	-2.5	2.1	3.4	2.8	-3.7	1.7	6.3	7.1	-3.9	
Anchorage	-5.4	1.4	6.2	5.9	-3.9	3.8	18.9	19.4	-1.0	
Credit Suisse Event Driven	-6.9	1.9	3.8	9.3	-10.4	-2.0	14.1	14.5	-7.2	
York	-45.2	-5.9	12.2	14.3	-12.9	-7.2	22.4	19.4	-0.8	
Credit Suisse Event Driven	-6.9	1.9	3.8	9.3	-10.4	-2.0	14.1	14.5	-7.2	
Capula	9.8	6.3	3.8	7.8	6.1	8.9	7.9	4.0	3.4	
HFRI Macro (Total) Index	0.8	2.4	1.1	-2.4	1.8	4.2	1.5	-0.1	-2.8	
Graham	-5.6	2.1	6.5	-3.2	-1.0	23.9	2.7	5.9	-8.3	
HFRI Macro (Total) Index	0.8	2.4	1.1	-2.4	1.8	4.2	1.5	-0.1	-2.8	
Circumference Group Core Value	5.0	2.7	15.9	14.0						
Russell 2000 Index	-6.6	-3.3	17.6	24.6						
Aeolus Keystone Fund	5.1	-5.8	-17.9	11.2						
Citigroup 3 Month T-Bill	1.6	2.3	1.3	0.5						
Eurekahedge ILS Advisers Index	2.9	-5.5	-6.6	5.0						
Nephila Rubik Holdings	3.1	-6.9	-7.7	2.2						
Citigroup 3 Month T-Bill	1.6	2.3	1.3	0.5						
Eurekahedge ILS Advisers Index	2.9	-5.5	-6.6	5.0						
Parametric Global Defensive Equity Fund	-4.2	3.9	5.8							
Performance Benchmark	2.4	4.4	6.0							
MSCI AC World Index	2.6	6.3	11.3							
Man Alternative Risk Premia	-7.9	1.8								
SG Multi Alternative Risk Premia Index	-11.6	0.4								
CFM ISD Fund 1.5x	-26.1	2.8								
SG Multi Alternative Risk Premia Index	-11.6	0.4								

As of December 31, 2020

## Calendar Year Performance

	Performance(%)									
	Fiscal Year 2020	Fiscal Year 2019	Fiscal Year 2018	Fiscal Year 2017	Fiscal Year 2016	Fiscal Year 2015	Fiscal Year 2014	Fiscal Year 2013	Fiscal Year 2012	Fiscal Year 2011
<b>Real Assets</b>	3.9	5.6	9.4	7.5	9.5	11.7	9.0			
Total Real Assets Benchmark	4.1	5.7	6.2	6.6	10.0	11.5	11.4			
<b>Real Estate</b>	2.0	5.7	11.1	6.9	12.0	13.4	12.1	7.9	9.8	17.7
NFI-ODCE (Net)	3.9	6.5	7.1	7.4	12.6	12.4	12.7	10.5	13.4	16.0
<b>Timber</b>	12.2	-0.3	1.2	8.0	0.4	9.4	-1.1	6.8	-5.3	4.8
Timberland Property Benchmark	3.1	0.1	2.6	3.7	2.5	10.5	7.7	6.9	-2.9	-0.4
BTG Timber Separate Account										
BTG U.S. Timberland Fund, L.P.										
<b>Agriculture</b>	1.8	3.5	3.3	4.3	9.8	2.5	11.0	11.5		
Agriculture Benchmark	3.3	5.4	3.5	4.5	5.6	6.5	12.8	20.9		
<b>HFMS Farmland</b>	1.4	3.4	2.9	3.9	10.7	2.5	11.0	11.5		
HFMS custom NCREIF Farmland Index	4.6	4.9	2.0	4.0	4.8	6.5	12.8	20.9		
UBS Agrivest Core Farmland Fund	3.1	4.0	4.5	5.0	6.2					
UBS Agrivest custom NCREIF Farmland Index	4.7	6.2	5.0	5.5	8.4					
<b>Infrastructure</b>	7.2	14.6								
CPI + 5%	5.7	6.7								
<b>Private Equity</b>	4.9	12.8	22.3	16.7	7.7	11.9	20.6	12.5	12.5	16.0
Private Equity Policy	-7.5	10.8	16.1	20.4	1.6	14.5	25.0	16.8	9.4	20.1
<b>Cash</b>	3.8	6.5	1.2	5.0	3.2					

\*The Real Assets and Private Equity returns and their benchmark returns are shown on a one-quarter lag.

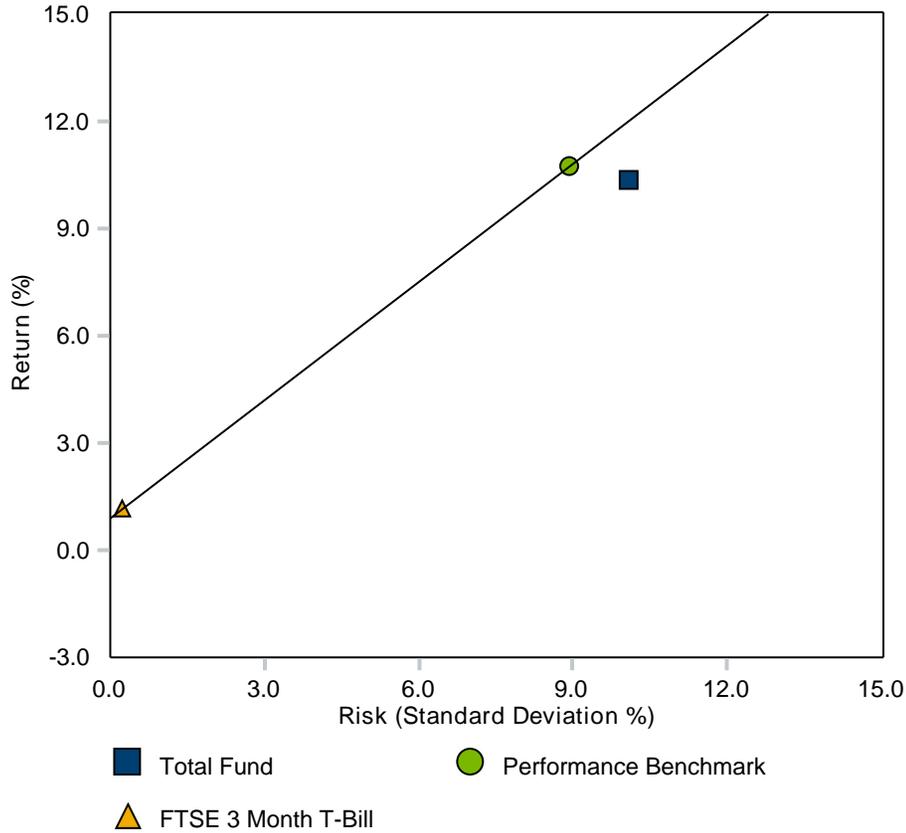
\*The inception of the Total Equity asset class was July 1, 2015. Performance prior to July 2015 represents the weighted average of the U.S. Equity and Global Equity asset class monthly returns. For historical performance of the U.S. Equity and Global Equity asset classes please see page 129 of this report.

\*The inception date above for infrastructure reflects the inception date for the calculation and reporting of time-weighted returns. The Infrastructure program began in July 2014 and the full history of Infrastructure returns are included in Total Real Assets and Total Fund performance.

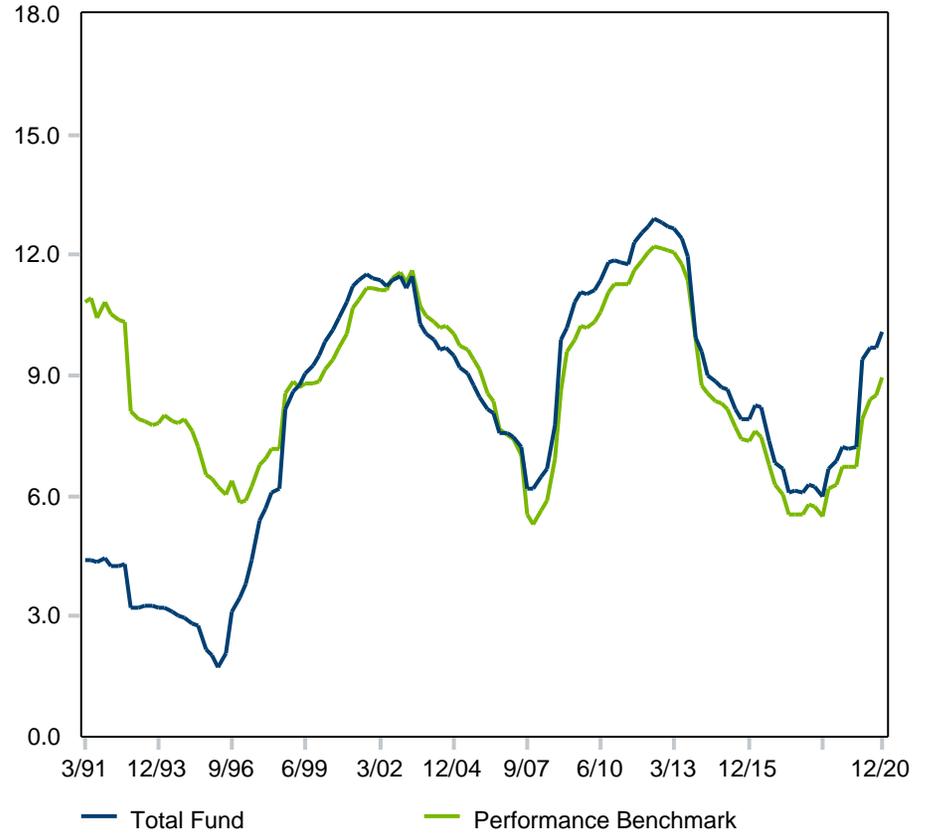
\*The BRS Recycling Tax Credit represents an annual income stream of \$16 million dollars over the next 14 years, which ATRS purchased for approximately \$162 million. This represents an approximate 9.9% yield for the 2017 fiscal year. The value shown above represents the year-end market value in accordance with GASB Statement 72, representing the 14 years of annual income, and has been incorporated into Total Fixed Income and Total Fund performance.

Total Fund Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation

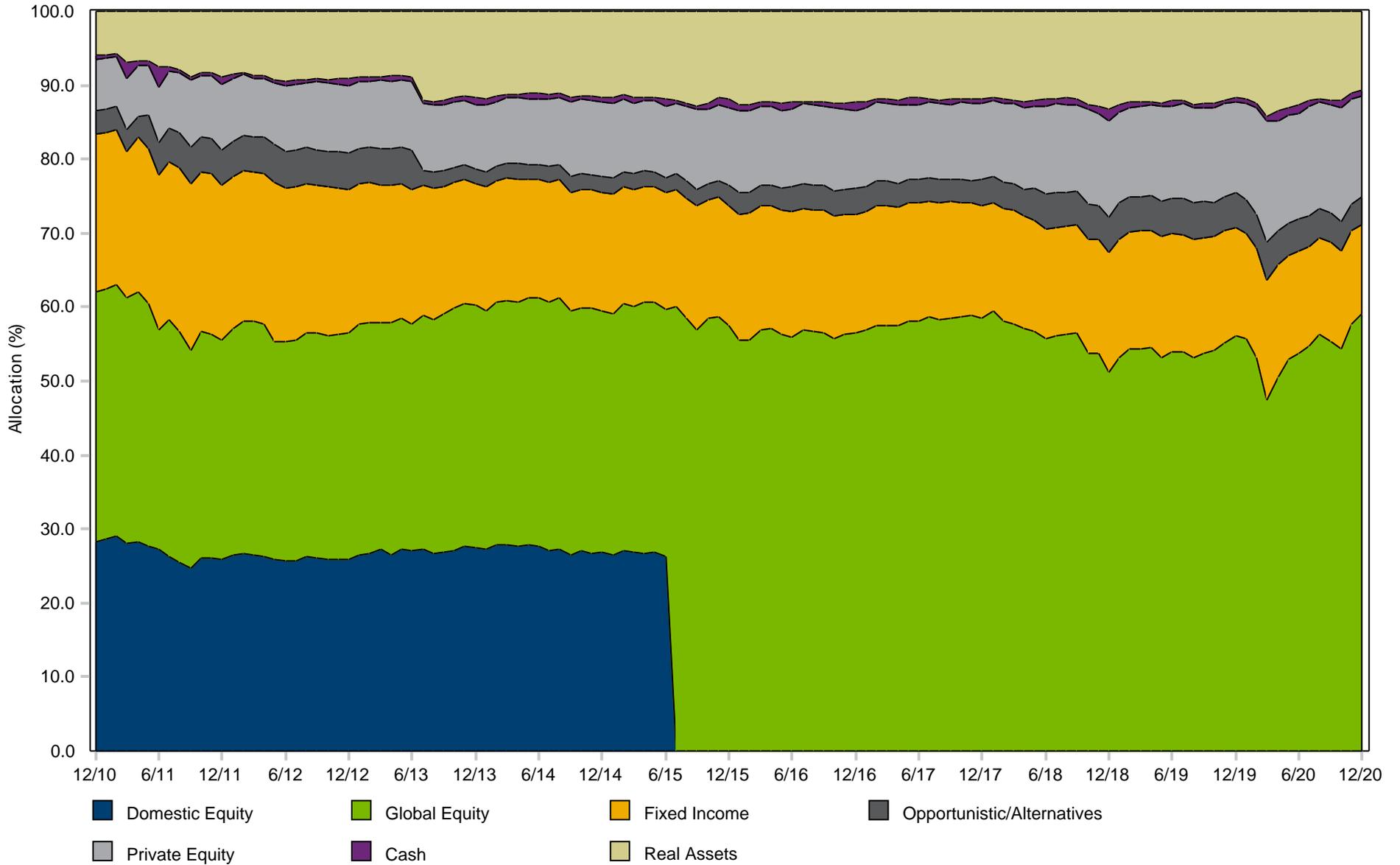


5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Fund	-0.26	3.03	-0.09	0.92	0.91	-1.13	1.08	10.31	10.11	0.96
Performance Benchmark	0.00	0.00	N/A	1.00	1.05	0.00	1.00	10.72	8.93	1.00
FTSE 3 Month T-Bill	-9.47	8.98	-1.05	0.04	N/A	1.21	-0.01	1.16	0.24	-0.19

Historical Asset Allocation by Segment

Total Fund



Asset Allocation as of 12/31/2020	Values in \$1,000								
	Total Equity	U.S. Bond	Real Estate	Private Equity	Cash	Total	Percent of Total	Interim Policy	Long-Term Target
Jacobs Levy 130/30	\$771,774.2	--	--	--	--	\$771,774.2	3.97%		
Kennedy Capital Management	\$610,688.7	--	--	--	--	\$610,688.7	3.14%		
Stephens	\$598,626.7	--	--	--	--	\$598,626.7	3.08%		
Voya Absolute Return	\$696,474.2	--	--	--	--	\$696,474.2	3.58%		
Allianz (Nicholas Applegate)	\$1,003,781.8	--	--	--	--	\$1,003,781.8	5.16%		
Pershing Square International	\$47,646.5	--	--	--	--	\$47,646.5	0.24%		
Pershing Square Holdings	\$250,652.4	--	--	--	--	\$250,652.4	1.29%		
SSgA Global Index	\$1,129,354.6	--	--	--	--	\$1,129,354.6	5.80%		
BlackRock MSCI ACWI IMI Fund	\$1,141,905.6	--	--	--	--	\$1,141,905.6	5.87%		
Wellington Global Perspectives	\$654,803.8	--	--	--	--	\$654,803.8	3.37%		
T. Rowe Price Global Equity	\$1,524,746.3	--	--	--	--	\$1,524,746.3	7.84%		
Lazard	\$780,821.9	--	--	--	--	\$780,821.9	4.01%		
D.E. Shaw	\$869,530.0	--	--	--	--	\$869,530.0	4.47%		
GMO Global All Country Equity	\$495,604.2	--	--	--	--	\$495,604.2	2.55%		
Harris Global Equity	\$551,272.4	--	--	--	--	\$551,272.4	2.83%		
Triam Partners	\$79,197.6	--	--	--	--	\$79,197.6	0.41%		
Triam Partners Co-Investments	\$99,099.6	--	--	--	--	\$99,099.6	0.51%		
Capital Guardian & Knight Vinke	\$76.9	--	--	--	--	\$76.9	0.00%		
<b>Total Equity</b>						<b>\$11,306,057.4</b>	<b>58.11%</b>	<b>55.91%</b>	<b>53.00%</b>
BlackRock	--	\$284,939.2	--	--	--	\$284,939.2	1.46%		
Loomis Sayles	--	\$494,620.8	--	--	--	\$494,620.8	2.54%		
Putnam	--	\$385,900.0	--	--	--	\$385,900.0	1.98%		
SSgA Aggregate Bond Index	--	\$197,151.8	--	--	--	\$197,151.8	1.01%		
Wellington Global Total Return	--	\$348,990.5	--	--	--	\$348,990.5	1.79%		
Reams Core Plus Bond Fund	--	\$403,949.8	--	--	--	\$403,949.8	2.08%		
BRS Recycling Tax Credit	--	\$176,000.0	--	--	--	\$176,000.0	0.90%		
BRS Recycling Tax Credit Phase 2	--	\$77,031.6	--	--	--	\$77,031.6	0.40%		
<b>Total Fixed Income</b>						<b>\$2,368,583.7</b>	<b>12.17%</b>	<b>15.00%</b>	<b>15.00%</b>
Anchorage	--	--	--	\$77,280.4	--	\$77,280.4	0.40%		
Capula	--	--	--	\$90,174.8	--	\$90,174.8	0.46%		
Graham	--	--	--	\$66,707.2	--	\$66,707.2	0.34%		
York	--	--	--	\$23,826.1	--	\$23,826.1	0.12%		
Circumference Group Core Value	--	--	--	\$33,092.0	--	\$33,092.0	0.17%		
Aeolus Keystone Fund	--	--	--	\$237,932.7	--	\$237,932.7	1.22%		
Nephila Rubik Holdings	--	--	--	\$42,359.8	--	\$42,359.8	0.22%		
Parametric Global Defensive Equity	--	--	--	\$179,568.1	--	\$179,568.1	0.92%		
Man Alternative Risk Premia	--	--	--	\$88,323.6	--	\$88,323.6	0.45%		
CFM ISD Fund 1.5x	--	--	--	\$75,957.4	--	\$75,957.4	0.39%		
<b>Total Opportunistic/Alternatives</b>						<b>\$915,222.1</b>	<b>4.70%</b>	<b>5.01%</b>	<b>5.00%</b>
<b>Real Estate</b>			\$1,323,530.8			\$1,323,530.8	6.80%		
<b>Timber</b>			\$296,475.1			\$296,475.1	1.52%		
<b>Agriculture</b>			\$210,269.9			\$210,269.9	1.08%		
<b>Infrastructure</b>			\$264,948.8			\$264,948.8	1.36%		
<b>Total Real Assets</b>						<b>\$2,095,224.5</b>	<b>10.77%</b>	<b>12.08%</b>	<b>15.00%</b>
<b>Total Private Equity</b>				\$2,640,778.9		\$2,640,778.9	13.57%	12.00%	12.00%
<b>Total Cash</b>					\$129,739.0	\$129,739.0	0.67%	0.00%	0.00%
<b>Total Fund</b>	<b>\$11,306,057.4</b>	<b>\$2,368,583.7</b>	<b>\$2,095,224.5</b>	<b>\$3,556,001.1</b>	<b>\$129,739.0</b>	<b>\$19,455,605.6</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

\*Note: The market values for the Real Assets and Private Equity investments shown above are lagged one quarter and adjusted for the current quarter's cash flows. Market values and allocation percentages may not add to the sum total due to rounding.

Asset Allocation as of 12/31/2020				Values in \$1,000			
	Real Estate	Percent of Real Estate	Percent of Total Fund		Real Estate	Percent of Real Estate	Percent of Total Fund
Almanac Realty Securities Fund V	\$122.3	0.01%	0.00%	LaSalle Income & Growth Fund VI	\$6,545.2	0.49%	0.03%
Almanac Realty Securities Fund VI	\$3,824.3	0.29%	0.02%	LaSalle Income & Growth Fund VII	\$14,831.8	1.12%	0.08%
Almanac Realty Securities Fund VII	\$14,611.5	1.10%	0.08%	LaSalle Income & Growth Fund VIII	\$8,318.8	0.63%	0.04%
Almanac Realty Securities Fund VIII	\$5,712.9	0.43%	0.03%	Lone Star Real Estate Fund IV	\$6,664.5	0.50%	0.03%
American Center	\$27,739.6	2.10%	0.14%	Long Wharf Real Estate Partners V	\$21,218.9	1.60%	0.11%
AR Insurance	\$2,236.7	0.17%	0.01%	Long Wharf Real Estate Partners VI	\$8,049.3	0.61%	0.04%
AR Teachers Retirement Building	\$5,376.0	0.41%	0.03%	Metropolitan RE Co-Investments	\$10,357.2	0.78%	0.05%
Blackstone Real Estate Partners VII	\$19,702.7	1.49%	0.10%	Met Life Commercial Mtg Inc Fund	\$48,683.6	3.68%	0.25%
Blackstone RE Europe VI	\$11,679.4	0.88%	0.06%	New Boston Fund VII	\$4.9	0.00%	0.00%
Carlyle Realty Partners VII	\$11,015.8	0.83%	0.06%	O'Connor NAPP II	\$8,502.3	0.64%	0.04%
Carlyle Realty VIII	\$9,729.0	0.74%	0.05%	PRISA	\$268,842.4	20.31%	1.38%
CBREI SP U.S. Opportunity V	\$1,023.8	0.08%	0.01%	Recoveries Land	\$70.0	0.01%	0.00%
CBREI SP VIII	\$22,735.3	1.72%	0.12%	Rockwood Capital RE Partners IX	\$5,501.2	0.42%	0.03%
CBREI SP IX	\$12,809.3	0.97%	0.07%	Rockwood Capital RE XI	\$10,197.3	0.77%	0.05%
Cerberus Institutional RE Partners III	\$9,960.9	0.75%	0.05%	Rose Law Firm	\$4,295.0	0.32%	0.02%
Chenal Retirement Village	\$0.0	0.00%	0.00%	Texarkana DHS	\$1,627.7	0.12%	0.01%
Calmwater	\$23,609.3	1.78%	0.12%	Torchlight Debt Opportunity Fund IV	\$4,770.6	0.36%	0.02%
Fletcher Properties	\$1,162.2	0.09%	0.01%	Torchlight Debt Opportunity Fund V	\$6,926.6	0.52%	0.04%
FPA Core Plus IV	\$19,055.8	1.44%	0.10%	Torchlight Debt Opportunity Fund VI	\$25,080.4	1.89%	0.13%
Harbert European Real Estate	\$20,472.0	1.55%	0.11%	Torchlight Debt Opportunity Fund VII	\$4,834.2	0.37%	0.02%
Heitman European Property IV	\$1,739.5	0.13%	0.01%	UBS Trumbull Property Fund	\$195,963.4	14.81%	1.01%
JP Morgan Strategic Property Fund	\$275,543.0	20.82%	1.42%	UBS Trumbull Property Income Fund	\$51,635.2	3.90%	0.27%
Kayne Anderson V	\$21,920.4	1.66%	0.11%	Victory	\$32,775.7	2.48%	0.17%
Landmark Fund VI	\$1,875.2	0.14%	0.01%	Walton Street Real Estate Debt II	\$7,337.2	0.55%	0.04%
Landmark Real Estate VIII	\$8,919.8	0.67%	0.05%	West Mphs. DHS	\$6.1	0.00%	0.00%
LaSalle Asia Opportunity Fund IV	\$2,116.0	0.16%	0.01%	Westbrook IX	\$10,461.5	0.79%	0.05%
LaSalle Asia Opportunity Fund V	\$10,654.6	0.81%	0.05%	Westbrook Real Estate Fund X	\$14,682.5	1.11%	0.08%
<b>Total Real Estate</b>					<b>\$1,323,530.8</b>	<b>100.00%</b>	<b>6.80%</b>

\*Note: The market values for the real estate investments shown above are lagged one quarter and adjusted for the current quarter's cash flows. Market values and allocation percentages may not add to the sum total due to rounding.

Asset Allocation as of 12/31/2020				Values in \$1,000			
	Private Equity	Percent of Private Equity	Percent of Total Fund		Private Equity	Percent of Private Equity	Percent of Total Fund
Arlington Capital IV	\$25,462.2	0.96%	0.13%	JF Lehman III	\$13,650.3	0.52%	0.07%
Arlington Capital V	\$5,854.5	0.22%	0.03%	JF Lehman IV	\$29,135.1	1.10%	0.15%
Advent GPE VI	\$4,898.2	0.19%	0.03%	JF Lehman V	\$8,365.9	0.32%	0.04%
Altus Capital II	\$6,304.6	0.24%	0.03%	KPS III	\$169.9	0.01%	0.00%
American Industrial Partners VI	\$22,171.7	0.84%	0.11%	KPS IV	\$22,553.0	0.85%	0.12%
American Industrial Partners VII	\$1,485.8	0.06%	0.01%	KPS X	\$5,621.4	0.21%	0.03%
Altaris Constellation Partners	\$27,161.5	1.03%	0.14%	KPS Mid-Cap	\$3,434.3	0.13%	0.02%
Altaris Health Partners IV	\$18,849.7	0.71%	0.10%	Levine Leichtman V	\$19,073.7	0.72%	0.10%
Atlas Capital II	\$11,697.6	0.44%	0.06%	Lime Rock III	\$11,268.3	0.43%	0.06%
Audax Mezzanine III	\$3,000.4	0.11%	0.02%	LLR III	\$9,812.0	0.37%	0.05%
Big River - Equity	\$377,800.0	14.31%	1.94%	Mason Wells III	\$9,849.7	0.37%	0.05%
Big River - Holdings Note 2023	\$12,871.4	0.49%	0.07%	NGP IX	\$880.6	0.03%	0.00%
Big River - Holdings Note 3/16/23	\$5,397.4	0.20%	0.03%	NGP X	\$5,439.9	0.21%	0.03%
Bison V	\$23,629.1	0.89%	0.12%	NGP XI	\$19,278.6	0.73%	0.10%
Boston Ventures VII	\$5,236.9	0.20%	0.03%	NGP XII	\$15,094.6	0.57%	0.08%
Boston Ventures IX	\$24,033.8	0.91%	0.12%	One Rock Capital Partners II	\$32,157.3	1.22%	0.17%
Boston Ventures X	\$224.4	0.01%	0.00%	PineBridge	\$5,768.2	0.22%	0.03%
BV VIII	\$19,390.4	0.73%	0.10%	Riverside IV	\$778.3	0.03%	0.00%
Castlelake II	\$15,862.2	0.60%	0.08%	Riverside V	\$24,946.3	0.94%	0.13%
Castlelake III	\$17,525.9	0.66%	0.09%	Riverside VI	\$8,109.4	0.31%	0.04%
Clearlake V	\$37,883.1	1.43%	0.19%	Siris III	\$23,107.6	0.88%	0.12%
Clearlake VI	\$7,906.8	0.30%	0.04%	Siris IV	\$16,086.3	0.61%	0.08%
Court Square III	\$37,066.7	1.40%	0.19%	SK Capital V	\$11,791.8	0.45%	0.06%
CSFB-ATRS 2005-1 Series	\$33,828.9	1.28%	0.17%	Sycamore Partners II	\$14,751.3	0.56%	0.08%
CSFB-ATRS 2006-1 Series	\$69,951.7	2.65%	0.36%	Sycamore Partners III	\$4,392.6	0.17%	0.02%
Diamond State Ventures II	\$4,568.1	0.17%	0.02%	TA XI	\$35,381.8	1.34%	0.18%
Doughty Hanson Tech I	\$422.3	0.02%	0.00%	Tennenbaum VI	\$10,659.5	0.40%	0.05%
DW Healthcare III	\$15,578.7	0.59%	0.08%	Thoma Bravo Discover	\$15,941.5	0.60%	0.08%
DW Healthcare IV	\$32,522.2	1.23%	0.17%	Thoma Bravo Discover II	\$16,486.7	0.62%	0.08%
DW Healthcare V	\$7,095.0	0.27%	0.04%	Thoma Bravo Discover III	-\$19.3	0.00%	0.00%
EnCap IX	\$6,455.5	0.24%	0.03%	Thoma Bravo Explore I	\$3,745.6	0.14%	0.02%
EnCap VIII	\$9,217.0	0.35%	0.05%	Thoma Bravo XI	\$31,600.0	1.20%	0.16%
EnCap X	\$19,195.6	0.73%	0.10%	Thoma Bravo XII	\$40,799.5	1.54%	0.21%
EnCap XI	\$7,470.8	0.28%	0.04%	Thoma Bravo XIII	\$26,958.7	1.02%	0.14%
Franklin Park Series	\$786,177.2	29.77%	4.04%	Vista Equity III	\$4,234.1	0.16%	0.02%
GCG IV	\$23,903.8	0.91%	0.12%	Vista Foundation II	\$15,245.6	0.58%	0.08%
GCG V	\$1,444.6	0.05%	0.01%	Vista Foundation III	\$34,007.5	1.29%	0.17%
GTLA Holdings	\$20,000.0	0.76%	0.10%	Wellspring V	\$12,861.4	0.49%	0.07%
Highland	\$279,828.4	10.60%	1.44%	Wicks IV	\$20,091.5	0.76%	0.10%
Insight Equity II	\$19,974.7	0.76%	0.10%	WNG II	\$6,295.2	0.24%	0.03%
Insight Mezzanine I	\$1,624.6	0.06%	0.01%				
<b>Total Private Equity</b>					<b>\$2,640,778.9</b>	<b>100.00%</b>	<b>13.57%</b>

\*Note: The market values for the private equity investments shown above are lagged one quarter and adjusted for the current quarter's cash flows.  
Market values and allocation percentages may not add to the sum total due to rounding.



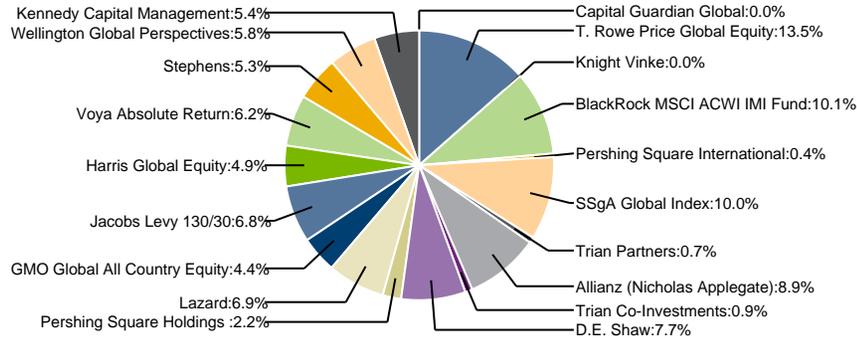
## Total Equity

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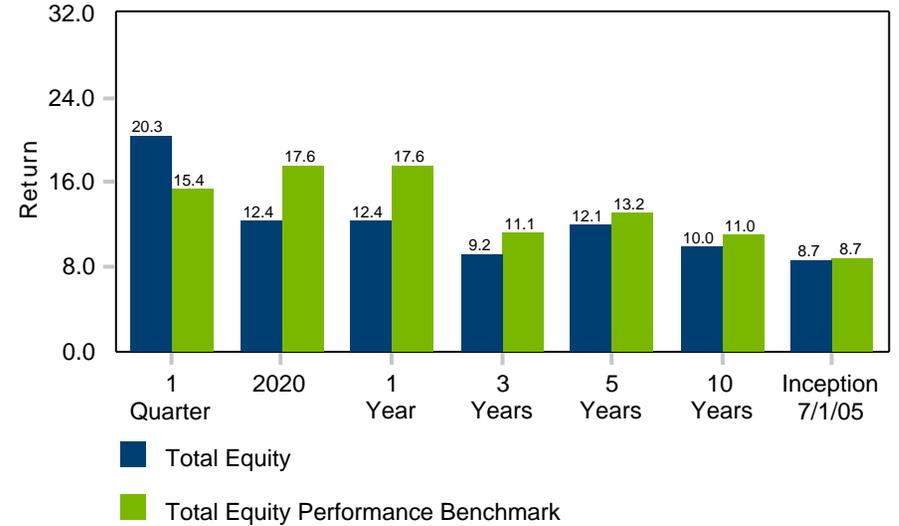
Total Equity Portfolio Overview

Current Allocation

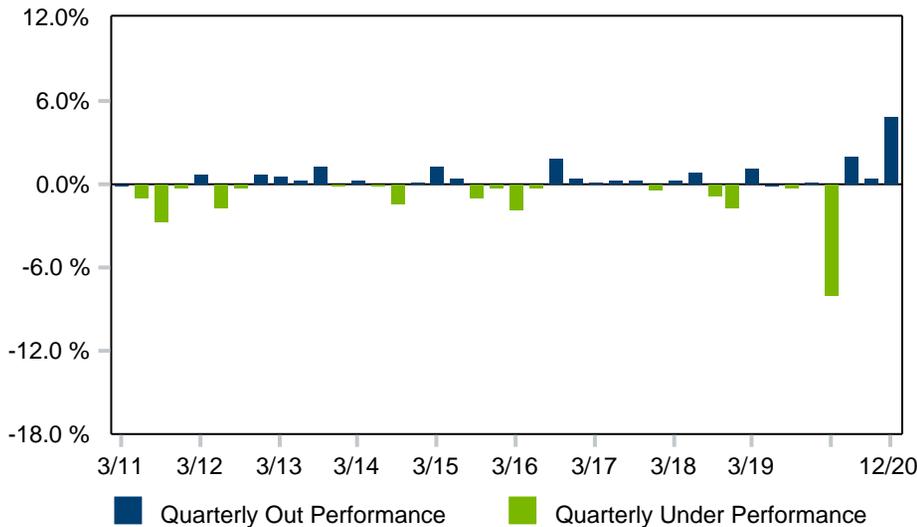
December 31, 2020 : \$11,306M



Return Summary



Quarterly Excess Performance



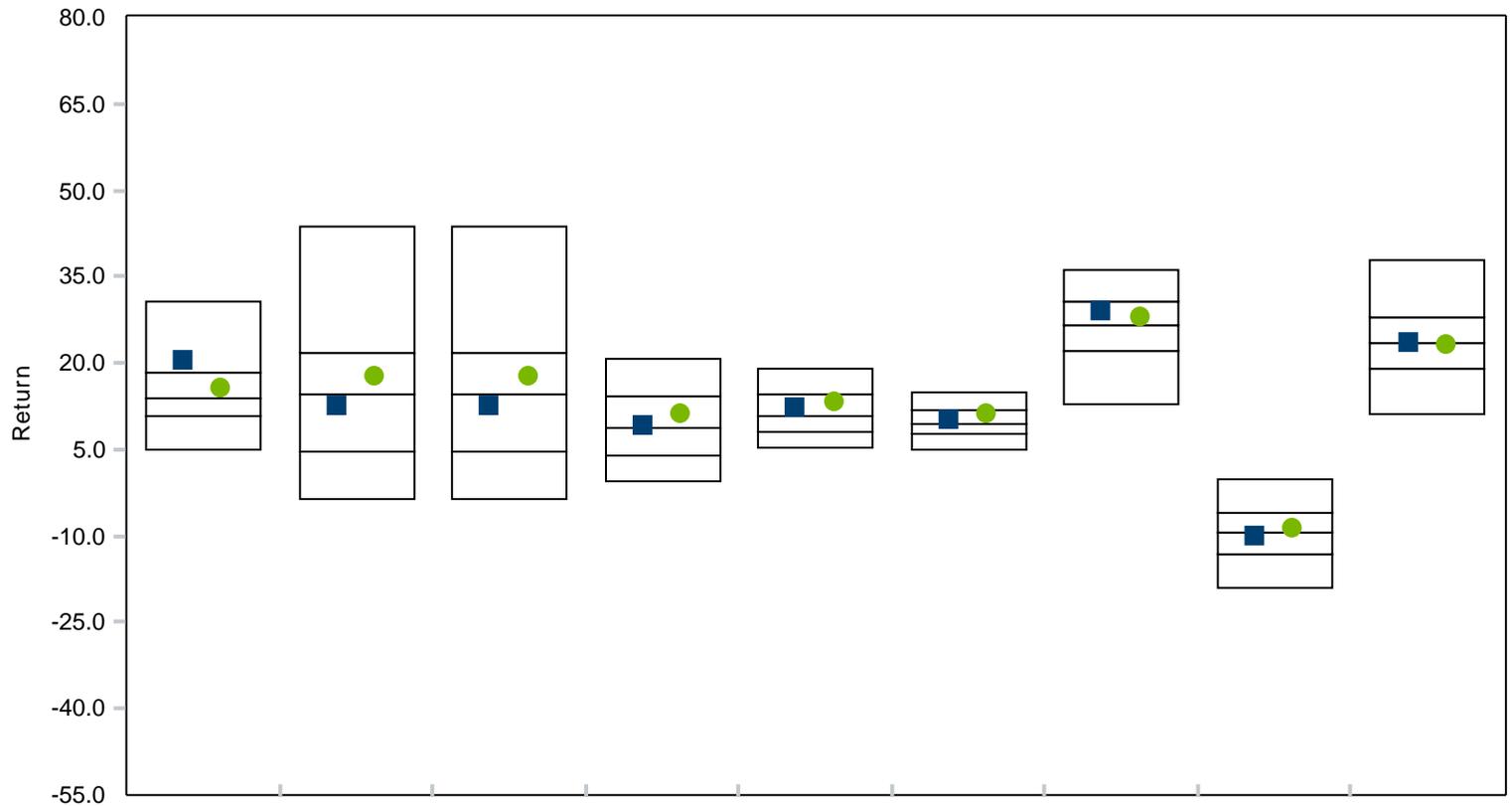
Ratio of Cumulative Wealth - 10 Years



The inception of the Total Equity asset class was July 1, 2015. Performance prior to July 2015 represents the weighted average of the U.S. Equity and Global Equity asset class monthly returns. For historical performance of the U.S. Equity and Global Equity asset classes please see page 129 of this report.

Peer Group Analysis

IM Global Equity (SA+CF)

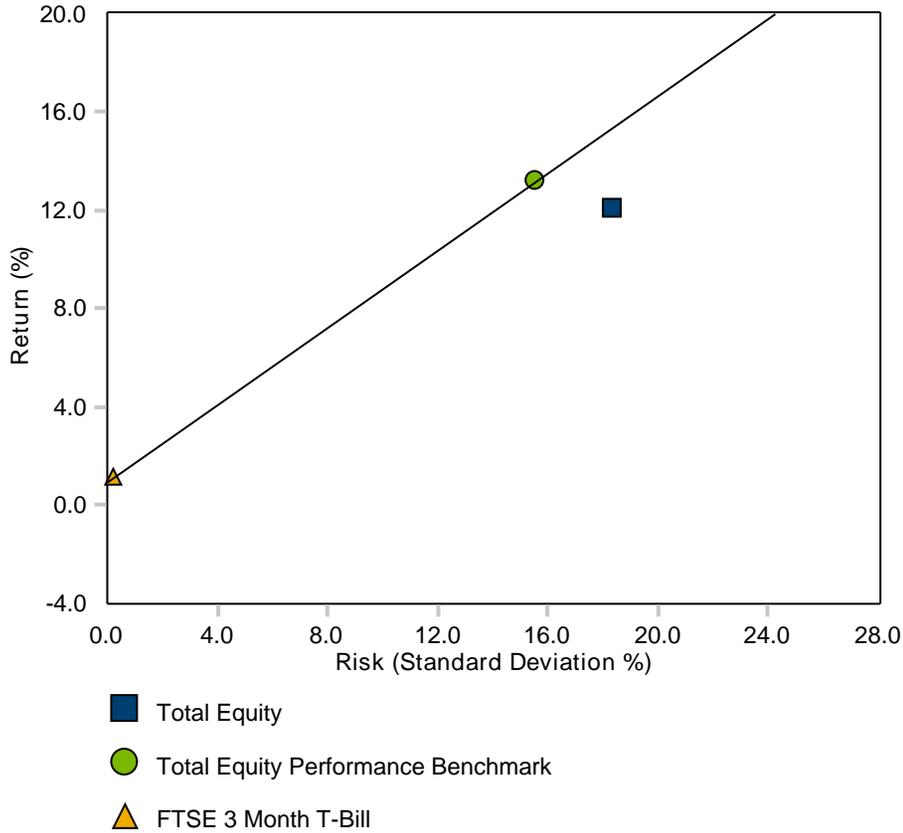


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Total Equity	20.3 (19)	12.4 (55)	12.4 (55)	9.2 (46)	12.1 (41)	10.0 (41)	29.0 (37)	-10.2 (57)	23.5 (50)
● Total Equity Performance Benchmark	15.4 (38)	17.6 (38)	17.6 (38)	11.1 (35)	13.2 (31)	11.0 (31)	27.8 (44)	-8.7 (45)	23.1 (52)
5th Percentile	30.6	43.5	43.5	20.7	19.2	14.9	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	11.9	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	9.4	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	7.8	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	4.9	13.0	-19.1	11.0
Population	245	242	242	238	219	127	380	395	403

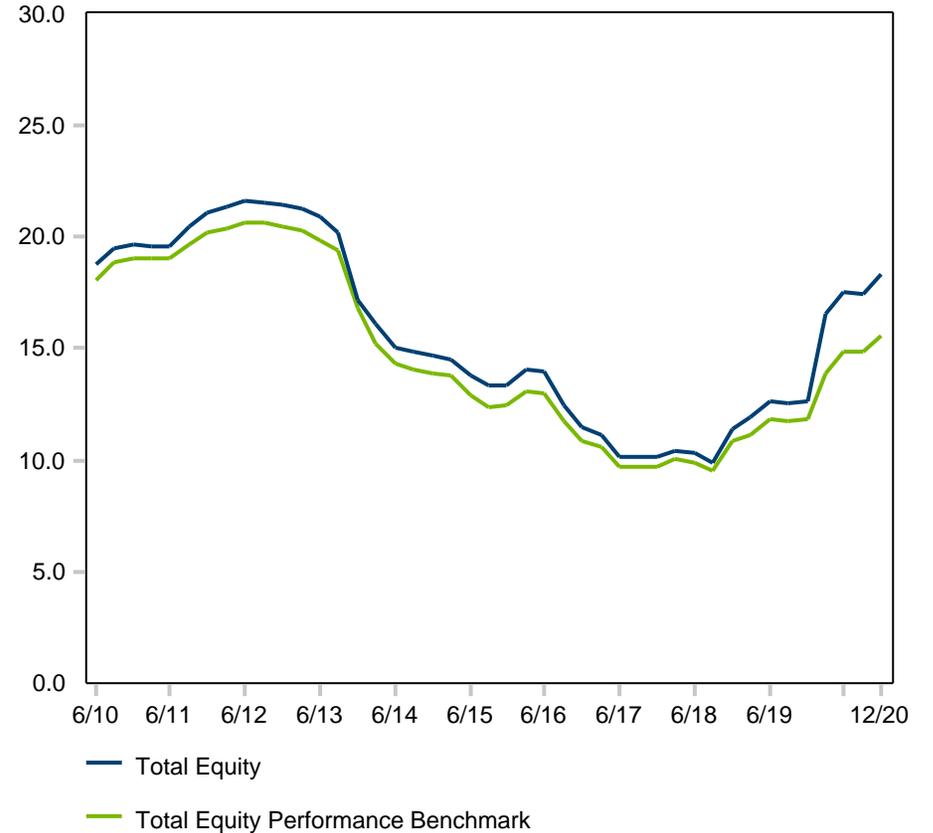
parentheses contain percentile rankings.

Total Equity Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation

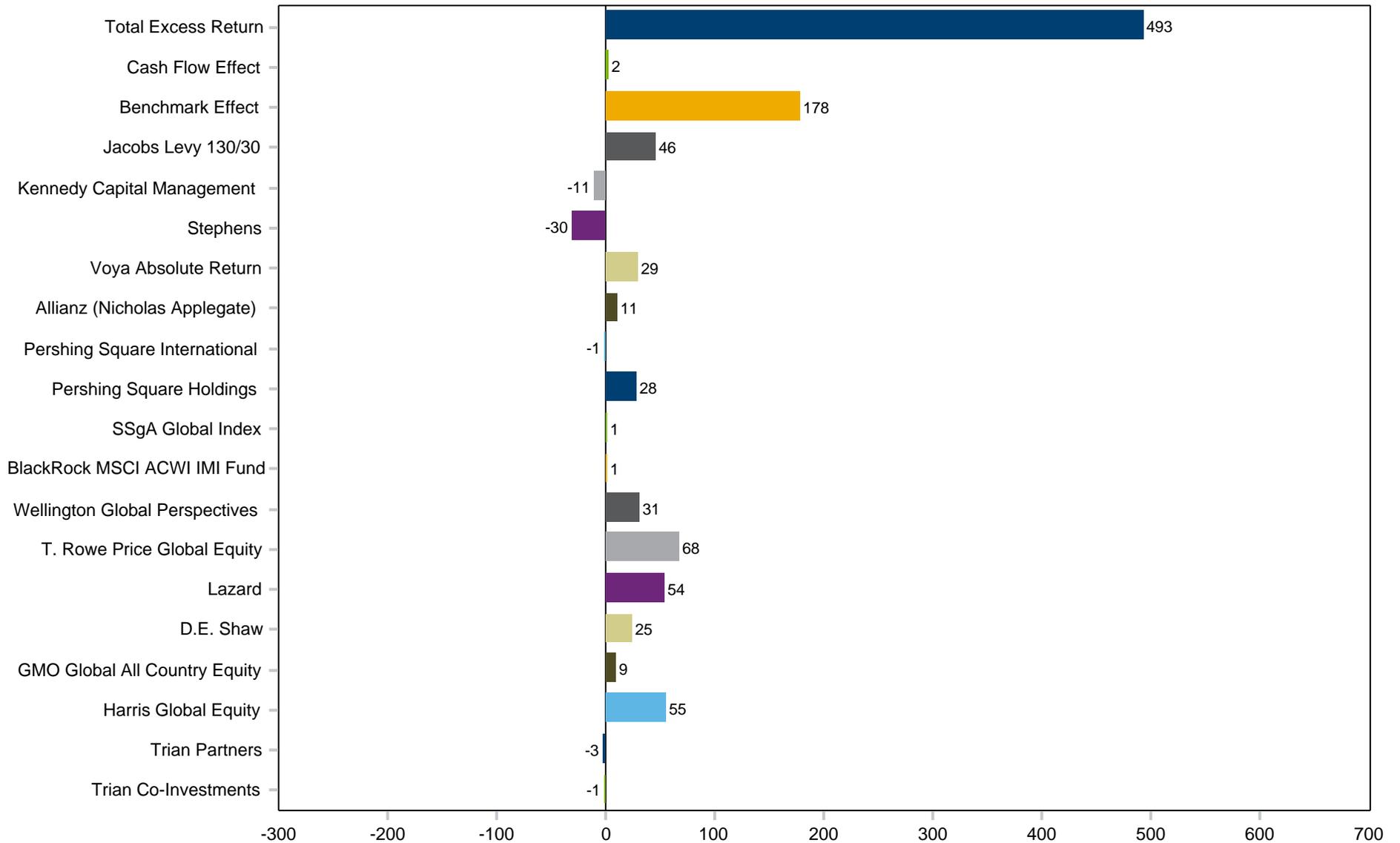


5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Equity	-0.48	4.08	-0.12	0.97	0.65	-2.64	1.16	12.05	18.36	0.98
Total Equity Performance Benchmark	0.00	0.00	N/A	1.00	0.80	0.00	1.00	13.18	15.57	1.00
FTSE 3 Month T-Bill	-12.49	15.62	-0.80	0.04	N/A	1.20	0.00	1.16	0.24	-0.19

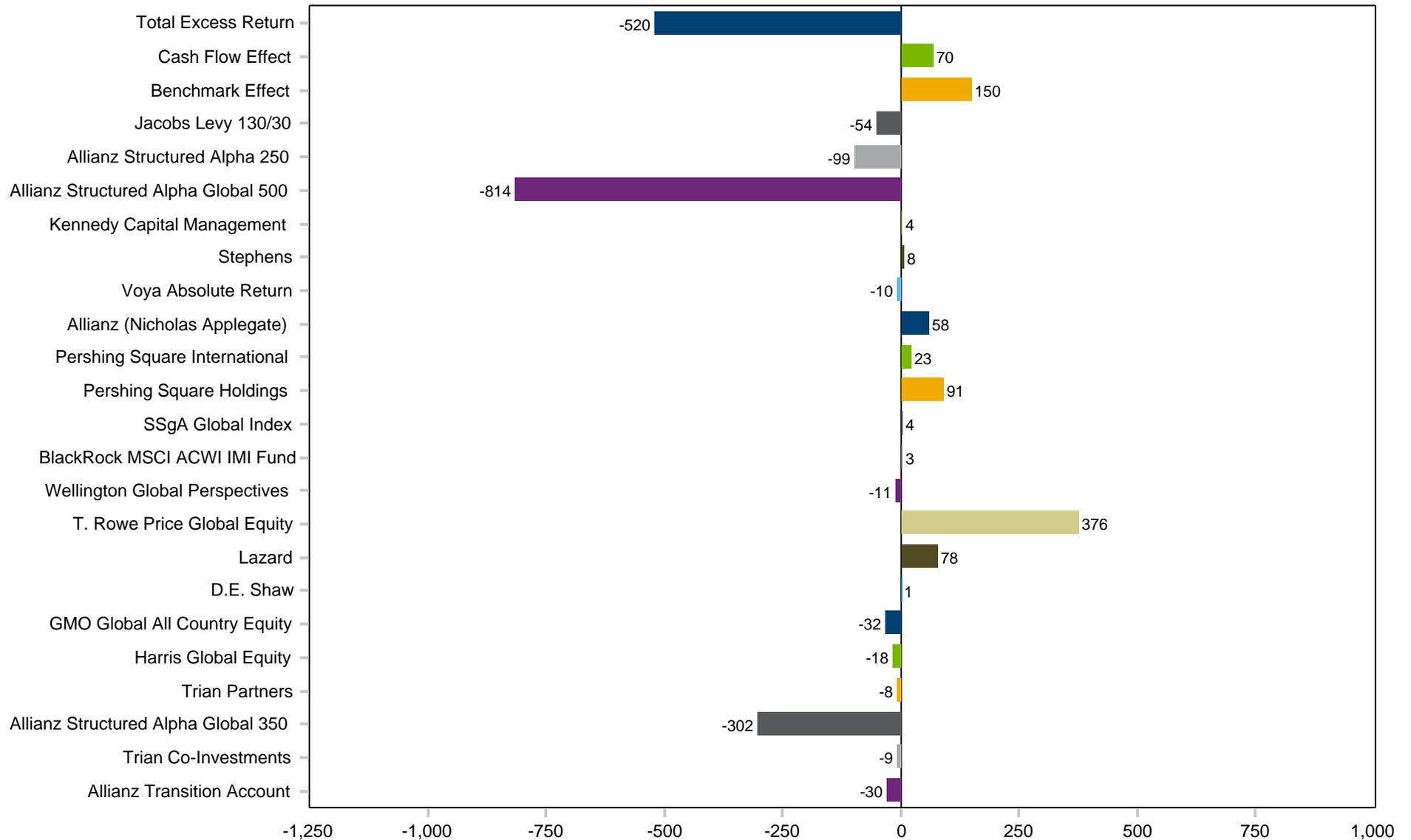
Asset Class Attribution

1 Quarter



Asset Class Attribution

1 Year

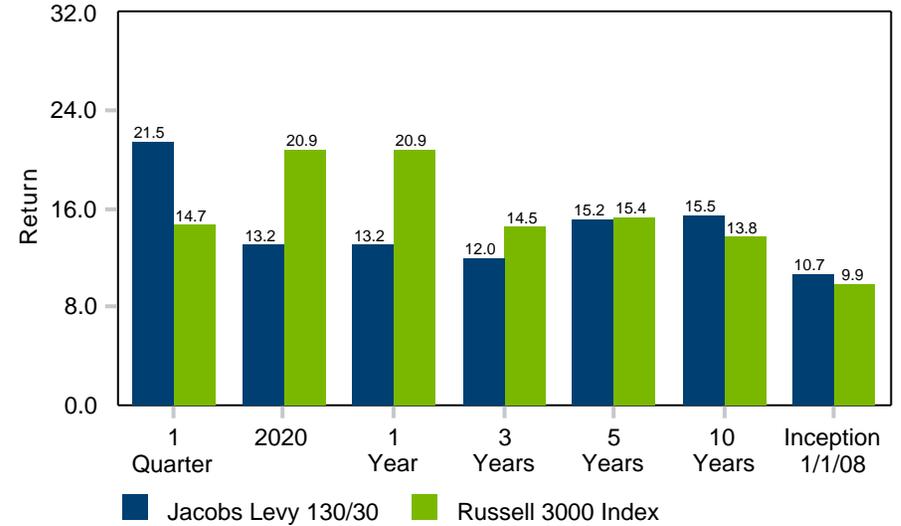


## Jacobs Levy 130/30 Performance Summary

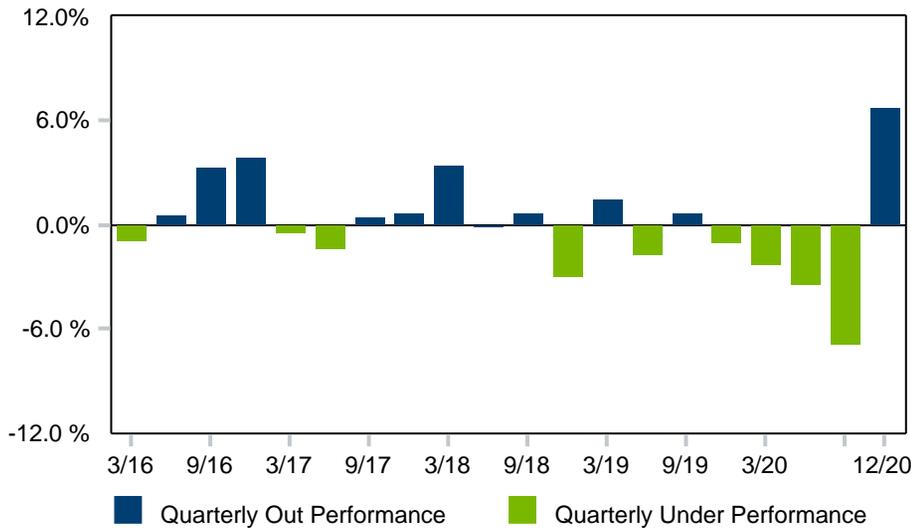
### Account Information

Account Name: Jacobs Levy 130/30  
 Inception Date: 12/31/2007  
 Account Structure: Commingled Fund  
 Asset Class: US Equity  
 Benchmark: Russell 3000 Index  
 Peer Group: IM U.S. Equity (SA+CF)

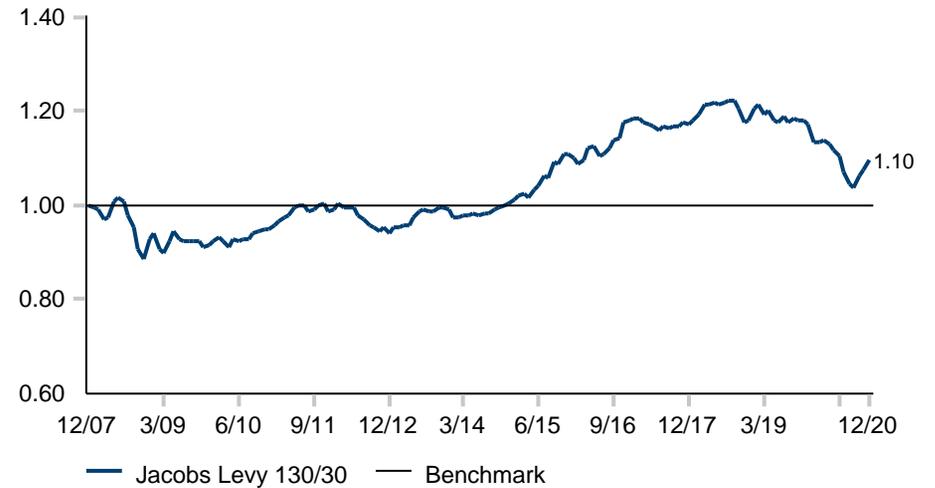
### Return Summary



### Quarterly Excess Performance

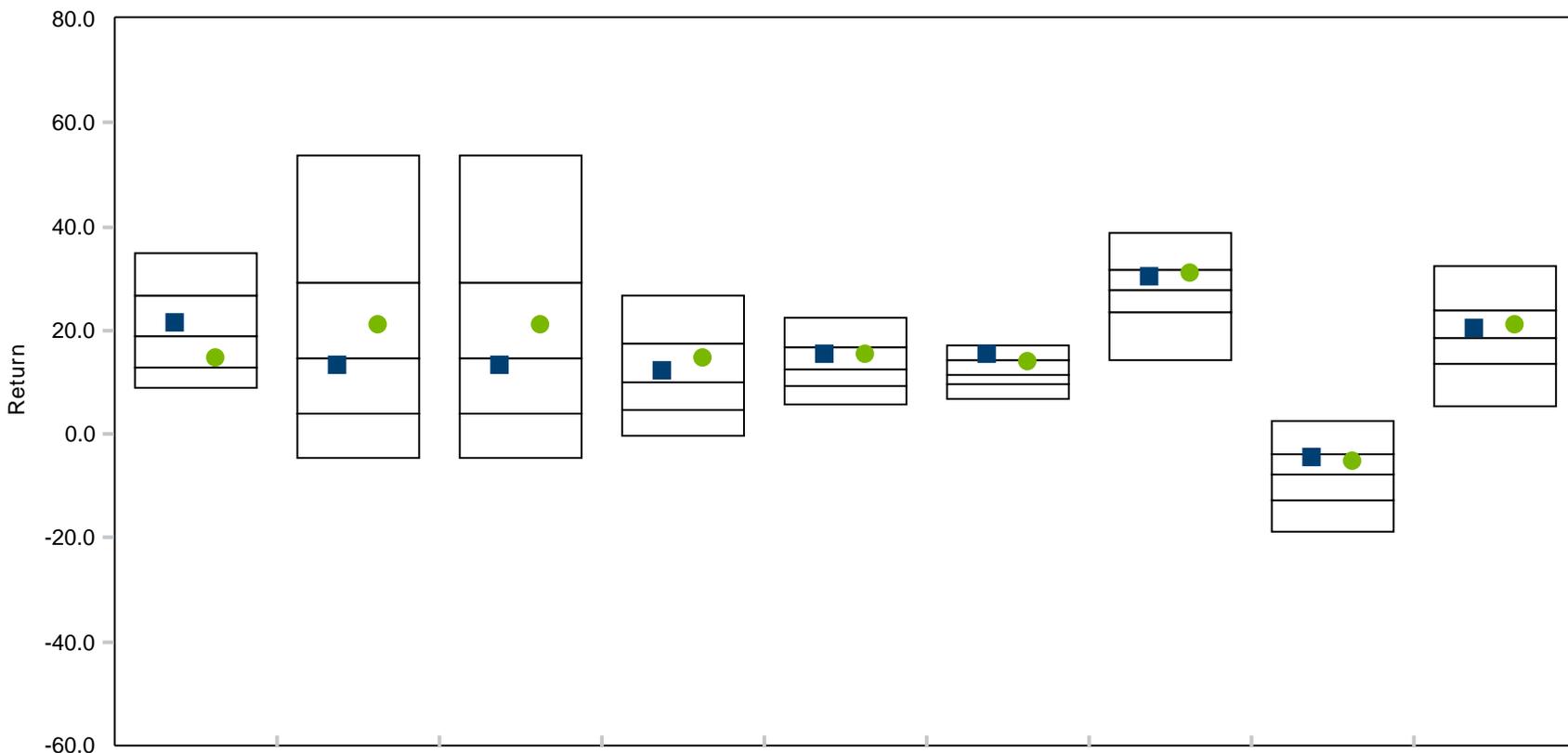


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Equity (SA+CF)

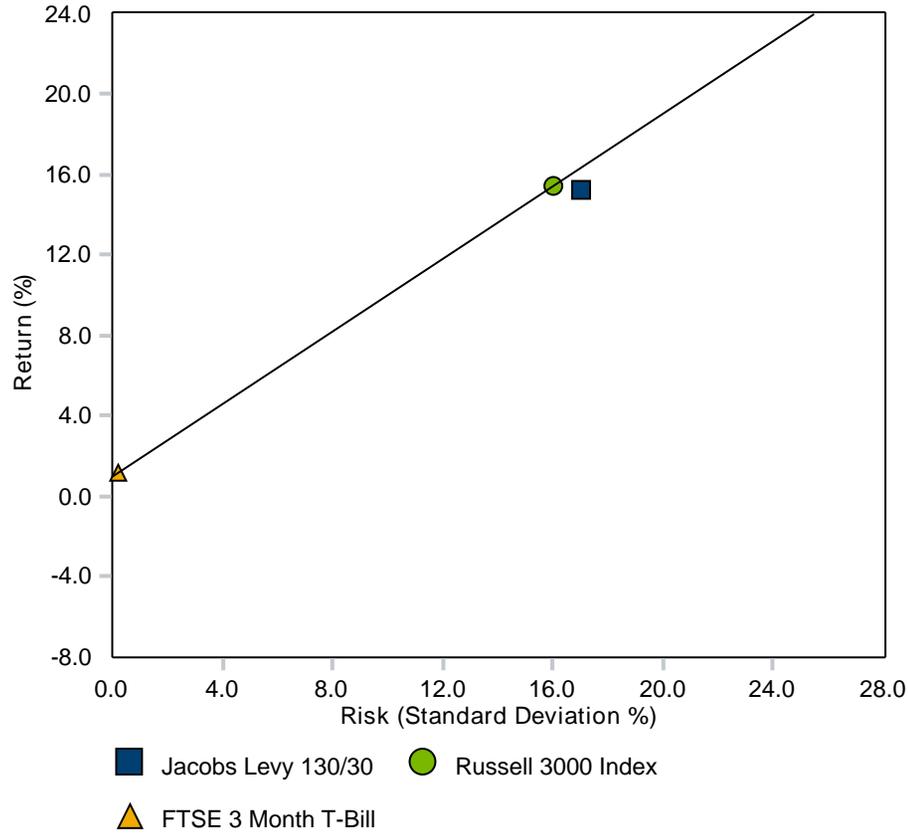


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Jacobs Levy 130/30	21.5 (42)	13.2 (53)	13.2 (53)	12.0 (43)	15.2 (33)	15.5 (14)	30.2 (35)	-4.7 (31)	20.3 (42)
● Russell 3000 Index	14.7 (68)	20.9 (36)	20.9 (36)	14.5 (34)	15.4 (32)	13.8 (29)	31.0 (30)	-5.2 (35)	21.1 (38)
5th Percentile	34.7	53.9	53.9	26.6	22.3	17.1	38.8	2.7	32.5
1st Quartile	26.7	29.3	29.3	17.3	16.9	14.1	31.8	-3.8	23.7
Median	18.9	14.6	14.6	10.1	12.6	11.5	27.9	-7.8	18.5
3rd Quartile	12.9	3.9	3.9	4.7	9.2	9.7	23.4	-12.6	13.7
95th Percentile	8.9	-4.7	-4.7	-0.2	5.7	6.9	14.2	-18.9	5.5
Population	1,249	1,242	1,242	1,184	1,092	915	1,787	1,883	1,952

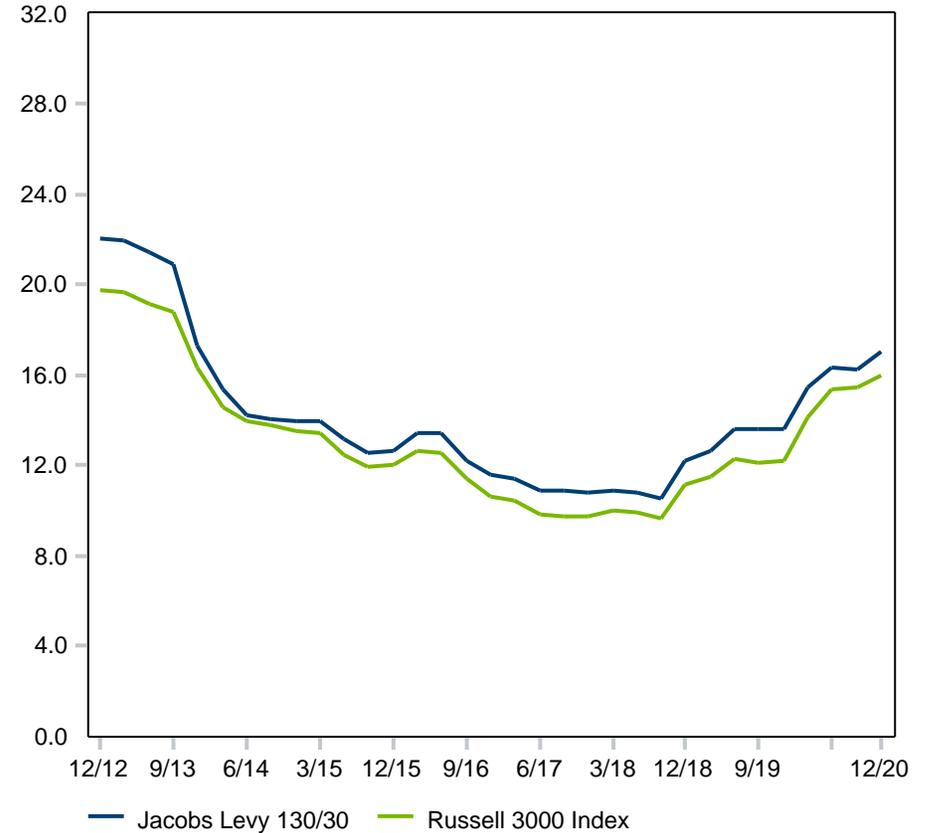
parentheses contain percentile rankings.

Jacobs Levy 130/30 Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

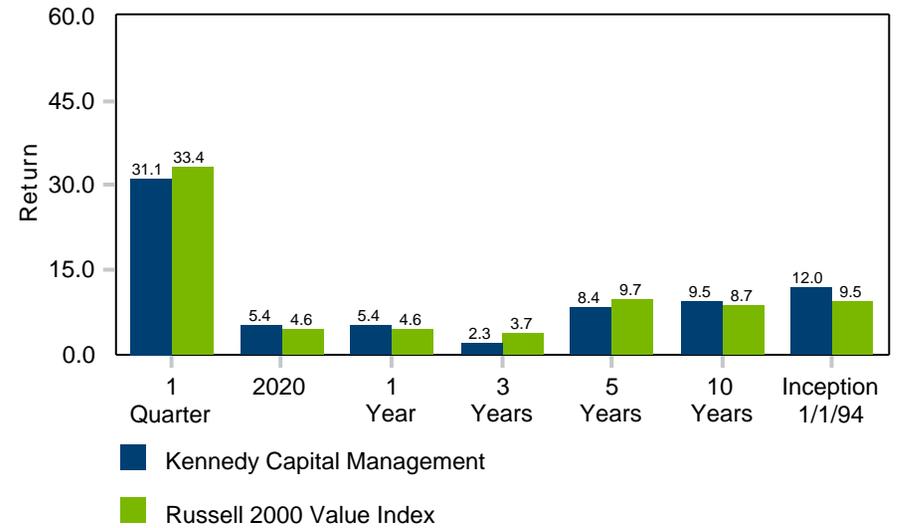
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Jacobs Levy 130/30	-0.03	4.48	-0.01	0.93	0.85	-0.44	1.03	15.21	17.04	0.97
Russell 3000 Index	0.00	0.00	N/A	1.00	0.91	0.00	1.00	15.43	16.02	1.00
FTSE 3 Month T-Bill	-14.56	16.06	-0.91	0.03	N/A	1.20	0.00	1.16	0.24	-0.16

## Kennedy Capital Management Performance Summary

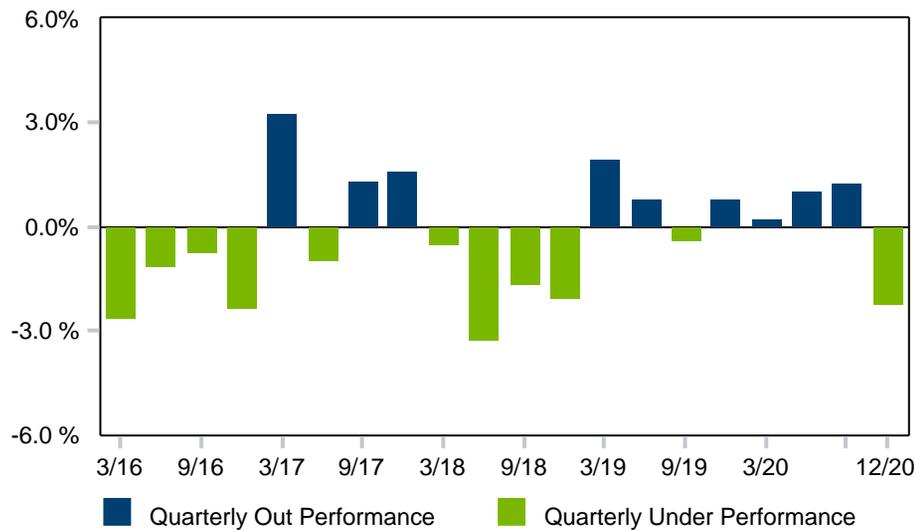
### Account Information

Account Name: Kennedy Capital Management  
 Inception Date: 12/31/1993  
 Account Structure: Separate Account  
 Asset Class: US Equity  
 Benchmark: Russell 2000 Value Index  
 Peer Group: IM U.S. Small Cap Value Equity (SA+CF)

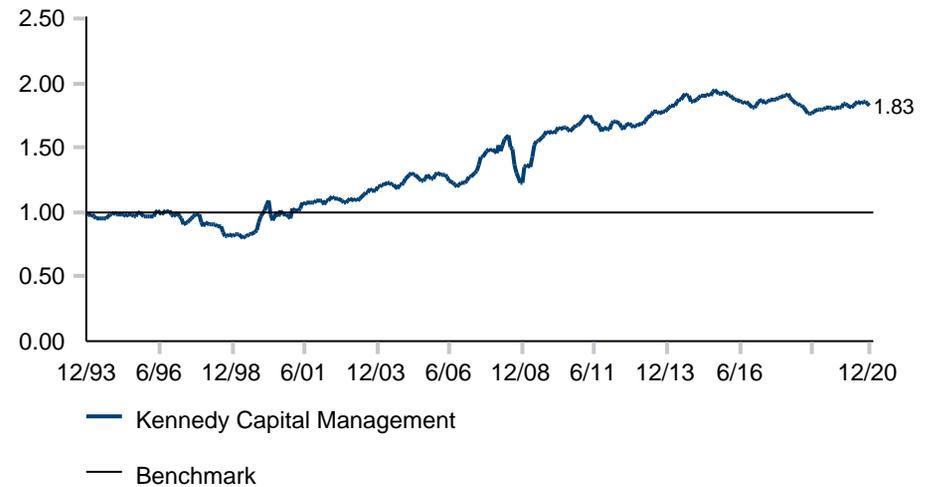
### Return Summary



### Quarterly Excess Performance

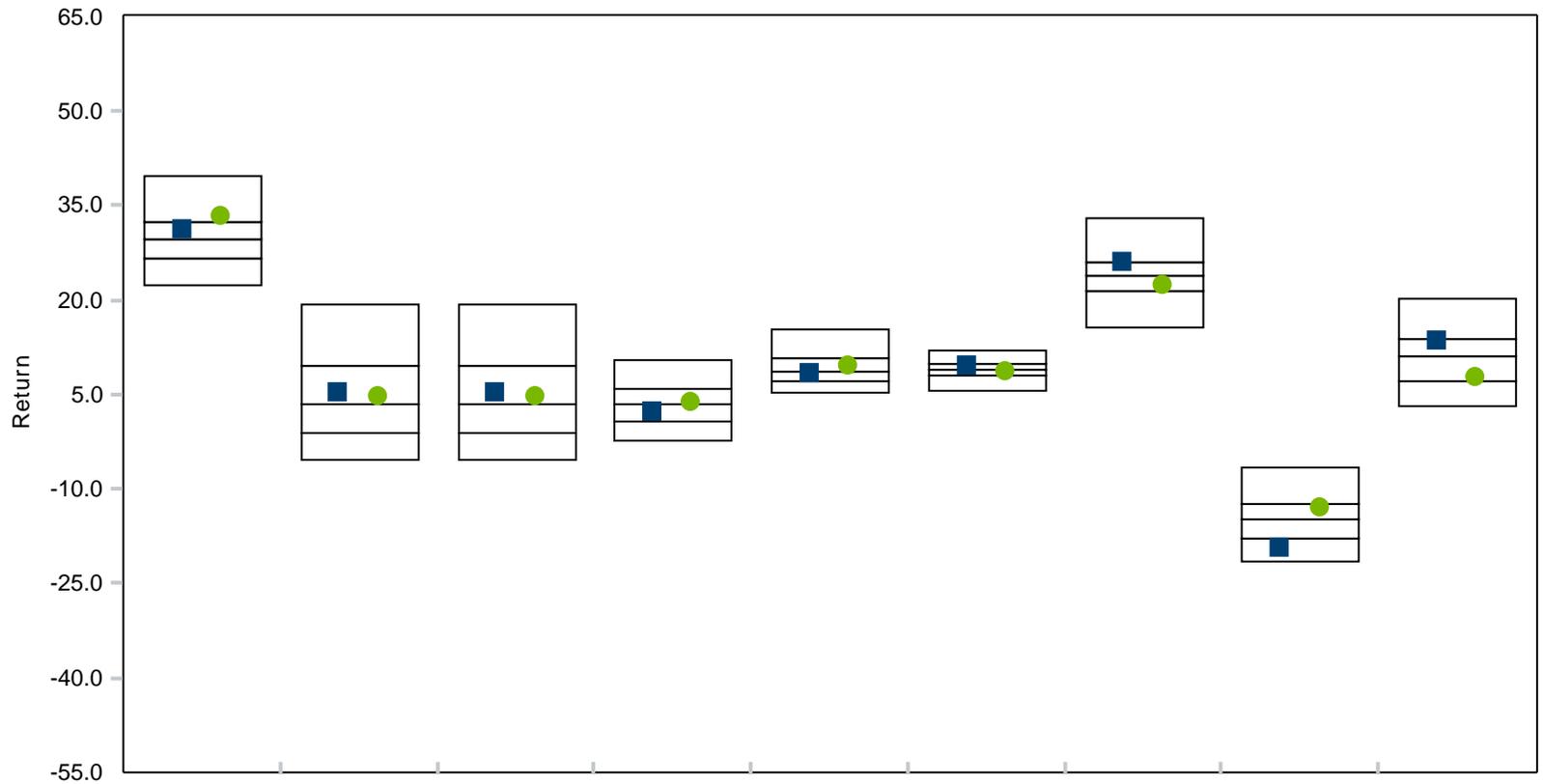


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Small Cap Value Equity (SA+CF)

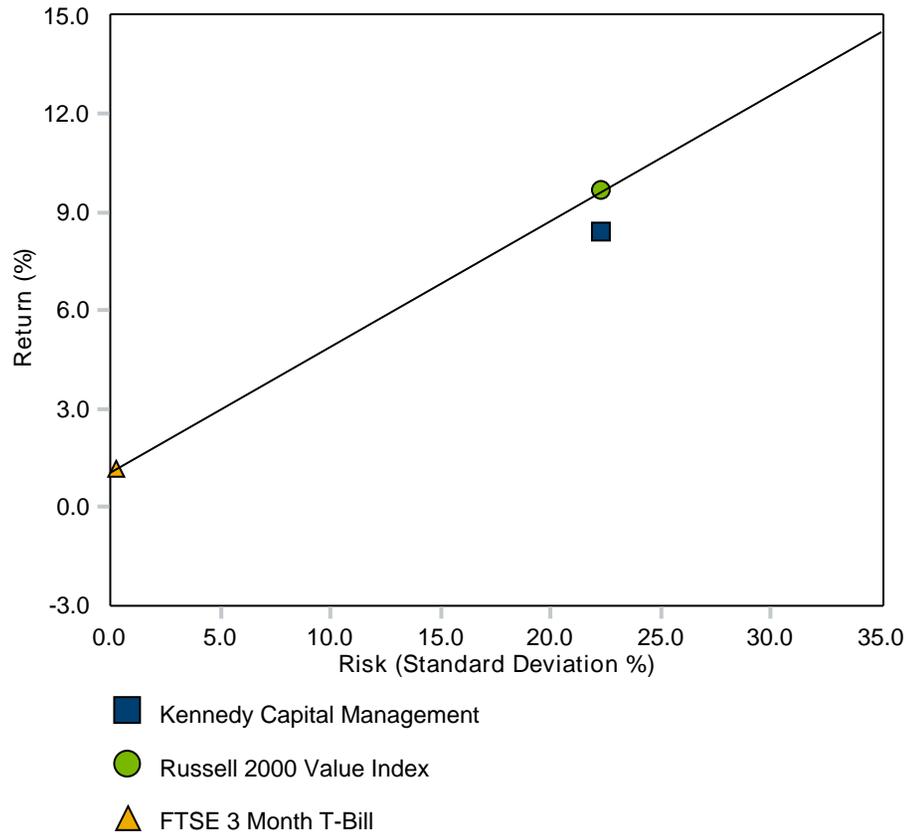


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Kennedy Capital Management	31.1 (36)	5.4 (43)	5.4 (43)	2.3 (63)	8.4 (55)	9.5 (37)	25.9 (29)	-19.4 (84)	13.4 (27)
● Russell 2000 Value Index	33.4 (22)	4.6 (46)	4.6 (46)	3.7 (46)	9.7 (36)	8.7 (60)	22.4 (64)	-12.9 (32)	7.8 (71)
5th Percentile	39.6	19.2	19.2	10.6	15.3	11.9	33.1	-6.4	20.2
1st Quartile	32.6	9.5	9.5	6.0	10.7	10.0	26.2	-12.2	13.9
Median	29.8	3.4	3.4	3.4	8.6	9.1	23.9	-14.9	11.0
3rd Quartile	26.7	-1.2	-1.2	0.8	7.1	8.1	21.4	-17.8	7.3
95th Percentile	22.3	-5.4	-5.4	-2.2	5.4	5.6	15.8	-21.4	3.1
Population	135	134	134	129	123	110	177	194	200

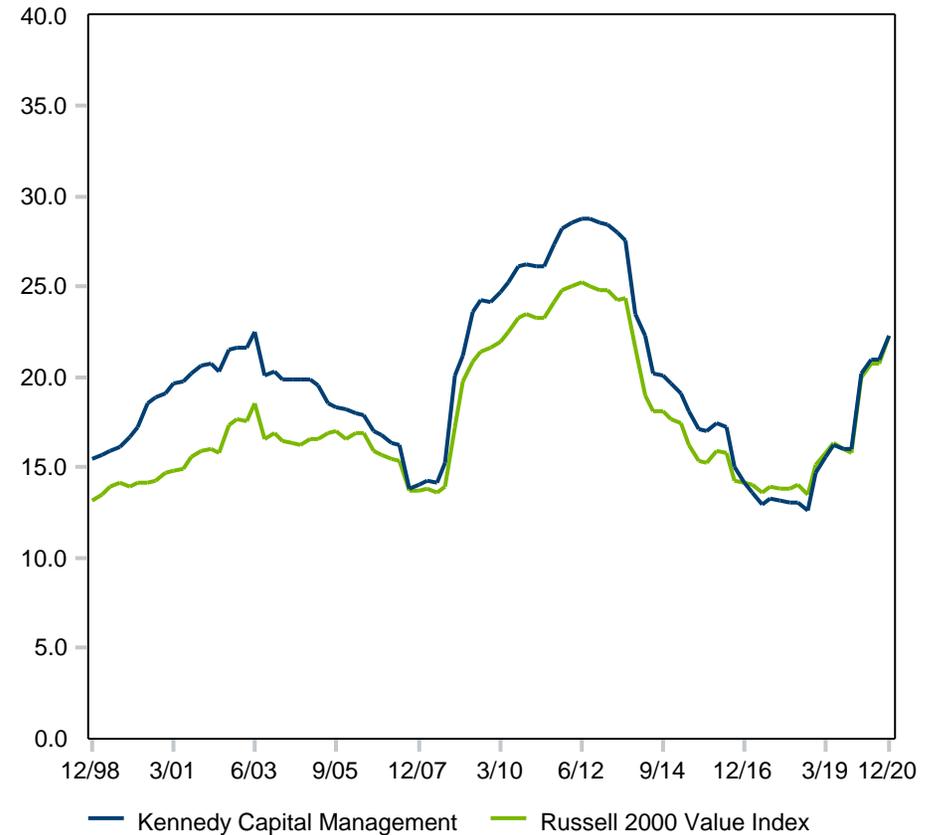
parentheses contain percentile rankings.

Kennedy Capital Management Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

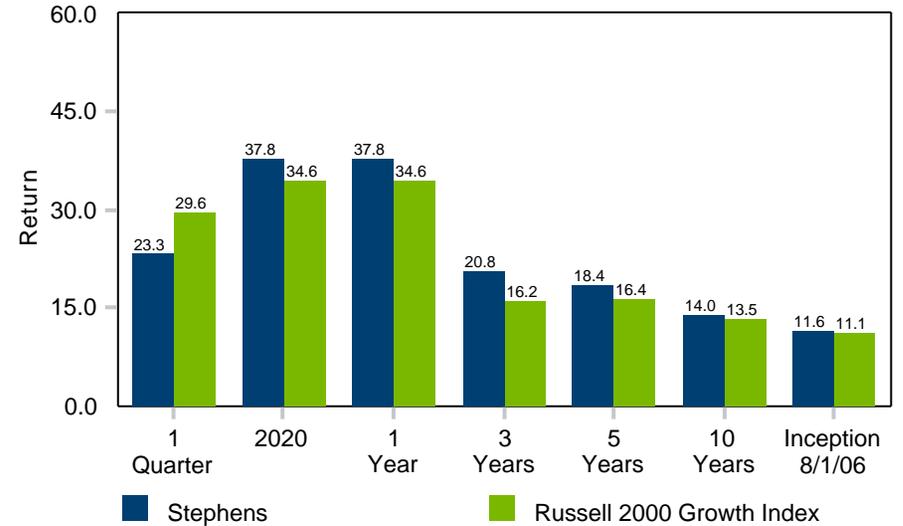
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Kennedy Capital Management	-1.13	2.87	-0.39	0.98	0.43	-1.00	0.99	8.41	22.30	0.99
Russell 2000 Value Index	0.00	0.00	N/A	1.00	0.47	0.00	1.00	9.65	22.34	1.00
FTSE 3 Month T-Bill	-10.64	22.40	-0.47	0.06	N/A	1.19	0.00	1.16	0.24	-0.24

## Stephens Performance Summary

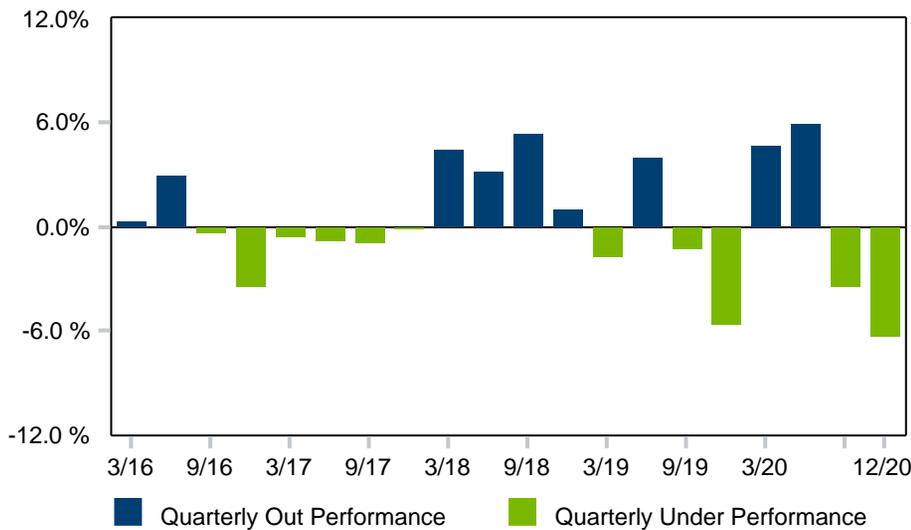
### Account Information

Account Name: Stephens  
 Inception Date: 07/31/2006  
 Account Structure: Separate Account  
 Asset Class: US Equity  
 Benchmark: Russell 2000 Growth Index  
 Peer Group: IM U.S. Small Cap Growth Equity (SA+CF)

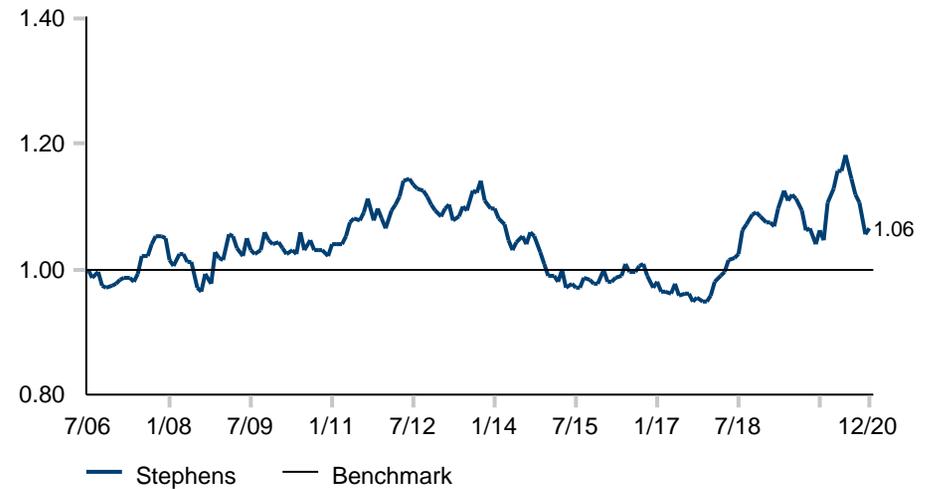
### Return Summary



### Quarterly Excess Performance

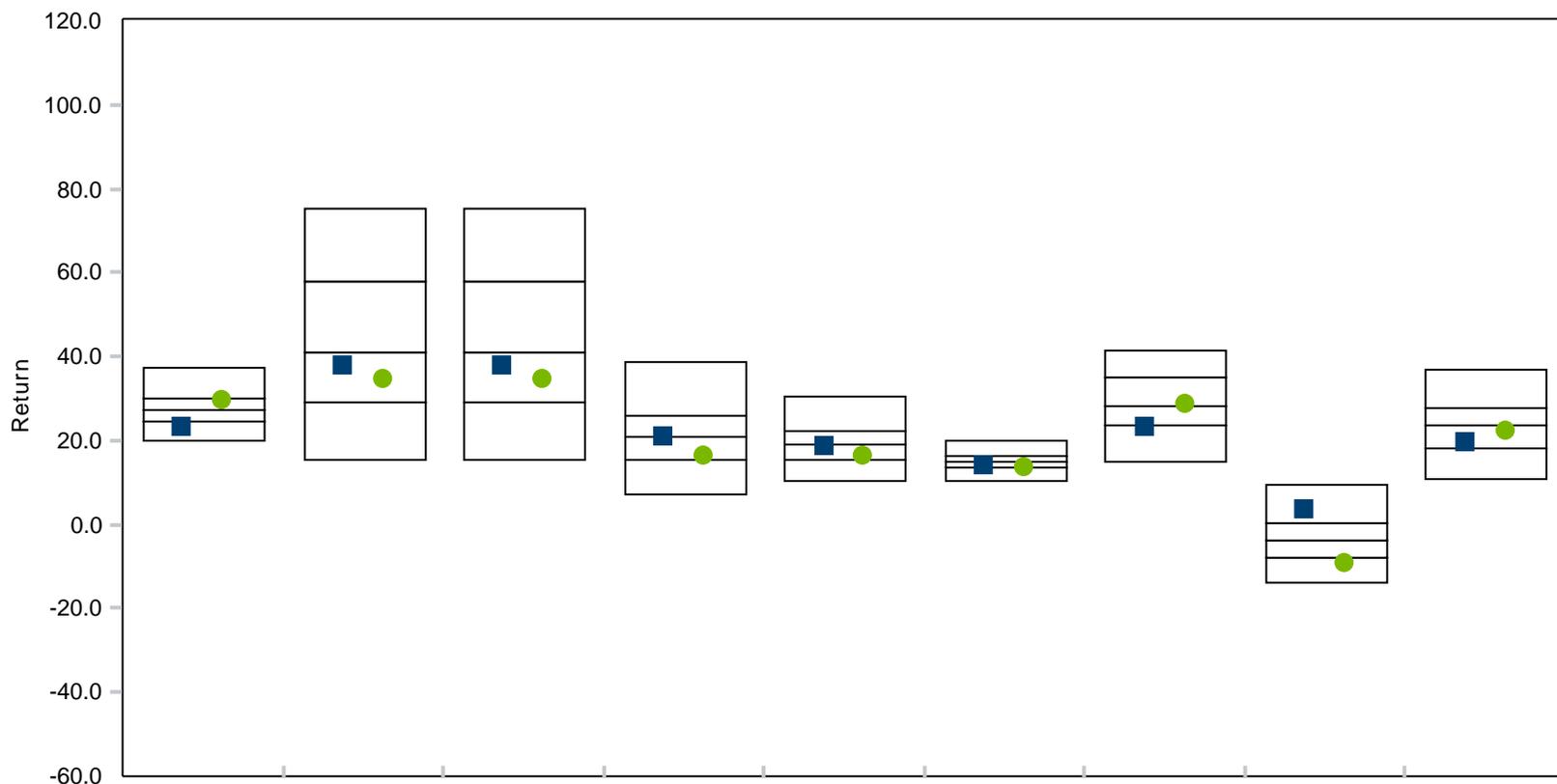


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Small Cap Growth Equity (SA+CF)

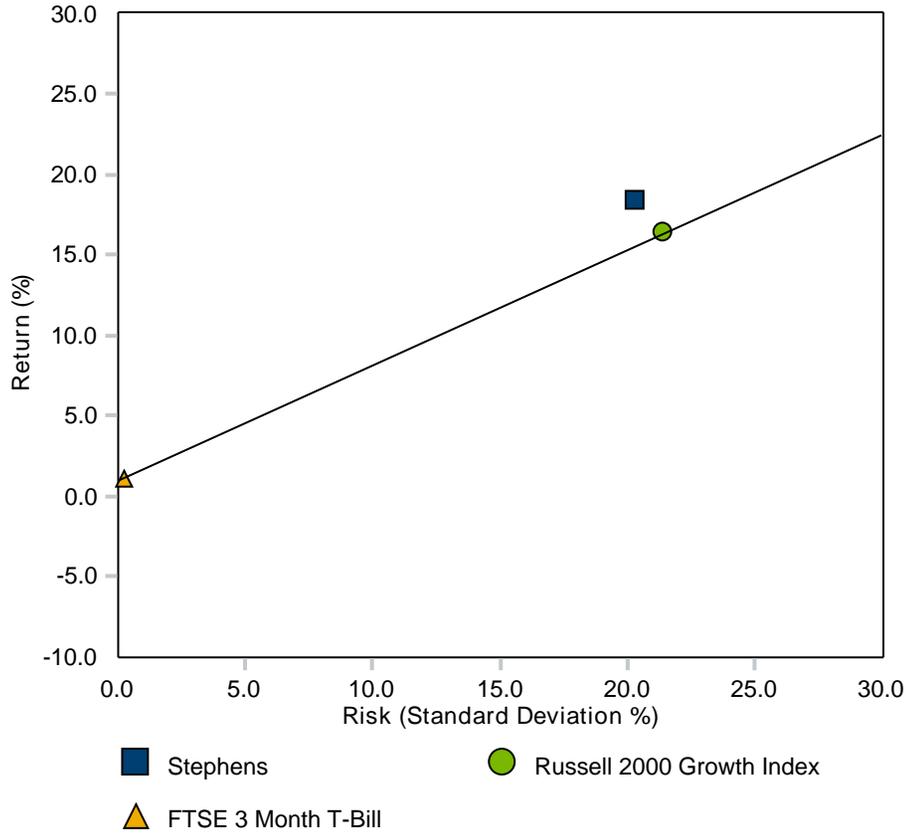


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Stephens	23.3 (83)	37.8 (59)	37.8 (59)	20.8 (52)	18.4 (58)	14.0 (69)	23.2 (77)	3.7 (13)	19.4 (70)
● Russell 2000 Growth Index	29.6 (29)	34.6 (63)	34.6 (63)	16.2 (73)	16.4 (70)	13.5 (77)	28.5 (49)	-9.3 (80)	22.2 (56)
5th Percentile	37.1	75.3	75.3	38.5	30.4	19.8	41.6	9.4	37.0
1st Quartile	29.9	57.8	57.8	25.9	22.3	16.1	35.2	0.4	27.9
Median	27.1	41.2	41.2	21.1	19.2	14.7	28.2	-4.0	23.6
3rd Quartile	24.6	29.1	29.1	15.4	15.3	13.6	23.6	-7.8	18.3
95th Percentile	20.0	15.4	15.4	7.0	10.1	10.4	15.1	-13.6	10.9
Population	101	99	99	96	92	82	138	145	147

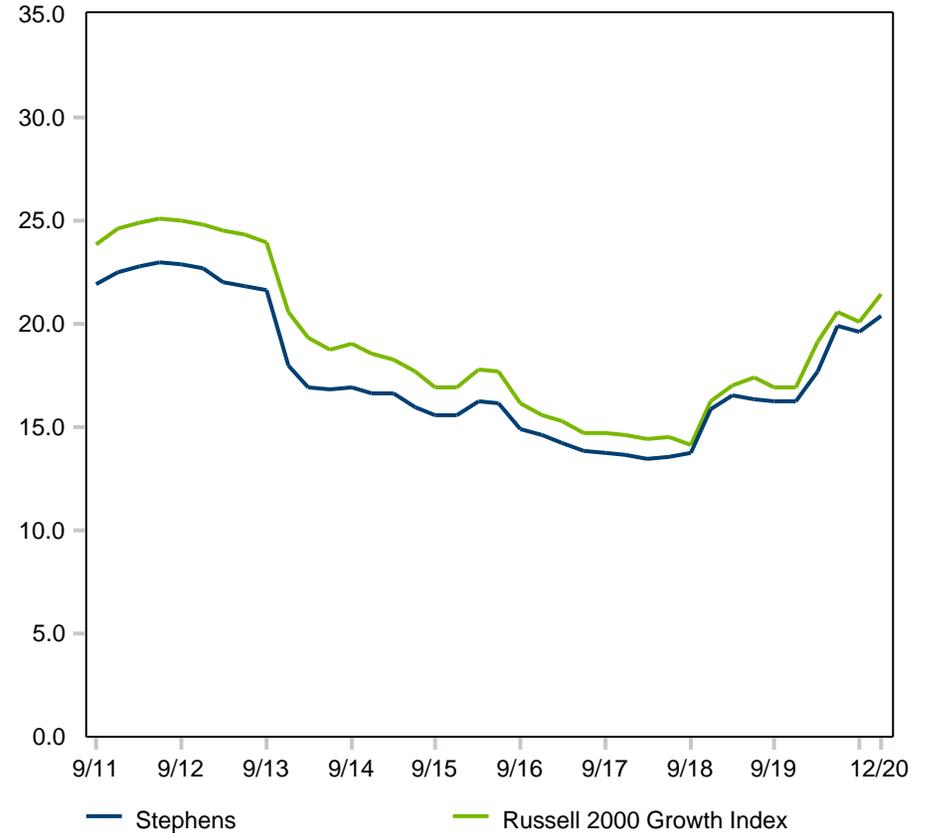
200 Parentheses contain percentile rankings.

Stephens Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

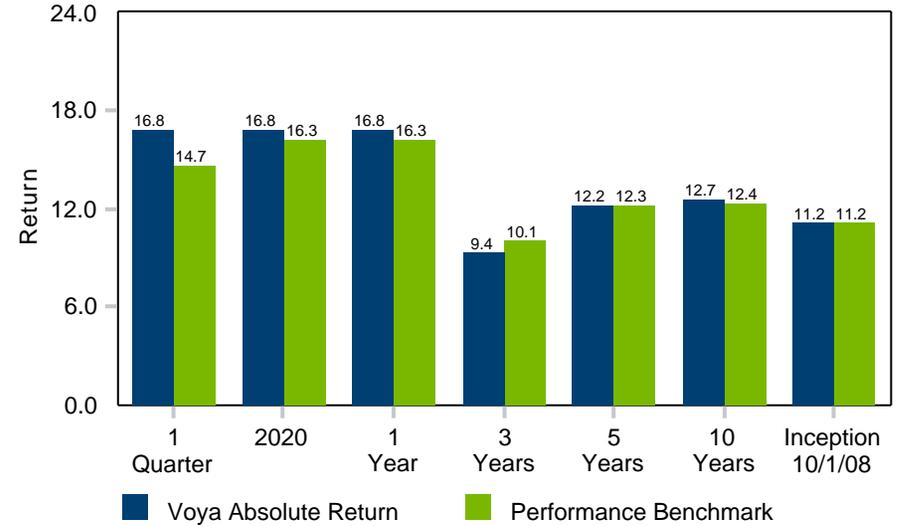
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Stephens	1.48	6.27	0.24	0.91	0.88	3.15	0.91	18.39	20.36	0.96
Russell 2000 Growth Index	0.00	0.00	N/A	1.00	0.76	0.00	1.00	16.36	21.46	1.00
FTSE 3 Month T-Bill	-16.40	21.51	-0.76	0.04	N/A	1.20	0.00	1.16	0.24	-0.21

Voya Absolute Return Performance Summary

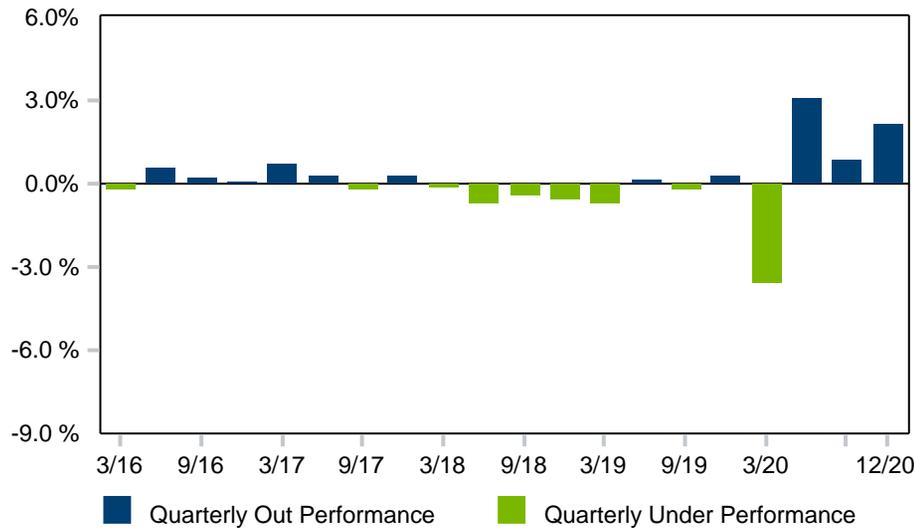
Account Information

Account Name: Voya Absolute Return  
 Inception Date: 09/30/2008  
 Account Structure: Commingled Fund  
 Asset Class: Global Equity  
 Benchmark: Performance Benchmark  
 Peer Group: IM Global Equity (MF)

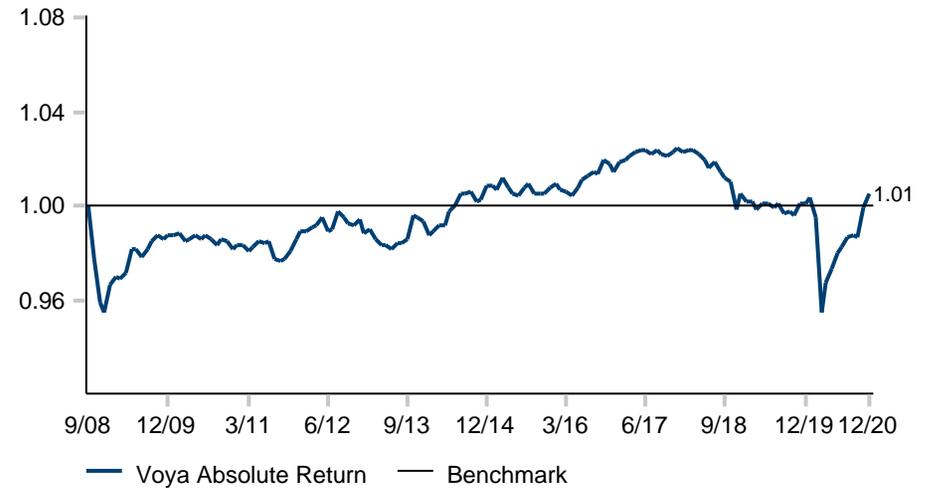
Return Summary



Quarterly Excess Performance

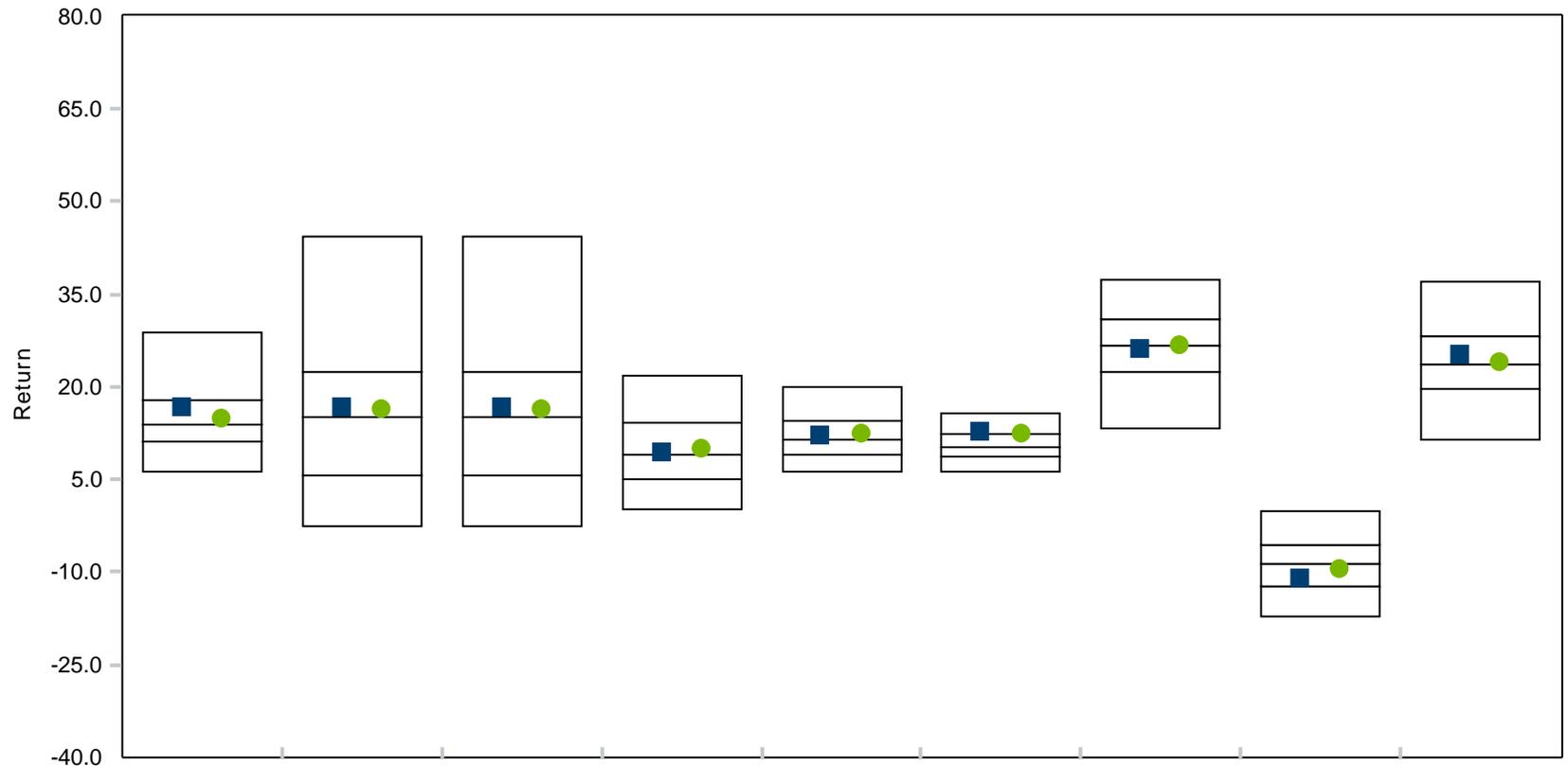


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Global Equity (SA+CF)

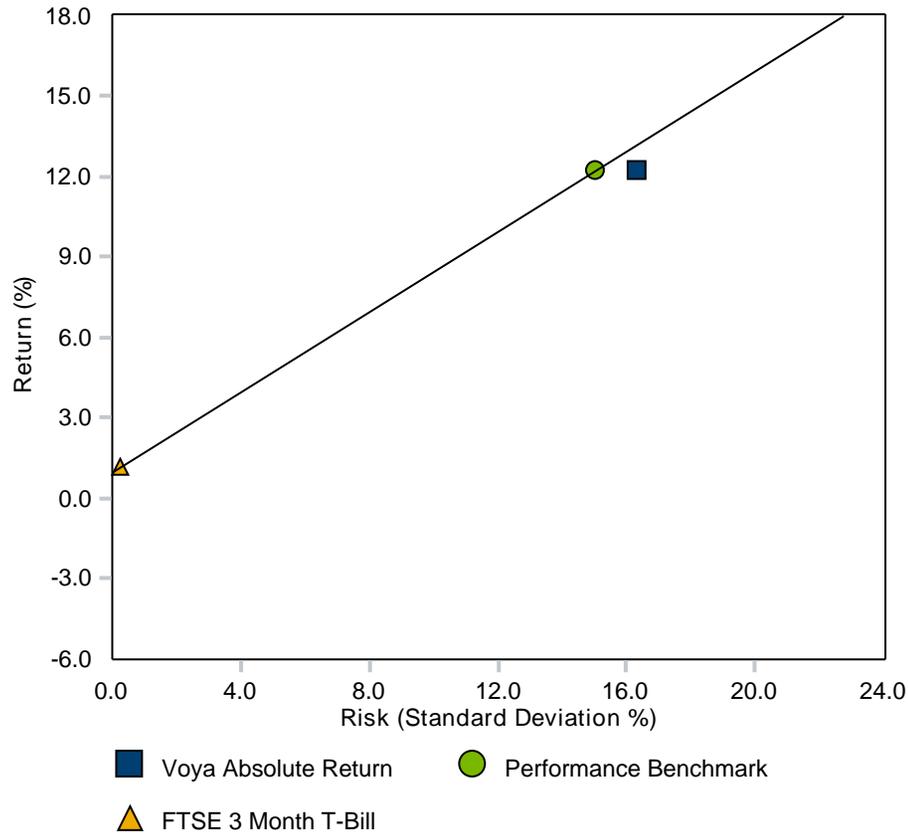


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Voya Absolute Return	16.8 (31)	16.8 (42)	16.8 (42)	9.4 (49)	12.2 (43)	12.7 (24)	26.0 (57)	-11.1 (69)	25.2 (41)
● Performance Benchmark	14.7 (44)	16.3 (45)	16.3 (45)	10.1 (45)	12.3 (43)	12.4 (26)	26.6 (52)	-9.4 (57)	24.0 (49)
5th Percentile	28.8	44.3	44.3	21.7	19.9	15.8	37.3	-0.1	37.2
1st Quartile	17.9	22.4	22.4	14.1	14.6	12.5	31.0	-5.6	28.2
Median	14.0	15.1	15.1	9.0	11.6	10.3	26.7	-8.7	23.5
3rd Quartile	11.3	5.7	5.7	5.2	9.1	8.7	22.3	-12.1	19.6
95th Percentile	6.2	-2.6	-2.6	0.2	6.2	6.3	13.3	-17.1	11.3
Population	323	322	322	317	294	182	521	552	572

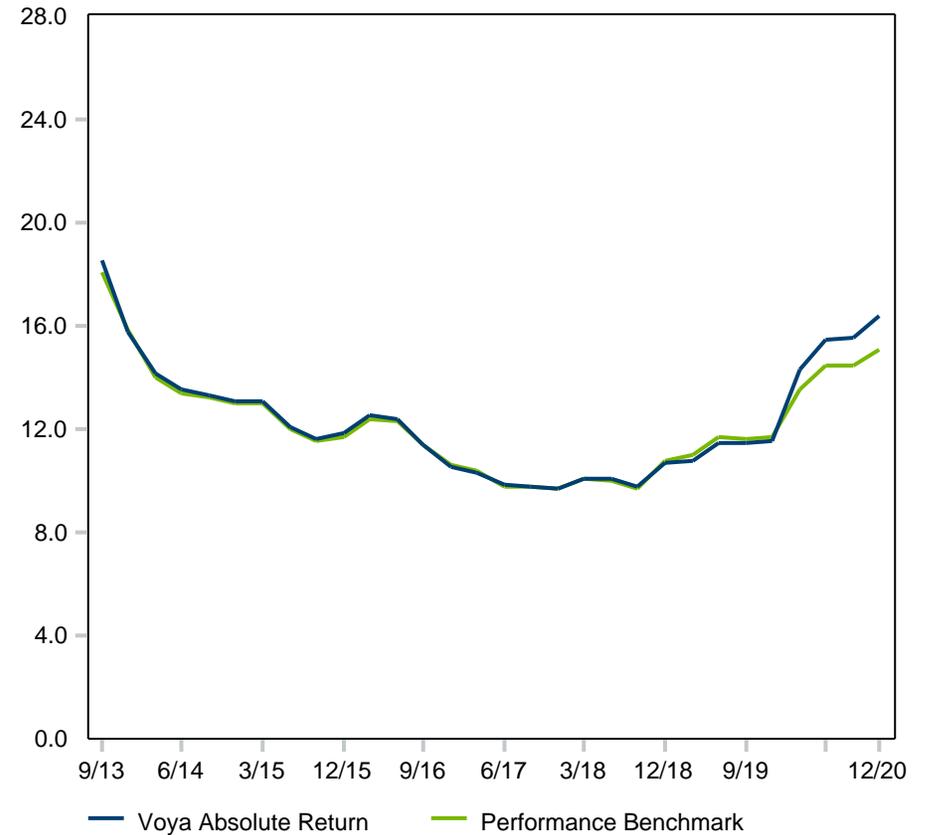
Parentheses contain percentile rankings.

Voya Absolute Return Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

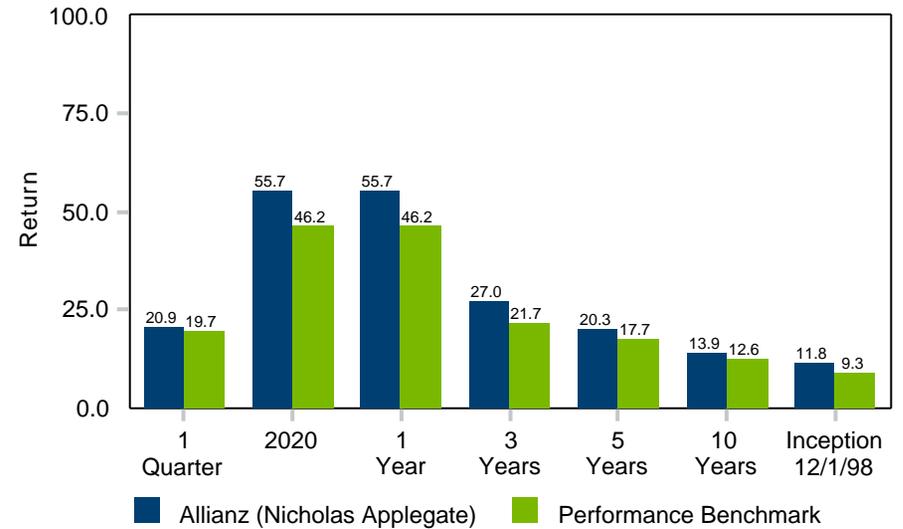
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Voya Absolute Return	0.16	2.15	0.08	0.99	0.72	-0.82	1.08	12.21	16.35	0.99
Performance Benchmark	0.00	0.00	N/A	1.00	0.77	0.00	1.00	12.26	15.08	1.00
FTSE 3 Month T-Bill	-11.59	15.13	-0.77	0.04	N/A	1.20	0.00	1.16	0.24	-0.19

Allianz (Nicholas Applegate) Performance Summary

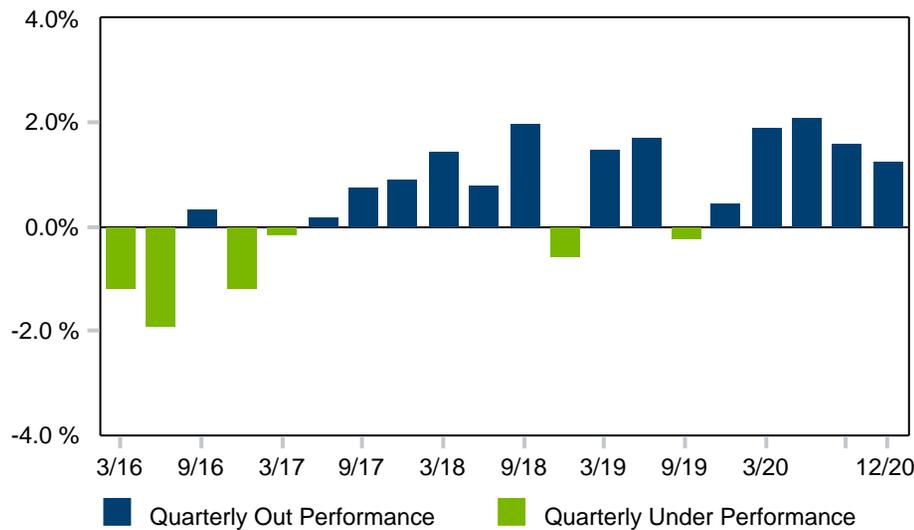
Account Information

Account Name: Allianz (Nicholas Applegate)  
 Inception Date: 11/30/1998  
 Account Structure: Separate Account  
 Asset Class: US Equity  
 Benchmark: Performance Benchmark  
 Peer Group: IM U.S. Equity (SA+CF)

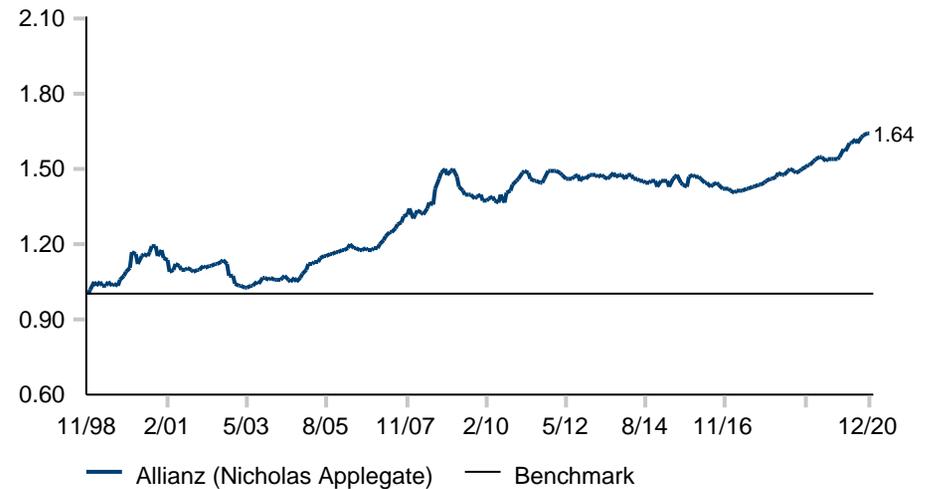
Return Summary



Quarterly Excess Performance

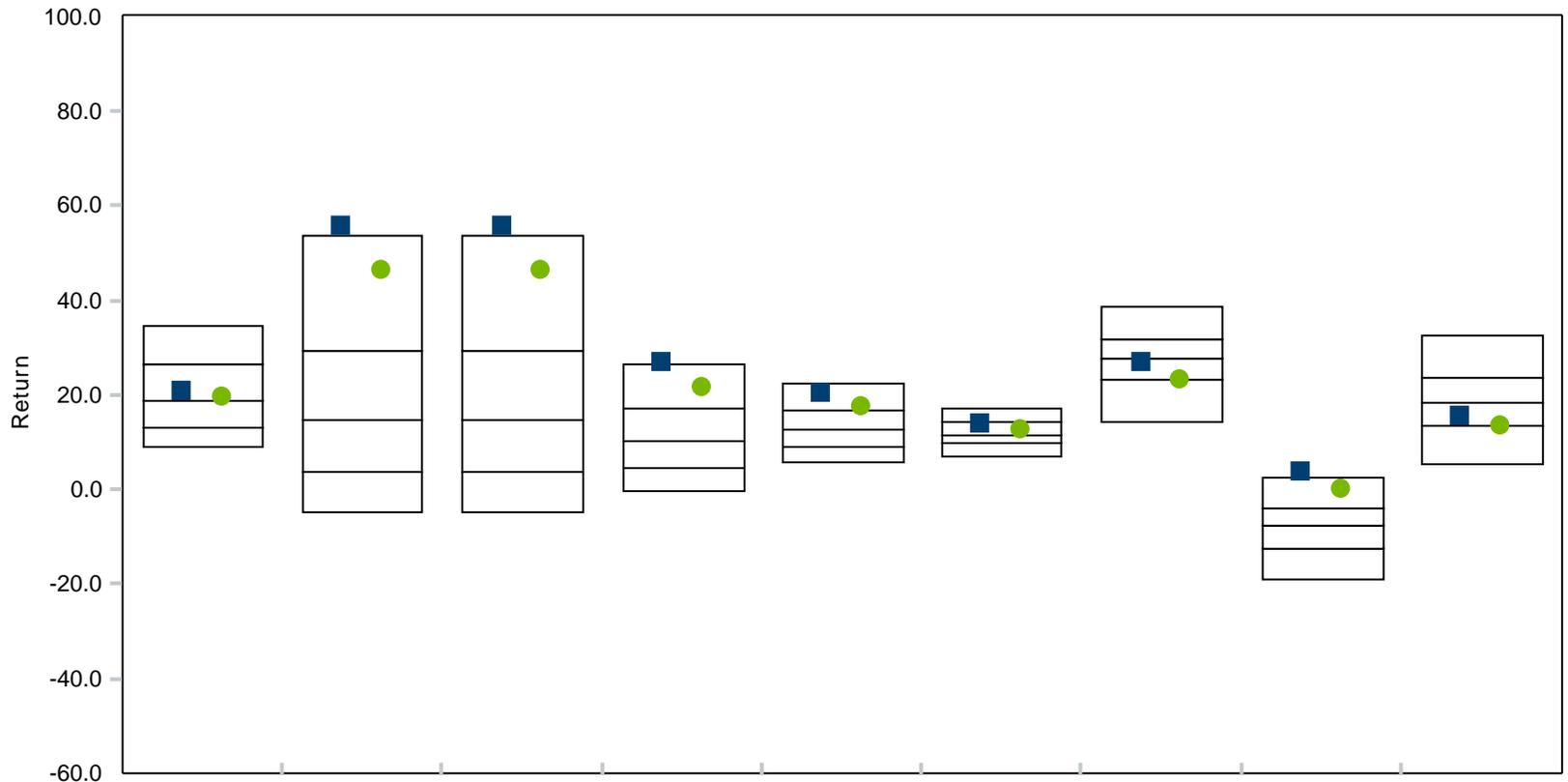


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Equity (SA+CF)

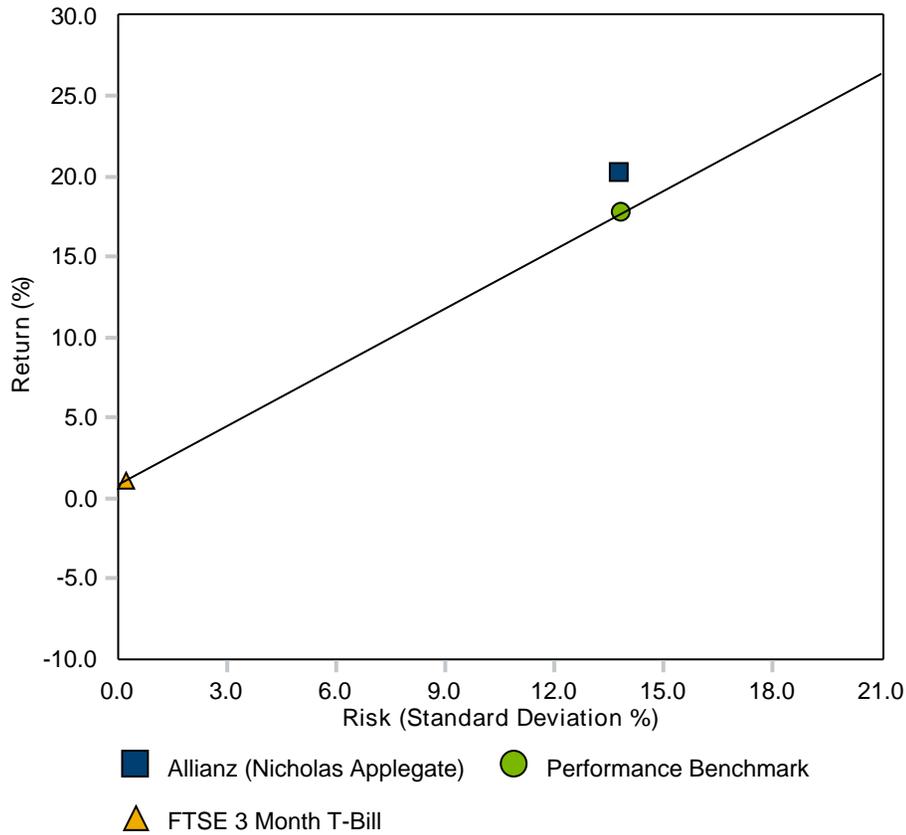


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Allianz (Nicholas Applegate)	20.9 (44)	55.7 (5)	55.7 (5)	27.0 (5)	20.3 (11)	13.9 (28)	27.0 (56)	3.7 (5)	15.6 (65)
● Performance Benchmark	19.7 (48)	46.2 (8)	46.2 (8)	21.7 (15)	17.7 (21)	12.6 (41)	23.1 (77)	0.2 (11)	13.7 (75)
5th Percentile	34.7	53.9	53.9	26.6	22.3	17.1	38.8	2.7	32.5
1st Quartile	26.7	29.3	29.3	17.3	16.9	14.1	31.8	-3.8	23.7
Median	18.9	14.6	14.6	10.1	12.6	11.5	27.9	-7.8	18.5
3rd Quartile	12.9	3.9	3.9	4.7	9.2	9.7	23.4	-12.6	13.7
95th Percentile	8.9	-4.7	-4.7	-0.2	5.7	6.9	14.2	-18.9	5.5
Population	1,249	1,242	1,242	1,184	1,092	915	1,787	1,883	1,952

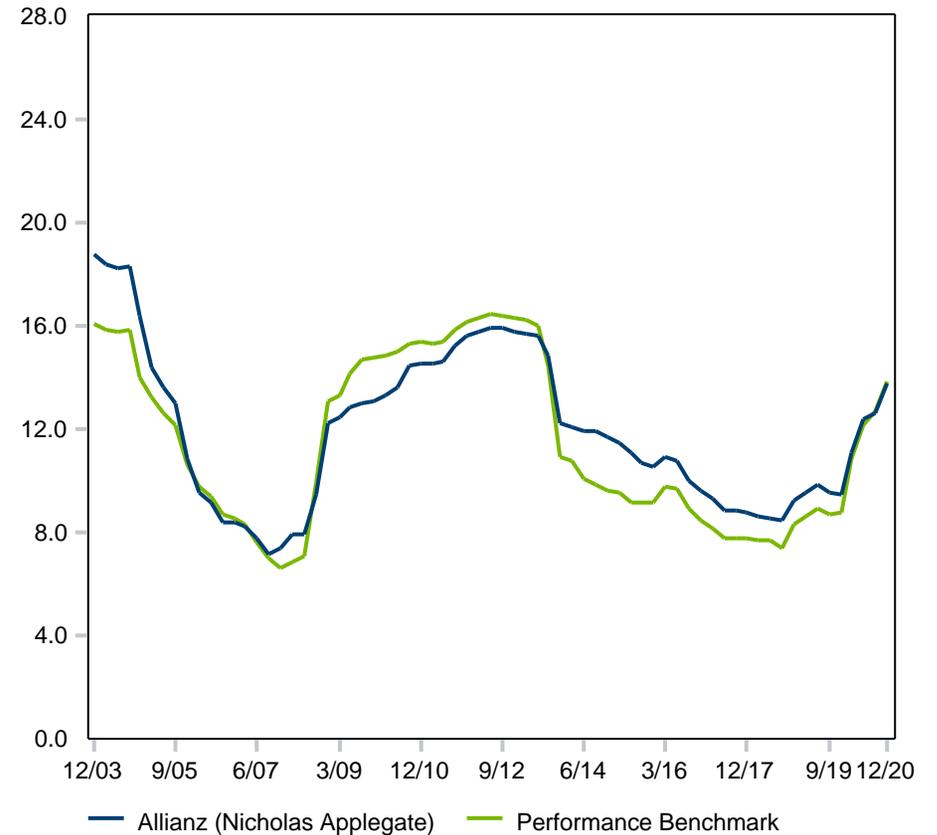
Parenteses contain percentile rankings.

Allianz (Nicholas Applegate) Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

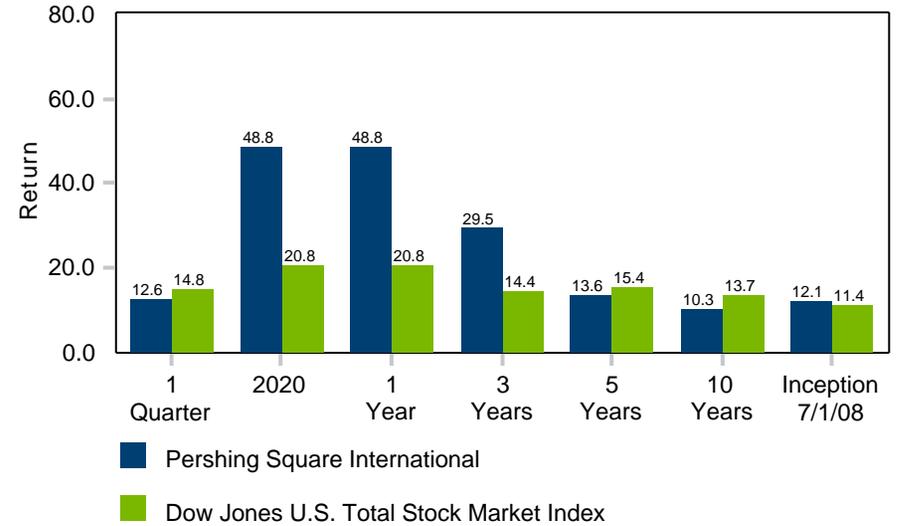
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Allianz (Nicholas Applegate)	2.15	2.19	0.98	0.98	1.33	2.45	0.98	20.29	13.80	0.99
Performance Benchmark	0.00	0.00	N/A	1.00	1.17	0.00	1.00	17.75	13.84	1.00
FTSE 3 Month T-Bill	-16.24	13.90	-1.17	0.05	N/A	1.23	0.00	1.16	0.24	-0.23

## Pershing Square International Performance Summary

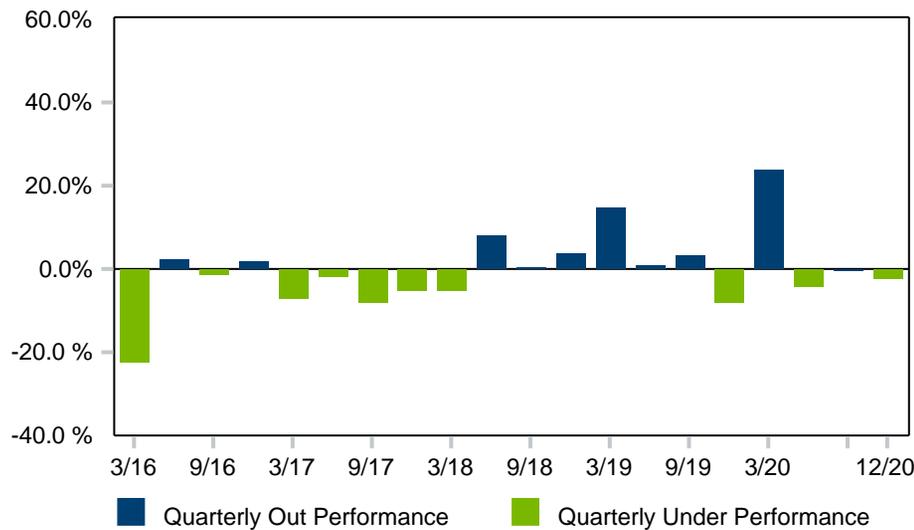
### Account Information

Account Name: Pershing Square International  
 Inception Date: 06/30/2008  
 Account Structure: Commingled Fund  
 Asset Class: US Equity  
 Benchmark: Dow Jones U.S. Total Stock Market Index  
 Peer Group: IM U.S. Equity (SA+CF)

### Return Summary



### Quarterly Excess Performance

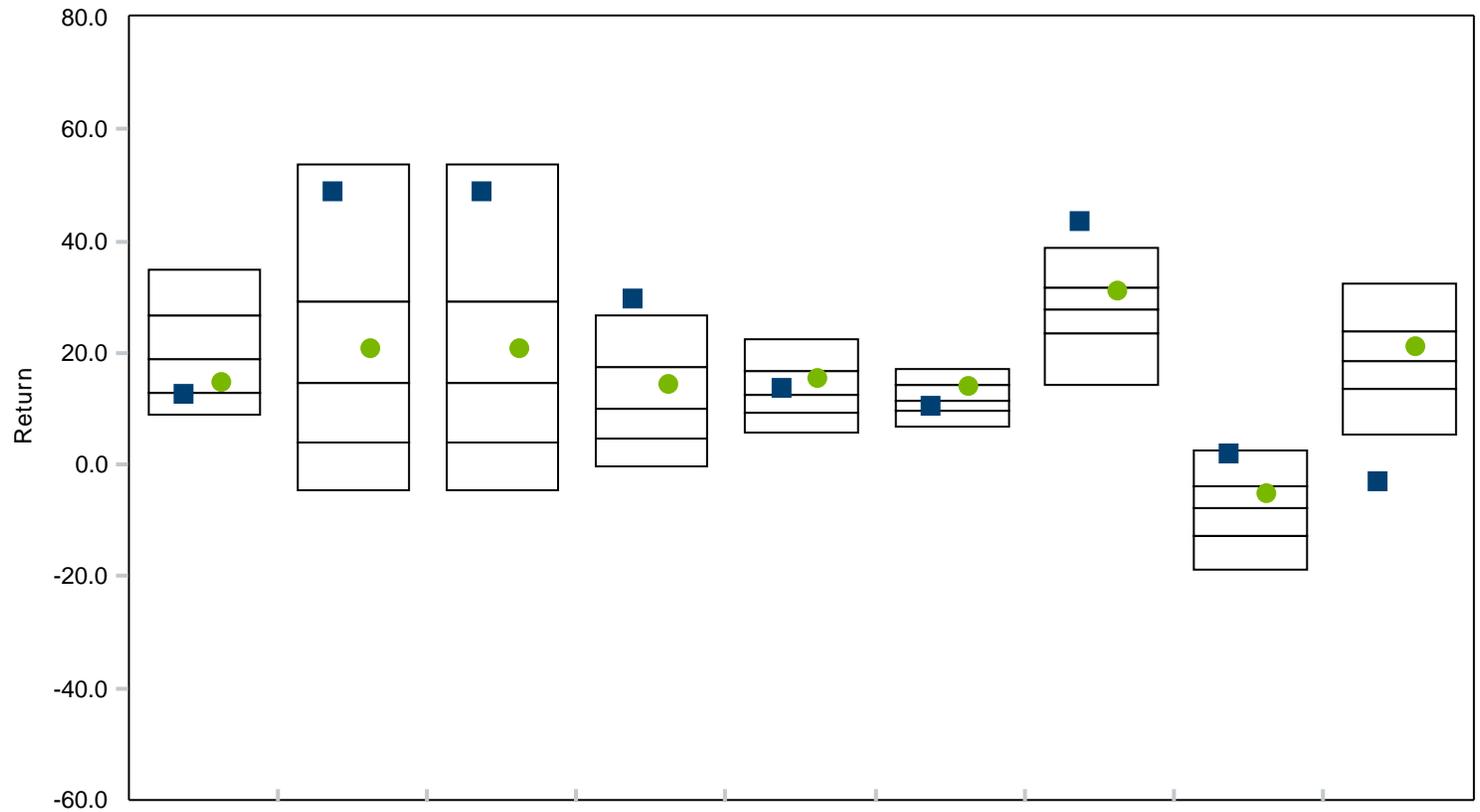


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Equity (SA+CF)

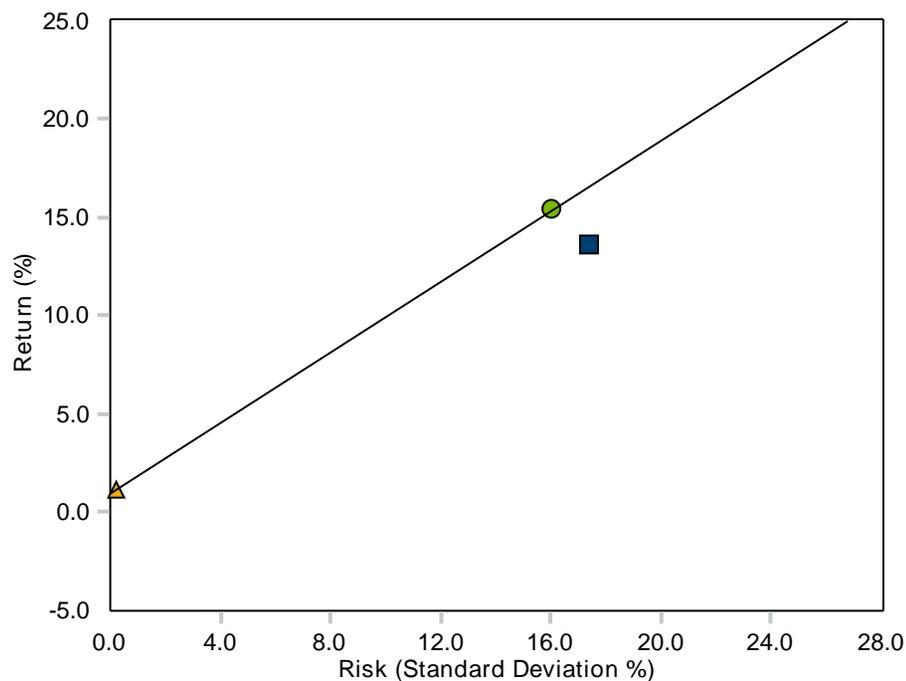


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Pershing Square International	12.6 (77)	48.8 (7)	48.8 (7)	29.5 (4)	13.6 (44)	10.3 (67)	43.5 (2)	1.8 (7)	-3.2 (99)
● Dow Jones U.S. Total Stock Market Index	14.8 (67)	20.8 (36)	20.8 (36)	14.4 (34)	15.4 (32)	13.7 (29)	30.9 (31)	-5.3 (35)	21.2 (38)
5th Percentile	34.7	53.9	53.9	26.6	22.3	17.1	38.8	2.7	32.5
1st Quartile	26.7	29.3	29.3	17.3	16.9	14.1	31.8	-3.8	23.7
Median	18.9	14.6	14.6	10.1	12.6	11.5	27.9	-7.8	18.5
3rd Quartile	12.9	3.9	3.9	4.7	9.2	9.7	23.4	-12.6	13.7
95th Percentile	8.9	-4.7	-4.7	-0.2	5.7	6.9	14.2	-18.9	5.5
Population	1,249	1,242	1,242	1,184	1,092	915	1,787	1,883	1,952

Parenteses contain percentile rankings.

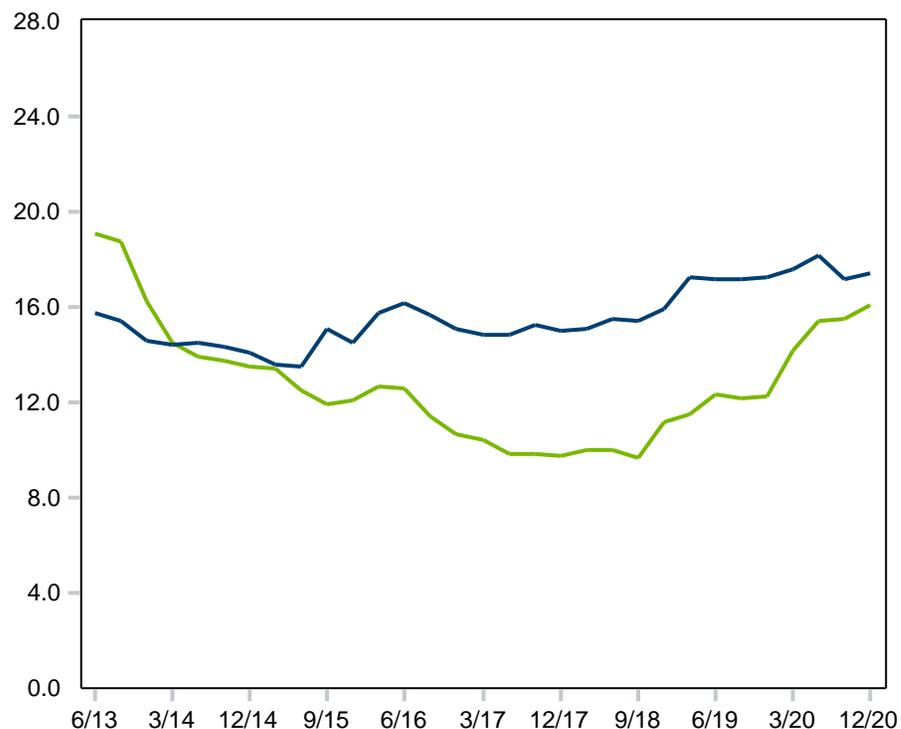
Pershing Square International Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



- Pershing Square International
- Dow Jones U.S. Total Stock Market Index
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Pershing Square International
- Dow Jones U.S. Total Stock Market Index

5 Years Historical Statistics

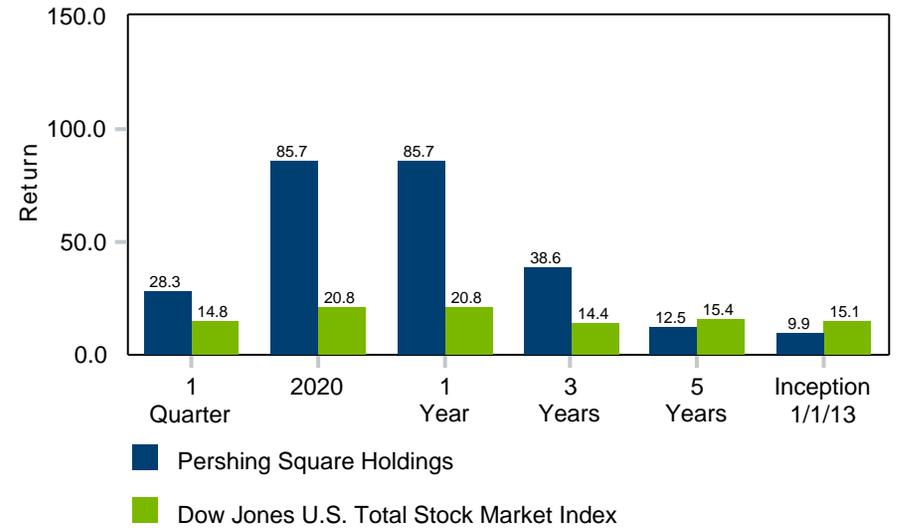
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Pershing Square International	-1.38	16.17	-0.09	0.29	0.76	5.33	0.58	13.58	17.38	0.53
Dow Jones U.S. Total Stock Market Index	0.00	0.00	N/A	1.00	0.90	0.00	1.00	15.36	16.05	1.00
FTSE 3 Month T-Bill	-14.50	16.09	-0.90	0.03	N/A	1.20	0.00	1.16	0.24	-0.16

Pershing Square Holdings Performance Summary

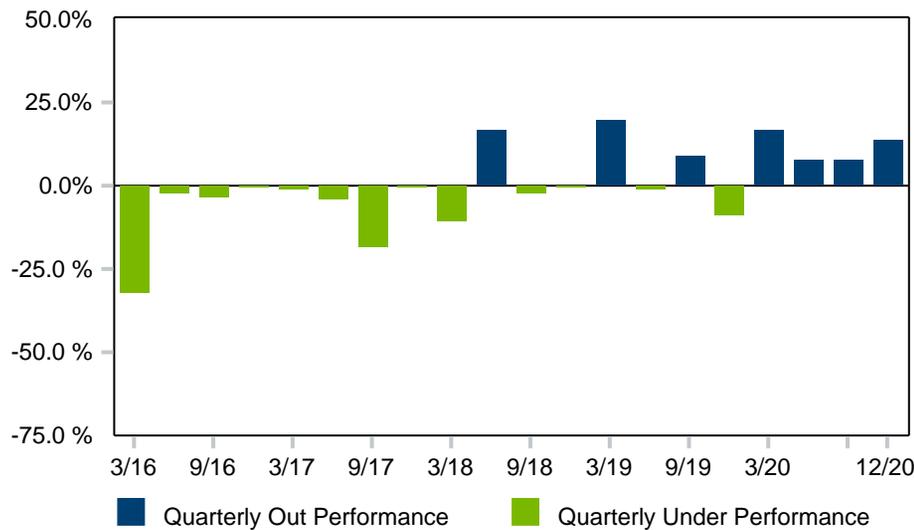
Account Information

Account Name: Pershing Square Holdings  
 Inception Date: 12/31/2012  
 Account Structure: Commingled Fund  
 Asset Class: US Equity  
 Benchmark: Dow Jones U.S. Total Stock Market Index  
 Peer Group: IM U.S. Equity (SA+CF)

Return Summary



Quarterly Excess Performance

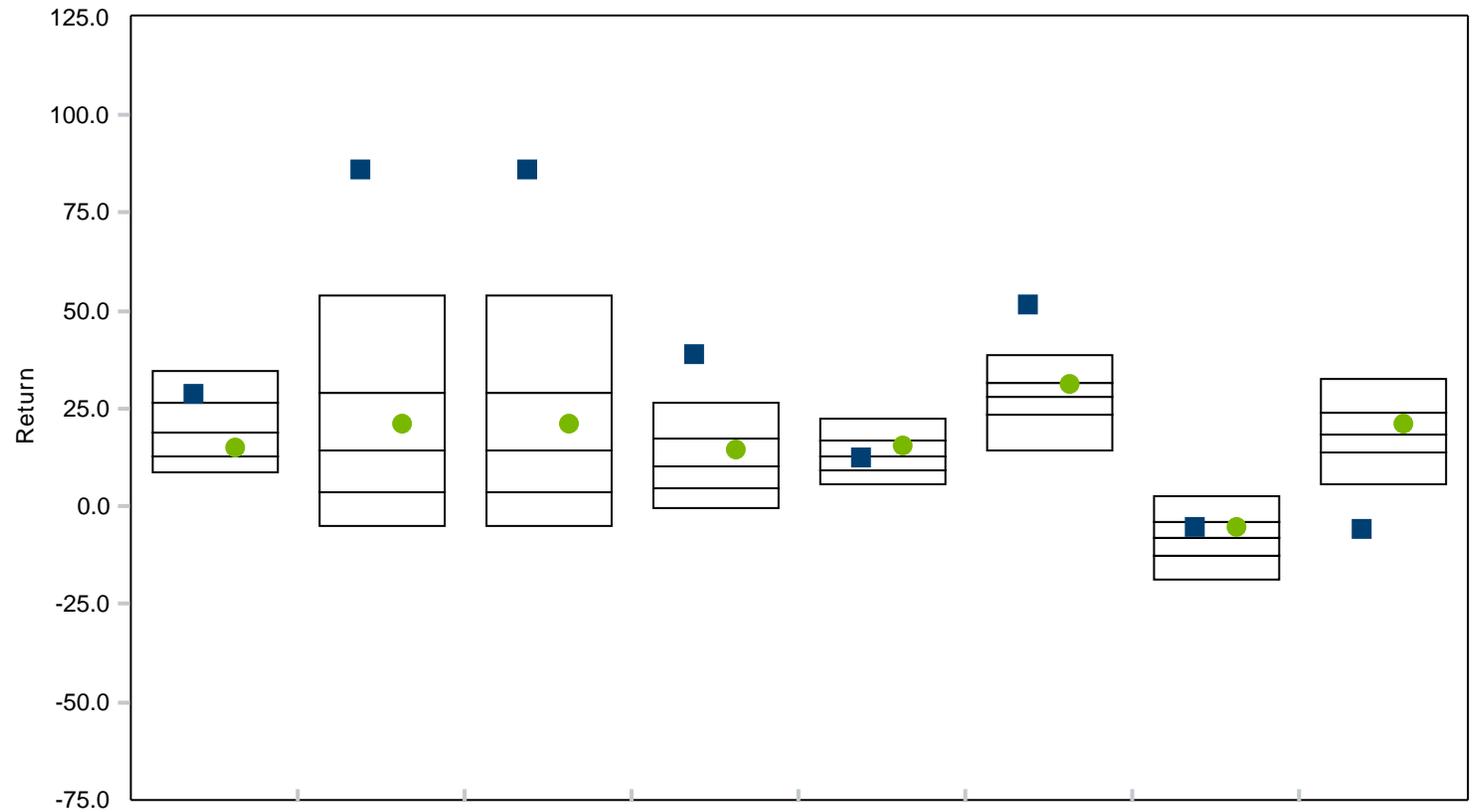


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Equity (SA+CF)

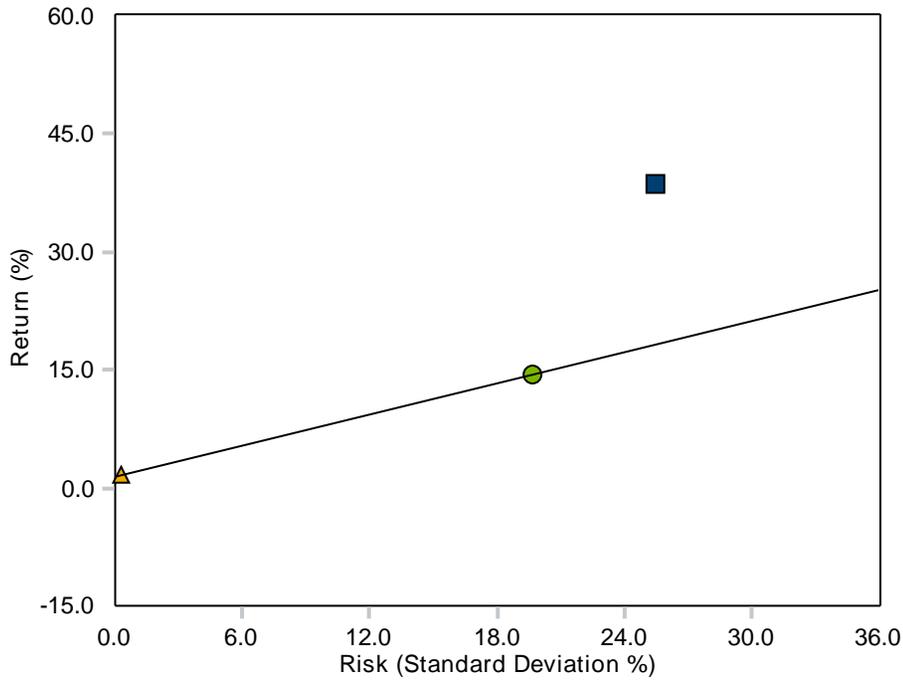


	1 Quarter	2020	1 Year	3 Years	5 Years	2019	2018	2017
■ Pershing Square Holdings	28.3 (19)	85.7 (1)	85.7 (1)	38.6 (1)	12.5 (51)	51.3 (1)	-5.3 (35)	-6.0 (100)
● Dow Jones U.S. Total Stock Market Index	14.8 (67)	20.8 (36)	20.8 (36)	14.4 (34)	15.4 (32)	30.9 (31)	-5.3 (35)	21.2 (38)
5th Percentile	34.7	53.9	53.9	26.6	22.3	38.8	2.7	32.5
1st Quartile	26.7	29.3	29.3	17.3	16.9	31.8	-3.8	23.7
Median	18.9	14.6	14.6	10.1	12.6	27.9	-7.8	18.5
3rd Quartile	12.9	3.9	3.9	4.7	9.2	23.4	-12.6	13.7
95th Percentile	8.9	-4.7	-4.7	-0.2	5.7	14.2	-18.9	5.5
Population	1,249	1,242	1,242	1,184	1,092	1,787	1,883	1,952

Parenteses contain percentile rankings.

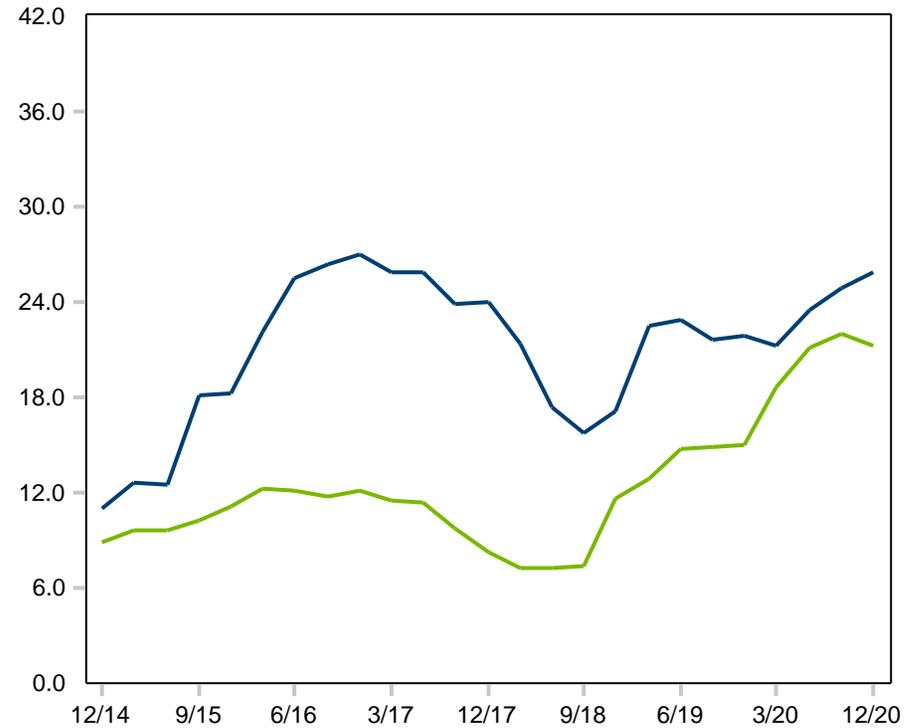
Pershing Square Holdings Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



- Pershing Square Holdings
- Dow Jones U.S. Total Stock Market Index
- ▲ FTSE 3 Month T-Bill

Rolling 2 Years Standard Deviation



- Pershing Square Holdings
- Dow Jones U.S. Total Stock Market Index

3 Years Historical Statistics

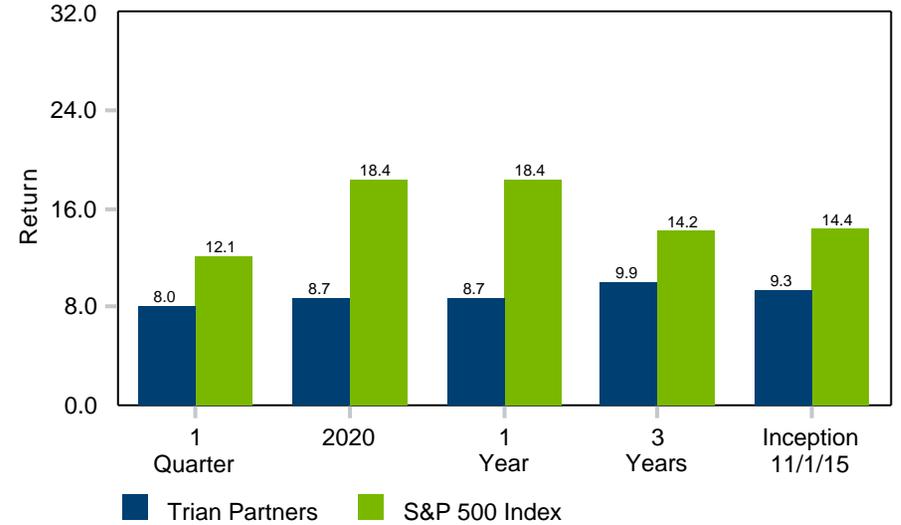
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Pershing Square Holdings	20.66	16.84	1.23	0.57	1.35	23.20	0.97	38.55	25.55	0.75
Dow Jones U.S. Total Stock Market Index	0.00	0.00	N/A	1.00	0.70	0.00	1.00	14.41	19.72	1.00
FTSE 3 Month T-Bill	-13.89	19.78	-0.70	0.06	N/A	1.61	0.00	1.56	0.24	-0.24

## Trian Partners Performance Summary

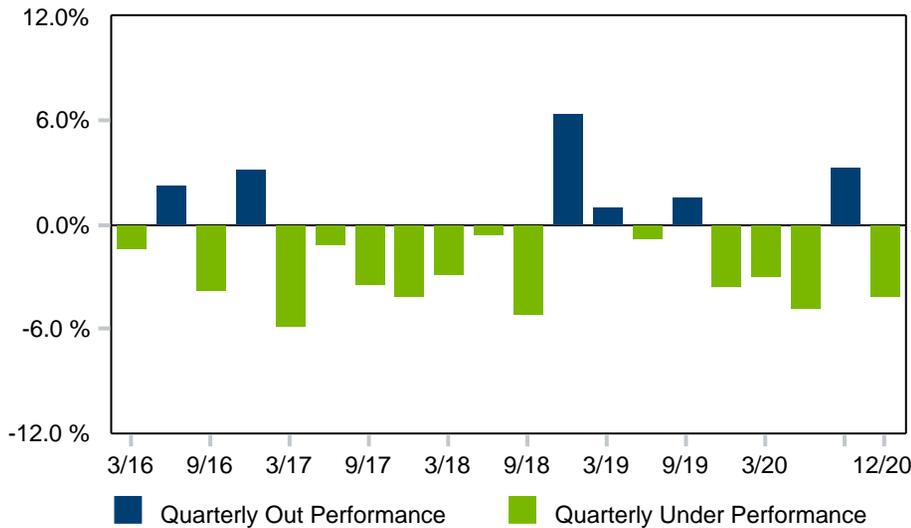
### Account Information

Account Name: Trian Partners  
 Inception Date: 11/01/2015  
 Account Structure: Commingled Fund  
 Asset Class: US Equity  
 Benchmark: S&P 500 Index  
 Peer Group:

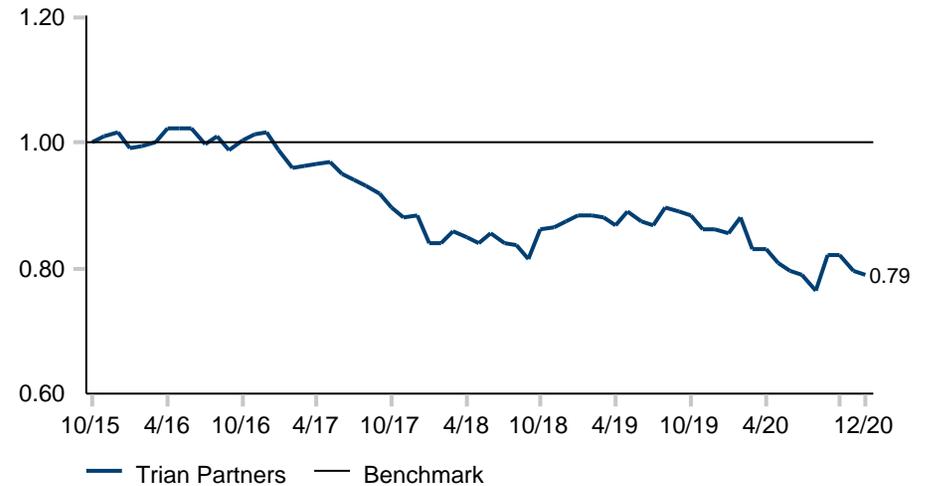
### Return Summary



### Quarterly Excess Performance



### Ratio of Cumulative Wealth - Since Inception

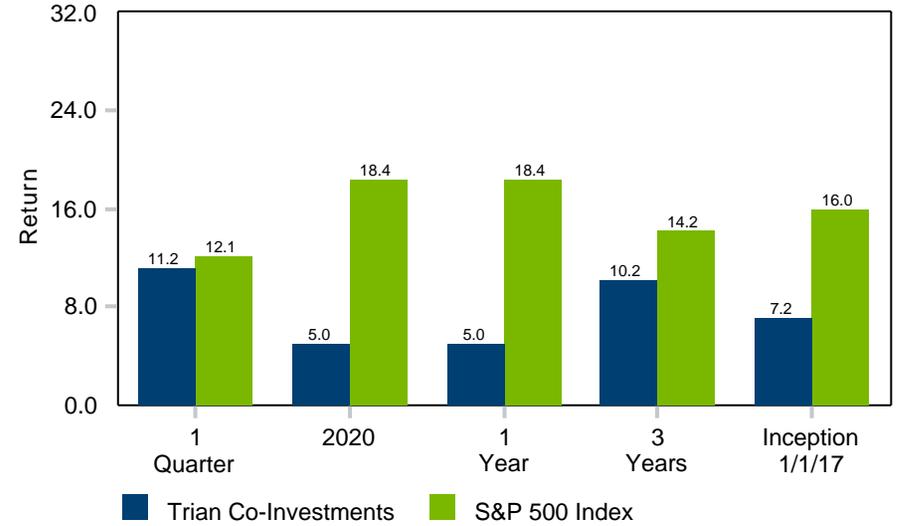


## Trian Co-Investments Performance Summary

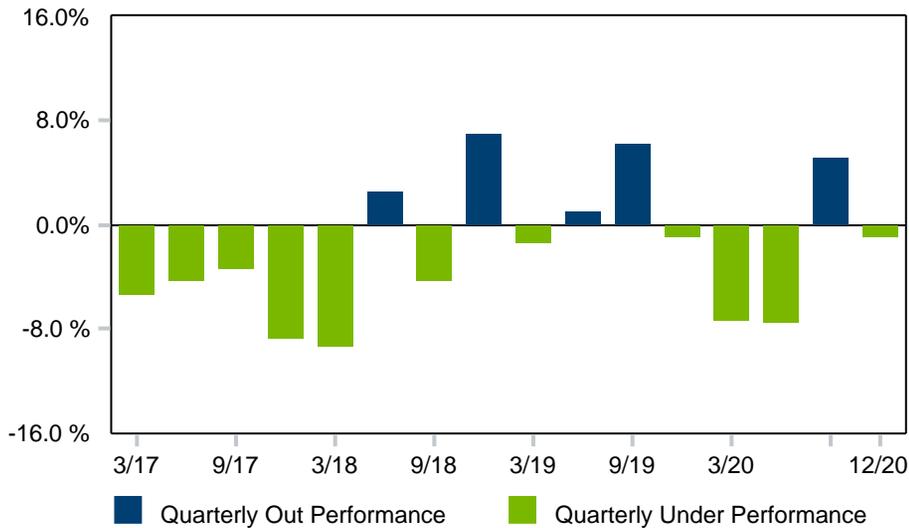
### Account Information

Account Name: Trian Co-Investments  
 Inception Date: 01/01/2017  
 Account Structure: Commingled Fund  
 Asset Class: US Equity  
 Benchmark: S&P 500 Index  
 Peer Group:

### Return Summary



### Quarterly Excess Performance



### Ratio of Cumulative Wealth - Since Inception

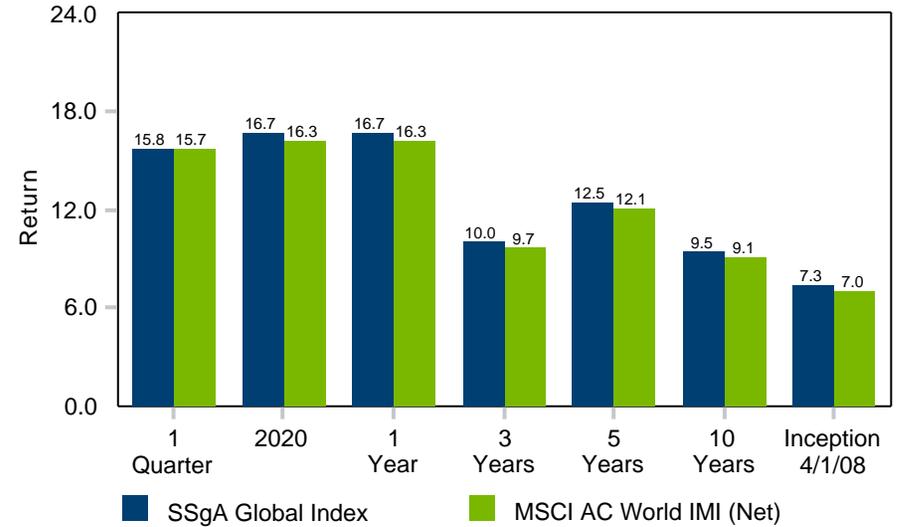


## SSgA Global Index Performance Summary

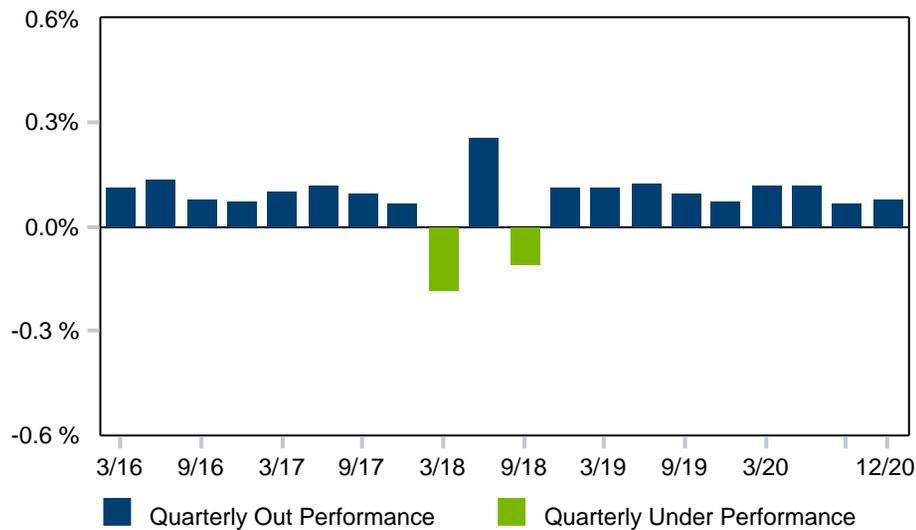
### Account Information

Account Name: SSgA Global Index  
 Inception Date: 03/31/2008  
 Account Structure: Commingled Fund  
 Asset Class: Global Equity  
 Benchmark: MSCI AC World IMI (Net)  
 Peer Group: IM Global Equity (SA+CF)

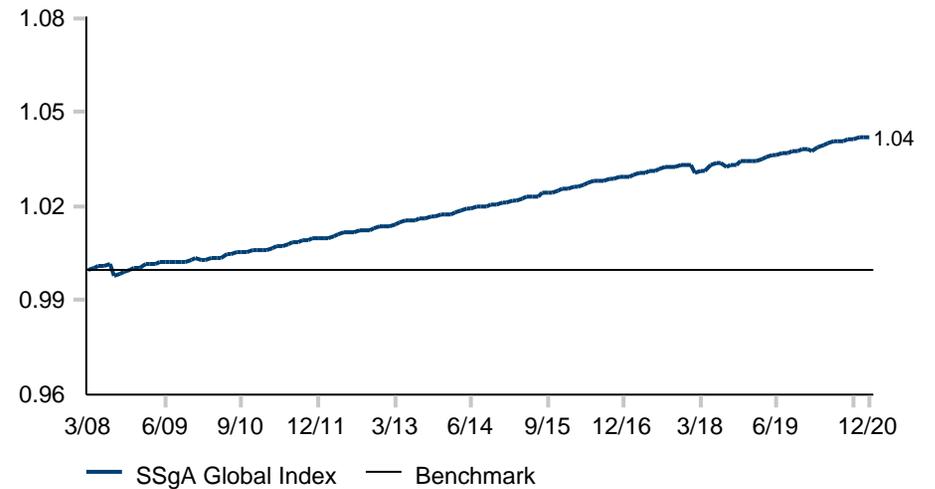
### Return Summary



### Quarterly Excess Performance

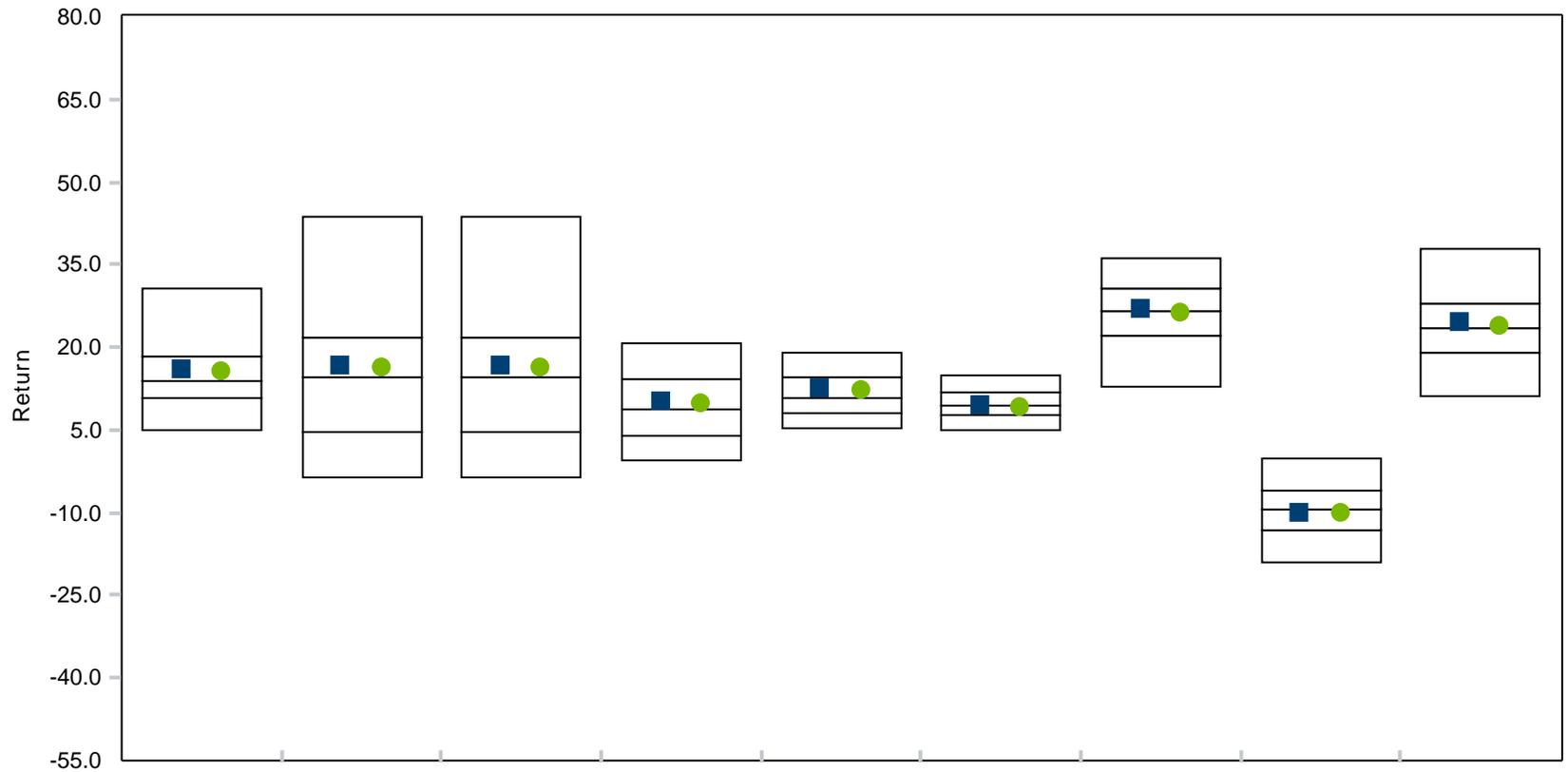


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Global Equity (SA+CF)

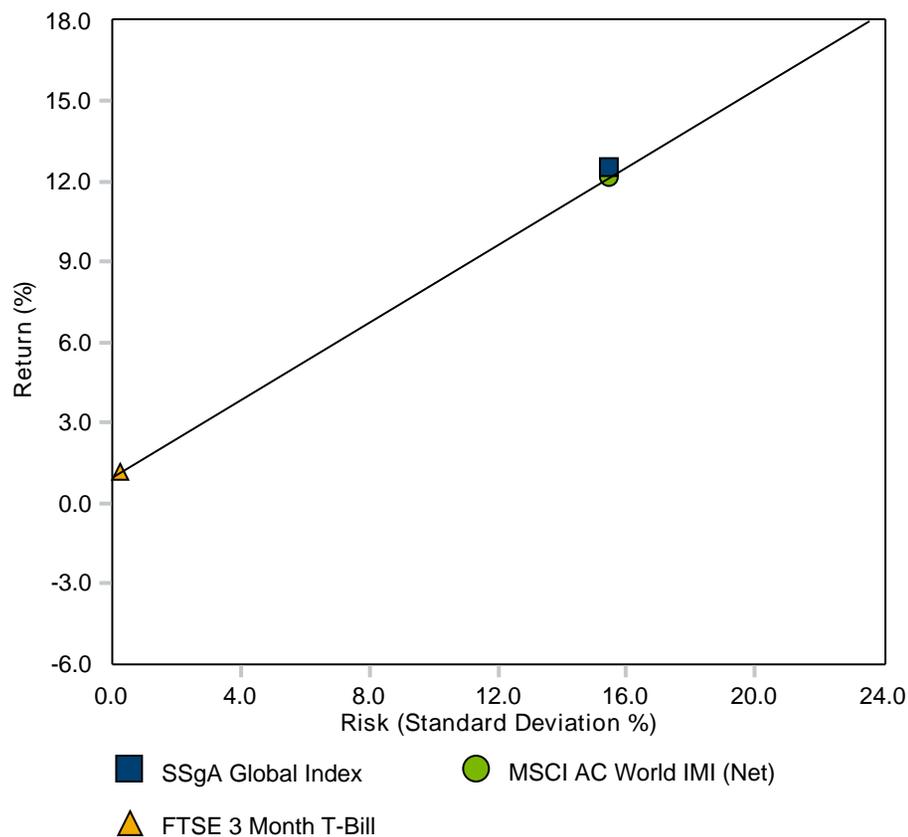


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ SSgA Global Index	15.8 (35)	16.7 (41)	16.7 (41)	10.0 (43)	12.5 (37)	9.5 (50)	26.8 (50)	-10.0 (56)	24.4 (44)
● MSCI AC World IMI (Net)	15.7 (35)	16.3 (43)	16.3 (43)	9.7 (44)	12.1 (40)	9.1 (57)	26.4 (52)	-10.1 (57)	23.9 (47)
5th Percentile	30.6	43.5	43.5	20.7	19.2	14.9	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	11.9	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	9.4	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	7.8	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	4.9	13.0	-19.1	11.0
Population	245	242	242	238	219	127	380	395	403

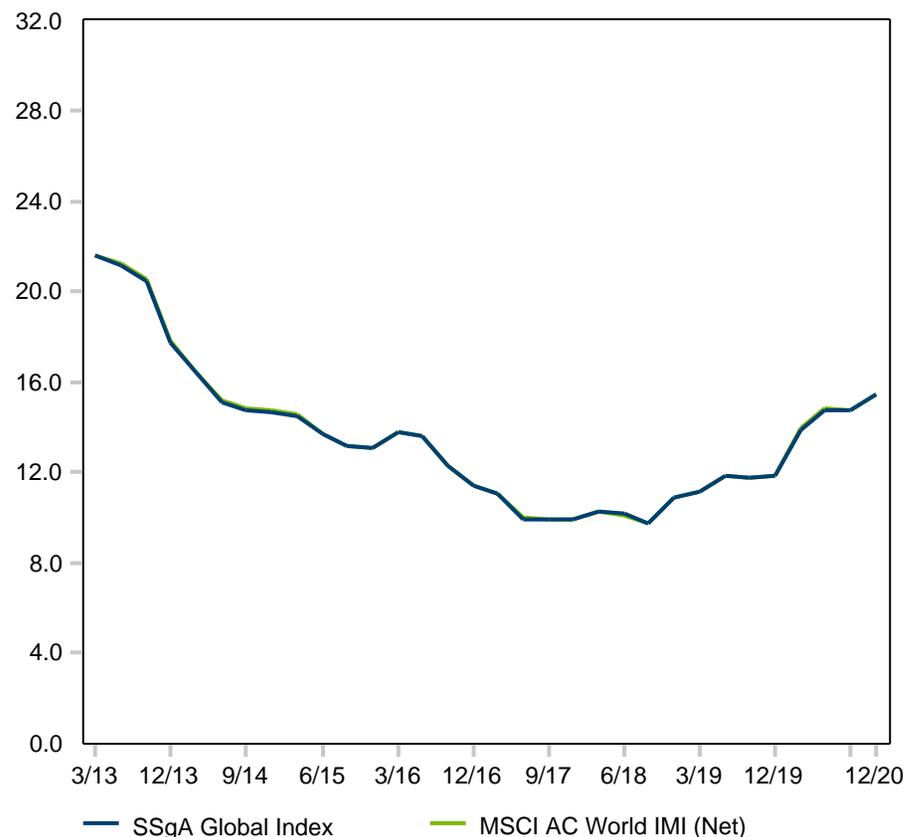
parentheses contain percentile rankings.

SSgA Global Index Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

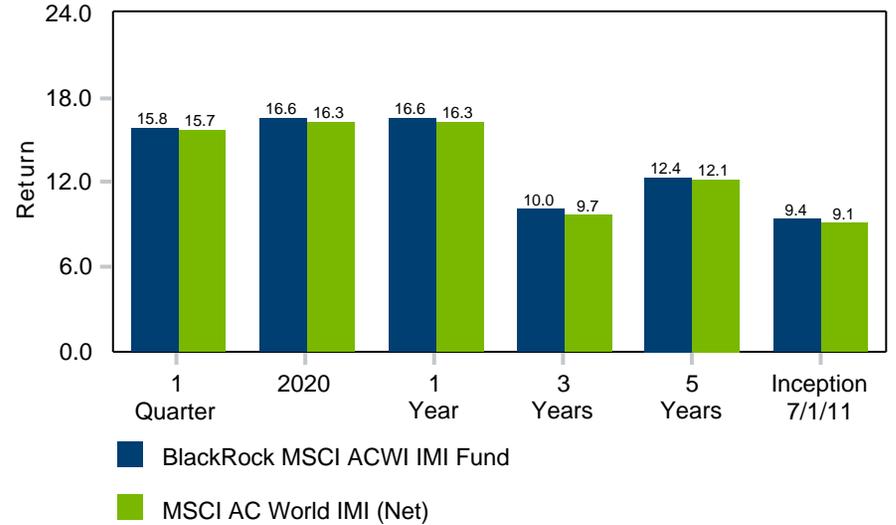
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
SSgA Global Index	0.33	0.18	1.88	1.00	0.77	0.33	1.00	12.51	15.46	1.00
MSCI AC World IMI (Net)	0.00	0.00	N/A	1.00	0.74	0.00	1.00	12.15	15.47	1.00
FTSE 3 Month T-Bill	-11.56	15.52	-0.74	0.04	N/A	1.20	0.00	1.16	0.24	-0.20

**BlackRock MSCI ACWI IMI Fund Performance Summary**

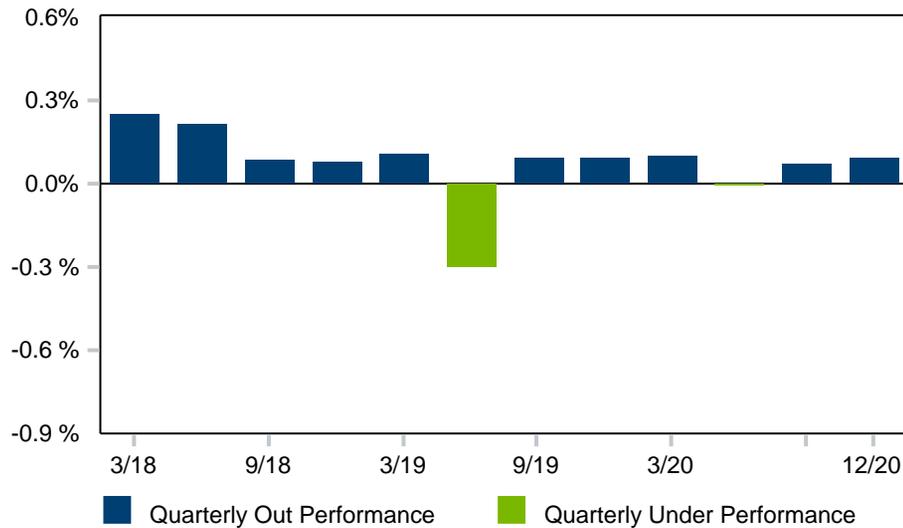
**Account Information**

Account Name: BlackRock MSCI ACWI IMI Fund  
 Inception Date: 06/30/2011  
 Account Structure: Commingled Fund  
 Asset Class: Global Equity  
 Benchmark: MSCI AC World IMI (Net)  
 Peer Group: IM Global Equity (SA+CF)

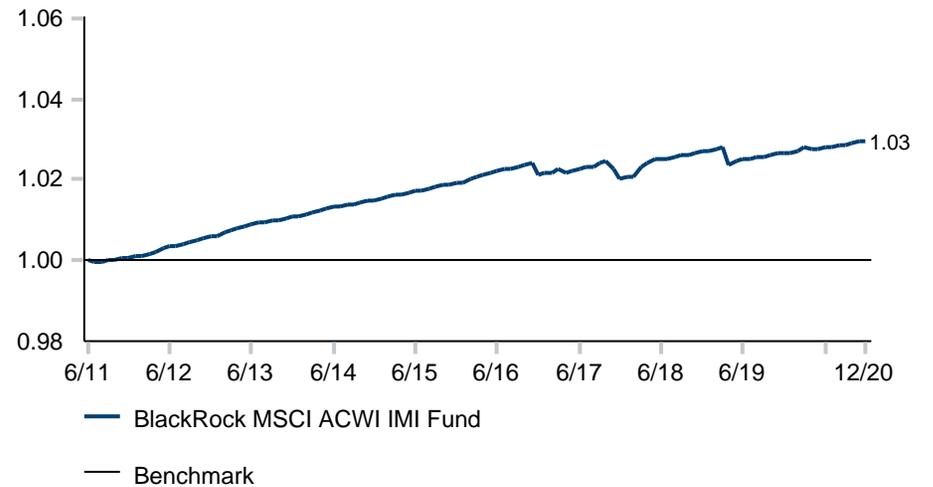
**Return Summary**



**Quarterly Excess Performance**

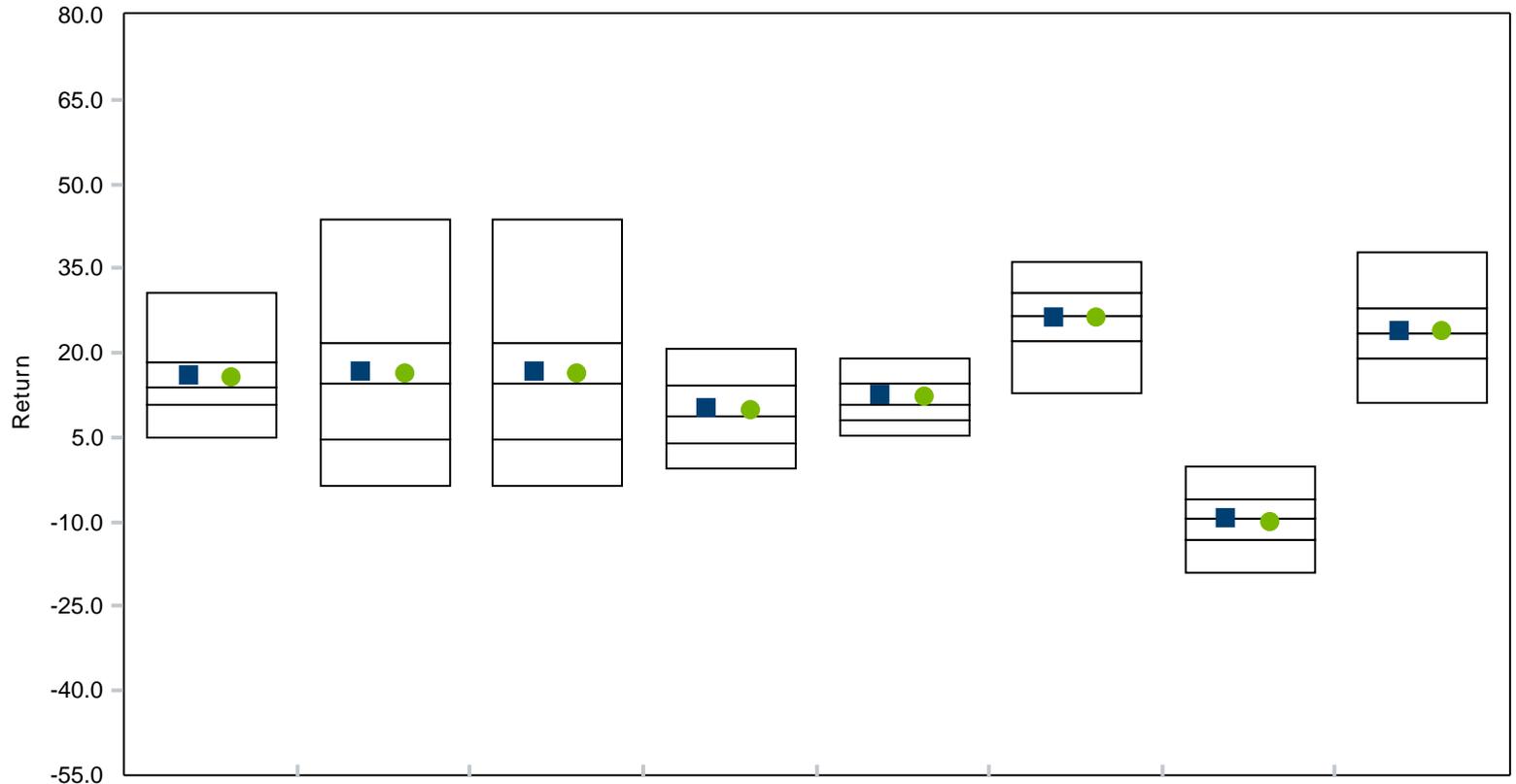


**Ratio of Cumulative Wealth - Since Inception**



Peer Group Analysis

IM Global Equity (SA+CF)

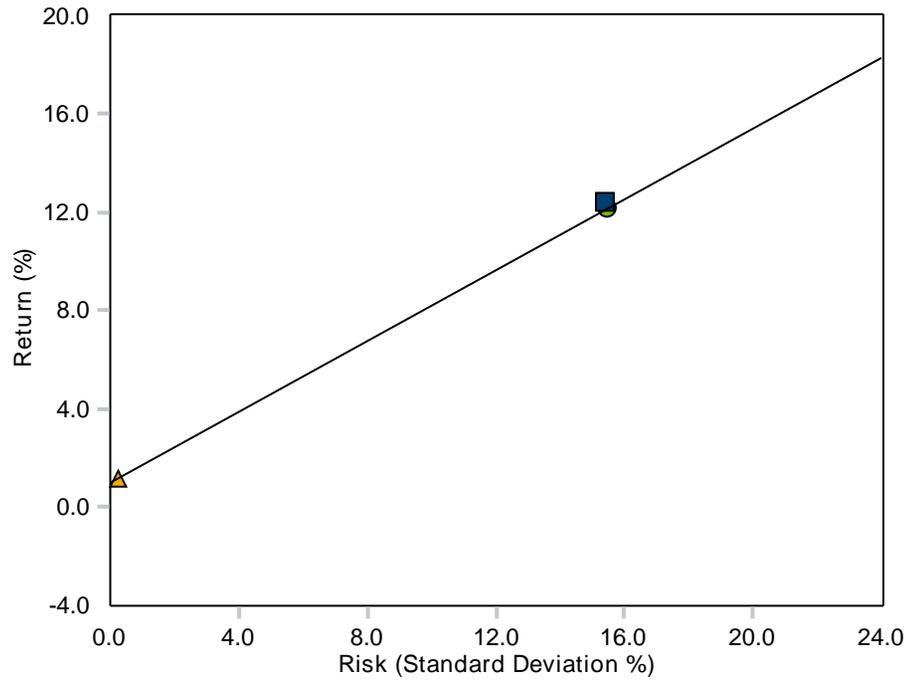


	1 Quarter	2020	1 Year	3 Years	5 Years	2019	2018	2017
■ BlackRock MSCI ACWI IMI Fund	15.8 (35)	16.6 (42)	16.6 (42)	10.0 (43)	12.4 (38)	26.3 (52)	-9.5 (51)	23.8 (48)
● MSCI AC World IMI (Net)	15.7 (35)	16.3 (43)	16.3 (43)	9.7 (44)	12.1 (40)	26.4 (52)	-10.1 (57)	23.9 (47)
5th Percentile	30.6	43.5	43.5	20.7	19.2	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	13.0	-19.1	11.0
Population	245	242	242	238	219	380	395	403

parentheses contain percentile rankings.

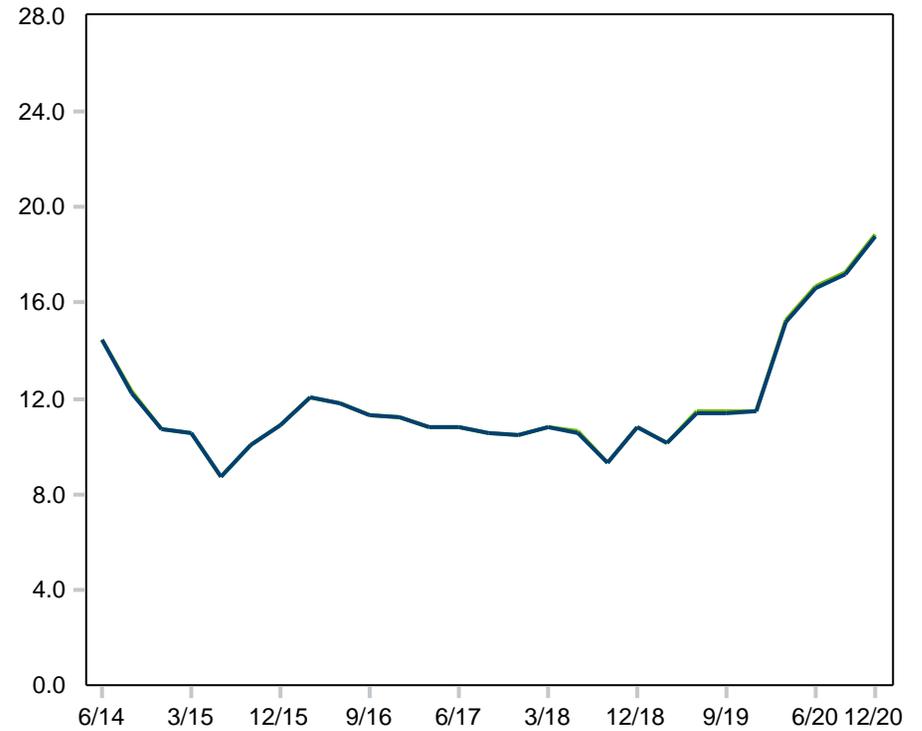
BlackRock MSCI ACWI IMI Fund Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



- BlackRock MSCI ACWI IMI Fund
- MSCI AC World IMI (Net)
- ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation



- BlackRock MSCI ACWI IMI Fund
- MSCI AC World IMI (Net)

5 Years Historical Statistics

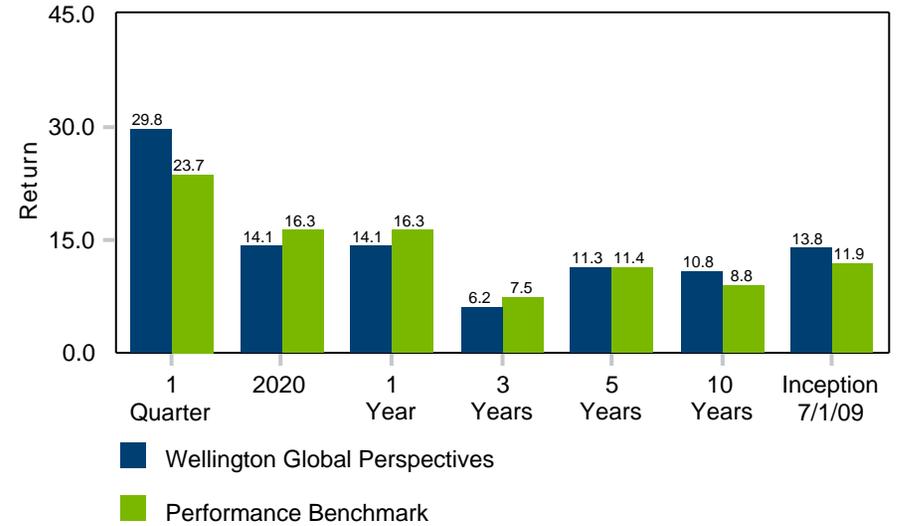
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
BlackRock MSCI ACWI IMI Fund	0.20	0.31	0.62	1.00	0.76	0.23	1.00	12.37	15.42	1.00
MSCI AC World IMI (Net)	0.00	0.00	N/A	1.00	0.74	0.00	1.00	12.15	15.47	1.00
FTSE 3 Month T-Bill	-11.56	15.52	-0.74	0.04	N/A	1.20	0.00	1.16	0.24	-0.20

## Wellington Global Perspectives Performance Summary

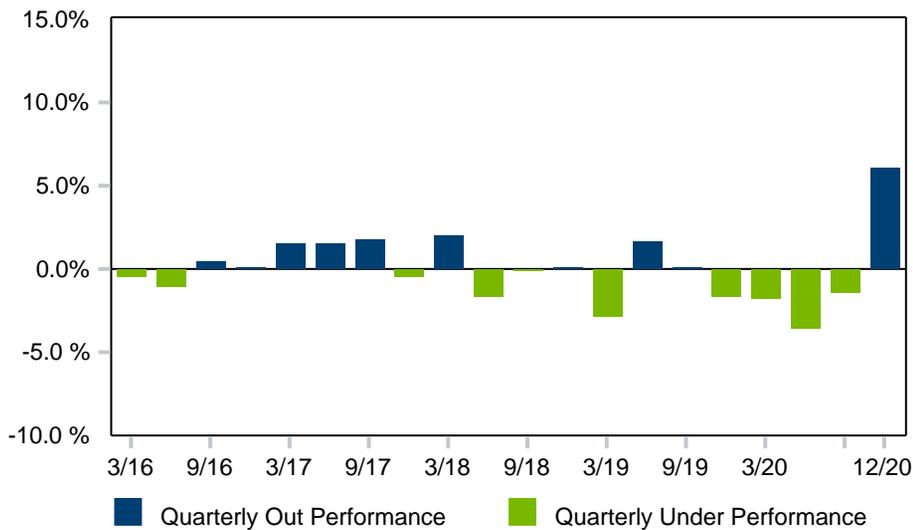
### Account Information

Account Name: Wellington Global Perspectives  
 Inception Date: 06/30/2009  
 Account Structure: Separate Account  
 Asset Class: Global Equity  
 Benchmark: Performance Benchmark  
 Peer Group: IM Global Equity (SA+CF)

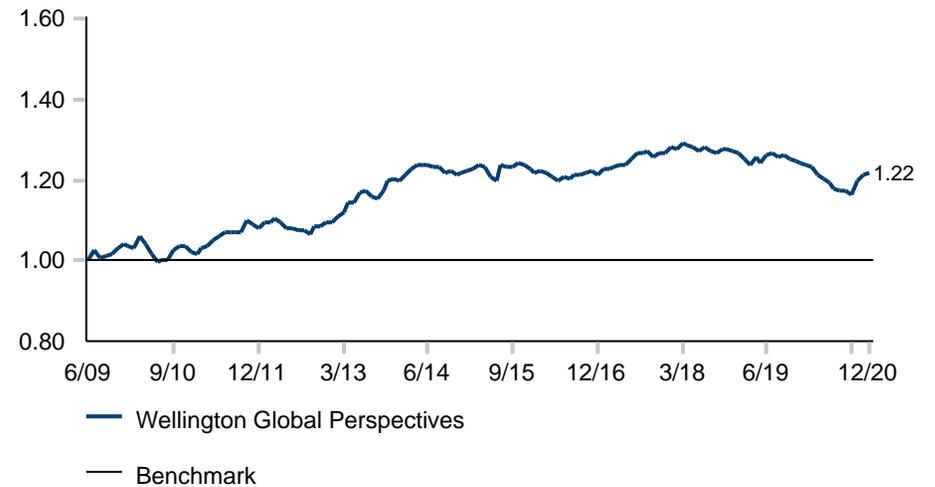
### Return Summary



### Quarterly Excess Performance

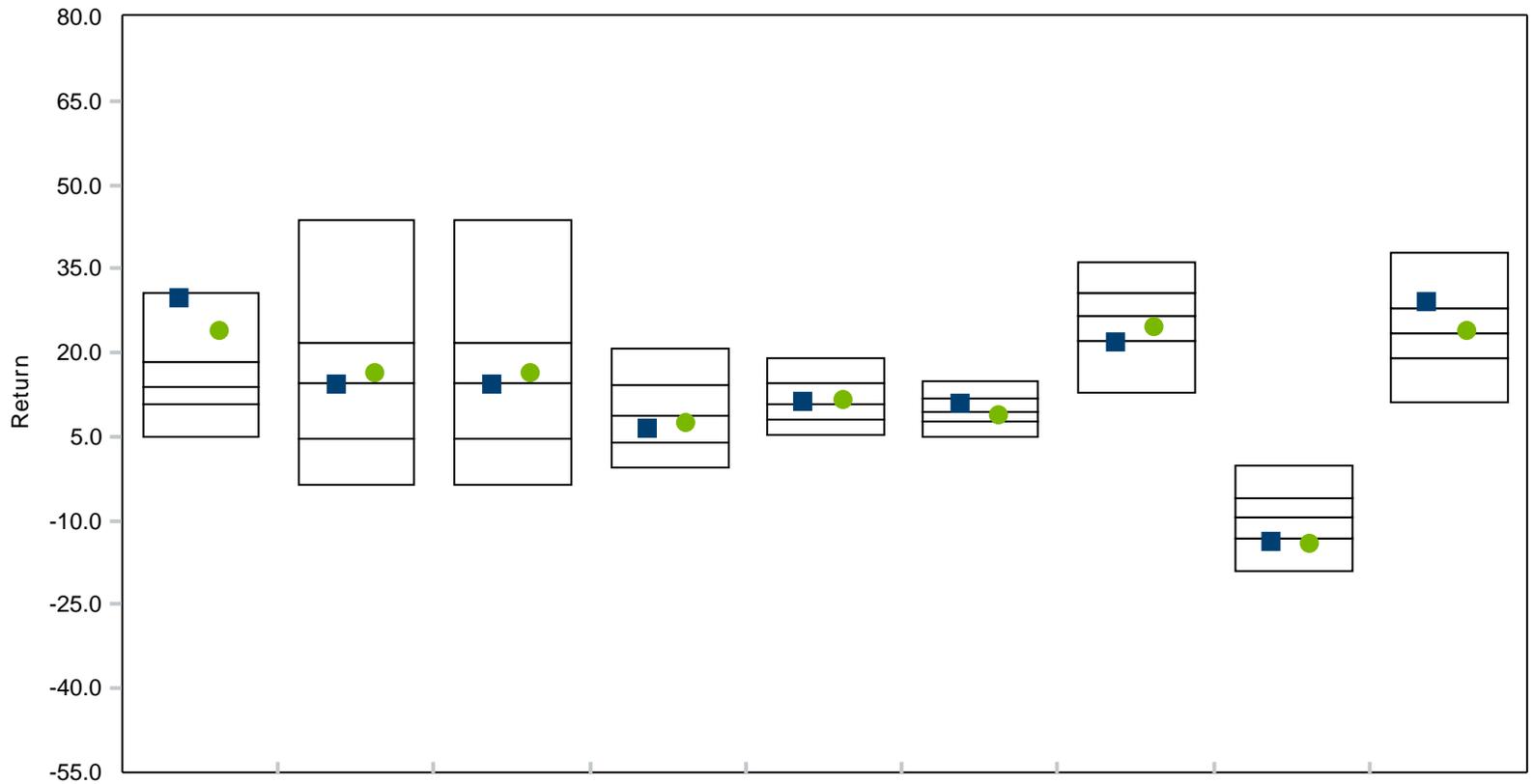


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Global Equity (SA+CF)

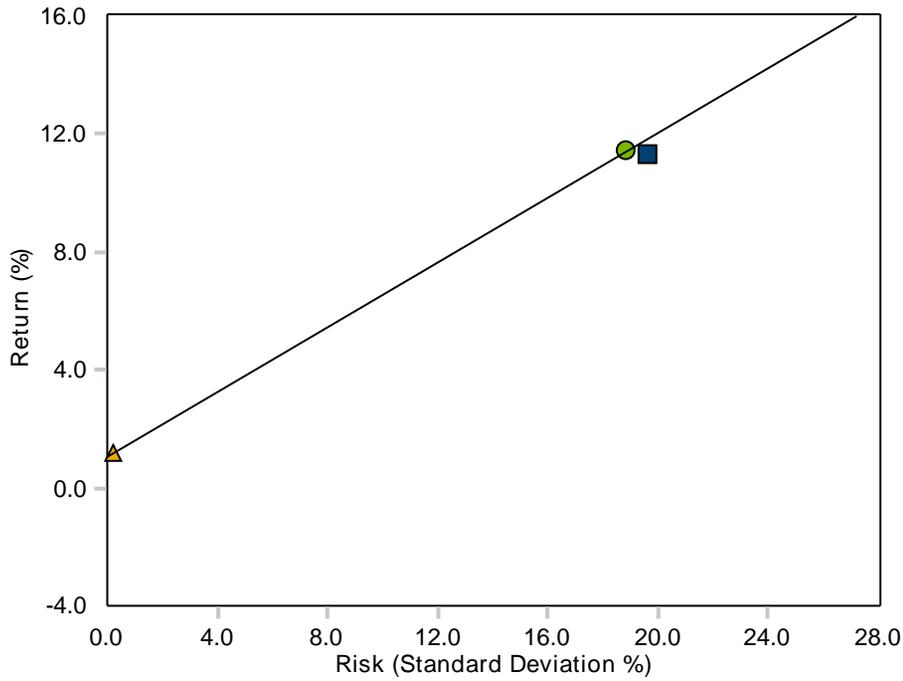


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Wellington Global Perspectives	29.8 (6)	14.1 (51)	14.1 (51)	6.2 (65)	11.3 (46)	10.8 (32)	21.9 (76)	-14.0 (80)	29.0 (23)
● Performance Benchmark	23.7 (12)	16.3 (42)	16.3 (42)	7.5 (58)	11.4 (44)	8.8 (61)	24.7 (64)	-14.4 (82)	23.8 (48)
5th Percentile	30.6	43.5	43.5	20.7	19.2	14.9	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	11.9	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	9.4	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	7.8	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	4.9	13.0	-19.1	11.0
Population	245	242	242	238	219	127	380	395	403

parentheses contain percentile rankings.

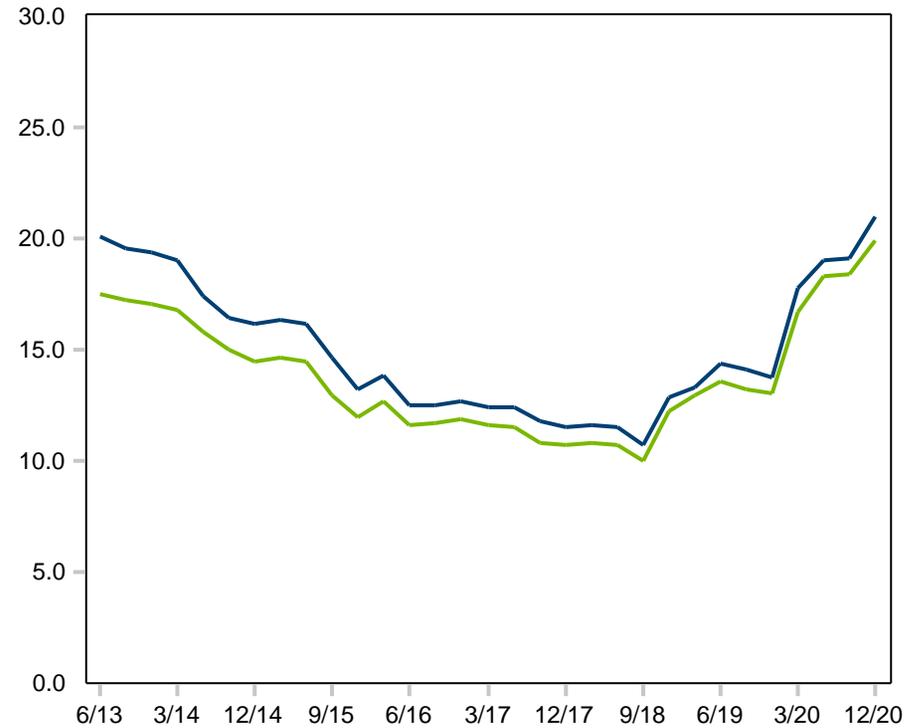
Wellington Global Perspectives Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



- Wellington Global Perspectives
- Performance Benchmark
- ▲ FTSE 3 Month T-Bill

Rolling 4 Years Standard Deviation



- Wellington Global Perspectives
- Performance Benchmark

5 Years Historical Statistics

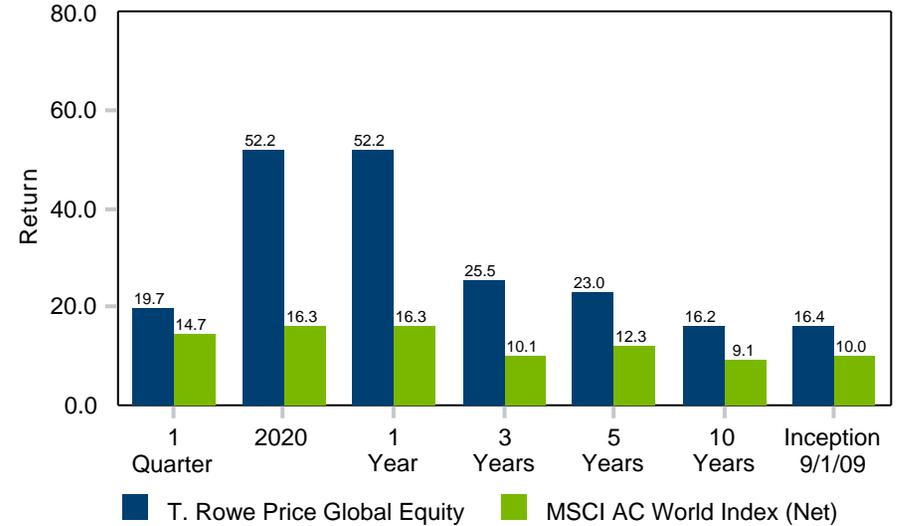
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Wellington Global Perspectives	0.08	3.11	0.03	0.98	0.59	-0.33	1.03	11.29	19.68	0.99
Performance Benchmark	0.00	0.00	N/A	1.00	0.61	0.00	1.00	11.39	18.83	1.00
FTSE 3 Month T-Bill	-11.49	18.89	-0.61	0.06	N/A	1.20	0.00	1.16	0.24	-0.24

T. Rowe Price Global Equity Performance Summary

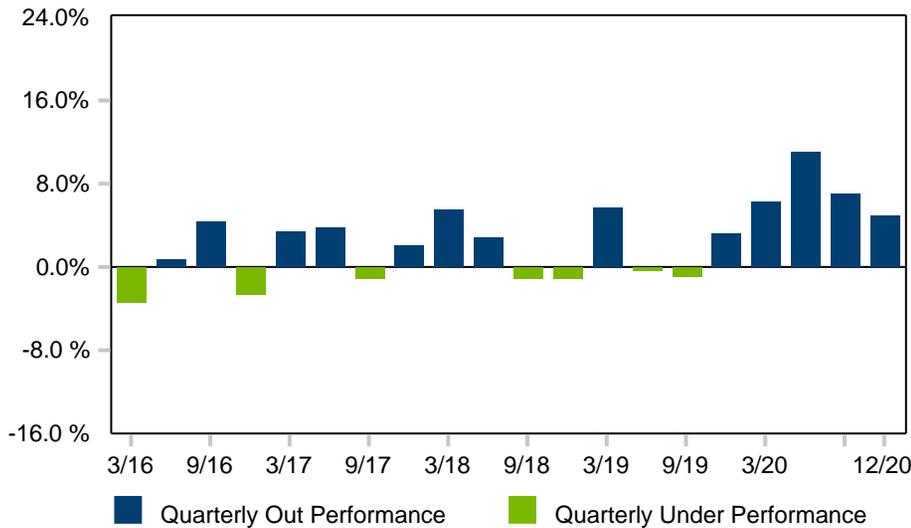
Account Information

Account Name: T. Rowe Price Global Equity  
 Inception Date: 08/31/2009  
 Account Structure: Separate Account  
 Asset Class: Global Equity  
 Benchmark: MSCI AC World Index (Net)  
 Peer Group: IM Global Equity (SA+CF)

Return Summary



Quarterly Excess Performance

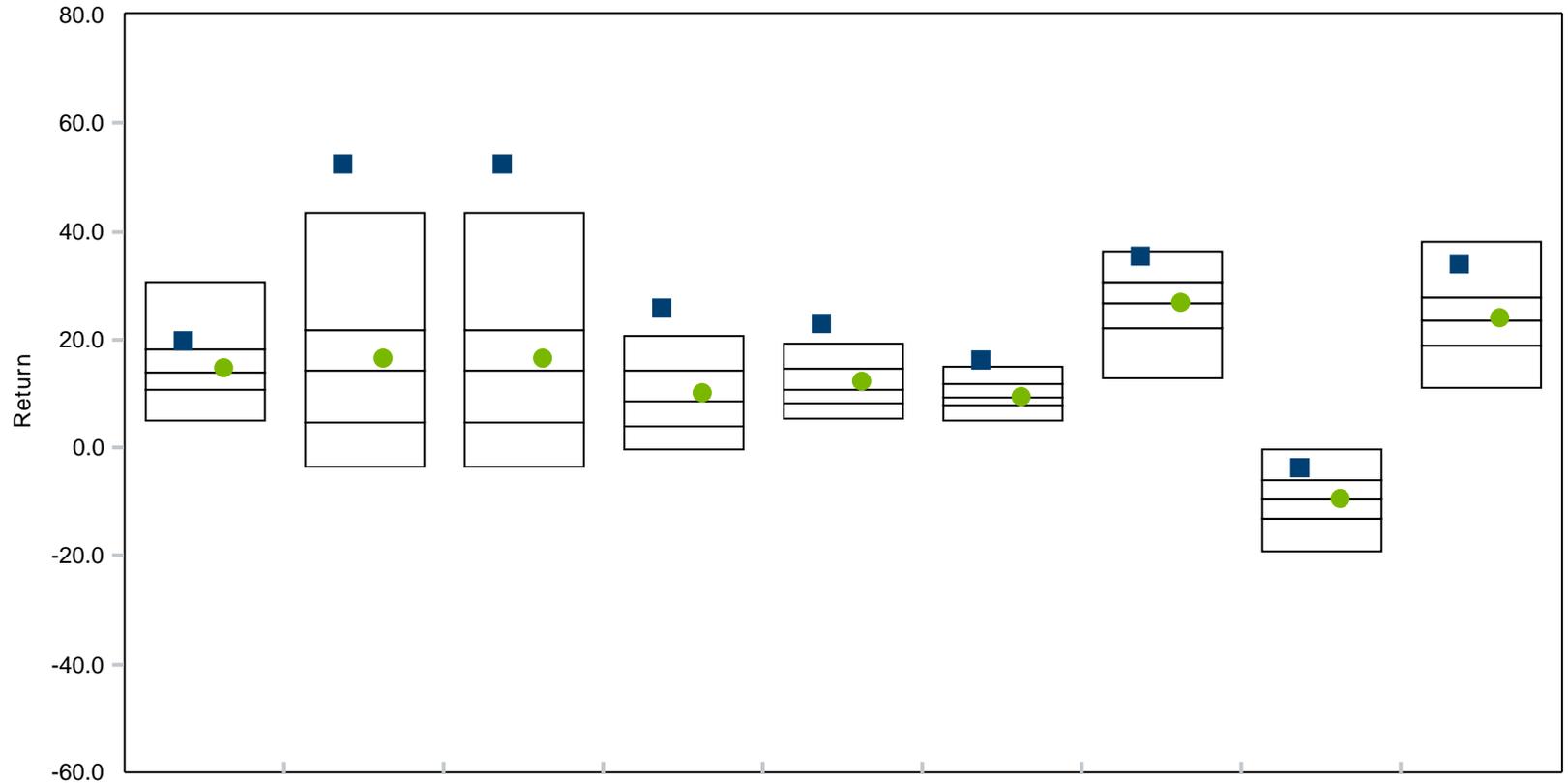


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Global Equity (SA+CF)

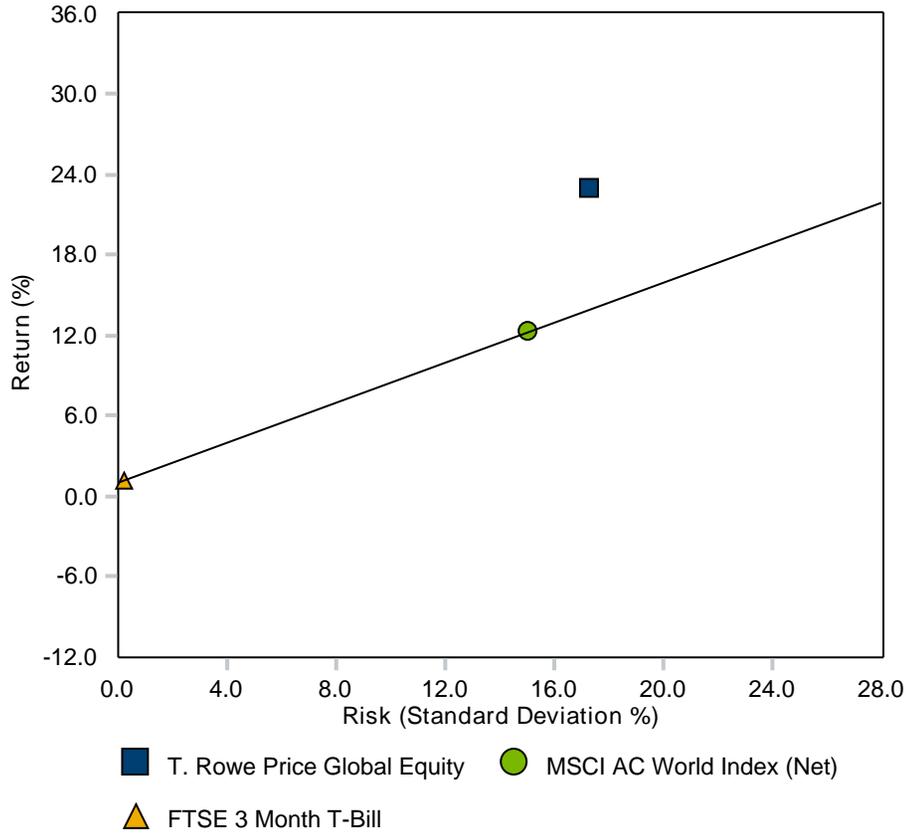


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ T. Rowe Price Global Equity	19.7 (21)	52.2 (3)	52.2 (3)	25.5 (2)	23.0 (2)	16.2 (3)	35.2 (10)	-4.0 (17)	33.7 (11)
● MSCI AC World Index (Net)	14.7 (44)	16.3 (43)	16.3 (43)	10.1 (42)	12.3 (39)	9.1 (57)	26.6 (51)	-9.4 (50)	24.0 (47)
5th Percentile	30.6	43.5	43.5	20.7	19.2	14.9	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	11.9	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	9.4	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	7.8	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	4.9	13.0	-19.1	11.0
Population	245	242	242	238	219	127	380	395	403

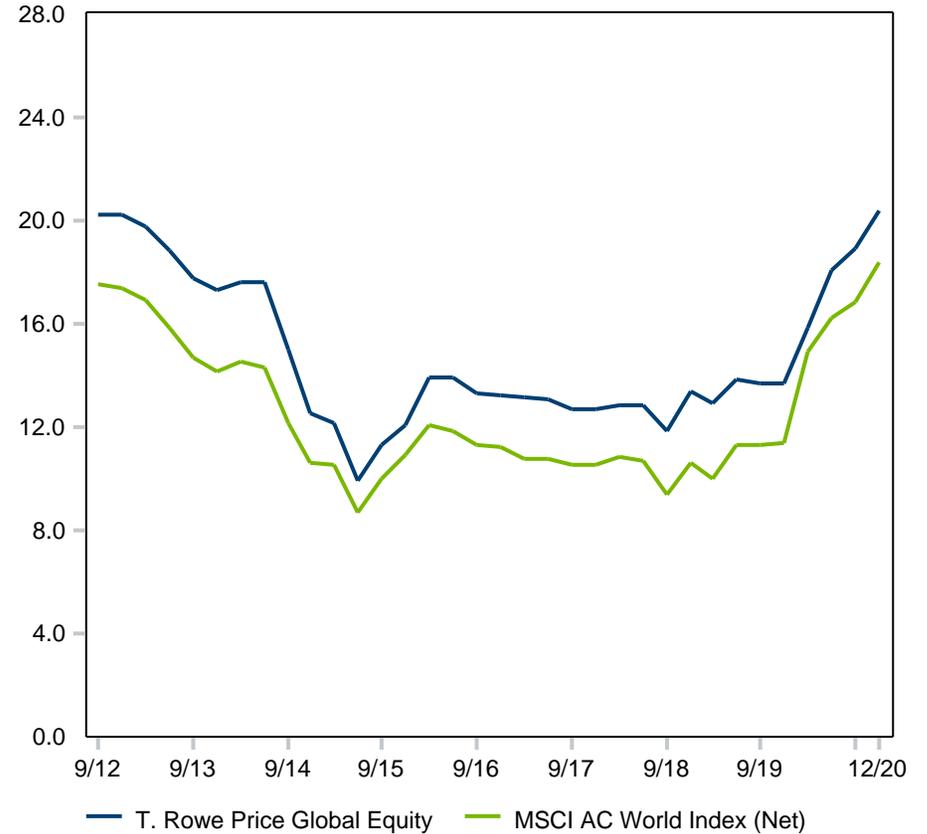
parentheses contain percentile rankings.

T. Rowe Price Global Equity Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 3 Years Standard Deviation



5 Years Historical Statistics

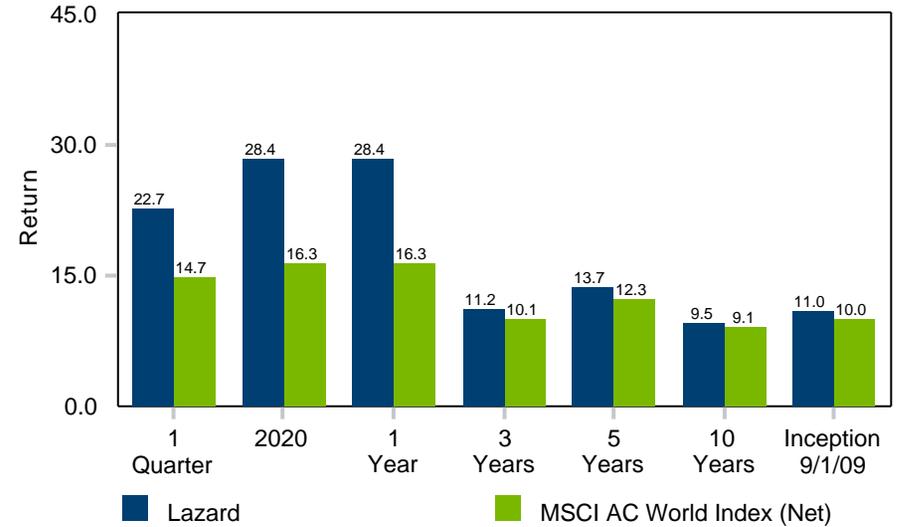
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
T. Rowe Price Global Equity	9.56	5.91	1.62	0.89	1.22	8.86	1.08	22.96	17.30	0.94
MSCI AC World Index (Net)	0.00	0.00	N/A	1.00	0.77	0.00	1.00	12.26	15.08	1.00
FTSE 3 Month T-Bill	-11.59	15.13	-0.77	0.04	N/A	1.20	0.00	1.16	0.24	-0.19

## Lazard Performance Summary

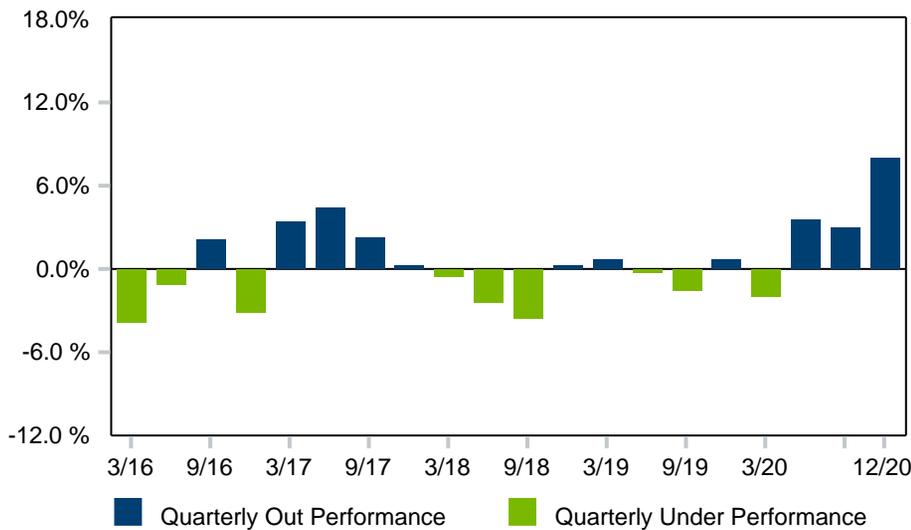
### Account Information

Account Name: Lazard  
 Inception Date: 08/31/2009  
 Account Structure: Separate Account  
 Asset Class: Global Equity  
 Benchmark: MSCI AC World Index (Net)  
 Peer Group: IM Global Equity (SA+CF)

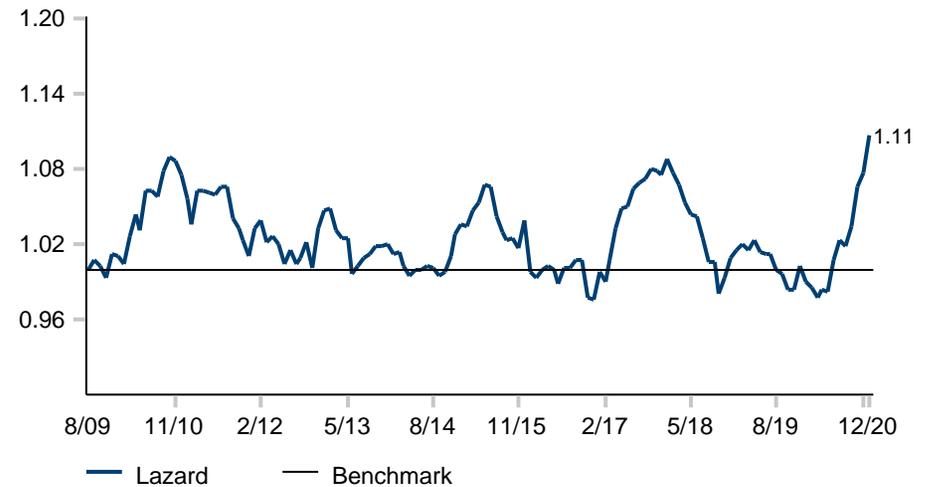
### Return Summary



### Quarterly Excess Performance

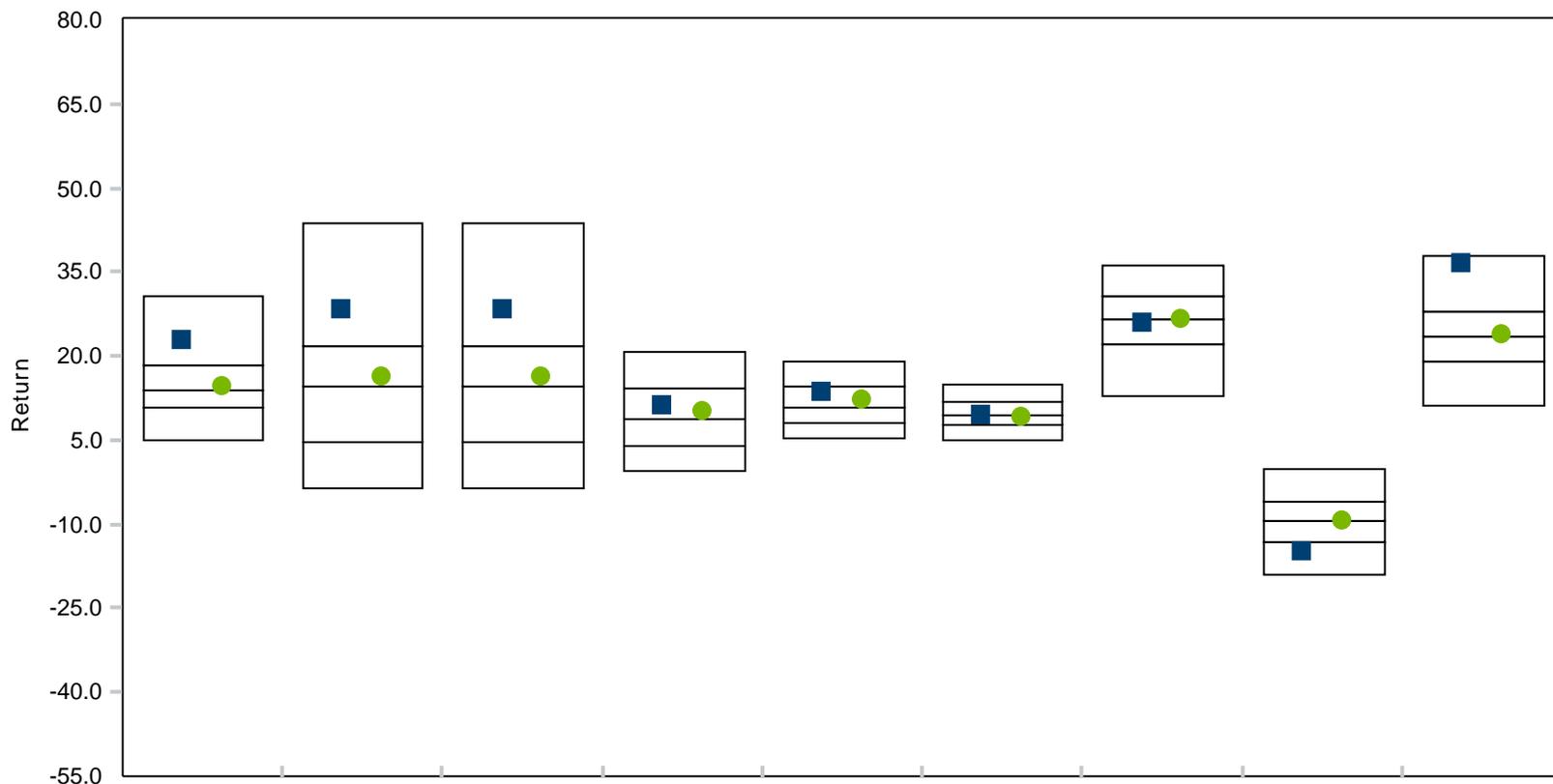


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Global Equity (SA+CF)

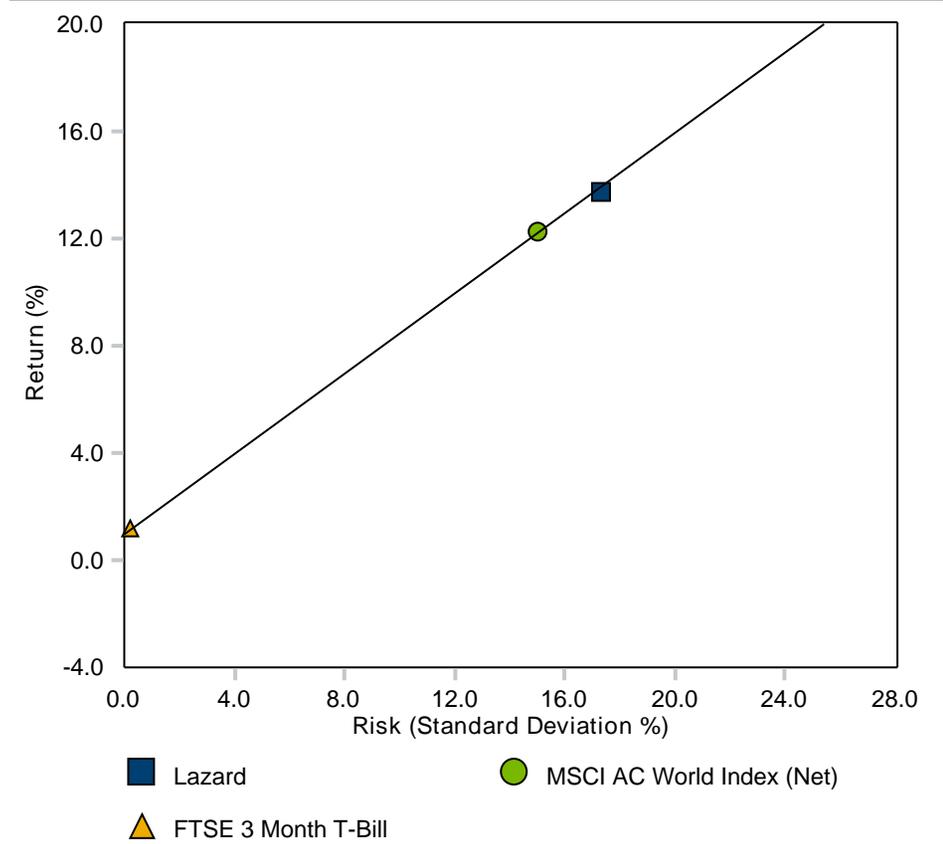


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Lazard	22.7 (16)	28.4 (19)	28.4 (19)	11.2 (35)	13.7 (29)	9.5 (50)	25.7 (56)	-14.9 (85)	36.5 (7)
● MSCI AC World Index (Net)	14.7 (44)	16.3 (43)	16.3 (43)	10.1 (42)	12.3 (39)	9.1 (57)	26.6 (51)	-9.4 (50)	24.0 (47)
5th Percentile	30.6	43.5	43.5	20.7	19.2	14.9	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	11.9	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	9.4	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	7.8	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	4.9	13.0	-19.1	11.0
Population	245	242	242	238	219	127	380	395	403

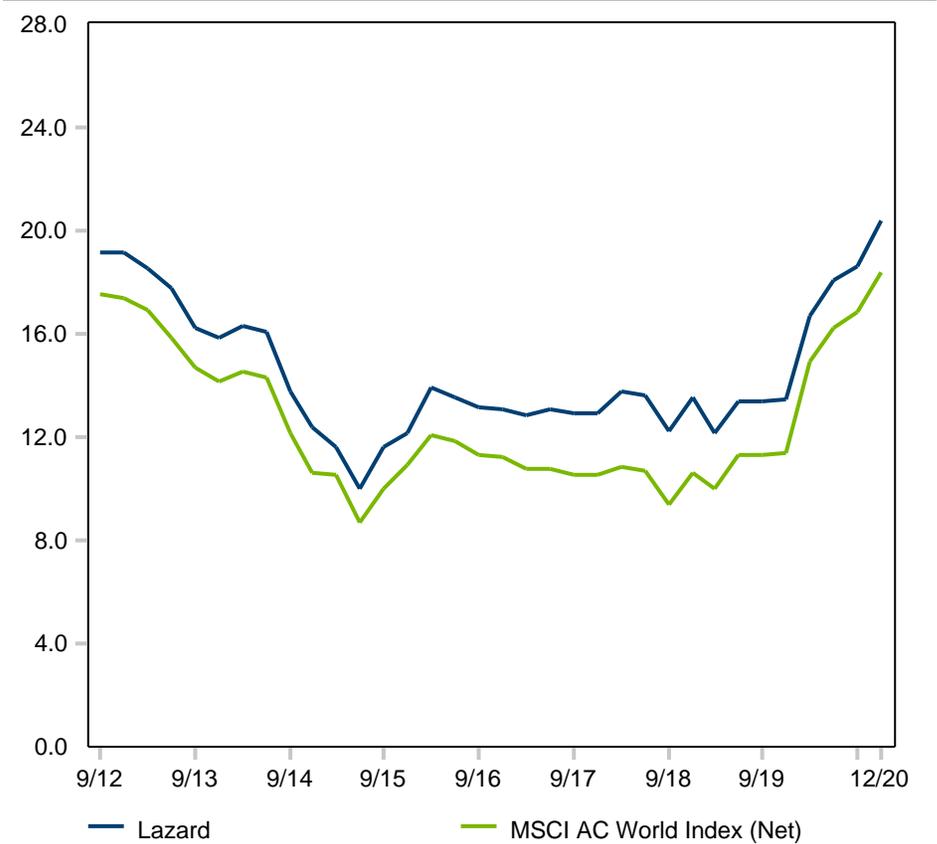
parentheses contain percentile rankings.

Lazard Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 3 Years Standard Deviation



5 Years Historical Statistics

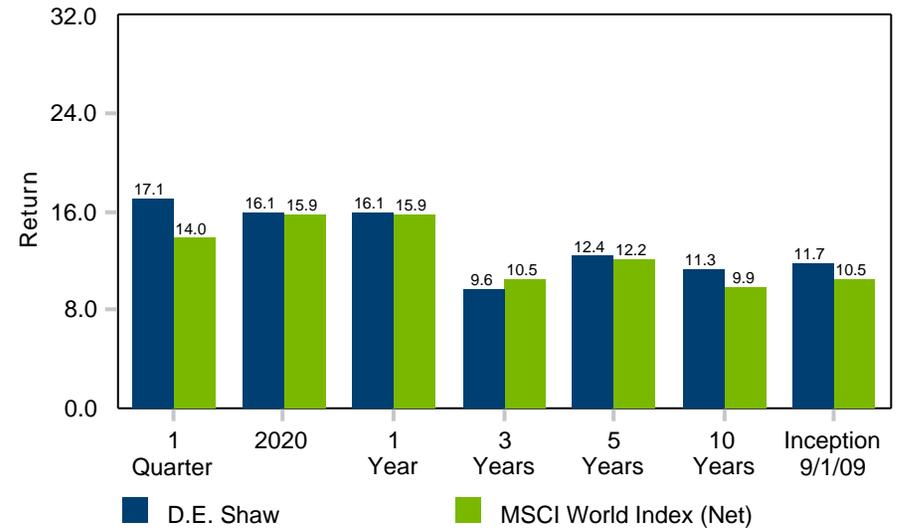
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Lazard	1.65	4.76	0.35	0.93	0.76	0.20	1.11	13.69	17.37	0.97
MSCI AC World Index (Net)	0.00	0.00	N/A	1.00	0.77	0.00	1.00	12.26	15.08	1.00
FTSE 3 Month T-Bill	-11.59	15.13	-0.77	0.04	N/A	1.20	0.00	1.16	0.24	-0.19

## D.E. Shaw Performance Summary

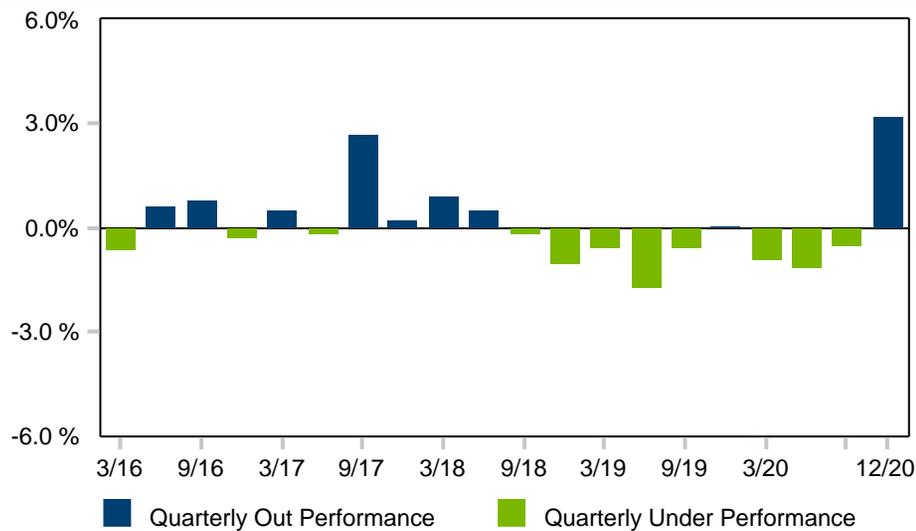
### Account Information

Account Name: D.E. Shaw  
 Inception Date: 08/31/2009  
 Account Structure: Commingled Fund  
 Asset Class: Global Equity  
 Benchmark: MSCI World Index (Net)  
 Peer Group: IM Global Equity (SA+CF)

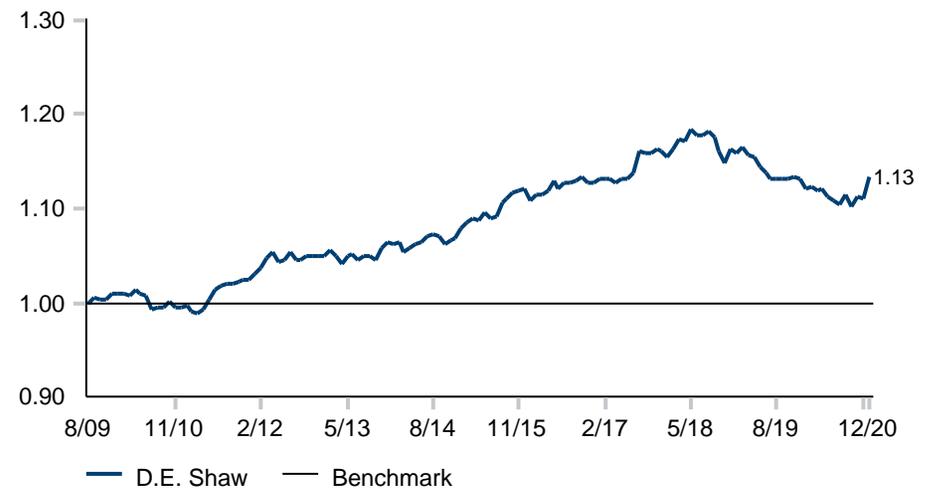
### Return Summary



### Quarterly Excess Performance

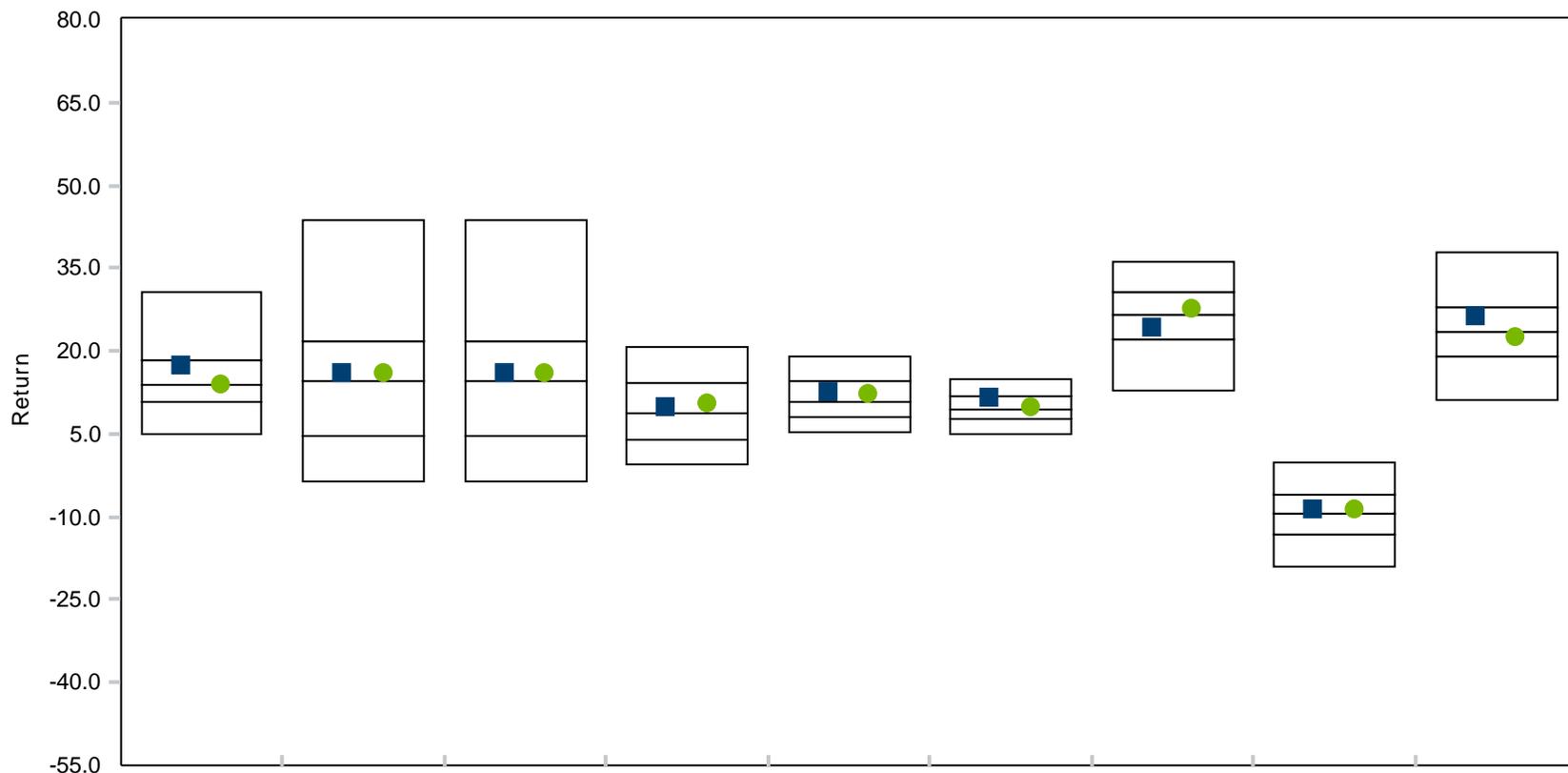


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Global Equity (SA+CF)

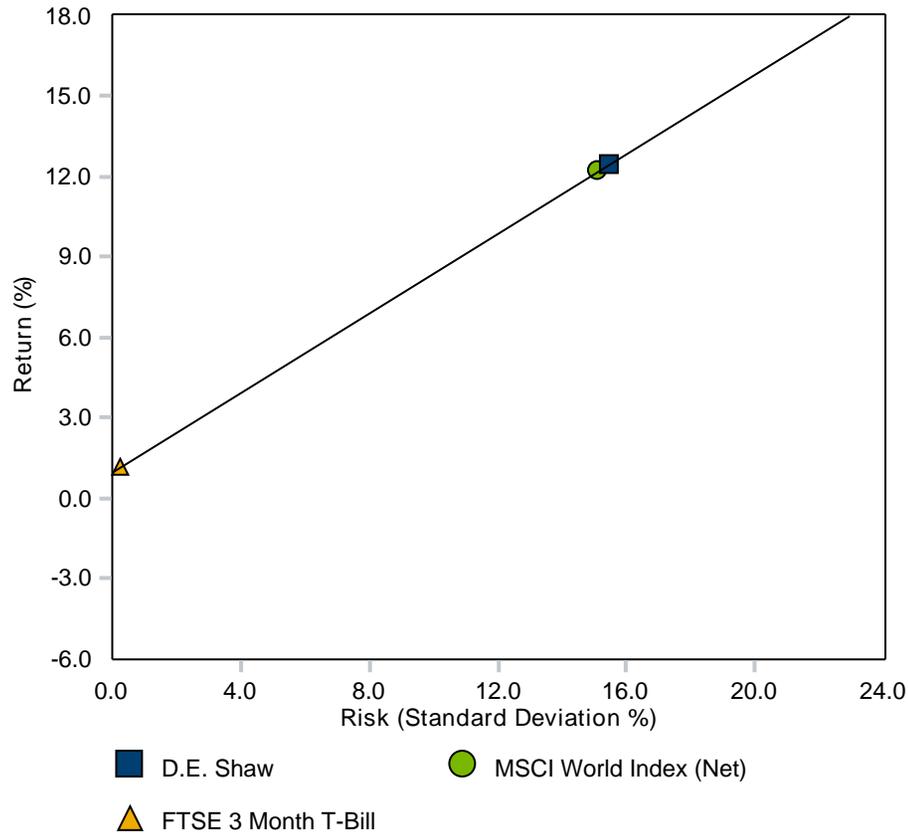


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ D.E. Shaw	17.1 (30)	16.1 (44)	16.1 (44)	9.6 (45)	12.4 (37)	11.3 (29)	24.2 (65)	-8.6 (45)	26.2 (33)
● MSCI World Index (Net)	14.0 (48)	15.9 (44)	15.9 (44)	10.5 (36)	12.2 (39)	9.9 (42)	27.7 (44)	-8.7 (46)	22.4 (56)
5th Percentile	30.6	43.5	43.5	20.7	19.2	14.9	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	11.9	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	9.4	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	7.8	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	4.9	13.0	-19.1	11.0
Population	245	242	242	238	219	127	380	395	403

parentheses contain percentile rankings.

D.E. Shaw Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 3 Years Standard Deviation



5 Years Historical Statistics

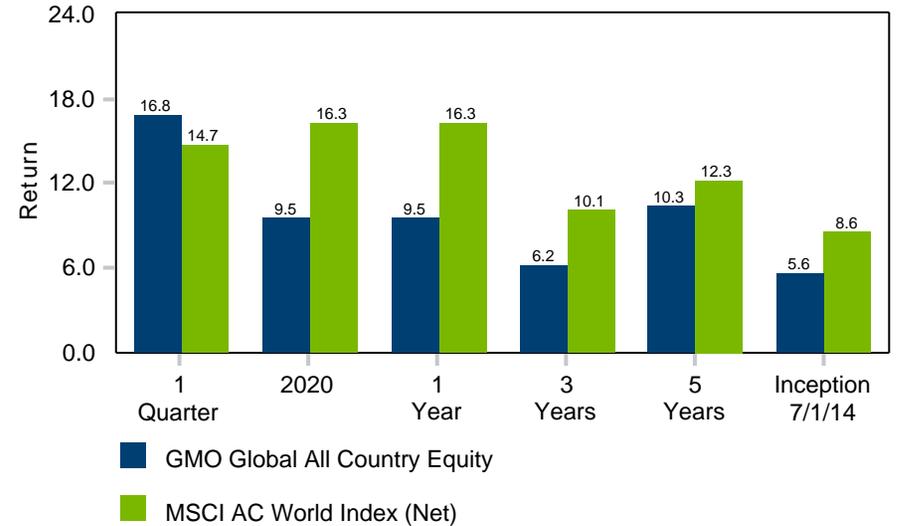
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
D.E. Shaw	0.27	2.40	0.11	0.98	0.76	0.12	1.01	12.43	15.51	0.99
MSCI World Index (Net)	0.00	0.00	N/A	1.00	0.76	0.00	1.00	12.19	15.14	1.00
FTSE 3 Month T-Bill	-11.54	15.18	-0.76	0.03	N/A	1.19	0.00	1.16	0.24	-0.17

GMO Global All Country Equity Performance Summary

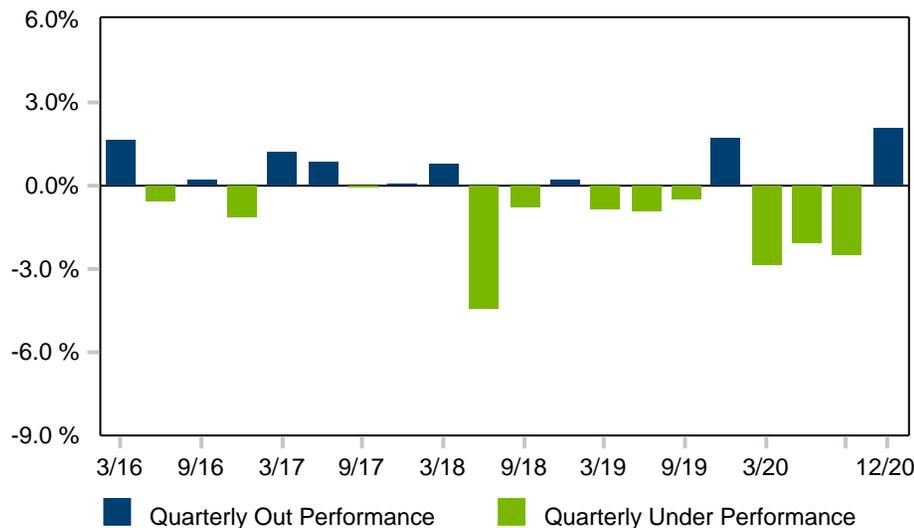
Account Information as of 12/31/20

Product Name : GMO:Global Eq All;III (GMGEX)  
 Fund Family : Grantham Mayo Van Otterloo & Co LLC  
 Ticker : GMGEX  
 Peer Group : IM Global Multi-Cap Core Equity (MF)  
 Benchmark : MSCI AC World Index (Net)  
 Fund Inception : 11/26/1996  
 Portfolio Manager : Team Managed  
 Total Assets : \$1,470.00 Million  
 Total Assets Date : 09/30/2020  
 Gross Expense : 0.59%  
 Net Expense : 0.58%  
 Turnover : 20%

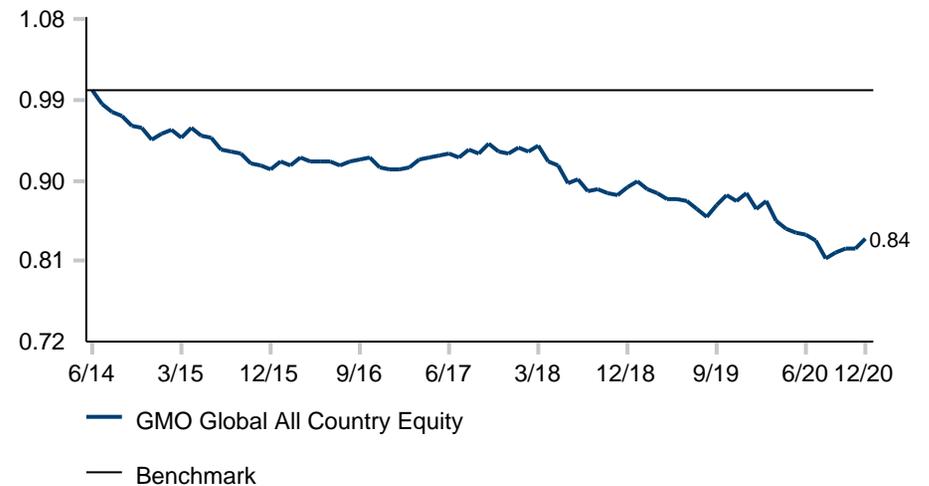
Return Summary



Quarterly Excess Performance

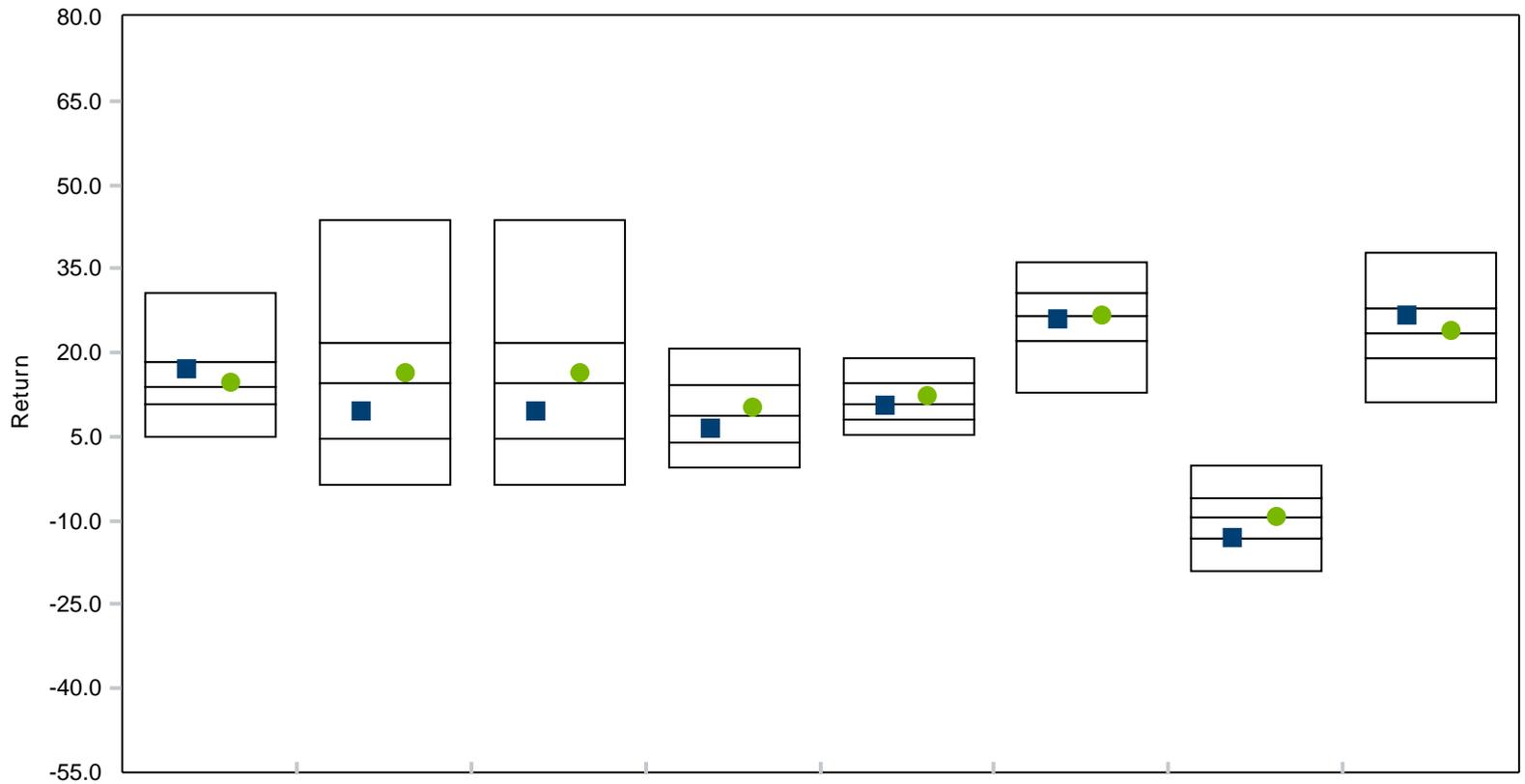


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Global Equity (SA+CF)

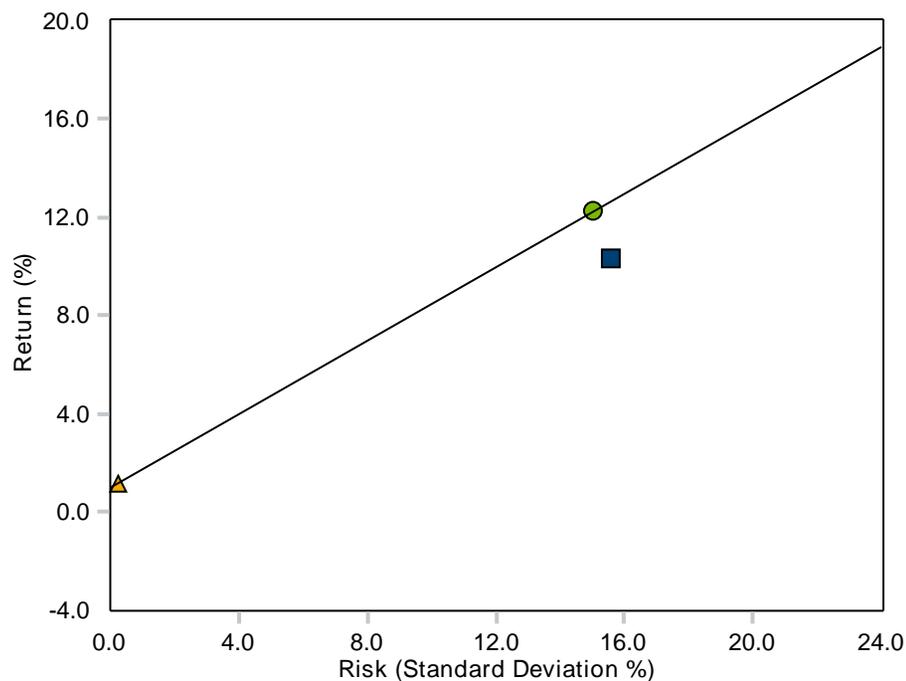


	1 Quarter	2020	1 Year	3 Years	5 Years	2019	2018	2017
■ GMO Global All Country Equity	16.8 (32)	9.5 (63)	9.5 (63)	6.2 (65)	10.3 (54)	25.8 (56)	-13.1 (76)	26.4 (33)
● MSCI AC World Index (Net)	14.7 (44)	16.3 (43)	16.3 (43)	10.1 (42)	12.3 (39)	26.6 (51)	-9.4 (50)	24.0 (47)
5th Percentile	30.6	43.5	43.5	20.7	19.2	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	13.0	-19.1	11.0
Population	245	242	242	238	219	380	395	403

parentheses contain percentile rankings.

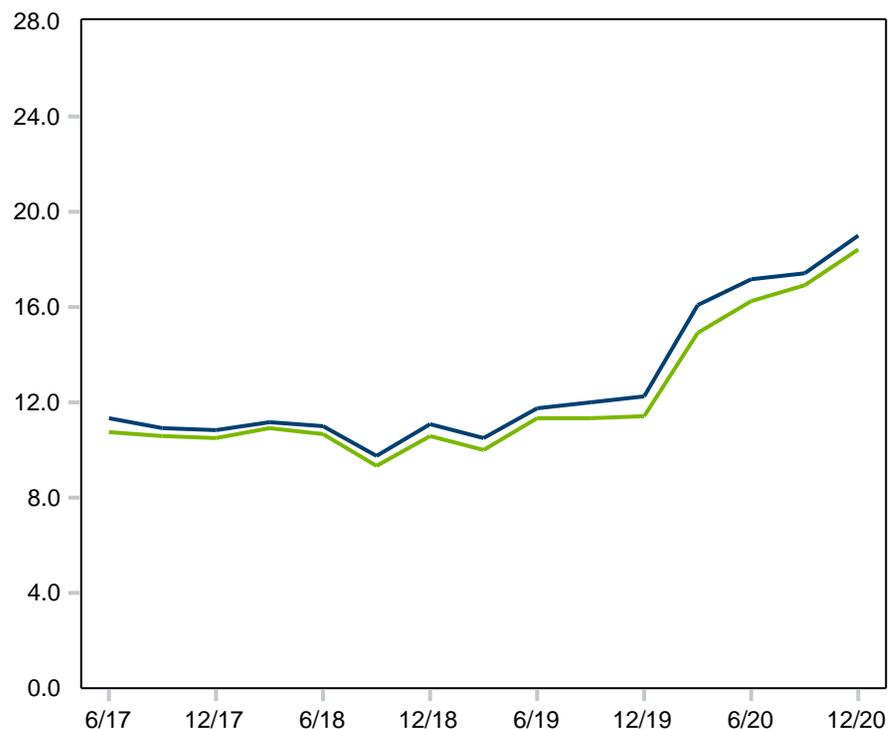
GMO Global All Country Equity Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



- GMO Global All Country Equity
- MSCI AC World Index (Net)
- ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation



- GMO Global All Country Equity
- MSCI AC World Index (Net)

5 Years Historical Statistics

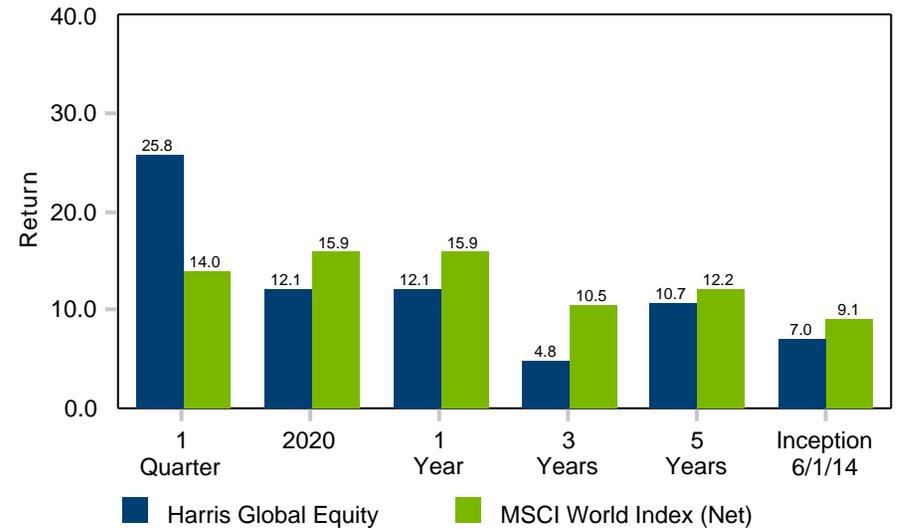
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
GMO Global All Country Equity	-1.67	3.27	-0.51	0.96	0.63	-1.81	1.01	10.32	15.61	0.98
MSCI AC World Index (Net)	0.00	0.00	N/A	1.00	0.77	0.00	1.00	12.26	15.08	1.00
FTSE 3 Month T-Bill	-11.59	15.13	-0.77	0.04	N/A	1.20	0.00	1.16	0.24	-0.19

Harris Global Equity Performance Summary

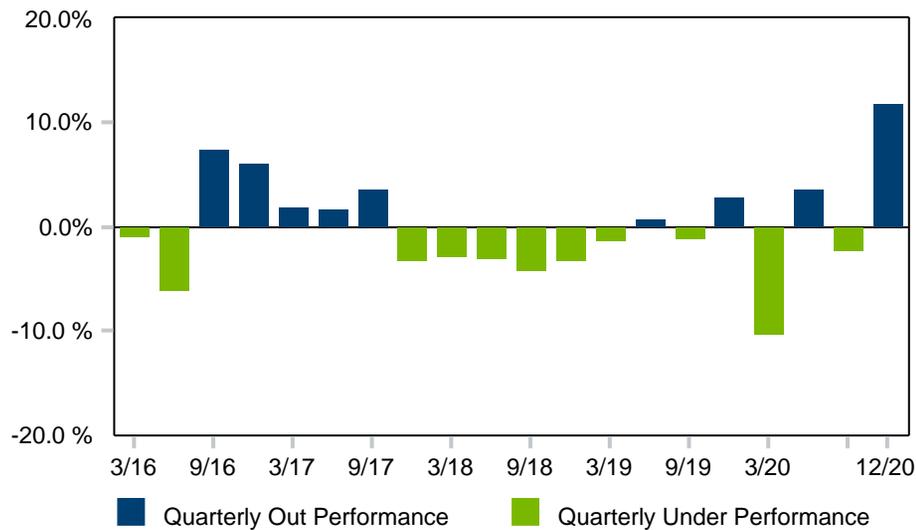
Account Information

Account Name: Harris Global Equity  
 Inception Date: 06/01/2014  
 Account Structure: Separate Account  
 Asset Class: Global Equity  
 Benchmark: MSCI World Index (Net)  
 Peer Group: IM Global Equity (SA+CF)

Return Summary



Quarterly Excess Performance

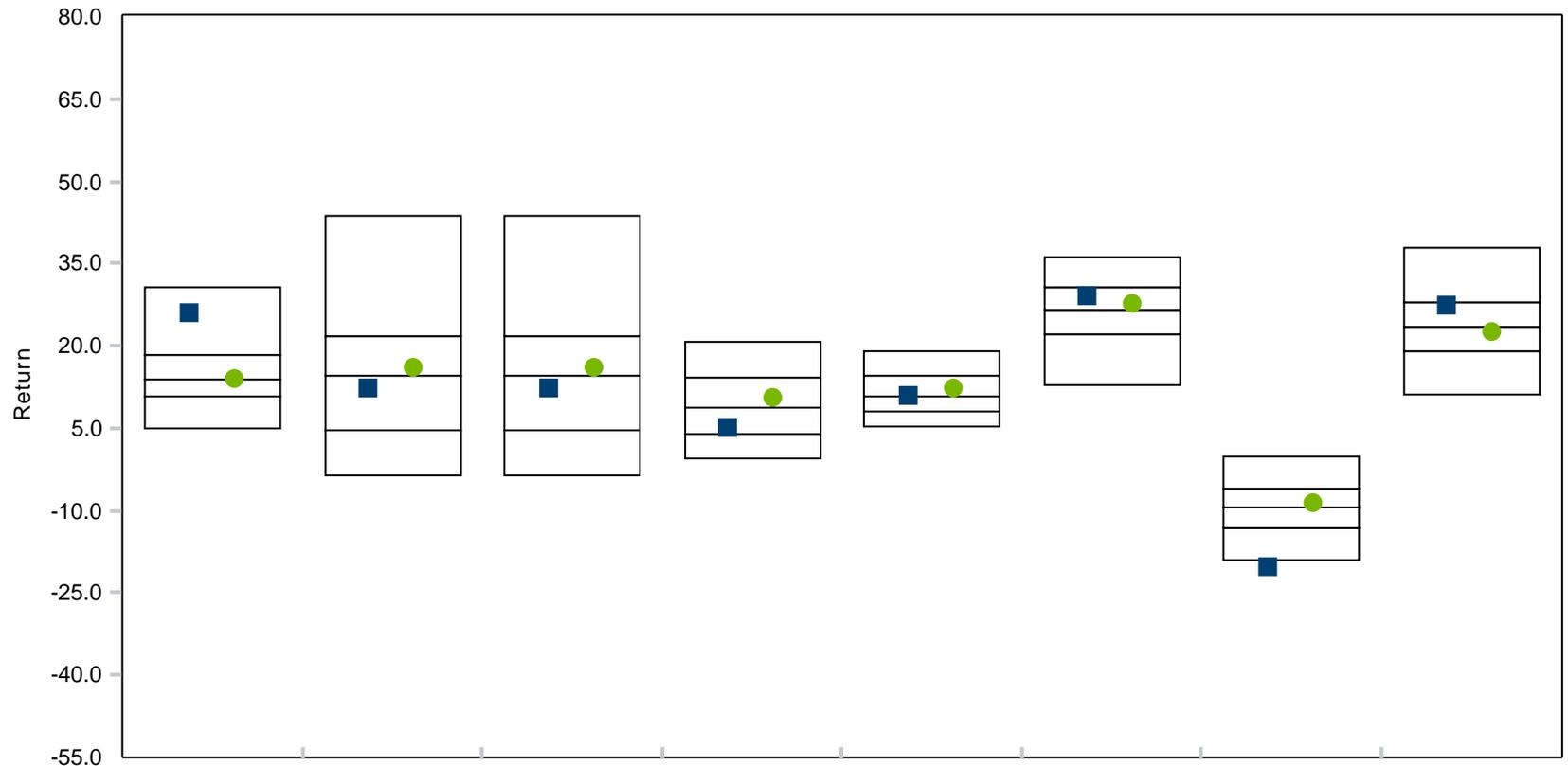


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Global Equity (SA+CF)

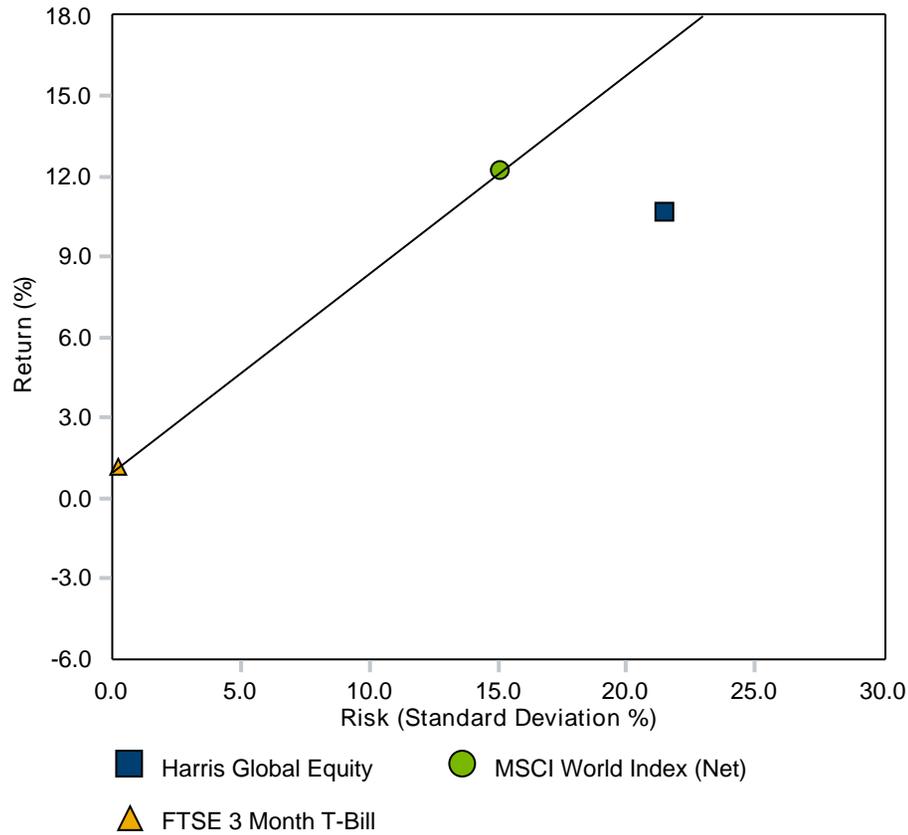


	1 Quarter	2020	1 Year	3 Years	5 Years	2019	2018	2017
■ Harris Global Equity	25.8 (9)	12.1 (55)	12.1 (55)	4.8 (74)	10.7 (51)	28.9 (37)	-20.4 (97)	27.2 (28)
● MSCI World Index (Net)	14.0 (48)	15.9 (44)	15.9 (44)	10.5 (36)	12.2 (39)	27.7 (44)	-8.7 (46)	22.4 (56)
5th Percentile	30.6	43.5	43.5	20.7	19.2	36.3	-0.3	37.9
1st Quartile	18.2	21.8	21.8	14.4	14.5	30.6	-5.9	27.9
Median	13.8	14.4	14.4	8.7	10.8	26.6	-9.4	23.5
3rd Quartile	10.8	4.7	4.7	4.1	8.2	21.9	-13.1	19.0
95th Percentile	4.9	-3.6	-3.6	-0.4	5.2	13.0	-19.1	11.0
Population	245	242	242	238	219	380	395	403

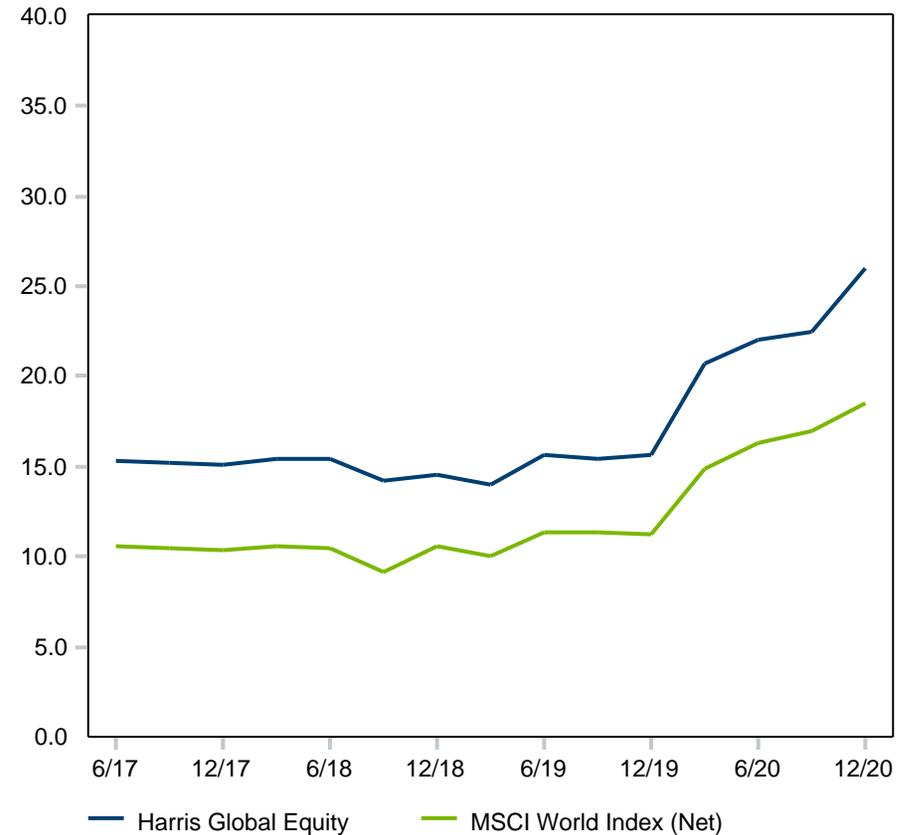
parentheses contain percentile rankings.

Harris Global Equity Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



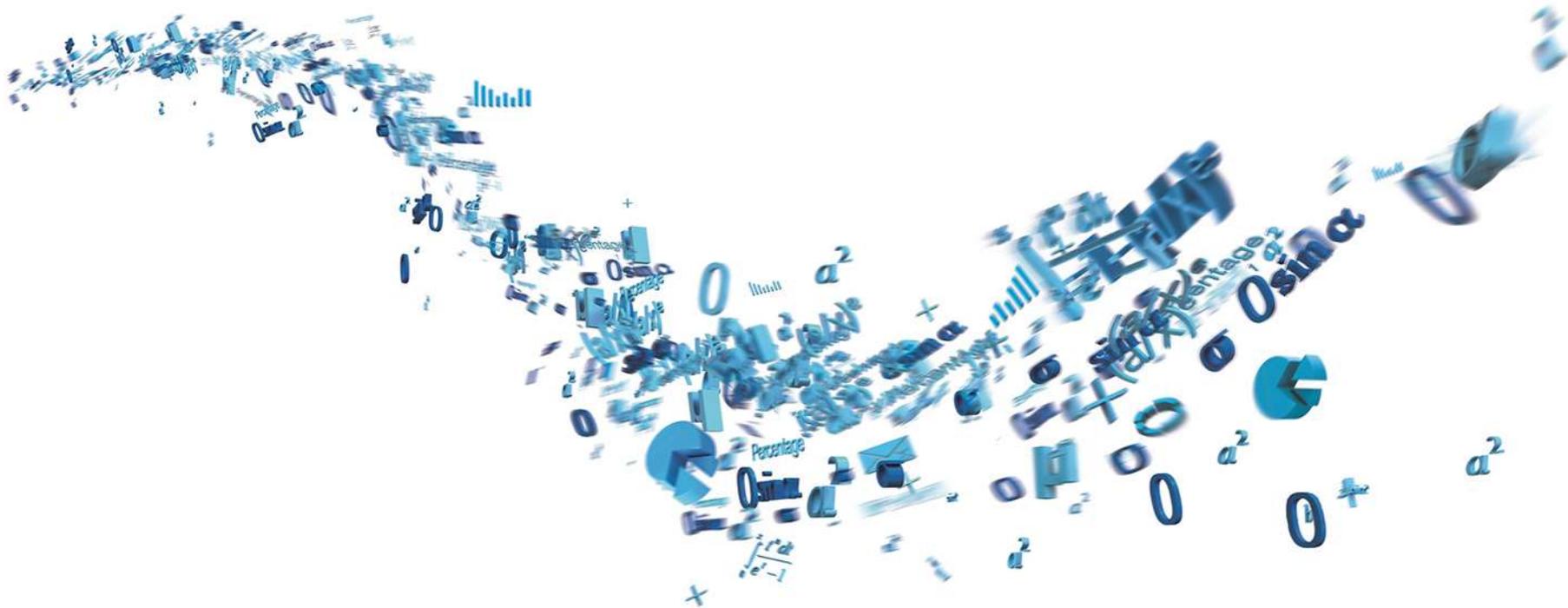
Rolling 3 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Harris Global Equity	-0.20	8.70	-0.02	0.90	0.53	-4.50	1.35	10.68	21.54	0.95
MSCI World Index (Net)	0.00	0.00	N/A	1.00	0.76	0.00	1.00	12.19	15.14	1.00
FTSE 3 Month T-Bill	-11.54	15.18	-0.76	0.03	N/A	1.19	0.00	1.16	0.24	-0.17

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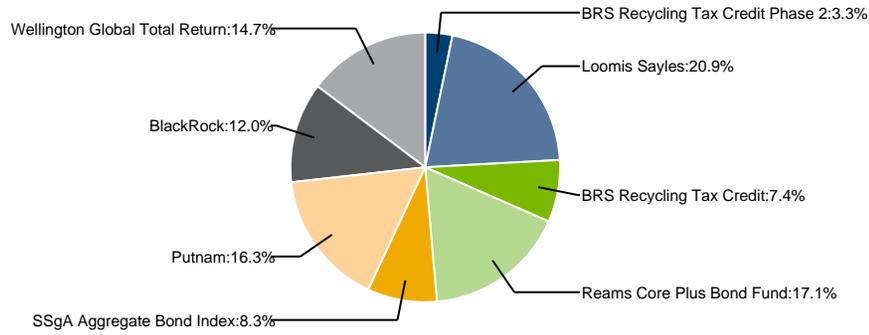
## Fixed Income

---

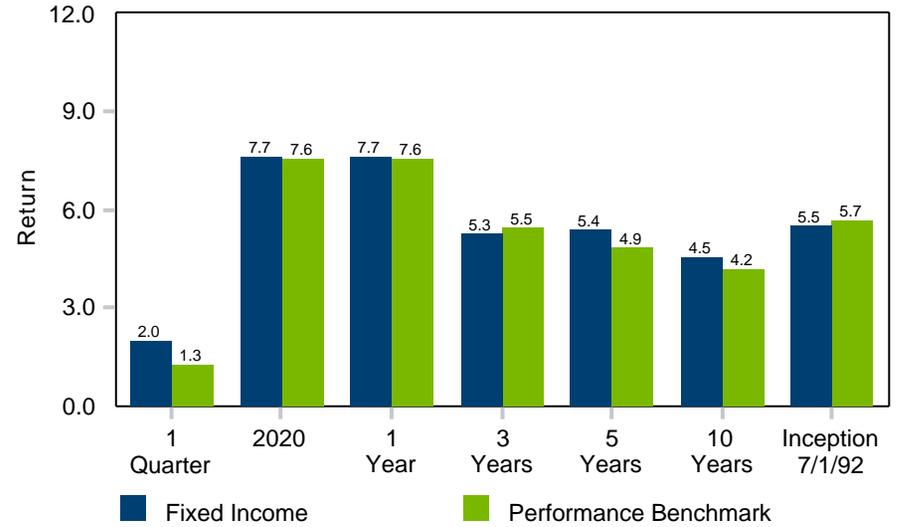
# Fixed Income Portfolio Overview

## Current Allocation

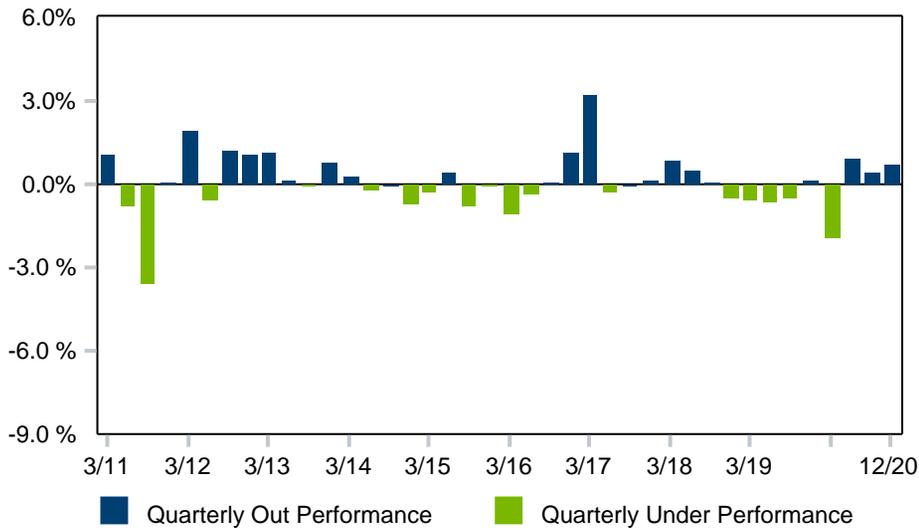
December 31, 2020 : \$2,369M



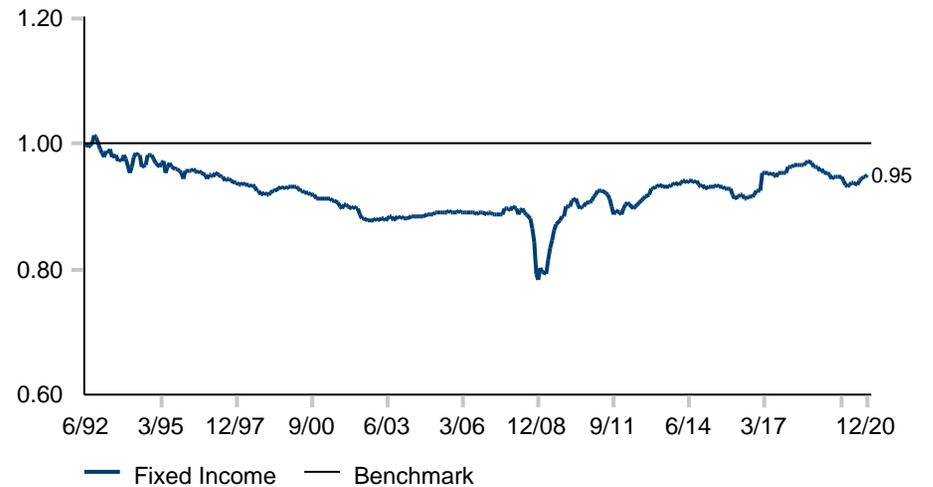
## Return Summary



## Quarterly Excess Performance

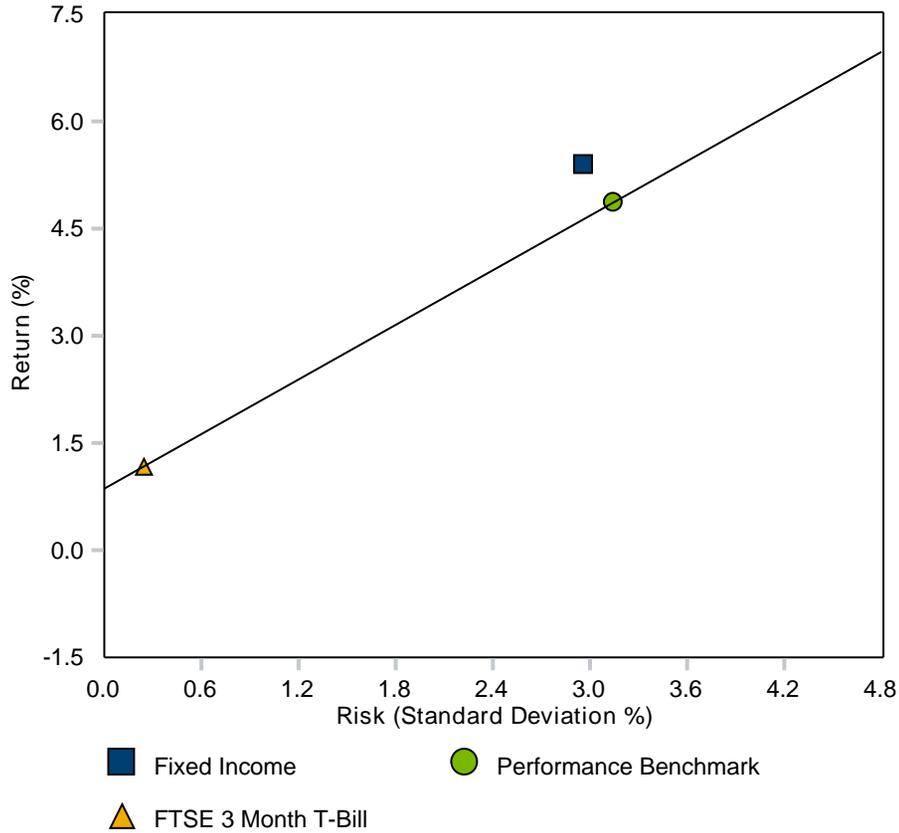


## Ratio of Cumulative Wealth - Since Inception

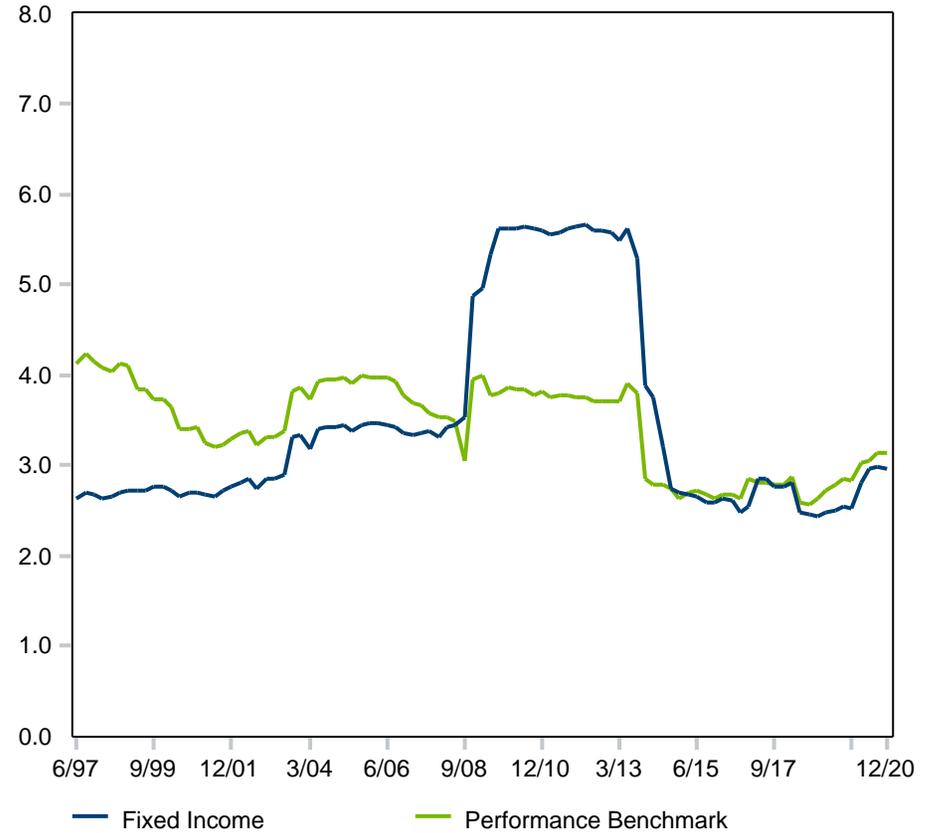


Fixed Income Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation

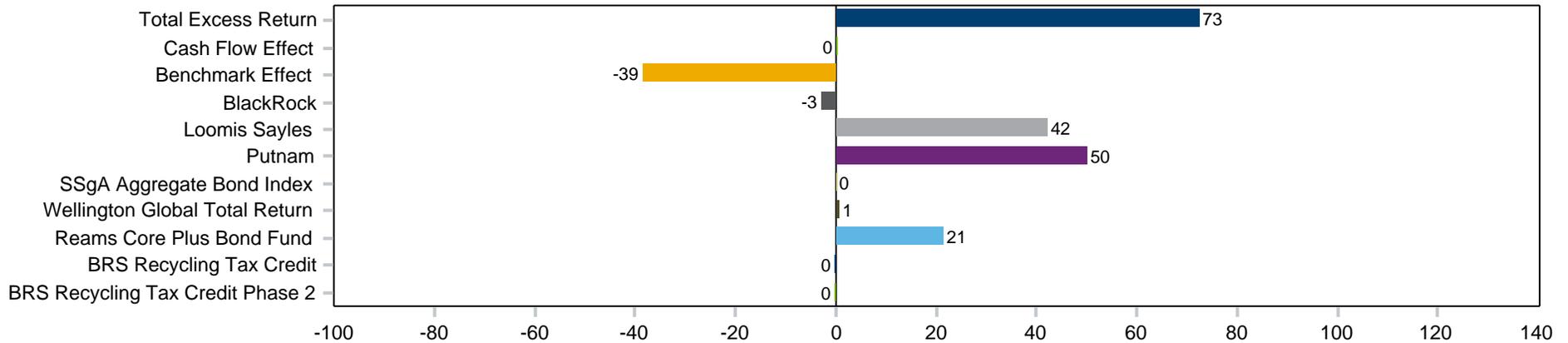


5 Years Historical Statistics

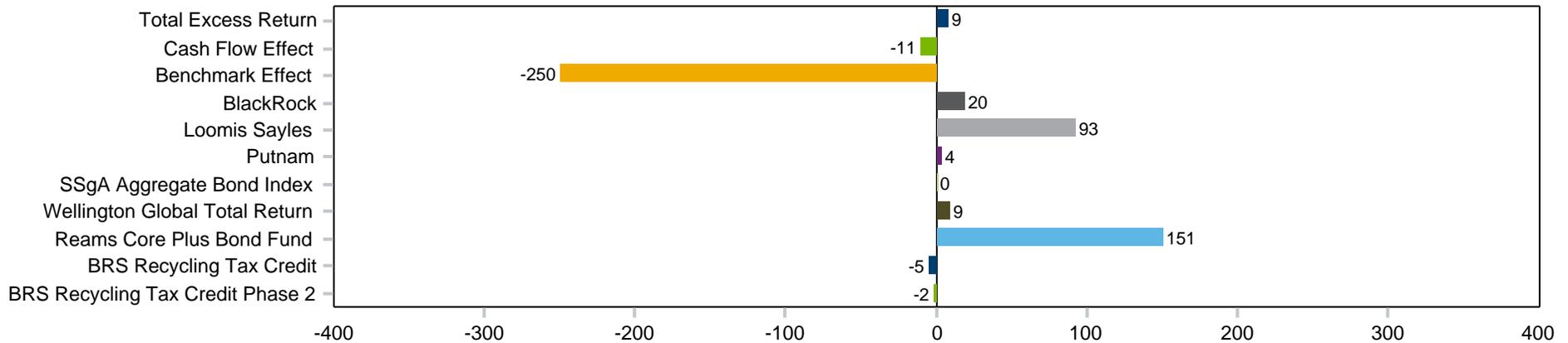
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Fixed Income	0.48	1.84	0.26	0.67	1.39	1.59	0.77	5.38	2.96	0.82
Performance Benchmark	0.00	0.00	N/A	1.00	1.17	0.00	1.00	4.87	3.15	1.00
FTSE 3 Month T-Bill	-3.66	3.14	-1.17	0.01	N/A	1.13	0.01	1.16	0.24	0.09

Asset Class Attribution

1 Quarter



1 Year



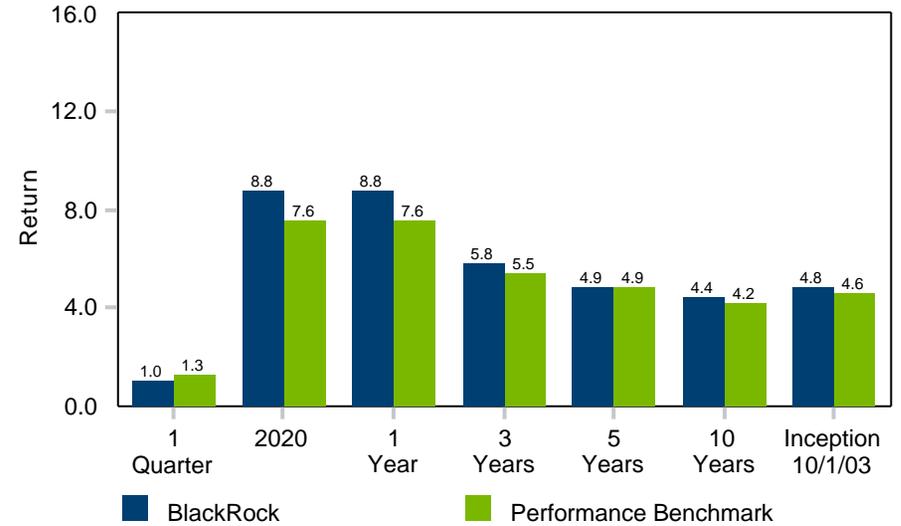
\*The BRS Recycling Tax Credit represents an annual income stream of \$16 million dollars over the next 14 years, which ATRS purchased for approximately \$162 million. This represents an approximate 9.9% yield for the 2017 fiscal year. The value shown above represents the year-end market value in accordance with GASB Statement 72, representing the 14 years of annual income, and has been incorporated into Total Fixed Income and Total Fund performance.

## BlackRock Performance Summary

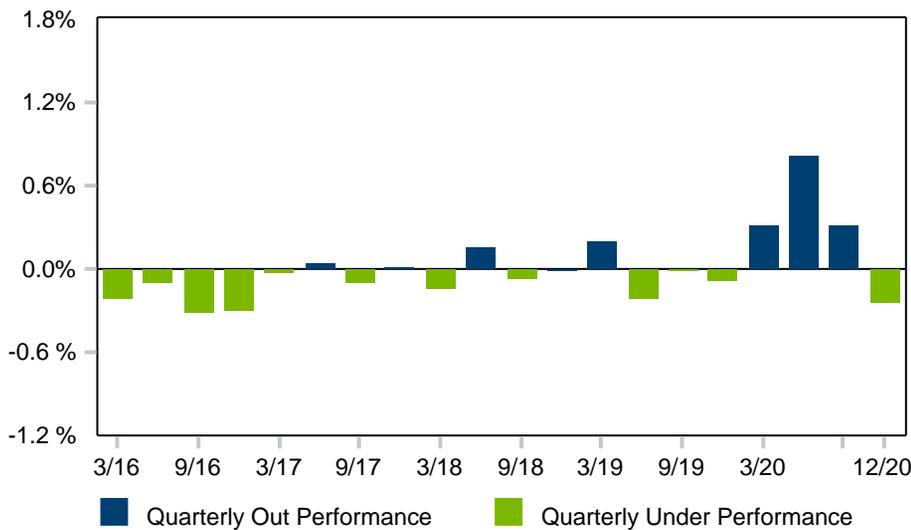
### Account Information

Account Name: BlackRock  
 Inception Date: 09/30/2003  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Performance Benchmark  
 Peer Group: IM U.S. Fixed Income (SA+CF)

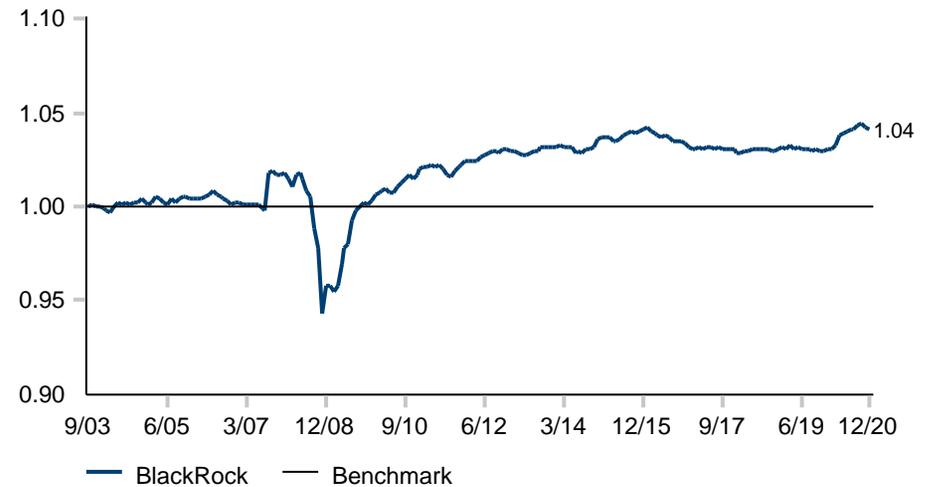
### Return Summary



### Quarterly Excess Performance

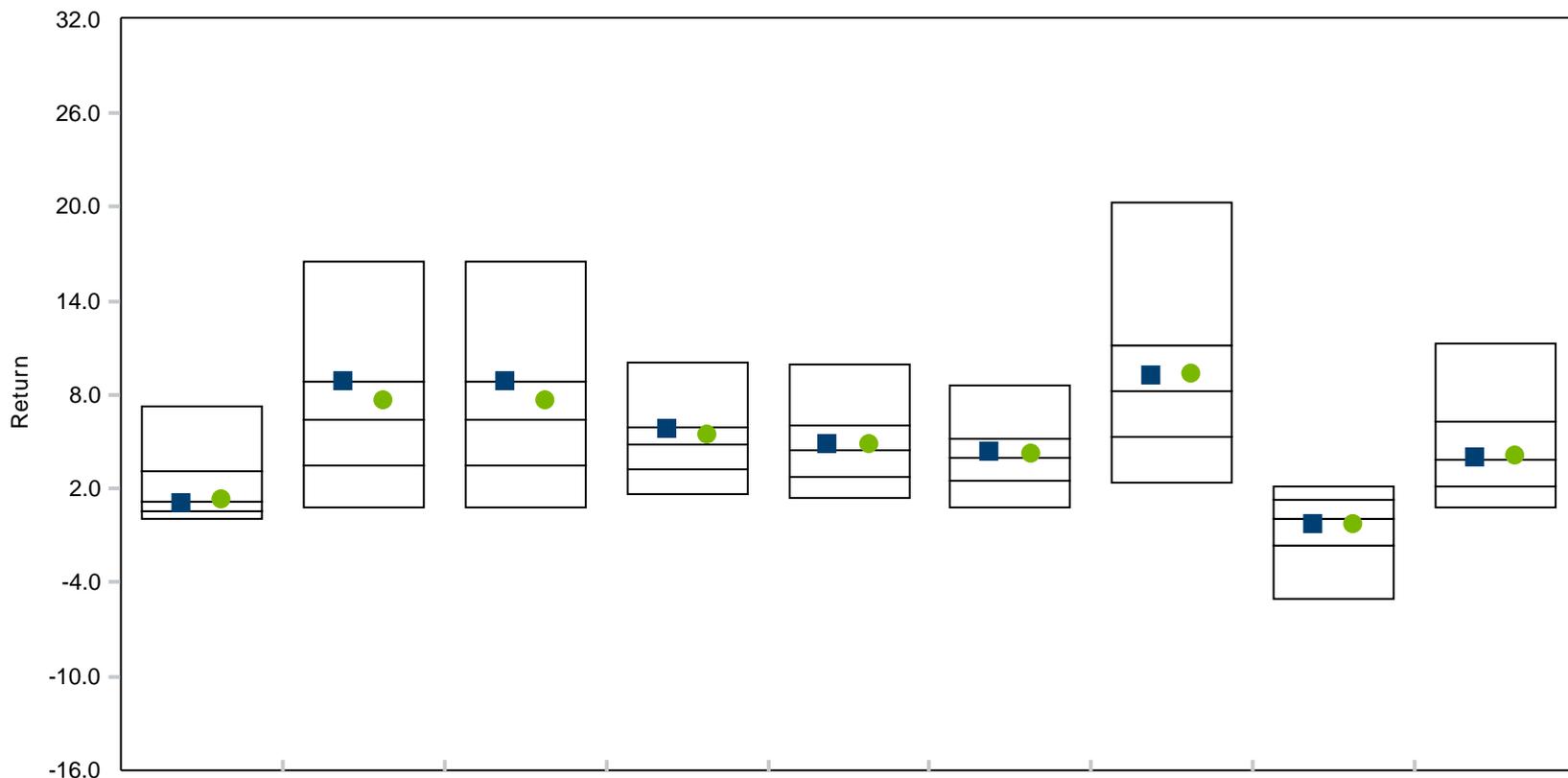


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Fixed Income (SA+CF)

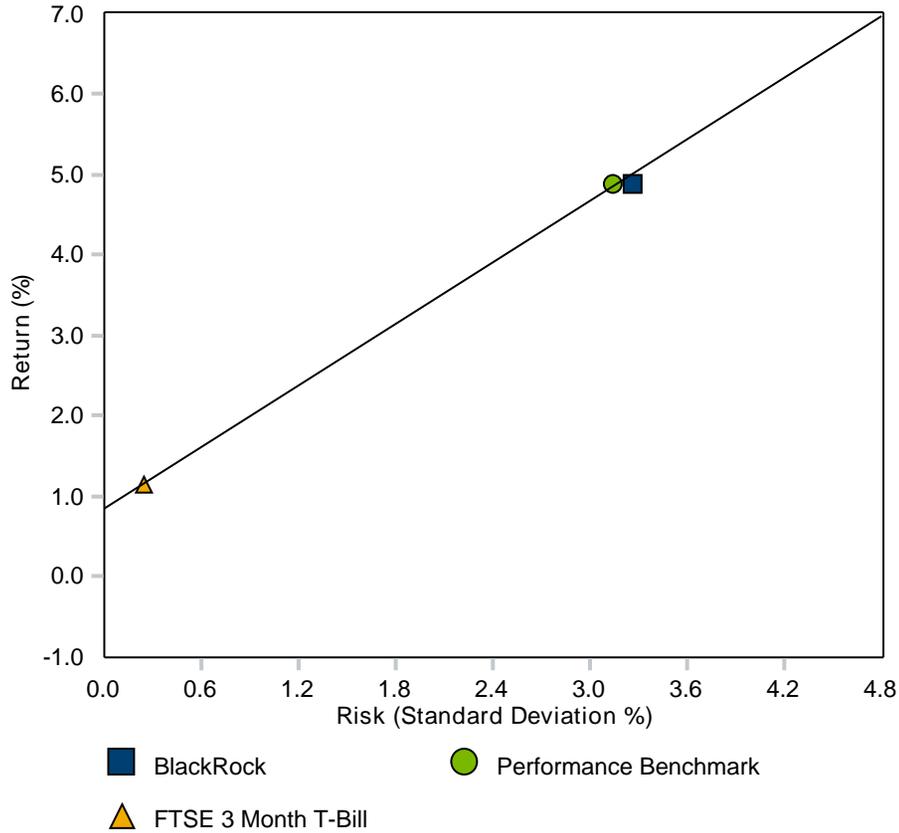


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ BlackRock	1.0 (55)	8.8 (25)	8.8 (25)	5.8 (31)	4.9 (42)	4.4 (40)	9.2 (39)	-0.3 (58)	4.0 (47)
● Performance Benchmark	1.3 (49)	7.6 (38)	7.6 (38)	5.5 (39)	4.9 (42)	4.2 (46)	9.3 (37)	-0.3 (57)	4.1 (47)
5th Percentile	7.2	16.5	16.5	10.1	10.0	8.6	20.3	2.1	11.3
1st Quartile	3.1	8.8	8.8	6.0	6.0	5.2	11.2	1.2	6.2
Median	1.2	6.4	6.4	4.8	4.4	4.0	8.2	0.1	3.8
3rd Quartile	0.5	3.5	3.5	3.3	2.7	2.5	5.3	-1.6	2.2
95th Percentile	0.0	0.8	0.8	1.7	1.4	0.9	2.4	-5.0	0.9
Population	633	631	631	592	549	477	1,007	1,062	1,088

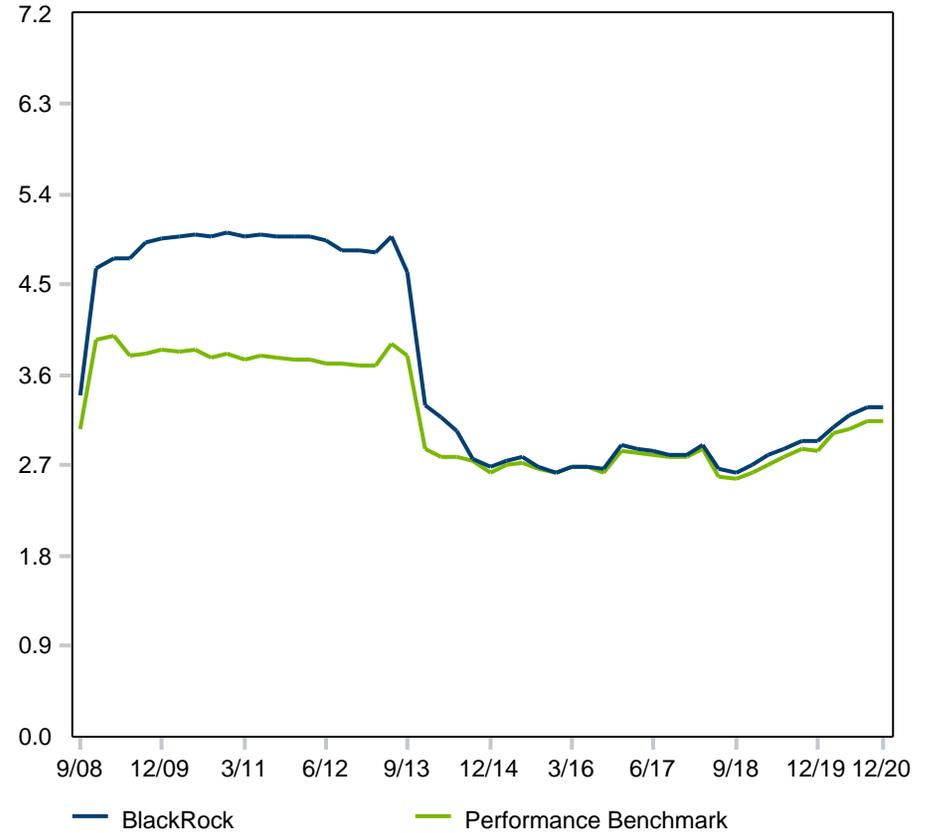
Parentheses contain percentile rankings.

BlackRock Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

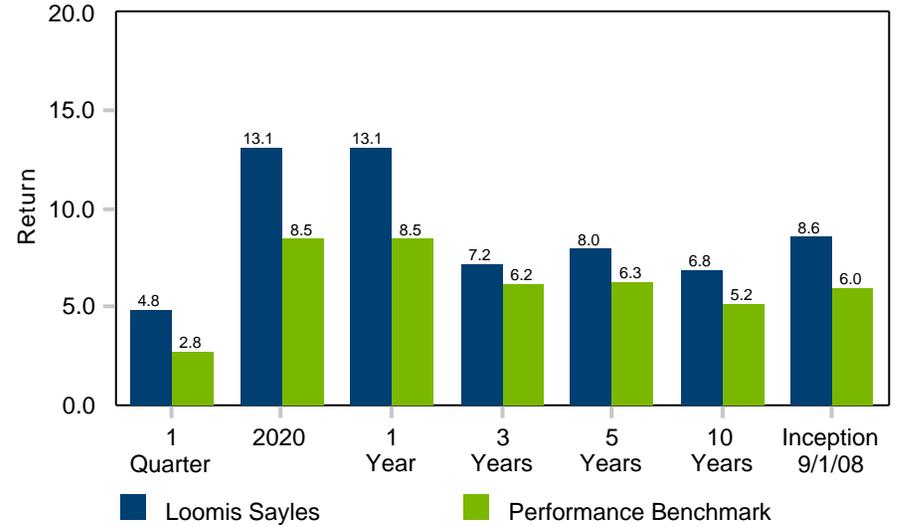
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
BlackRock	0.01	0.43	0.02	0.98	1.12	-0.14	1.03	4.87	3.28	0.99
Performance Benchmark	0.00	0.00	N/A	1.00	1.17	0.00	1.00	4.87	3.15	1.00
FTSE 3 Month T-Bill	-3.66	3.14	-1.17	0.01	N/A	1.13	0.01	1.16	0.24	0.09

## Loomis Sayles Performance Summary

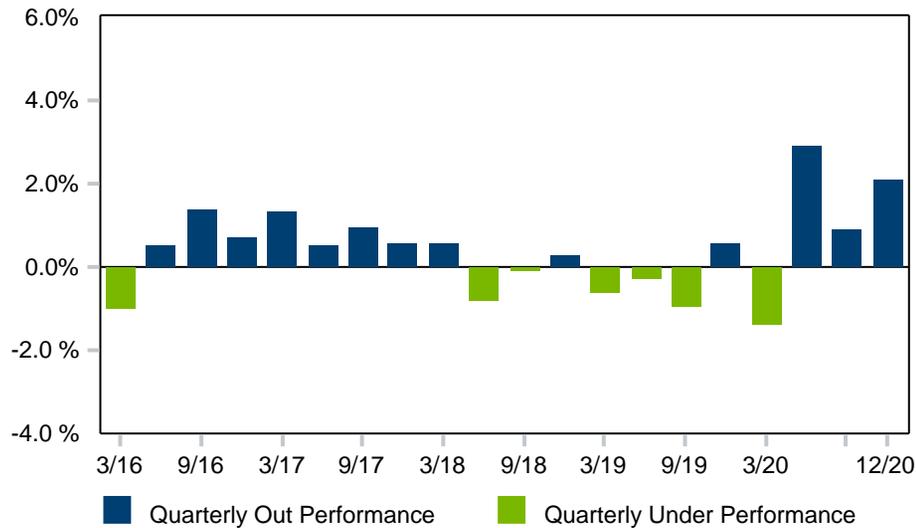
### Account Information

Account Name: Loomis Sayles  
 Inception Date: 06/30/2008  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Performance Benchmark  
 Peer Group: IM U.S. Fixed Income (SA+CF)

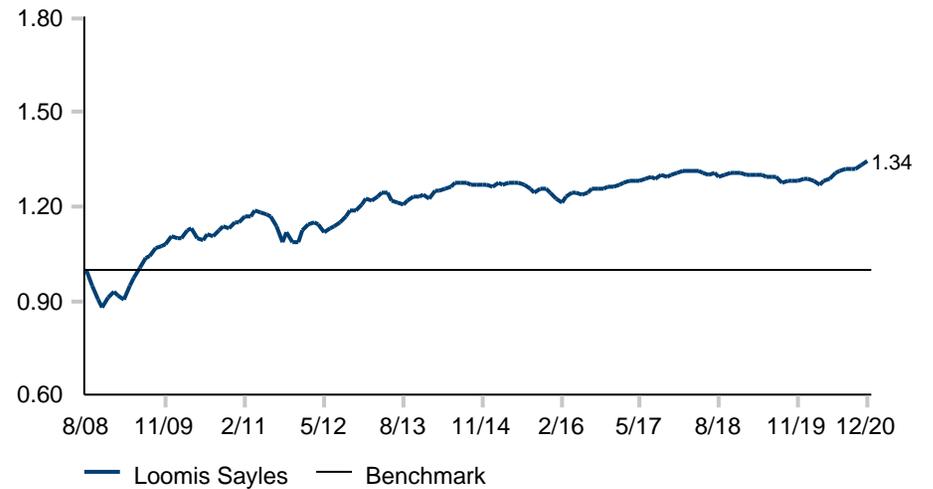
### Return Summary



### Quarterly Excess Performance

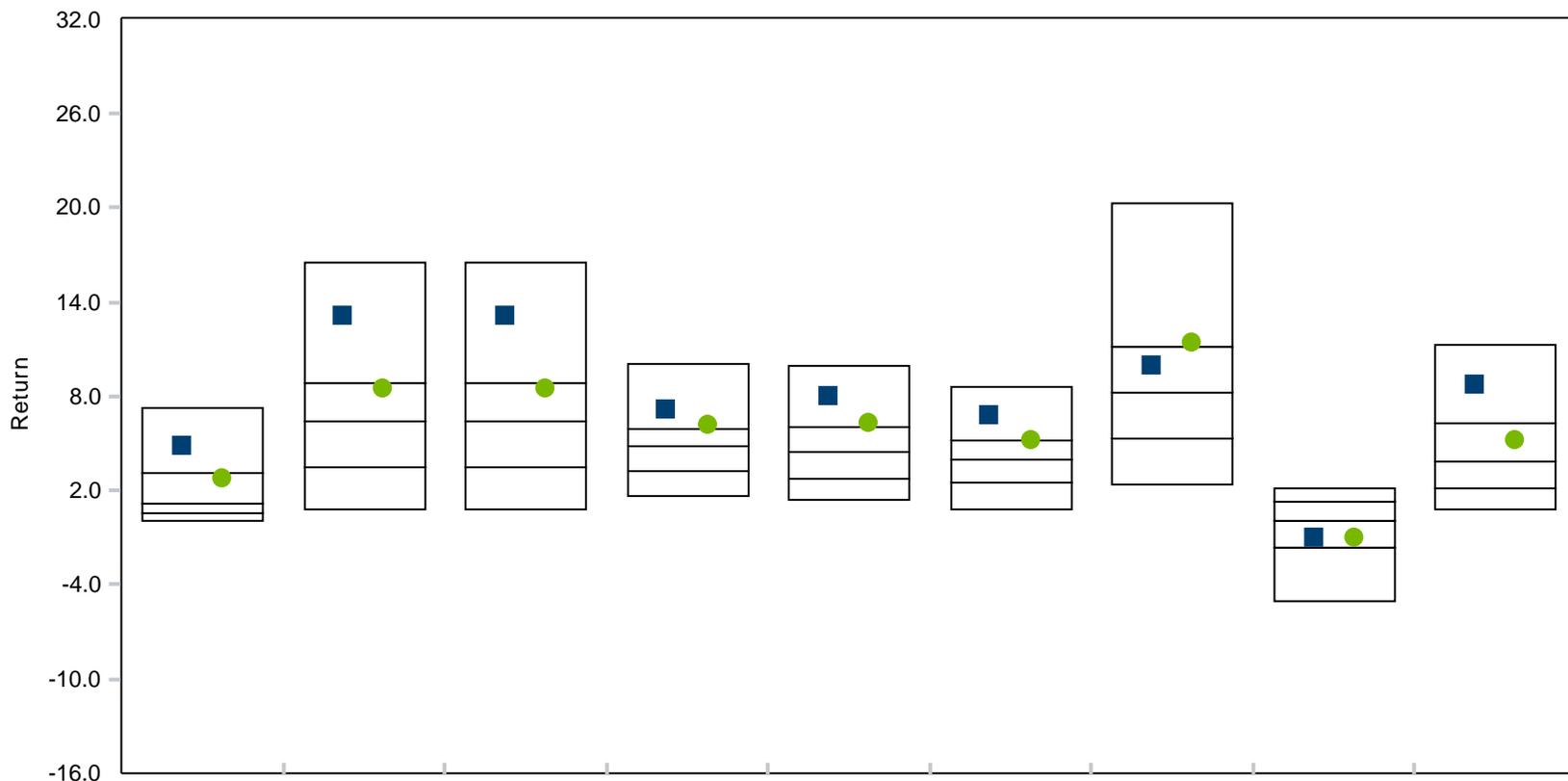


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Fixed Income (SA+CF)

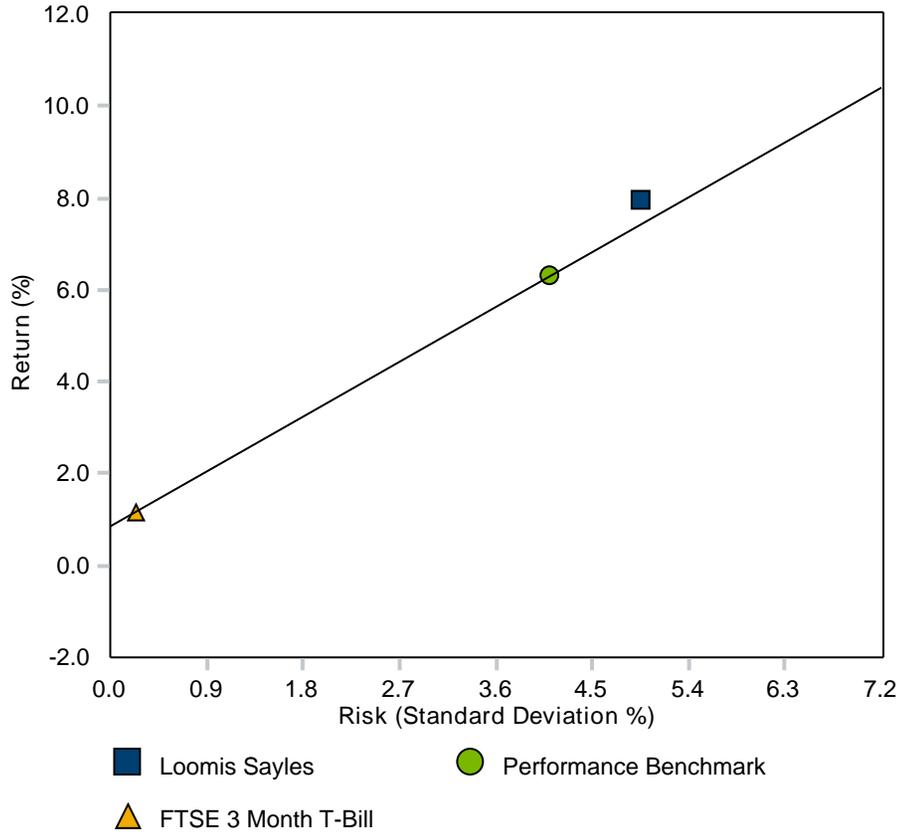


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Loomis Sayles	4.8 (16)	13.1 (9)	13.1 (9)	7.2 (13)	8.0 (12)	6.8 (12)	10.0 (31)	-1.1 (70)	8.8 (10)
● Performance Benchmark	2.8 (28)	8.5 (28)	8.5 (28)	6.2 (20)	6.3 (23)	5.2 (26)	11.4 (25)	-1.0 (69)	5.2 (33)
5th Percentile	7.2	16.5	16.5	10.1	10.0	8.6	20.3	2.1	11.3
1st Quartile	3.1	8.8	8.8	6.0	6.0	5.2	11.2	1.2	6.2
Median	1.2	6.4	6.4	4.8	4.4	4.0	8.2	0.1	3.8
3rd Quartile	0.5	3.5	3.5	3.3	2.7	2.5	5.3	-1.6	2.2
95th Percentile	0.0	0.8	0.8	1.7	1.4	0.9	2.4	-5.0	0.9
Population	633	631	631	592	549	477	1,007	1,062	1,088

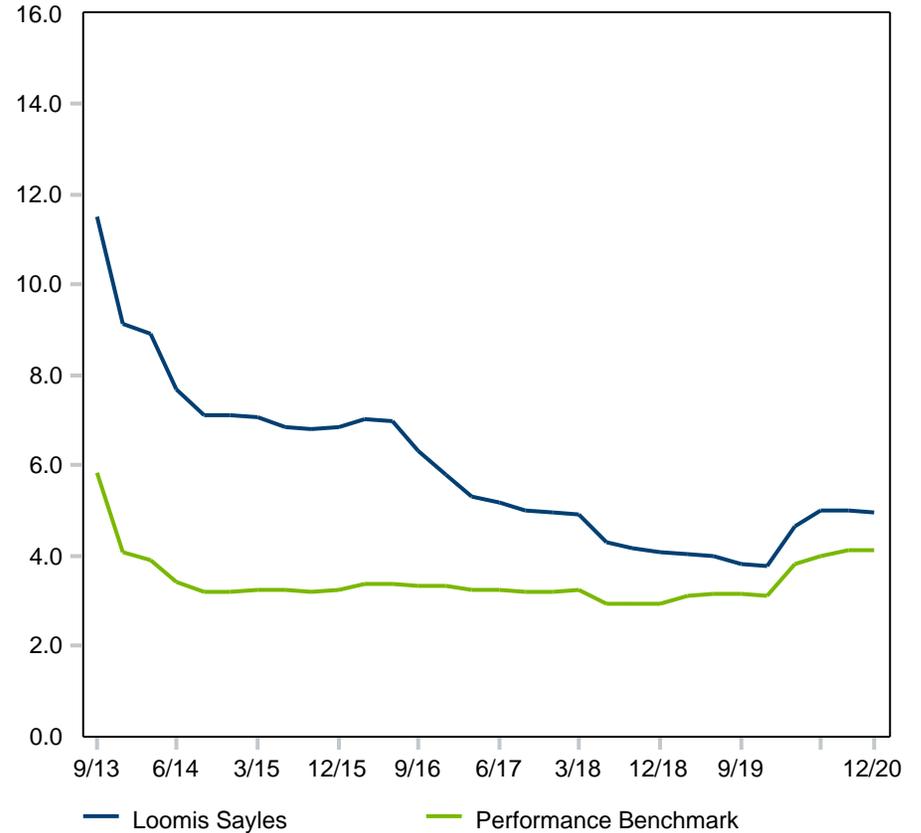
Parentheses contain percentile rankings.

Loomis Sayles Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

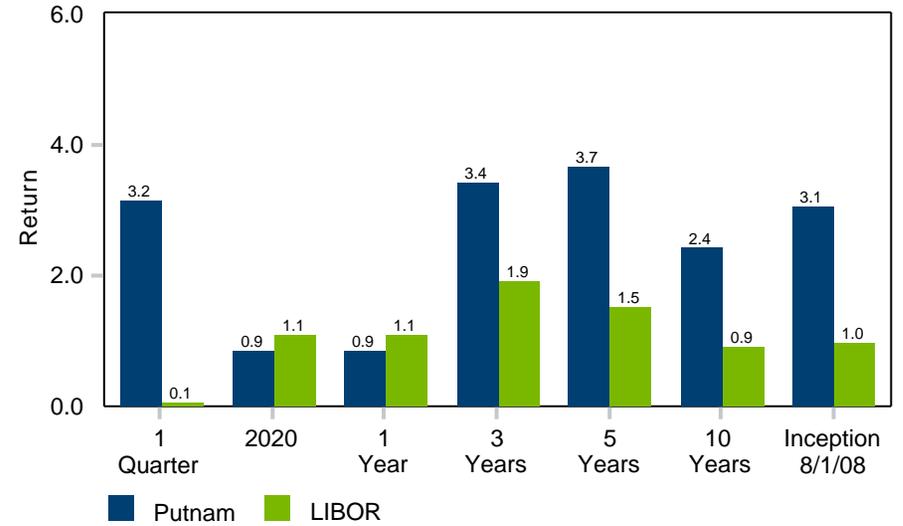
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Loomis Sayles	1.59	1.99	0.80	0.85	1.33	0.92	1.11	7.96	4.96	0.92
Performance Benchmark	0.00	0.00	N/A	1.00	1.22	0.00	1.00	6.31	4.12	1.00
FTSE 3 Month T-Bill	-5.06	4.14	-1.22	0.00	N/A	1.18	0.00	1.16	0.24	-0.07

Putnam Performance Summary

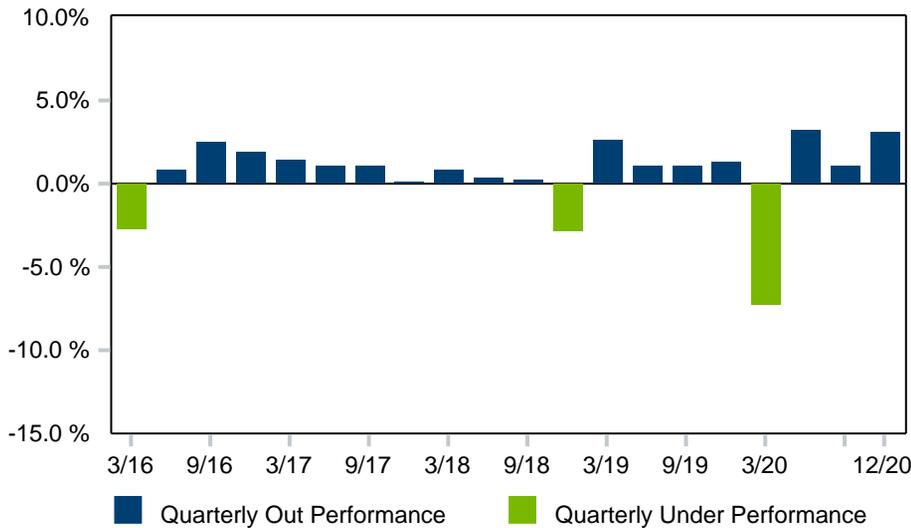
Account Information

Account Name: Putnam  
 Inception Date: 06/30/2008  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: LIBOR  
 Peer Group: IM U.S. Fixed Income (SA+CF)

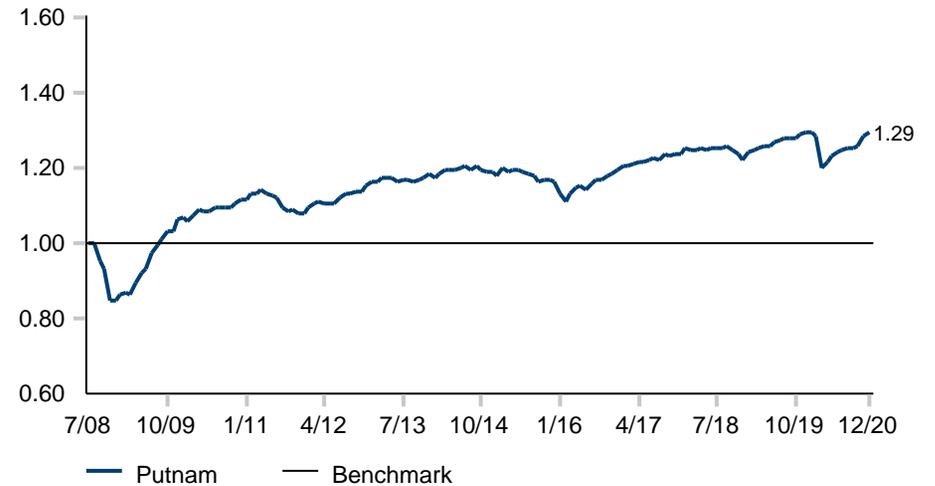
Return Summary



Quarterly Excess Performance

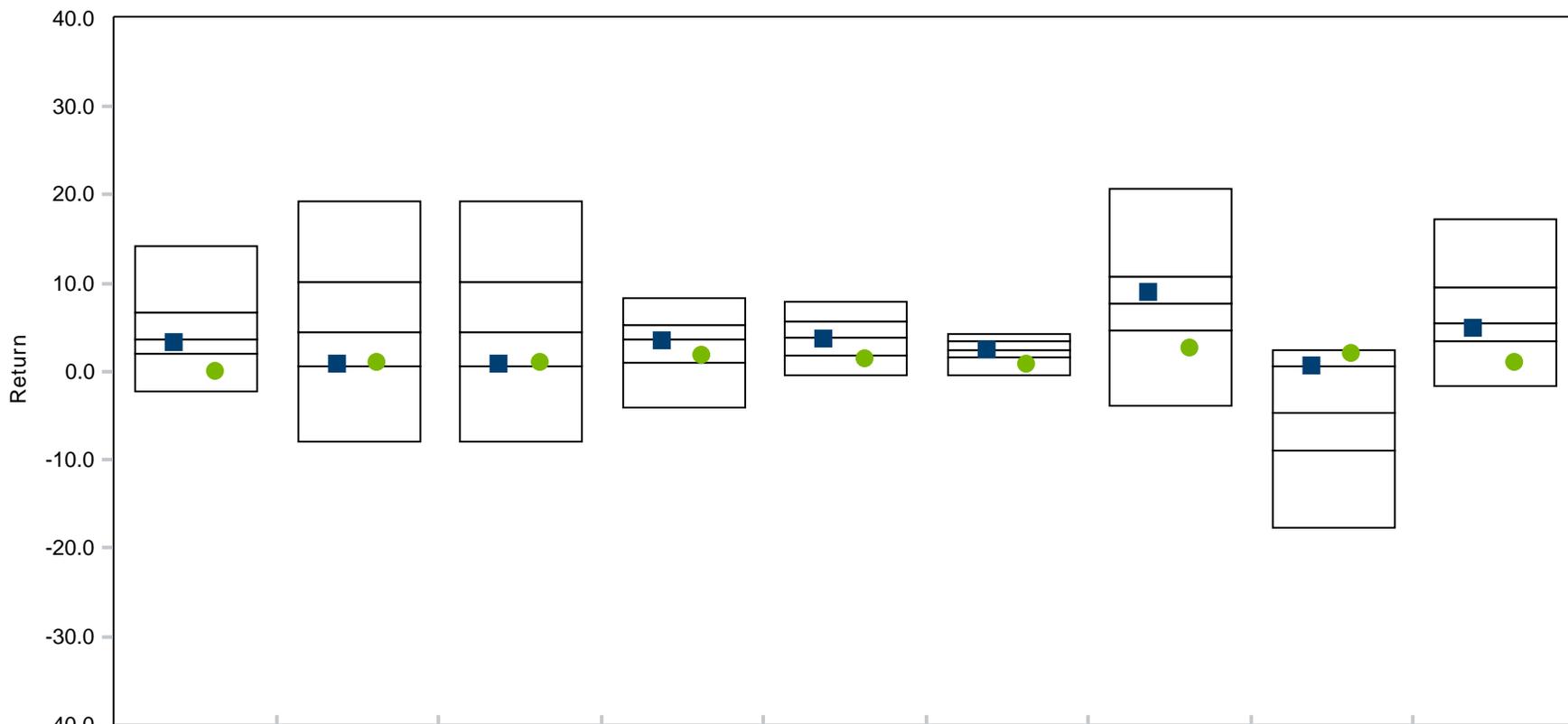


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Absolute Return (MF)

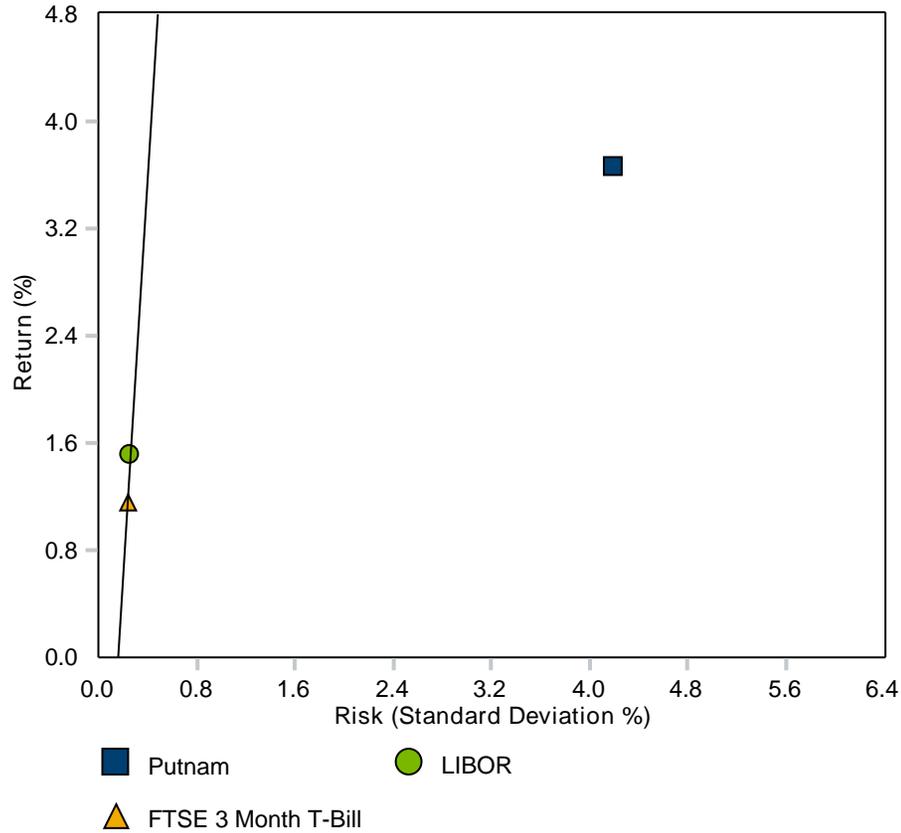


	1 Quarter	2020	1 Year	3 Years	5 Years	10 Years	2019	2018	2017
■ Putnam	3.2 (54)	0.9 (73)	0.9 (73)	3.4 (51)	3.7 (54)	2.4 (51)	9.0 (31)	0.7 (23)	4.9 (57)
● LIBOR	0.1 (86)	1.1 (72)	1.1 (72)	1.9 (68)	1.5 (76)	0.9 (82)	2.6 (84)	2.1 (6)	1.1 (91)
5th Percentile	14.1	19.4	19.4	8.3	7.9	4.2	20.7	2.4	17.2
1st Quartile	6.7	10.1	10.1	5.3	5.7	3.4	10.7	0.5	9.5
Median	3.6	4.4	4.4	3.6	3.9	2.4	7.7	-4.6	5.5
3rd Quartile	2.0	0.6	0.6	0.9	1.9	1.5	4.6	-9.0	3.5
95th Percentile	-2.2	-8.0	-8.0	-4.1	-0.4	-0.3	-3.8	-17.6	-1.7
Population	34	34	34	34	34	10	40	49	51

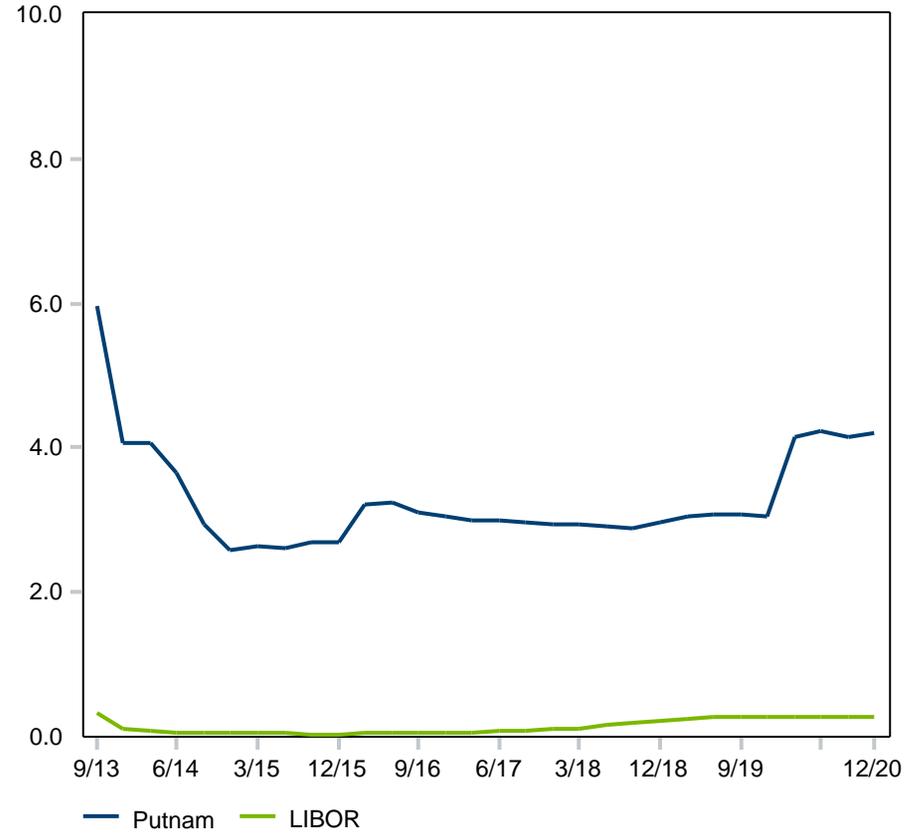
parentheses contain percentile rankings.

Putnam Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

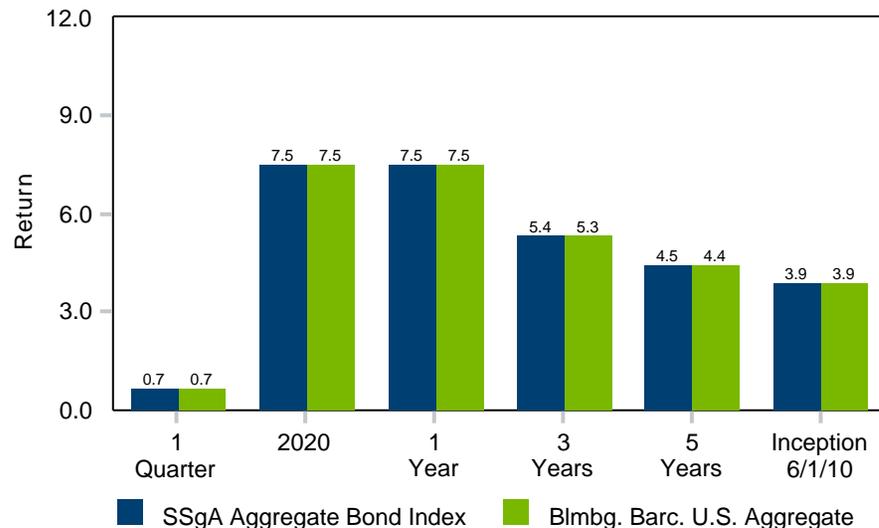
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Putnam	2.19	4.20	0.52	0.00	0.60	2.71	0.68	3.66	4.20	0.04
LIBOR	0.00	0.00	N/A	1.00	2.90	0.00	1.00	1.50	0.27	1.00
FTSE 3 Month T-Bill	-0.34	0.12	-2.90	0.80	N/A	-0.07	0.82	1.16	0.24	0.90

## SSgA Aggregate Bond Index Performance Summary

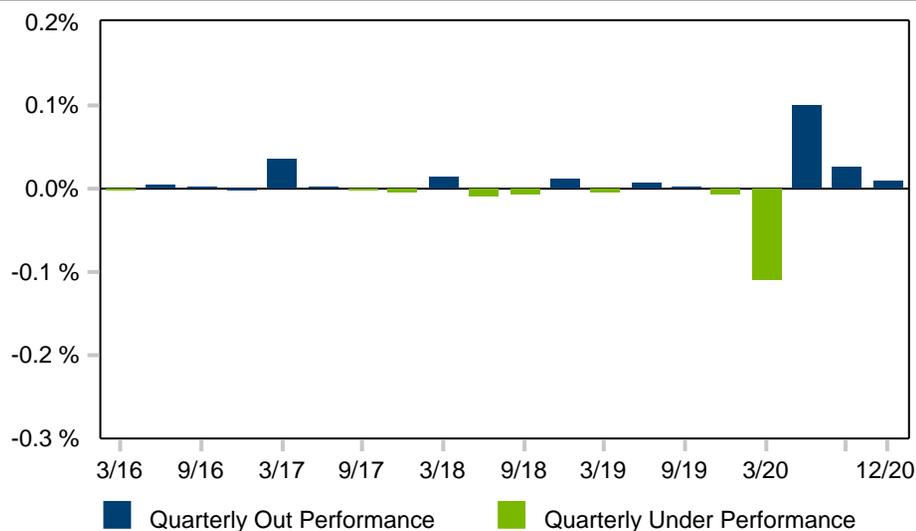
### Account Information

Account Name: SSgA Aggregate Bond Index  
 Inception Date: 01/01/1901  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Aggregate  
 Peer Group: IM U.S. Fixed Income (SA+CF)

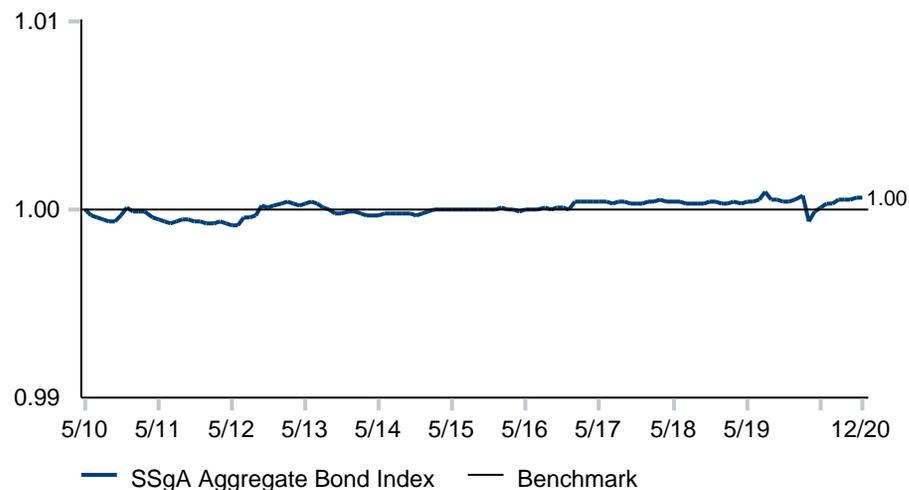
### Return Summary



### Quarterly Excess Performance

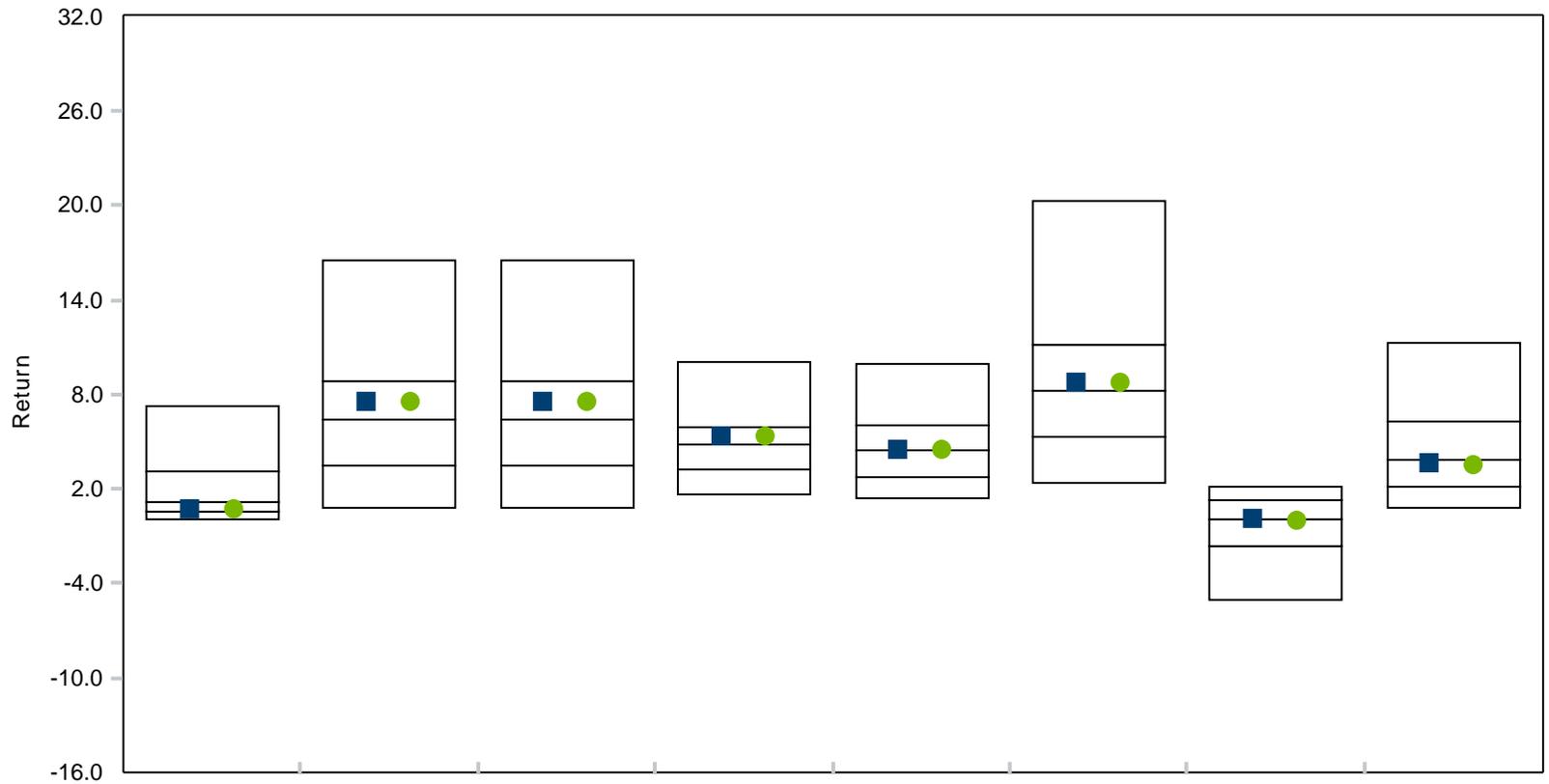


### Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Fixed Income (SA+CF)

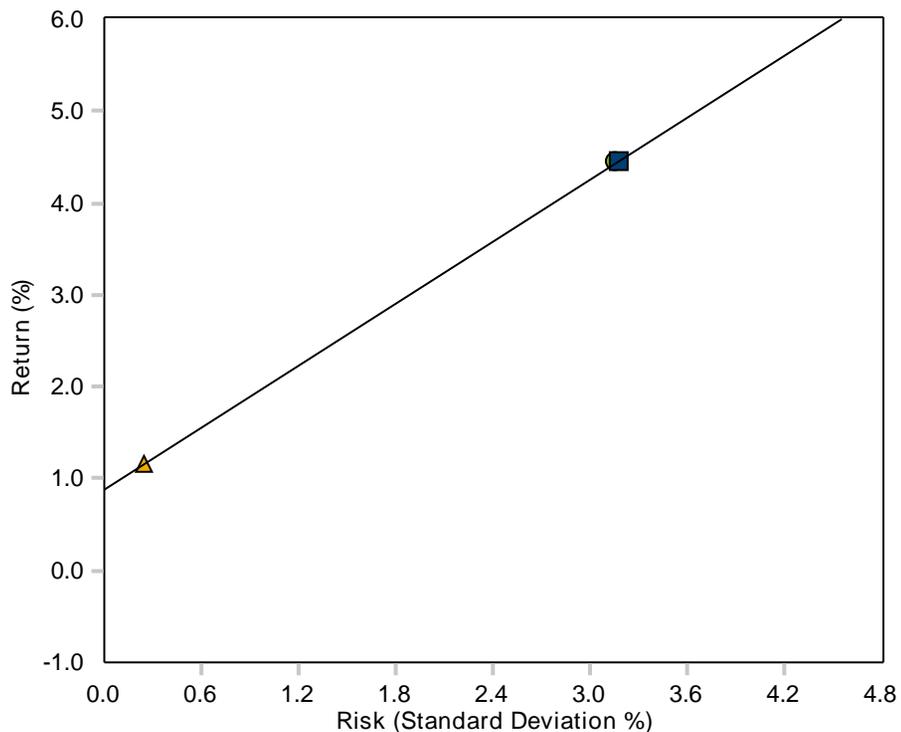


	1 Quarter	2020	1 Year	3 Years	5 Years	2019	2018	2017
■ SSgA Aggregate Bond Index	0.7 (67)	7.5 (38)	7.5 (38)	5.4 (41)	4.5 (50)	8.7 (45)	0.0 (52)	3.6 (55)
● Blmbg. Barc. U.S. Aggregate	0.7 (68)	7.5 (38)	7.5 (38)	5.3 (41)	4.4 (50)	8.7 (45)	0.0 (52)	3.5 (55)
5th Percentile	7.2	16.5	16.5	10.1	10.0	20.3	2.1	11.3
1st Quartile	3.1	8.8	8.8	6.0	6.0	11.2	1.2	6.2
Median	1.2	6.4	6.4	4.8	4.4	8.2	0.1	3.8
3rd Quartile	0.5	3.5	3.5	3.3	2.7	5.3	-1.6	2.2
95th Percentile	0.0	0.8	0.8	1.7	1.4	2.4	-5.0	0.9
Population	633	631	631	592	549	1,007	1,062	1,088

parentheses contain percentile rankings.

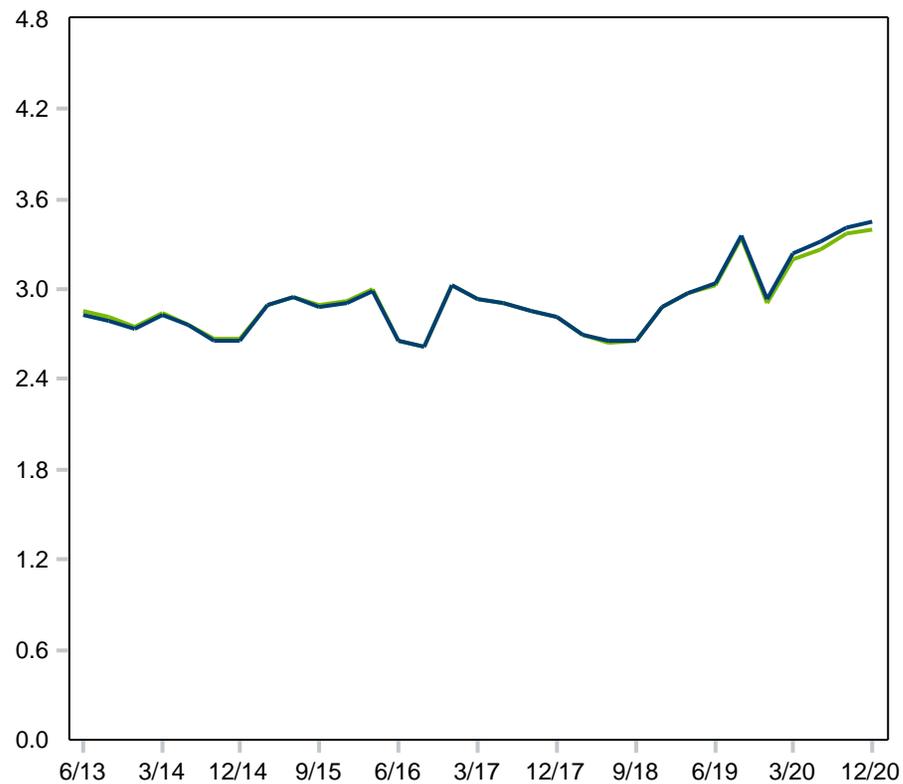
SSgA Aggregate Bond Index Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



■ SSgA Aggregate Bond Index    ● Blmbg. Barc. U.S. Aggregate  
 ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation



— SSgA Aggregate Bond Index    — Blmbg. Barc. U.S. Aggregate

5 Years Historical Statistics

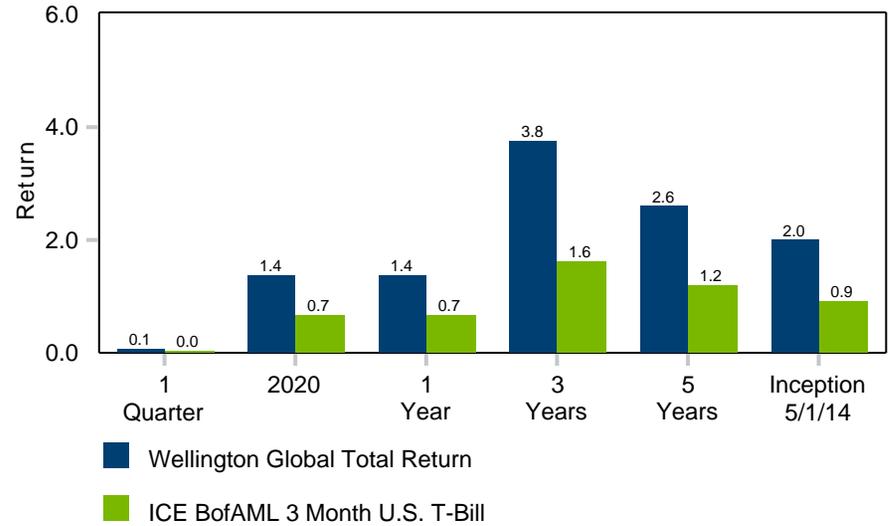
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
SSgA Aggregate Bond Index	0.01	0.08	0.19	1.00	1.03	-0.02	1.01	4.45	3.19	1.00
Blmbg. Barc. U.S. Aggregate	0.00	0.00	N/A	1.00	1.04	0.00	1.00	4.44	3.16	1.00
FTSE 3 Month T-Bill	-3.24	3.13	-1.04	0.03	N/A	1.10	0.01	1.16	0.24	0.17

Wellington Global Total Return Performance Summary

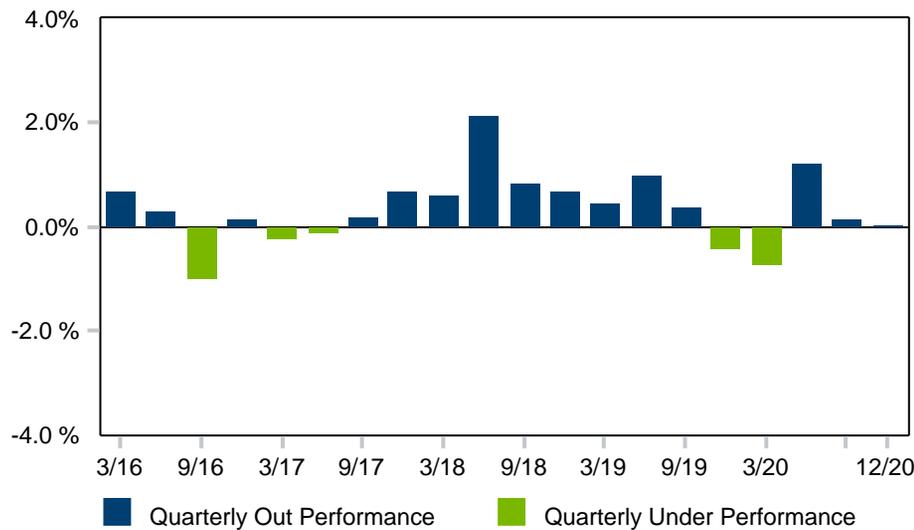
Account Information

Account Name: Wellington Global Total Return  
 Inception Date: 05/13/2014  
 Account Structure: Commingled Fund  
 Asset Class: Global Fixed Income  
 Benchmark: ICE BofAML 3 Month U.S. T-Bill  
 Peer Group: IM Absolute Return (MF)

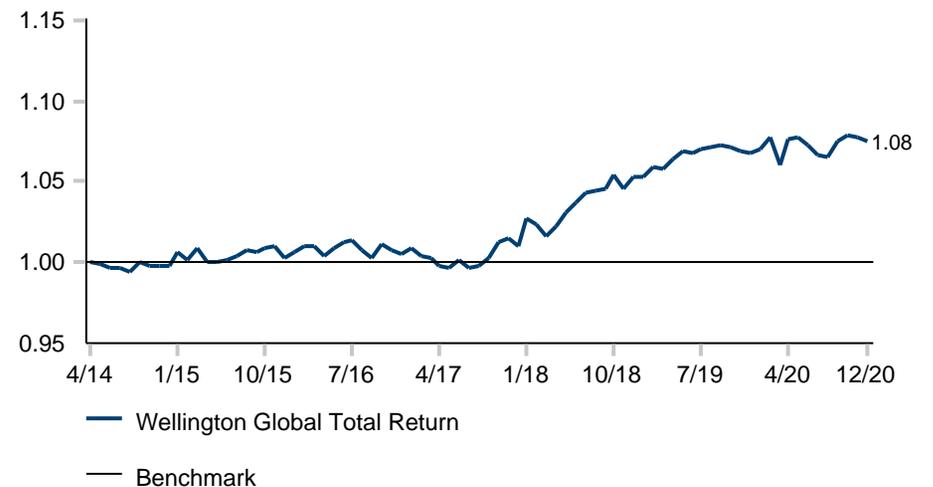
Return Summary



Quarterly Excess Performance

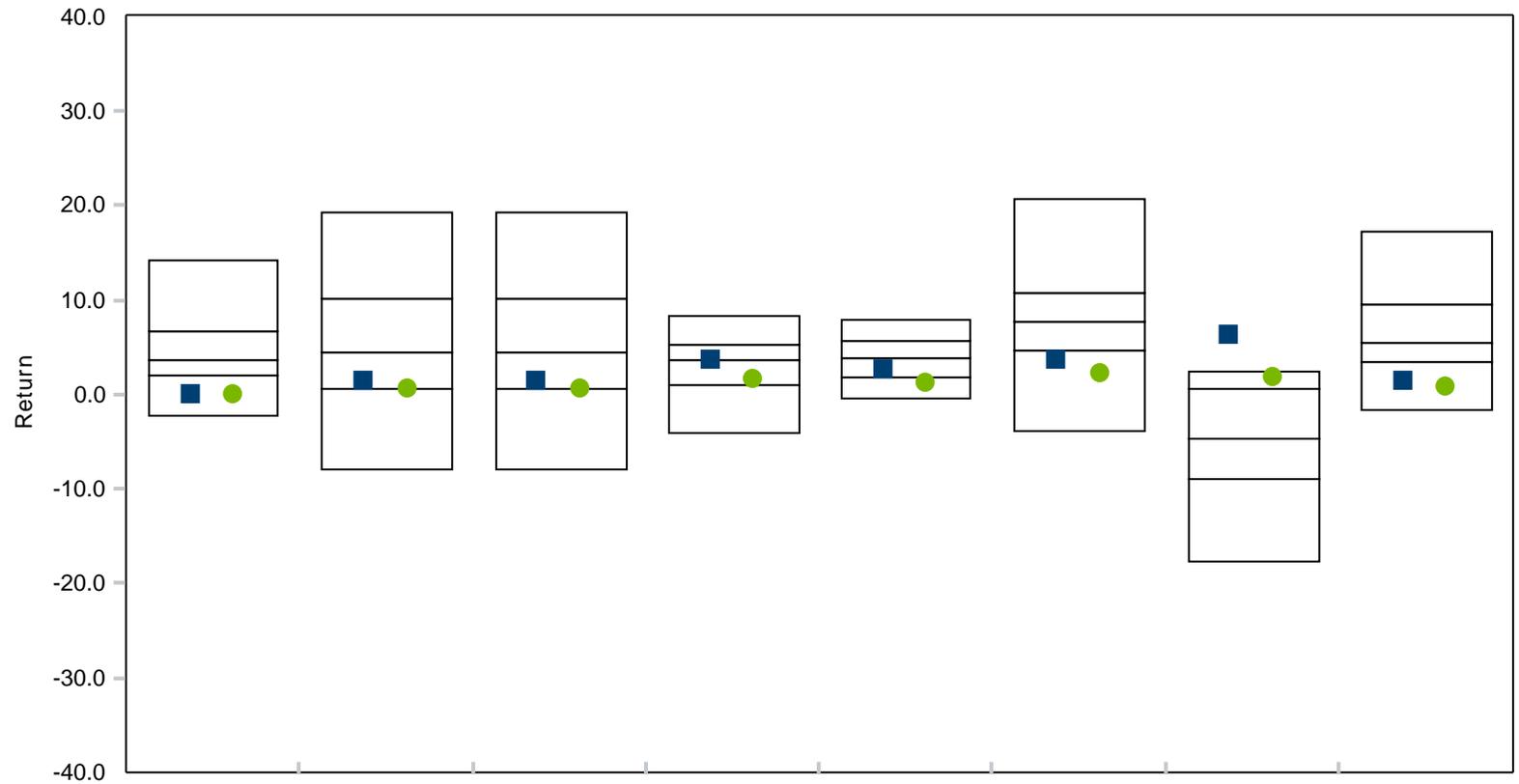


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM Absolute Return (MF)

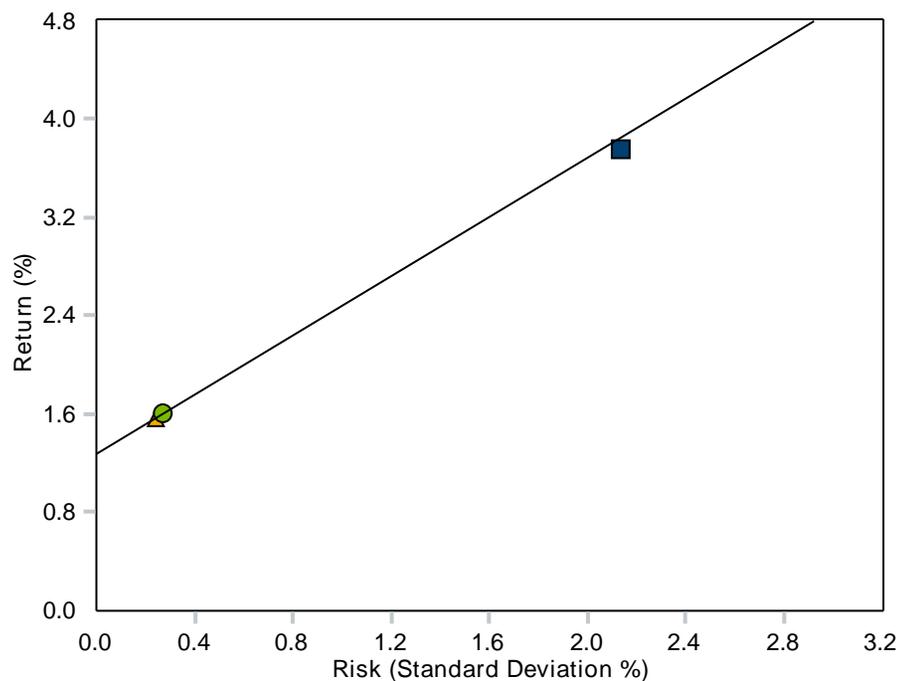


	1 Quarter	2020	1 Year	3 Years	5 Years	2019	2018	2017
■ Wellington Global Total Return	0.1 (86)	1.4 (72)	1.4 (72)	3.8 (49)	2.6 (74)	3.7 (83)	6.2 (4)	1.4 (91)
● ICE BofAML 3 Month U.S. T-Bill	0.0 (87)	0.7 (75)	0.7 (75)	1.6 (70)	1.2 (81)	2.3 (84)	1.9 (6)	0.9 (91)
5th Percentile	14.1	19.4	19.4	8.3	7.9	20.7	2.4	17.2
1st Quartile	6.7	10.1	10.1	5.3	5.7	10.7	0.5	9.5
Median	3.6	4.4	4.4	3.6	3.9	7.7	-4.6	5.5
3rd Quartile	2.0	0.6	0.6	0.9	1.9	4.6	-9.0	3.5
95th Percentile	-2.2	-8.0	-8.0	-4.1	-0.4	-3.8	-17.6	-1.7
Population	34	34	34	34	34	40	49	51

parentheses contain percentile rankings.

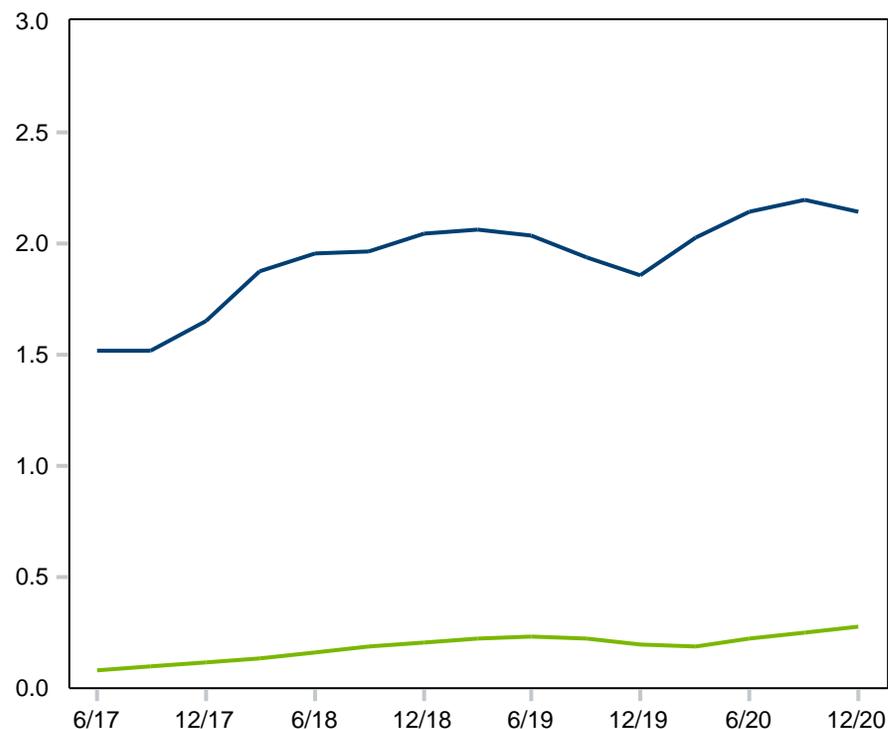
Wellington Global Total Return Risk Profile

Annualized Return vs. Annualized Standard Deviation 3 Years



- Wellington Global Total Return
- ICE BofAML 3 Month U.S. T-Bill
- ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation



- Wellington Global Total Return
- ICE BofAML 3 Month U.S. T-Bill

3 Years Historical Statistics

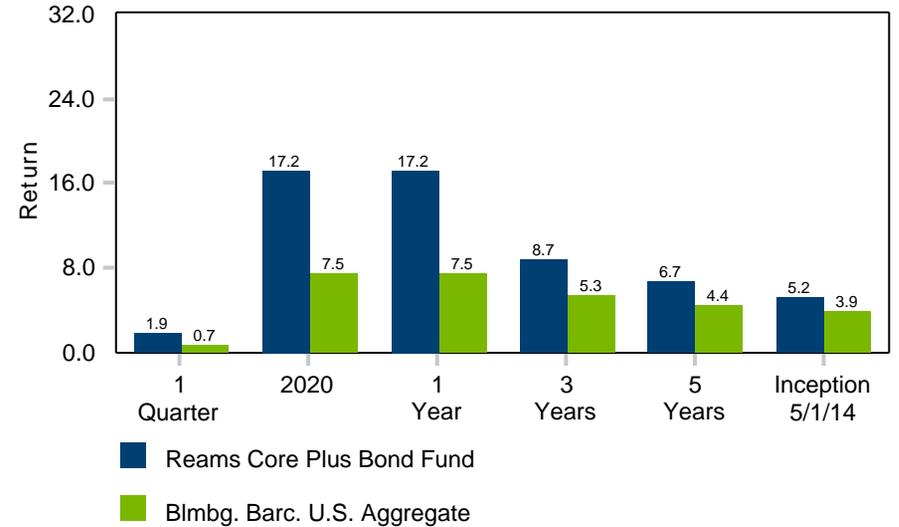
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Wellington Global Total Return	2.12	2.17	0.98	0.00	1.03	4.12	-0.21	3.75	2.14	-0.03
ICE BofAML 3 Month U.S. T-Bill	0.00	0.00	N/A	1.00	0.36	0.00	1.00	1.61	0.28	1.00
FTSE 3 Month T-Bill	-0.04	0.12	-0.36	0.83	N/A	0.29	0.79	1.56	0.24	0.91

Reams Core Plus Bond Fund Performance Summary

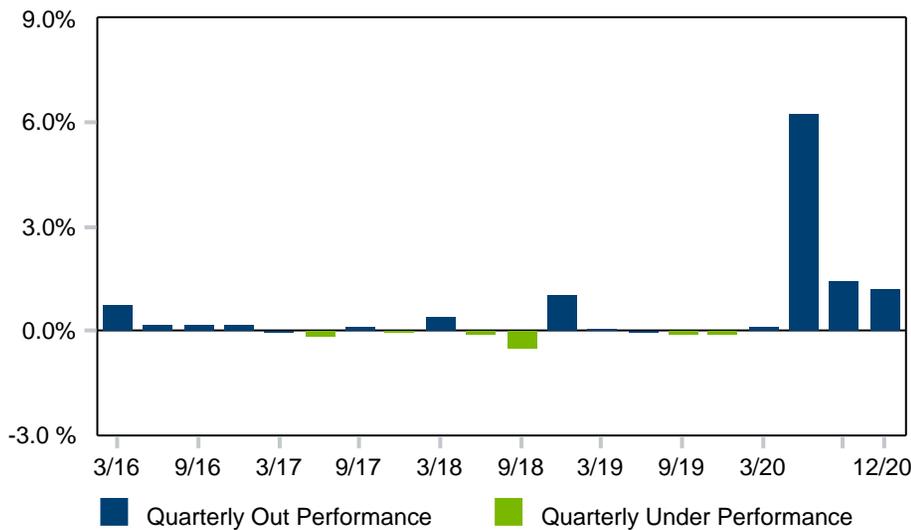
Account Information

Account Name: Reams Core Plus Bond Fund  
 Inception Date: 05/08/2014  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Aggregate  
 Peer Group: IM U.S. Fixed Income (SA+CF)

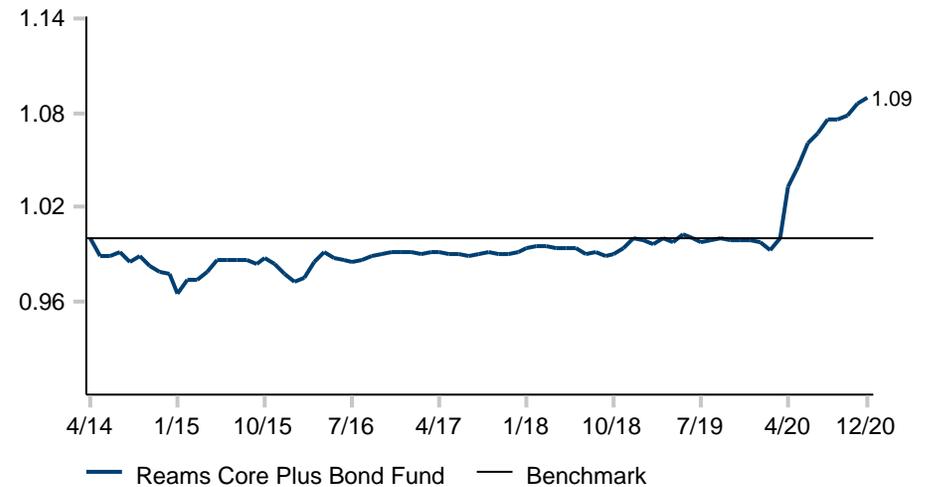
Return Summary



Quarterly Excess Performance

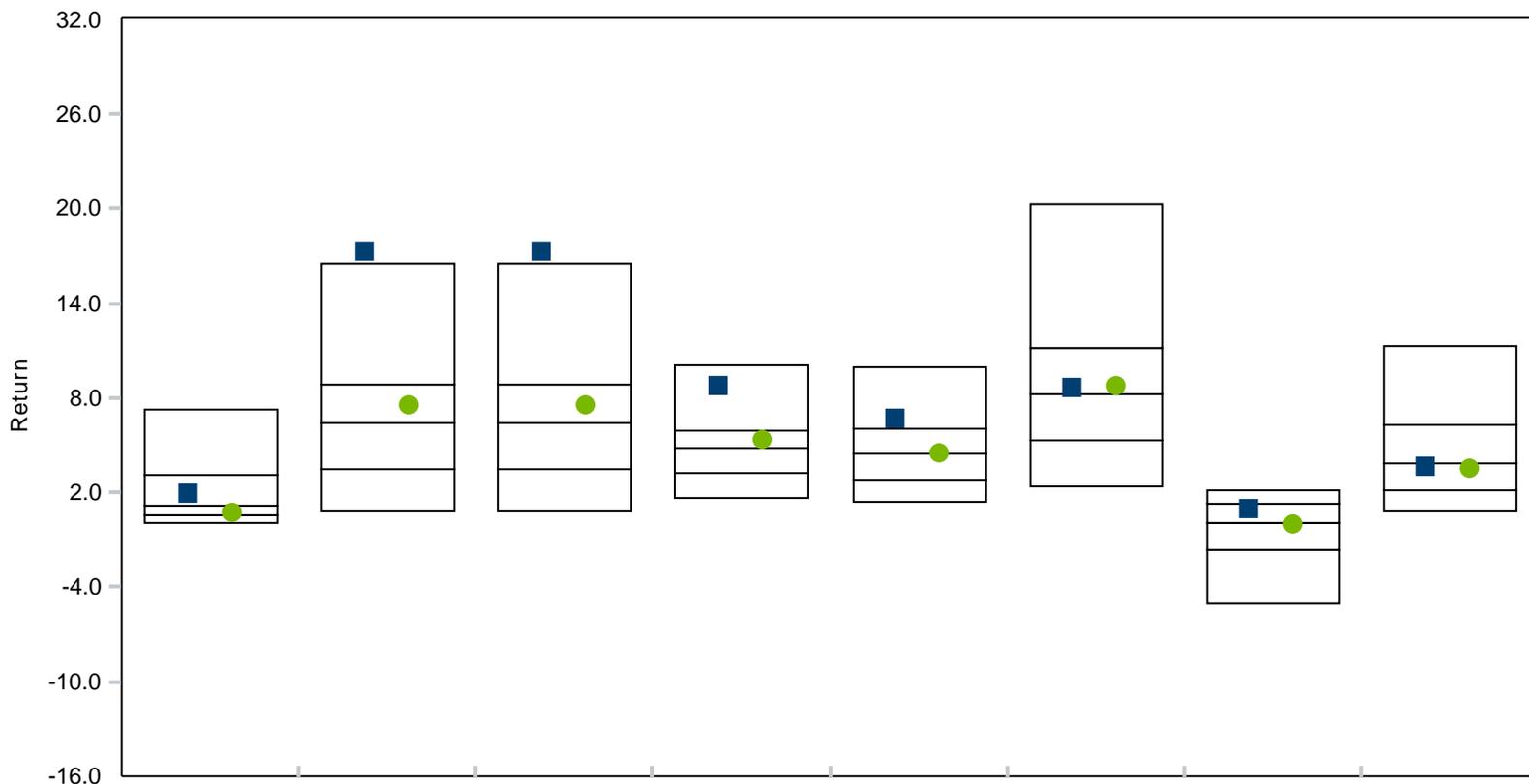


Ratio of Cumulative Wealth - Since Inception



Peer Group Analysis

IM U.S. Fixed Income (SA+CF)

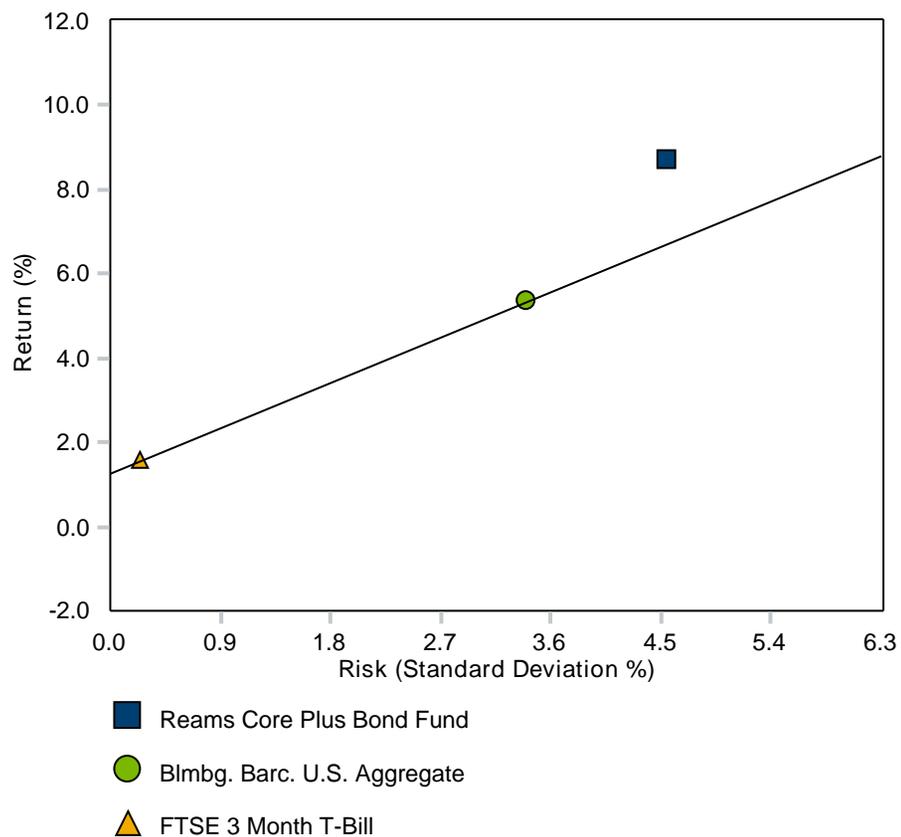


	1 Quarter	2020	1 Year	3 Years	5 Years	2019	2018	2017
■ Reams Core Plus Bond Fund	1.9 (39)	17.2 (5)	17.2 (5)	8.7 (9)	6.7 (21)	8.6 (46)	0.9 (35)	3.6 (55)
● Blmbg. Barc. U.S. Aggregate	0.7 (68)	7.5 (38)	7.5 (38)	5.3 (41)	4.4 (50)	8.7 (45)	0.0 (52)	3.5 (55)
5th Percentile	7.2	16.5	16.5	10.1	10.0	20.3	2.1	11.3
1st Quartile	3.1	8.8	8.8	6.0	6.0	11.2	1.2	6.2
Median	1.2	6.4	6.4	4.8	4.4	8.2	0.1	3.8
3rd Quartile	0.5	3.5	3.5	3.3	2.7	5.3	-1.6	2.2
95th Percentile	0.0	0.8	0.8	1.7	1.4	2.4	-5.0	0.9
Population	633	631	631	592	549	1,007	1,062	1,088

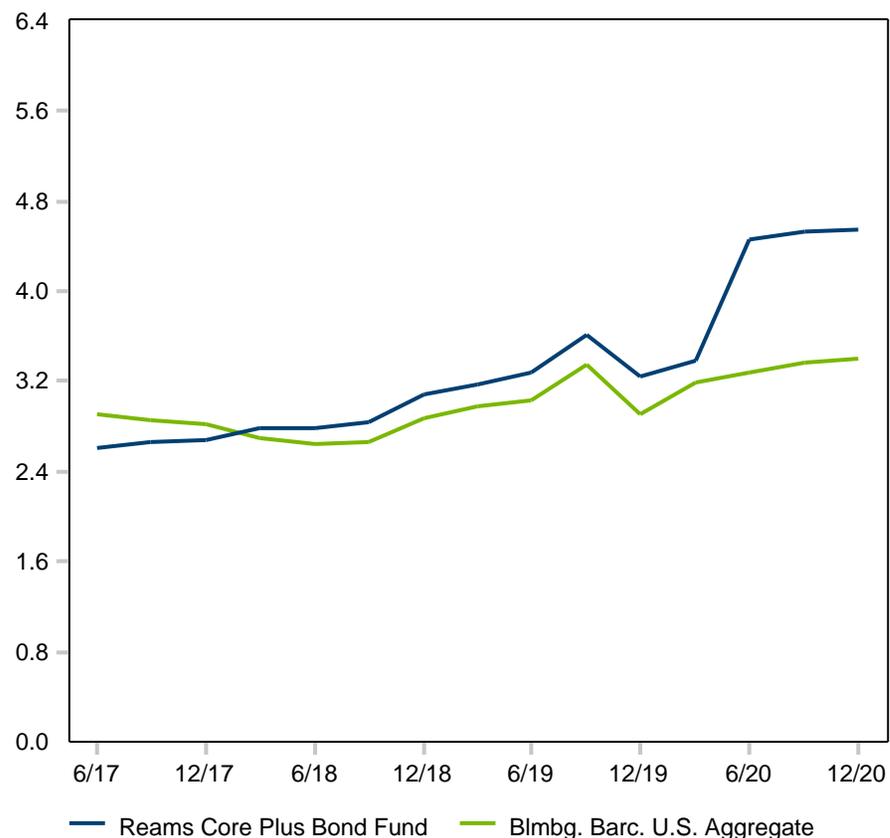
parentheses contain percentile rankings.

Reams Core Plus Bond Fund Risk Profile

Annualized Return vs. Annualized Standard Deviation 3 Years

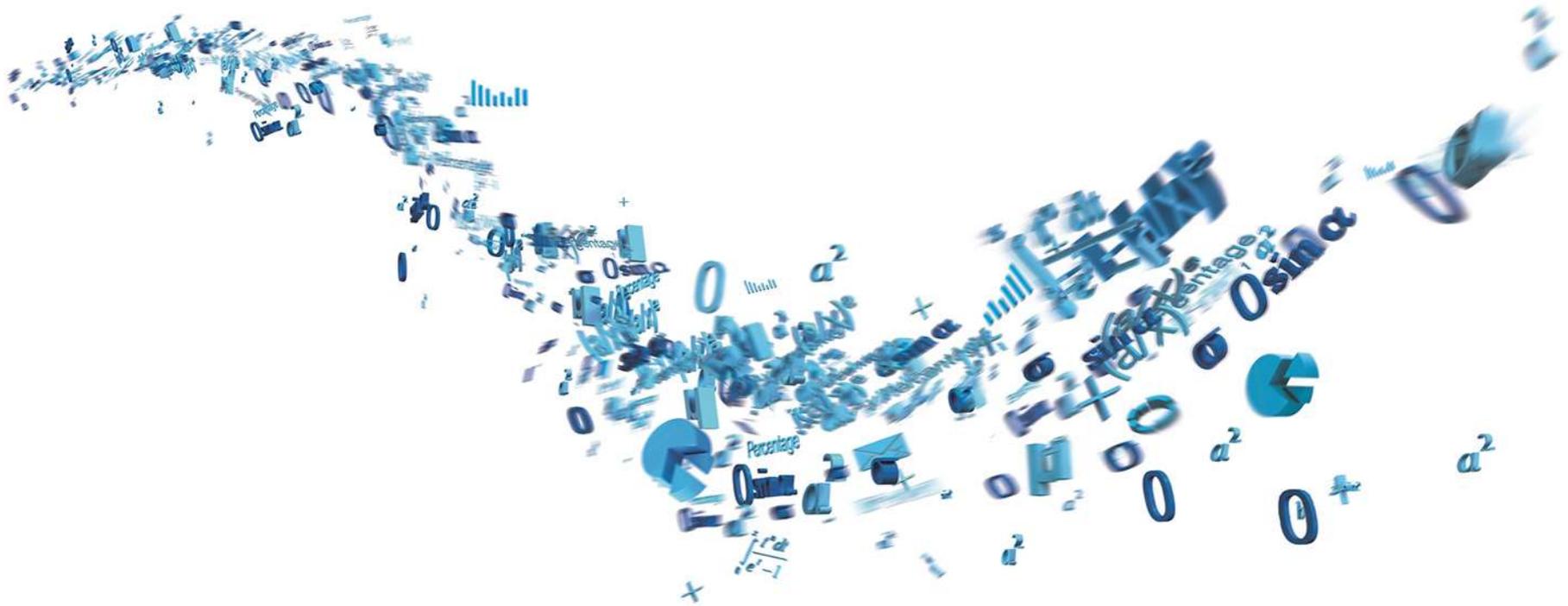


Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Reams Core Plus Bond Fund	3.21	2.38	1.35	0.74	1.52	2.47	1.15	8.72	4.54	0.86
Blmbg. Barc. U.S. Aggregate	0.00	0.00	N/A	1.00	1.10	0.00	1.00	5.34	3.40	1.00
FTSE 3 Month T-Bill	-3.72	3.37	-1.10	0.03	N/A	1.49	0.01	1.56	0.24	0.18



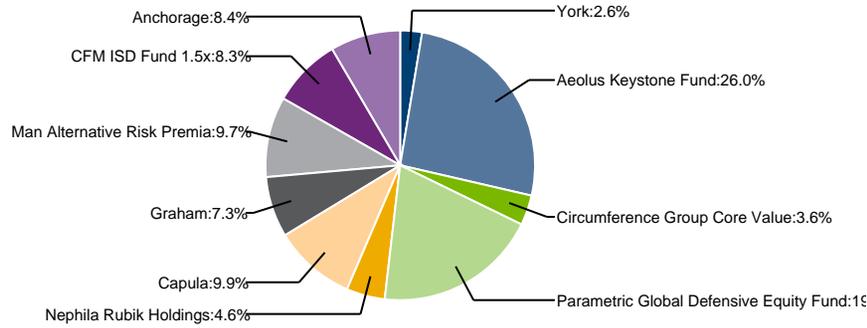
## Opportunistic/Alternatives

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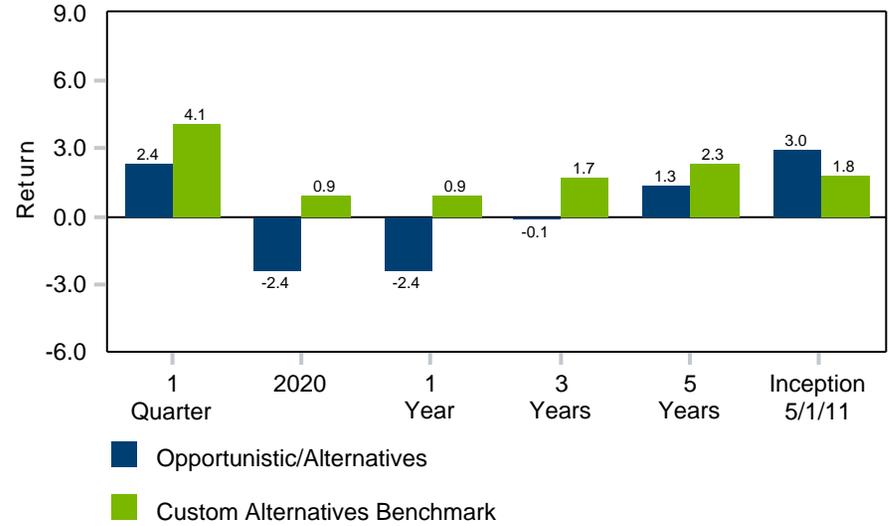
# Opportunistic/Alternatives Portfolio Overview

## Current Allocation

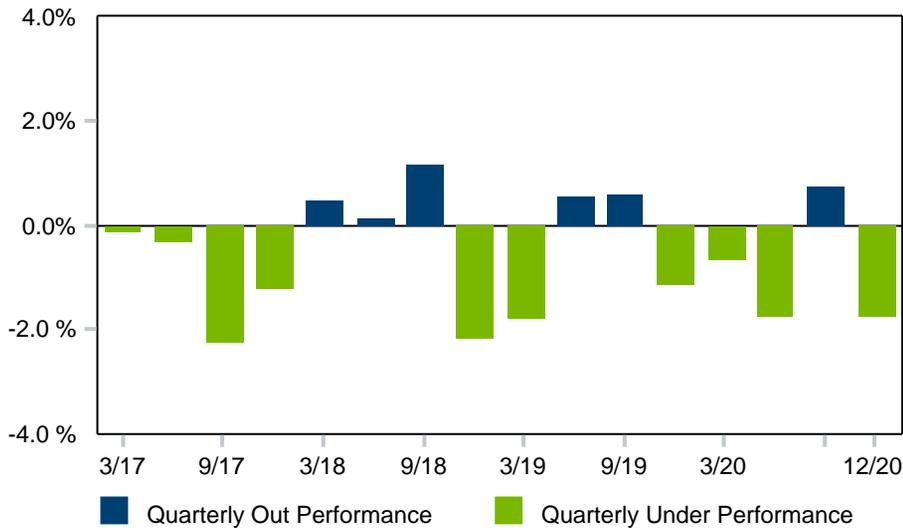
December 31, 2020 : \$915M



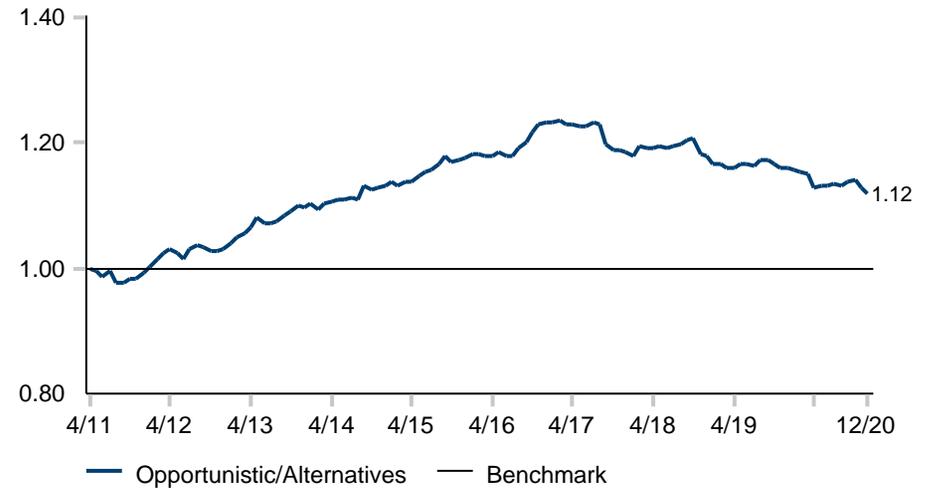
## Return Summary



## Quarterly Excess Performance

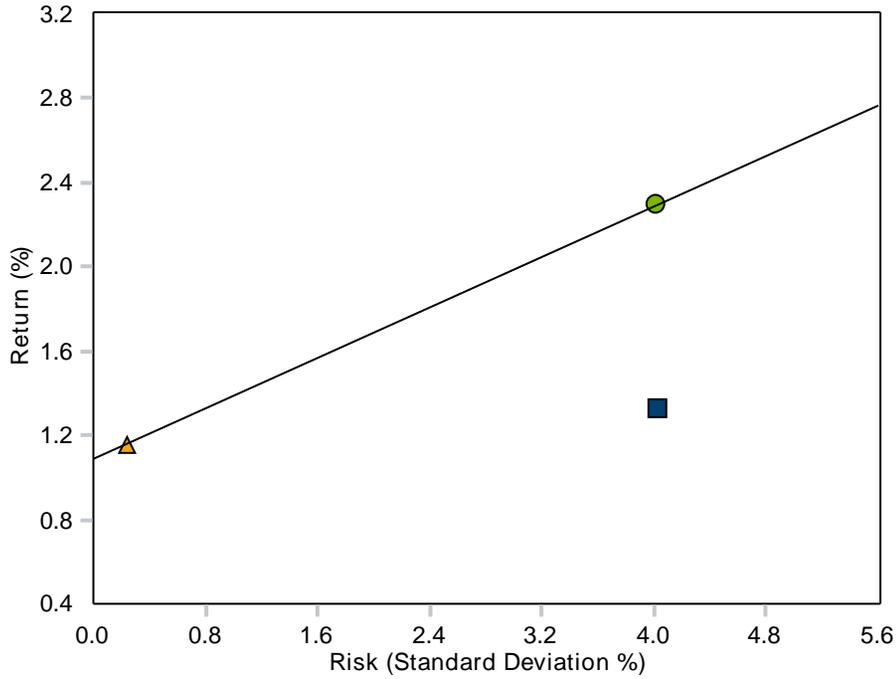


## Ratio of Cumulative Wealth - Since Inception



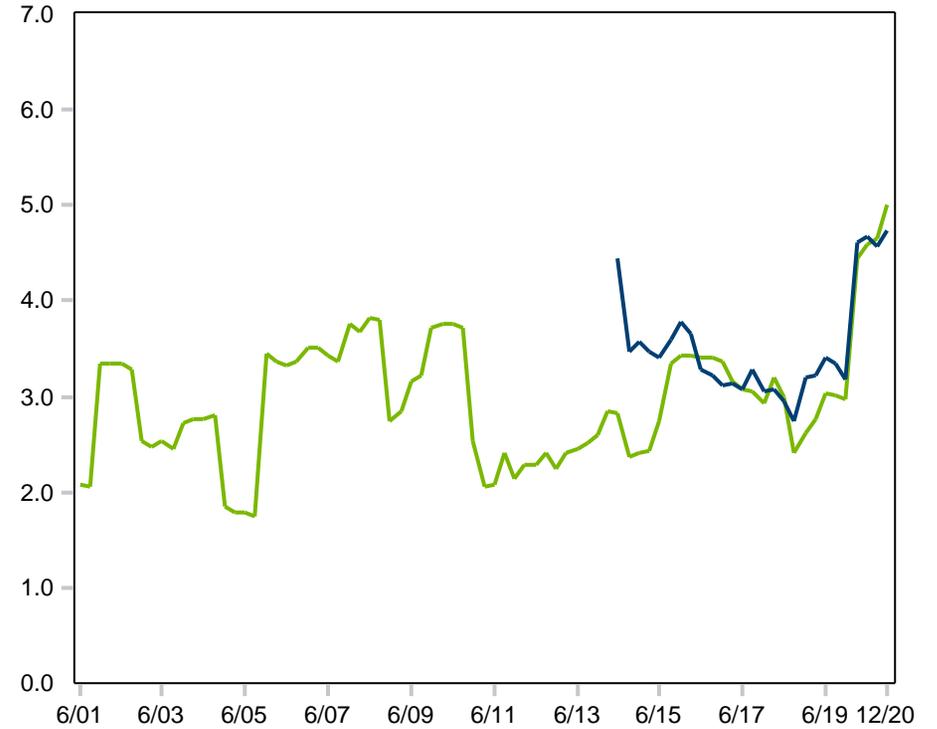
Opportunistic/Alternatives Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



- Opportunistic/Alternatives
- Custom Alternatives Benchmark
- ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation



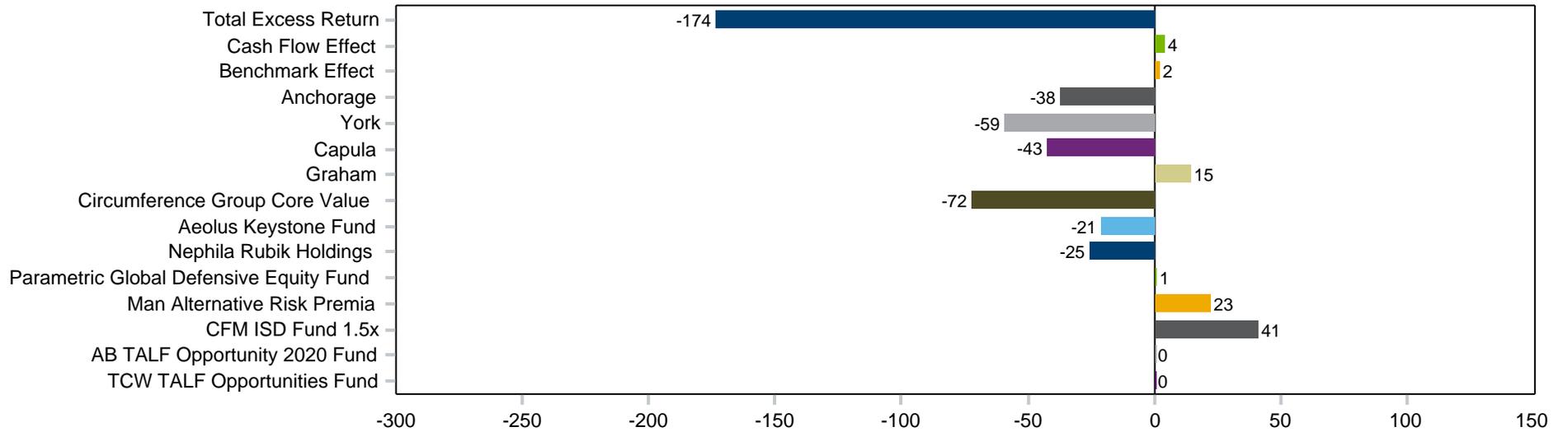
- Opportunistic/Alternatives
- Custom Alternatives Benchmark

5 Years Historical Statistics

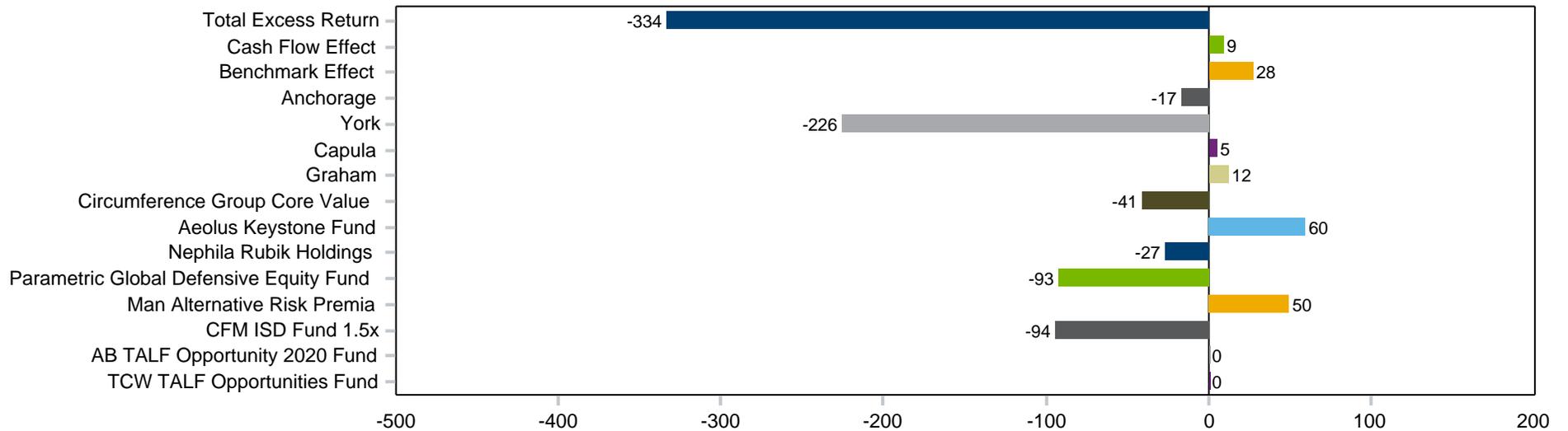
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Opportunistic/Alternatives	-0.95	2.37	-0.40	0.68	0.06	-0.55	0.83	1.33	4.03	0.83
Custom Alternatives Benchmark	0.00	0.00	N/A	1.00	0.30	0.00	1.00	2.29	4.01	1.00
FTSE 3 Month T-Bill	-1.20	4.05	-0.30	0.02	N/A	1.18	-0.01	1.16	0.24	-0.13

Asset Class Attribution

1 Quarter



1 Year

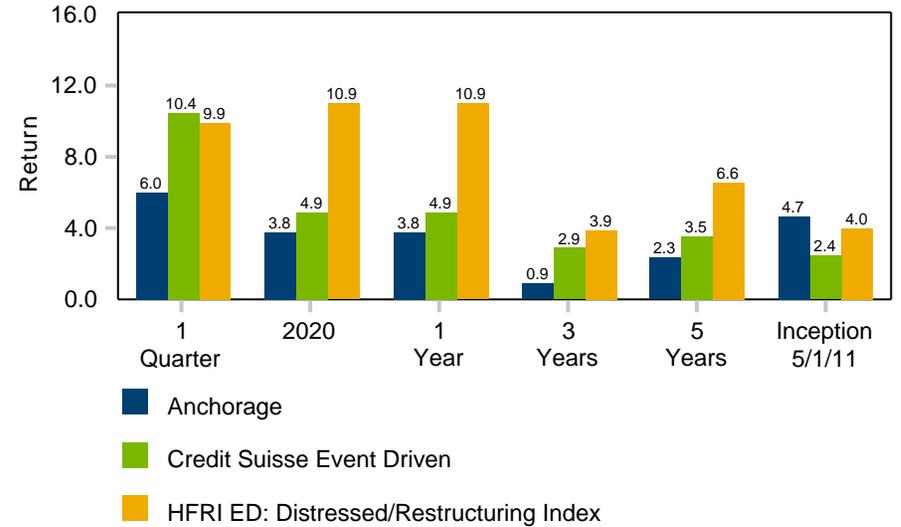


## Anchorage Performance Summary

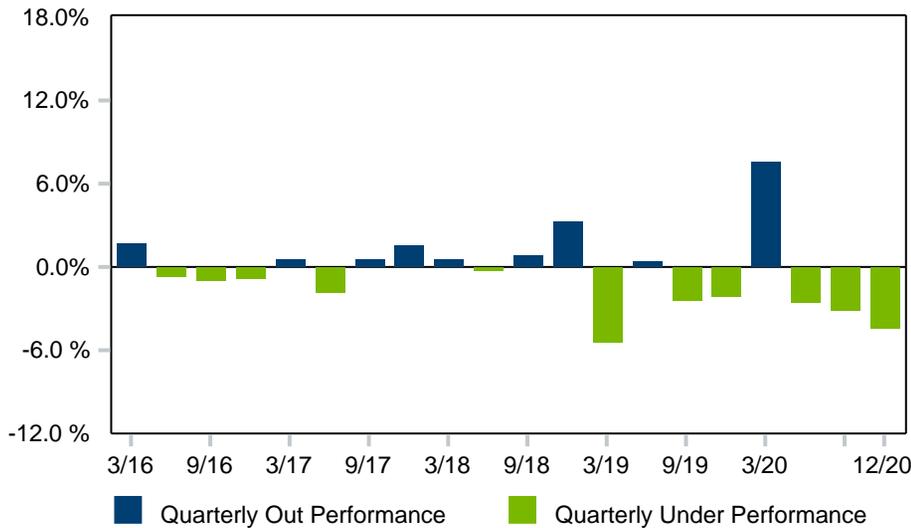
### Account Information

Account Name: Anchorage  
 Inception Date: 05/01/2011  
 Account Structure: Hedge Fund  
 Asset Class: US Hedge Fund  
 Benchmark: Credit Suisse Event Driven  
 Peer Group:

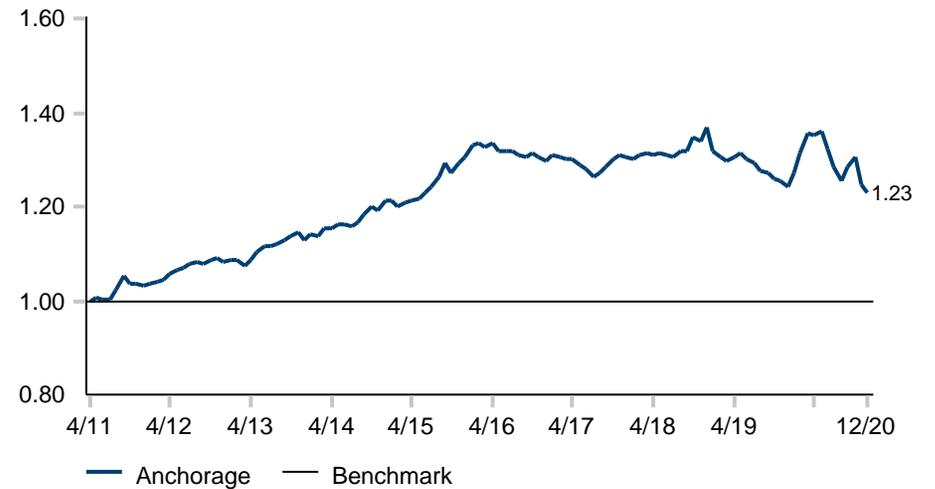
### Return Summary



### Quarterly Excess Performance

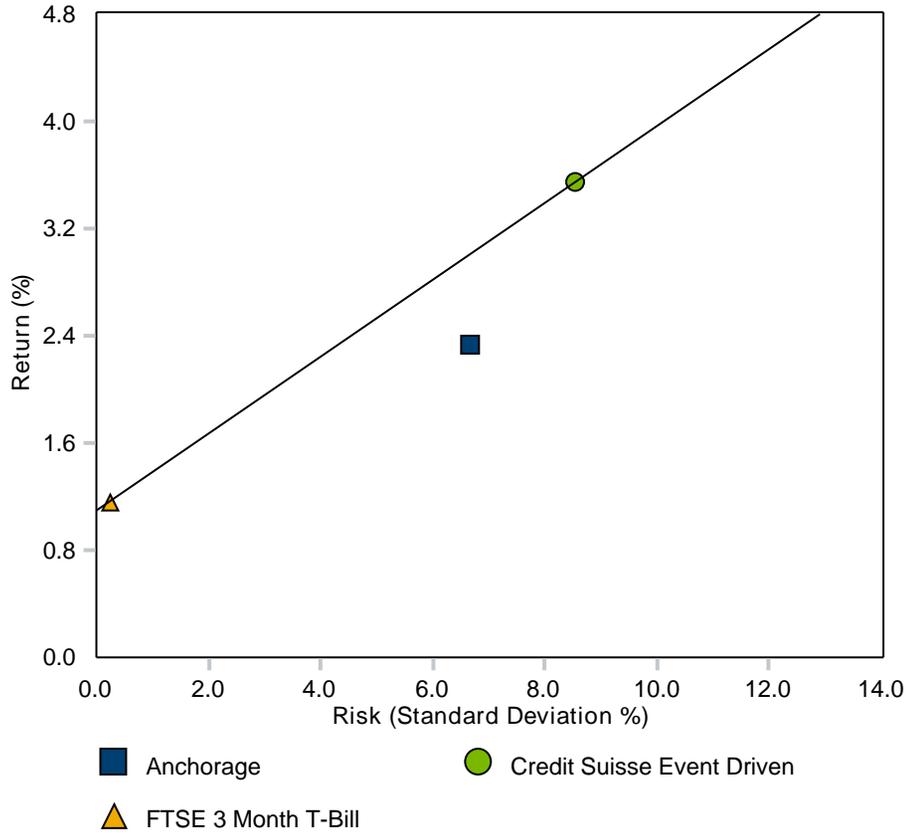


### Ratio of Cumulative Wealth - Since Inception

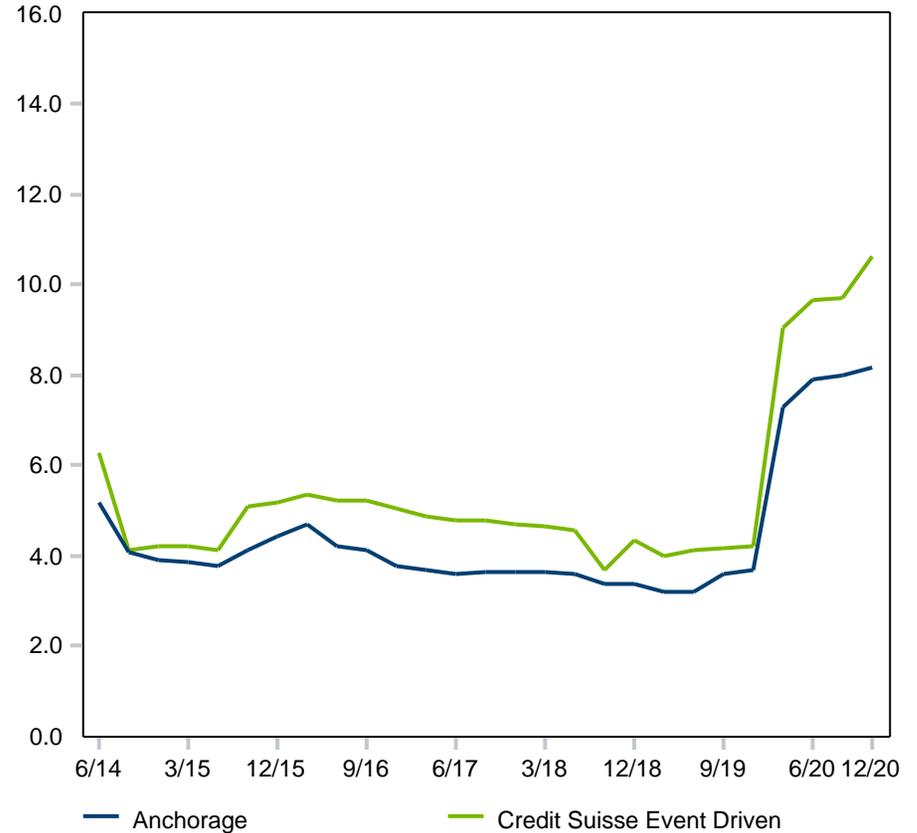


Anchorage Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 3 Years Standard Deviation



5 Years Historical Statistics

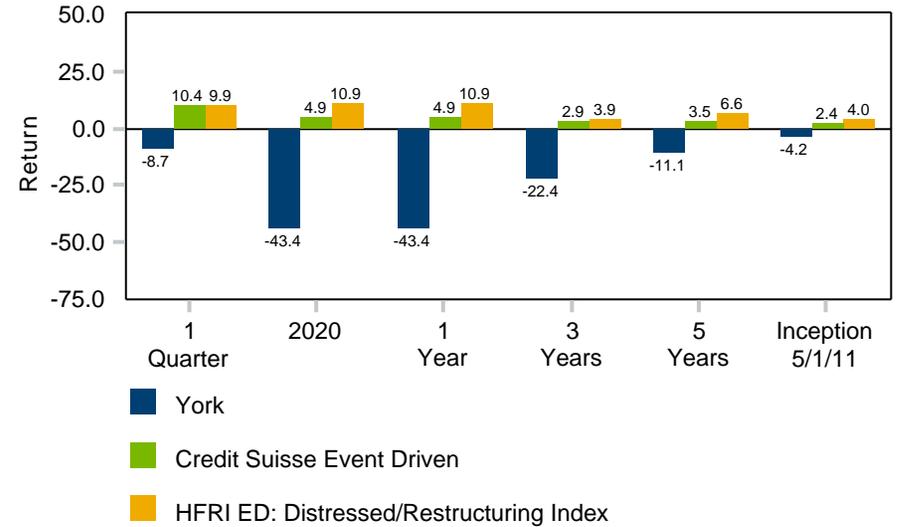
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Anchorage	-1.33	5.00	-0.26	0.66	0.21	0.09	0.63	2.33	6.68	0.81
Credit Suisse Event Driven	0.00	0.00	N/A	1.00	0.32	0.00	1.00	3.54	8.54	1.00
FTSE 3 Month T-Bill	-2.71	8.59	-0.32	0.04	N/A	1.18	-0.01	1.16	0.24	-0.21

## York Performance Summary

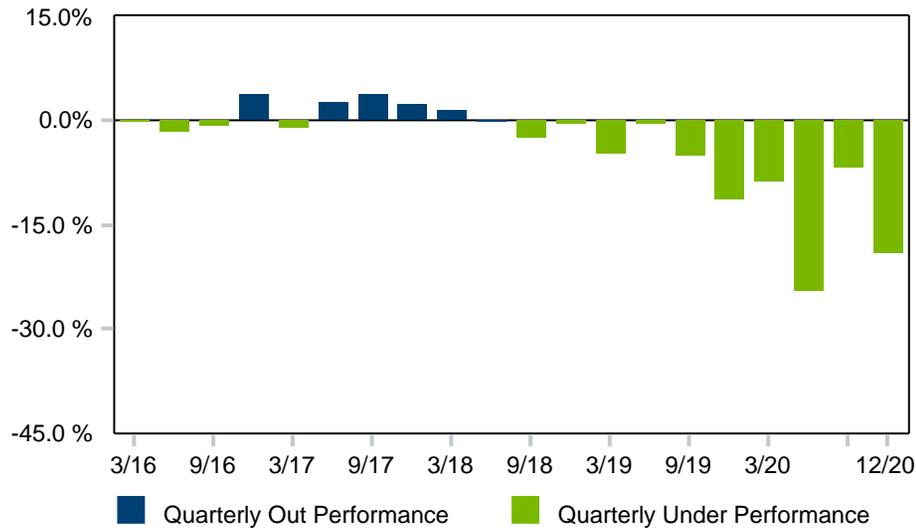
### Account Information

Account Name: York  
 Inception Date: 05/01/2011  
 Account Structure: Hedge Fund  
 Asset Class: US Hedge Fund  
 Benchmark: Credit Suisse Event Driven  
 Peer Group:

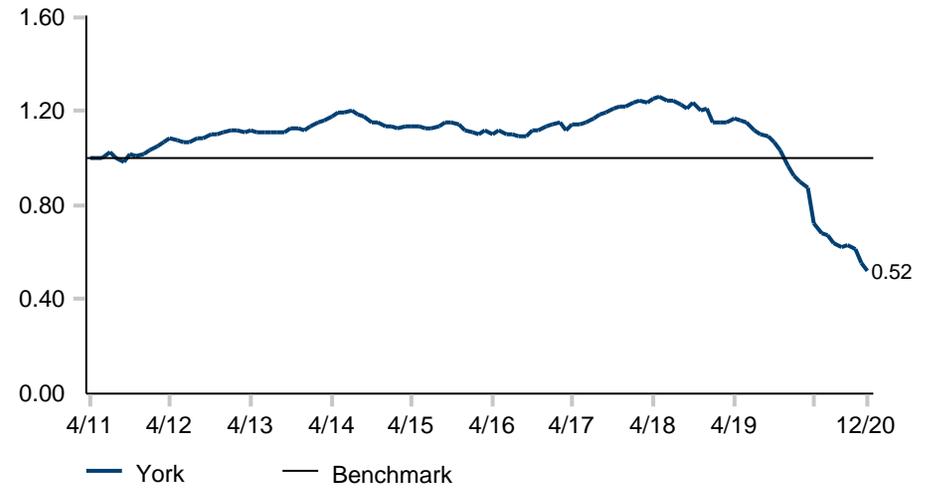
### Return Summary



### Quarterly Excess Performance

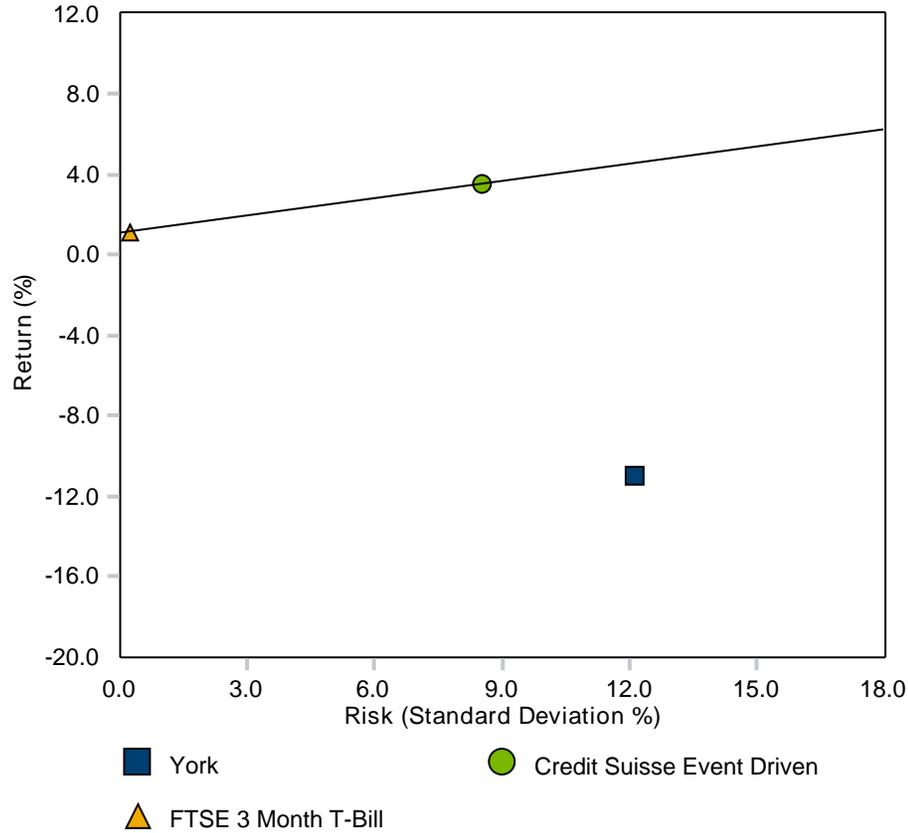


### Ratio of Cumulative Wealth - Since Inception

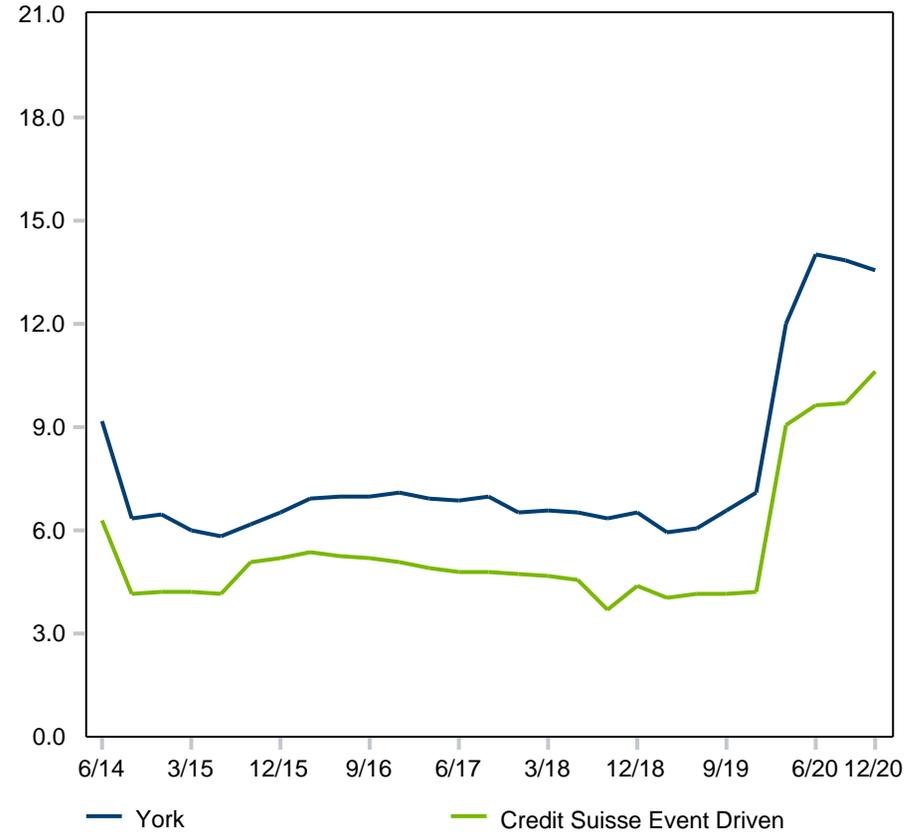


York Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 3 Years Standard Deviation



5 Years Historical Statistics

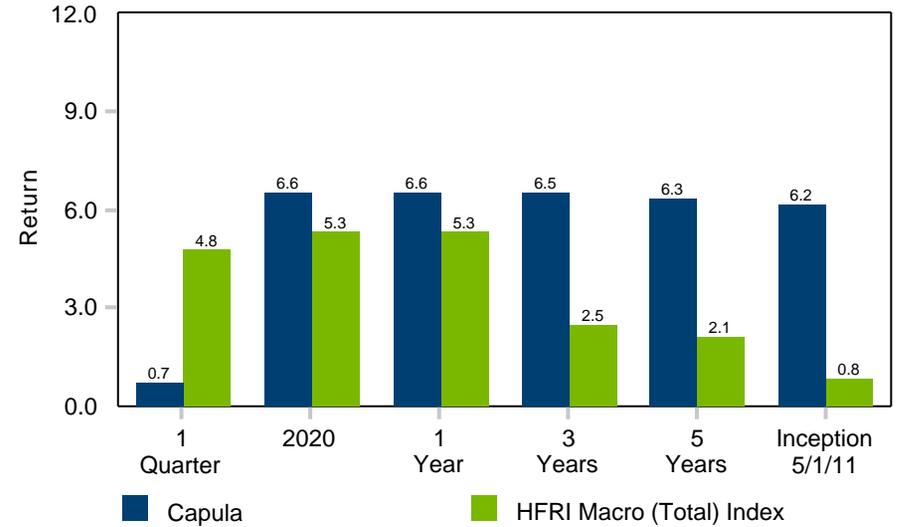
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
York	-14.74	11.66	-1.26	0.17	-0.99	-12.36	0.58	-11.06	12.15	0.41
Credit Suisse Event Driven	0.00	0.00	N/A	1.00	0.32	0.00	1.00	3.54	8.54	1.00
FTSE 3 Month T-Bill	-2.71	8.59	-0.32	0.04	N/A	1.18	-0.01	1.16	0.24	-0.21

## Capula Performance Summary

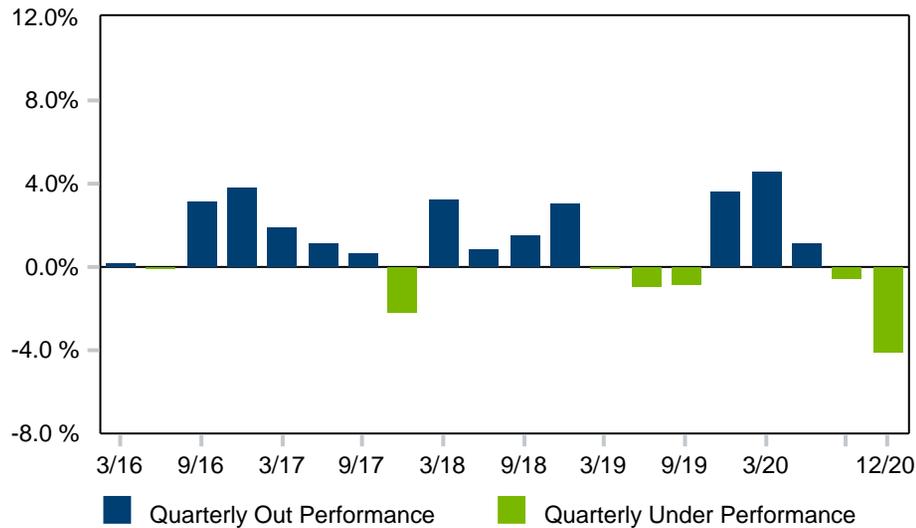
### Account Information

Account Name: Capula  
 Inception Date: 05/01/2011  
 Account Structure: Hedge Fund  
 Asset Class: US Hedge Fund  
 Benchmark: HFRI Macro (Total) Index  
 Peer Group:

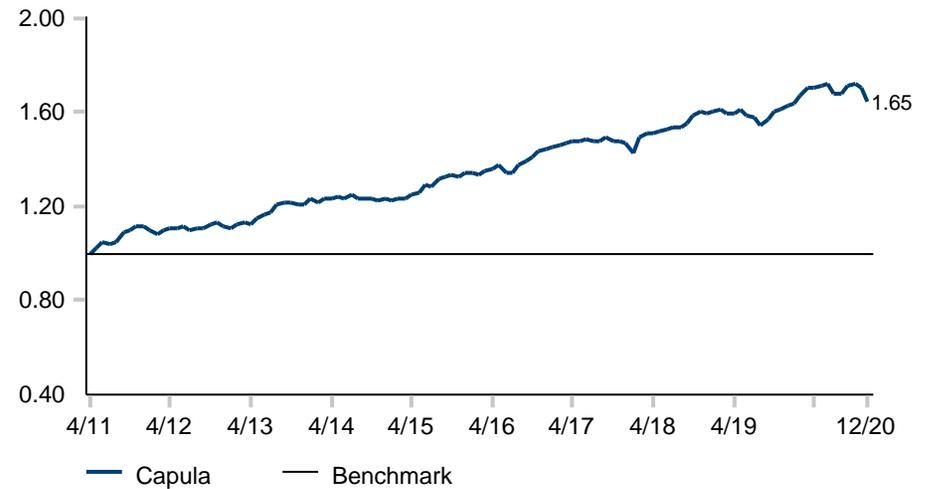
### Return Summary



### Quarterly Excess Performance

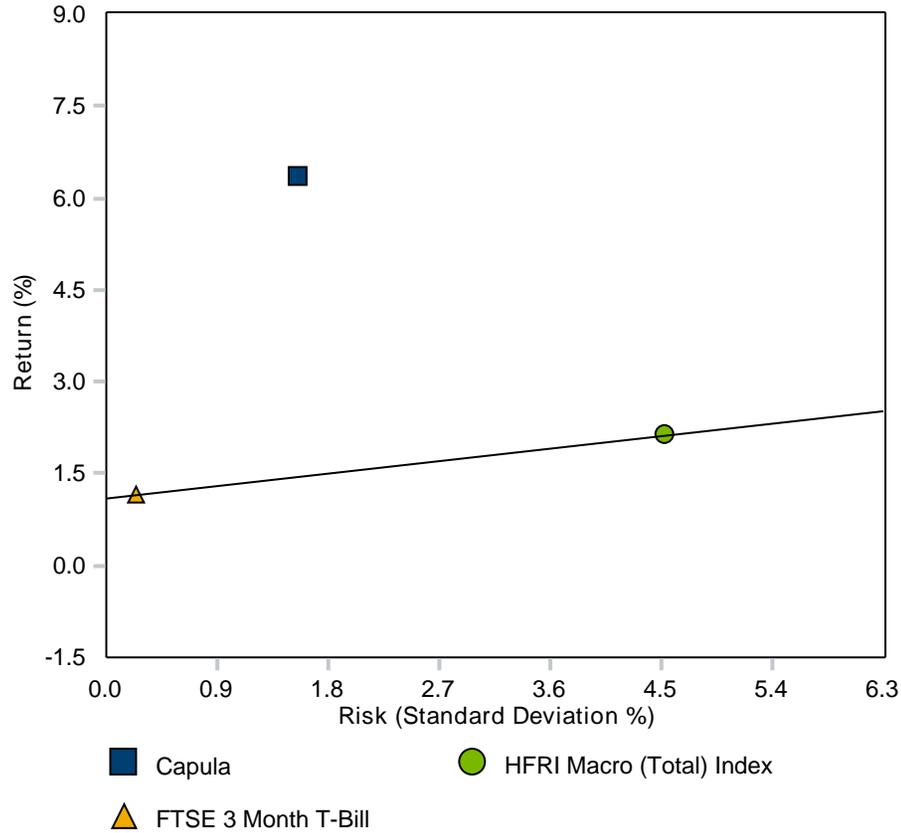


### Ratio of Cumulative Wealth - Since Inception

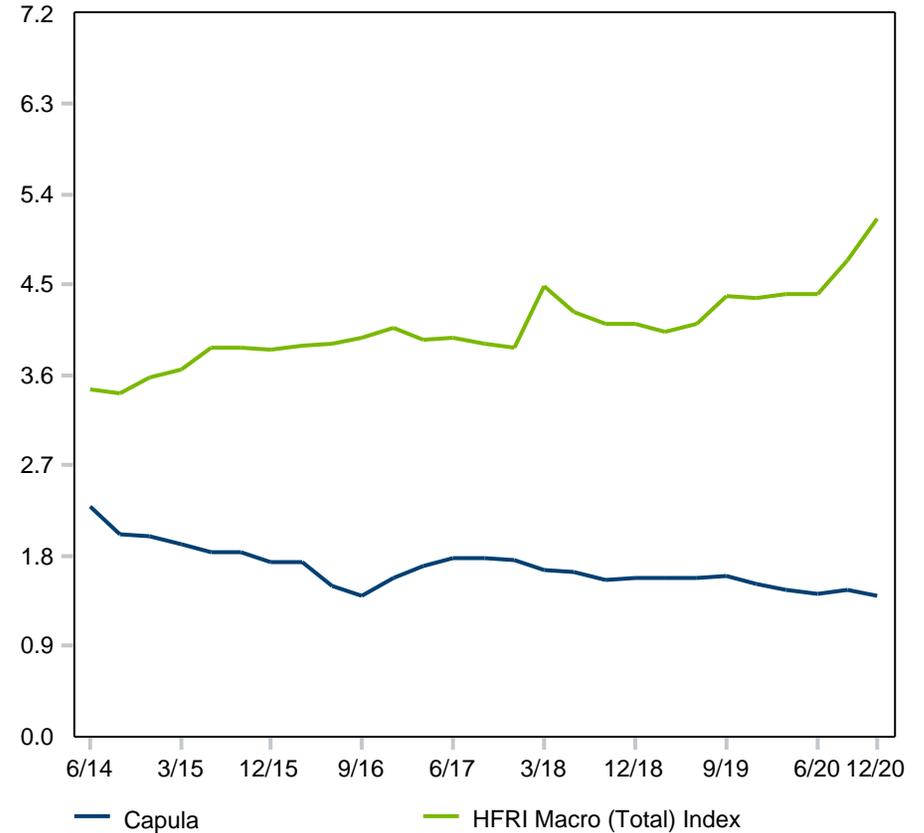


Capula Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 3 Years Standard Deviation



5 Years Historical Statistics

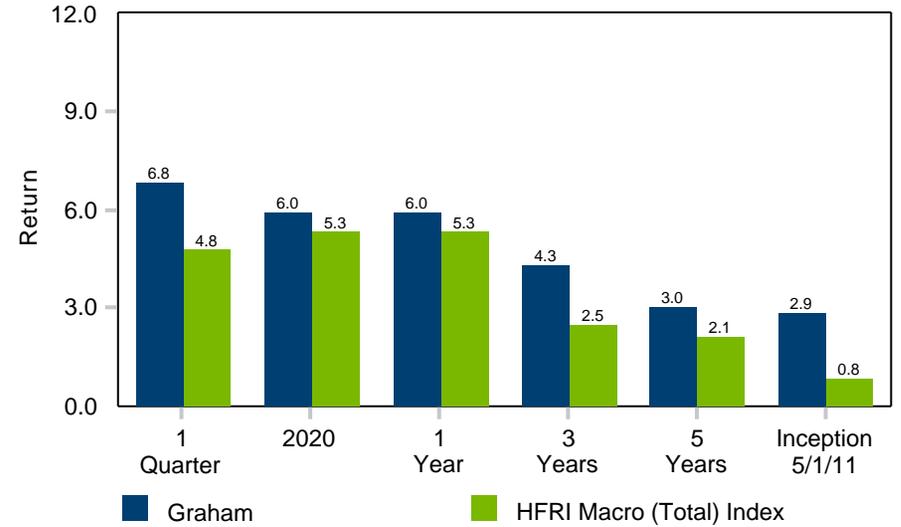
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Capula	3.98	4.84	0.82	0.00	3.20	6.39	-0.01	6.35	1.56	-0.03
HFRI Macro (Total) Index	0.00	0.00	N/A	1.00	0.23	0.00	1.00	2.12	4.53	1.00
FTSE 3 Month T-Bill	-1.05	4.54	-0.23	0.00	N/A	1.16	0.00	1.16	0.24	-0.04

## Graham Performance Summary

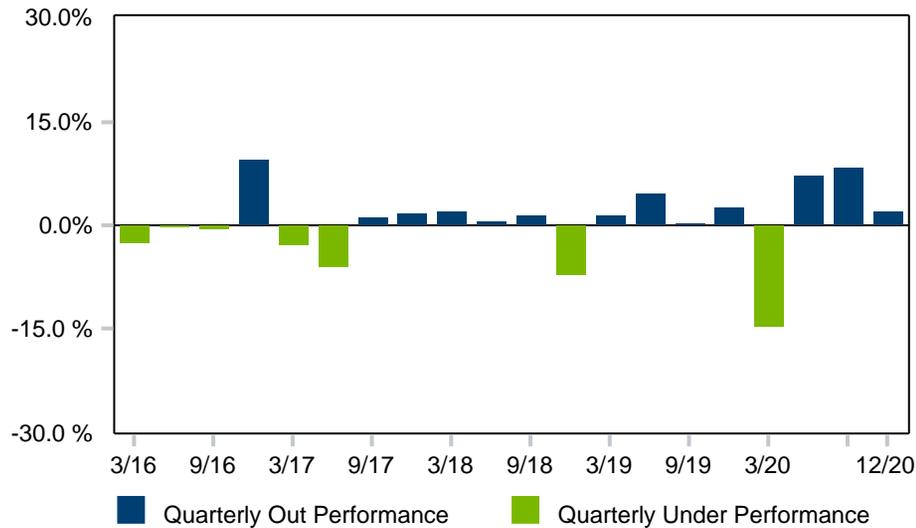
### Account Information

Account Name: Graham  
 Inception Date: 05/01/2011  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: HFRI Macro (Total) Index  
 Peer Group:

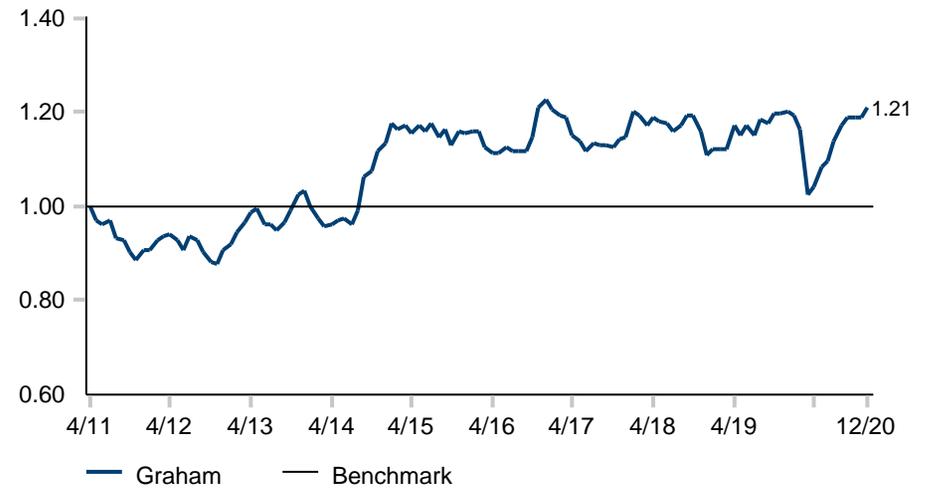
### Return Summary



### Quarterly Excess Performance

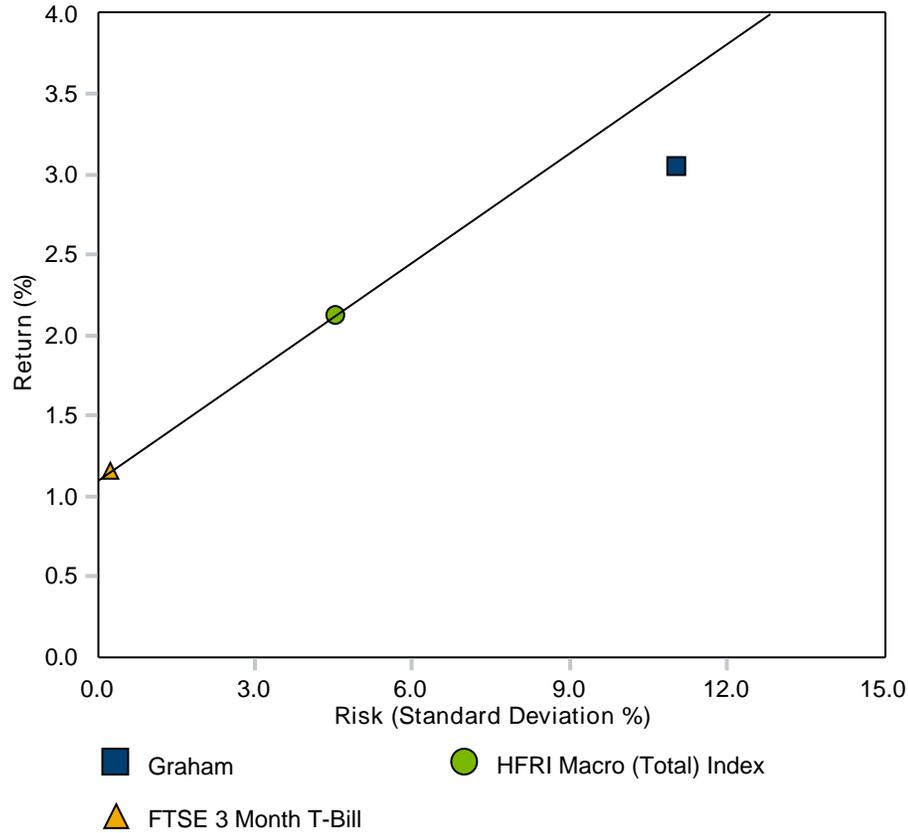


### Ratio of Cumulative Wealth - Since Inception

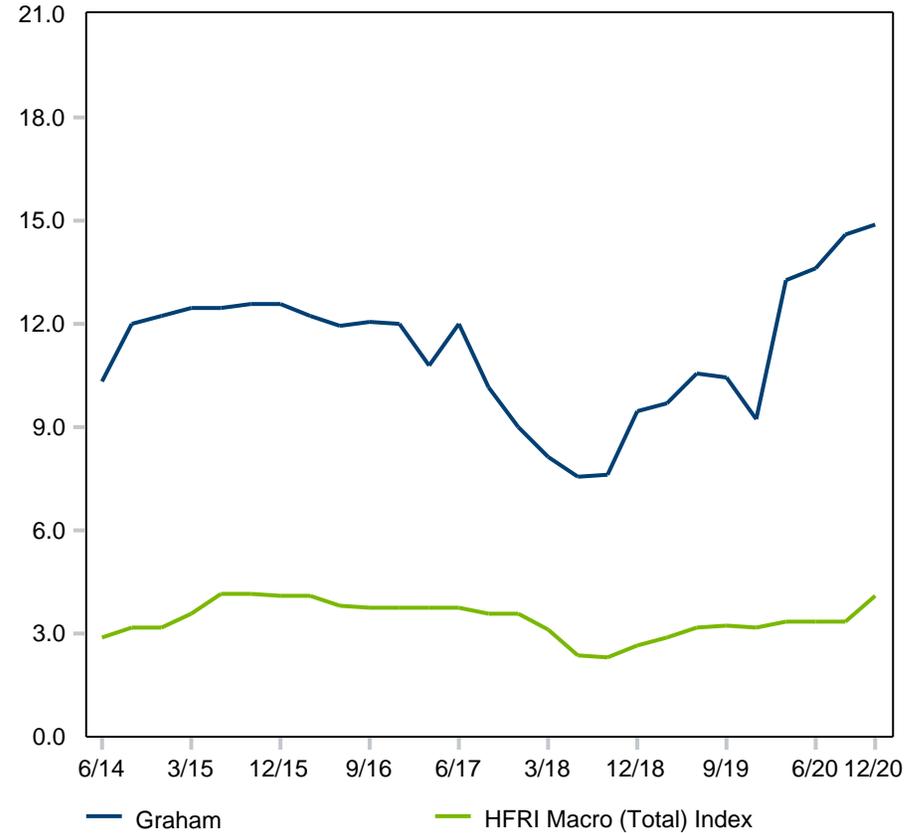


Graham Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 3 Years Standard Deviation



5 Years Historical Statistics

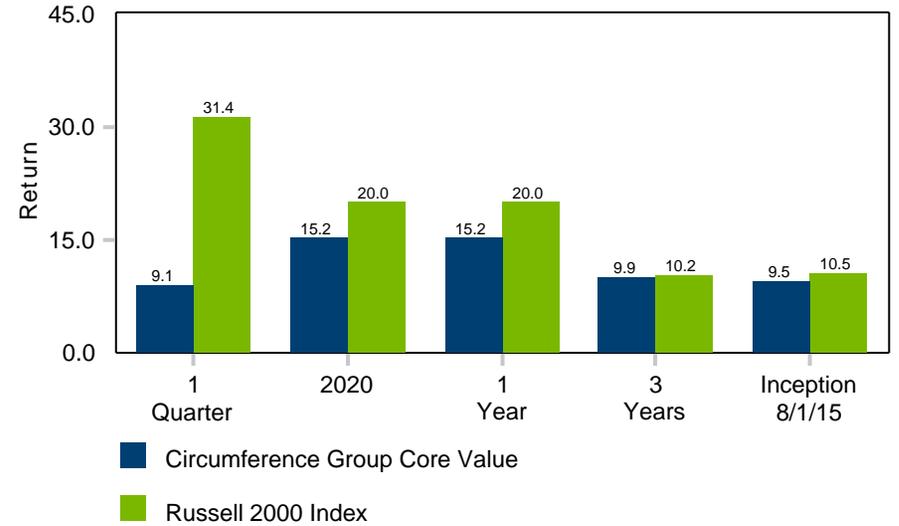
	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Graham	1.41	8.78	0.16	0.43	0.22	0.09	1.60	3.05	11.05	0.65
HFRI Macro (Total) Index	0.00	0.00	N/A	1.00	0.23	0.00	1.00	2.12	4.53	1.00
FTSE 3 Month T-Bill	-1.05	4.54	-0.23	0.00	N/A	1.16	0.00	1.16	0.24	-0.04

Circumference Group Core Value Performance Summary

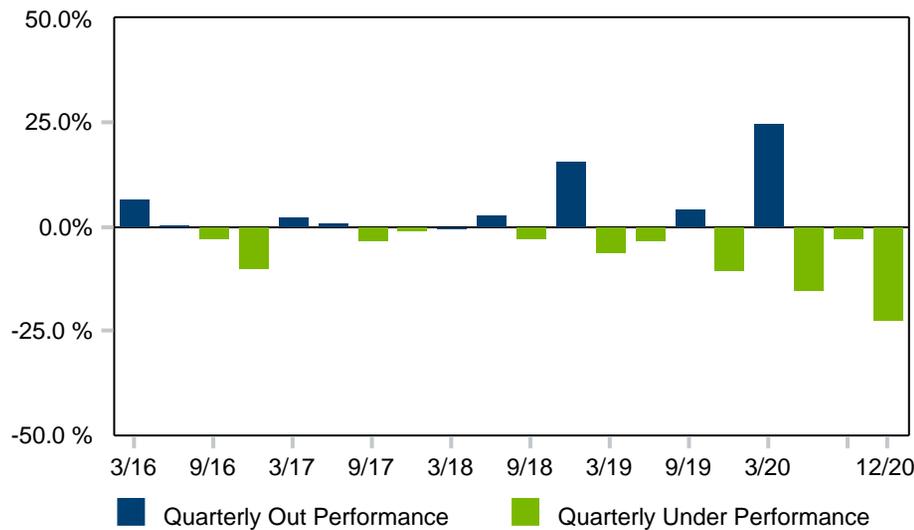
Account Information

Account Name: Circumference Group Core Value  
 Inception Date: 08/31/2015  
 Account Structure: Hedge Fund  
 Asset Class: US Hedge Fund  
 Benchmark: Russell 2000 Index  
 Peer Group:

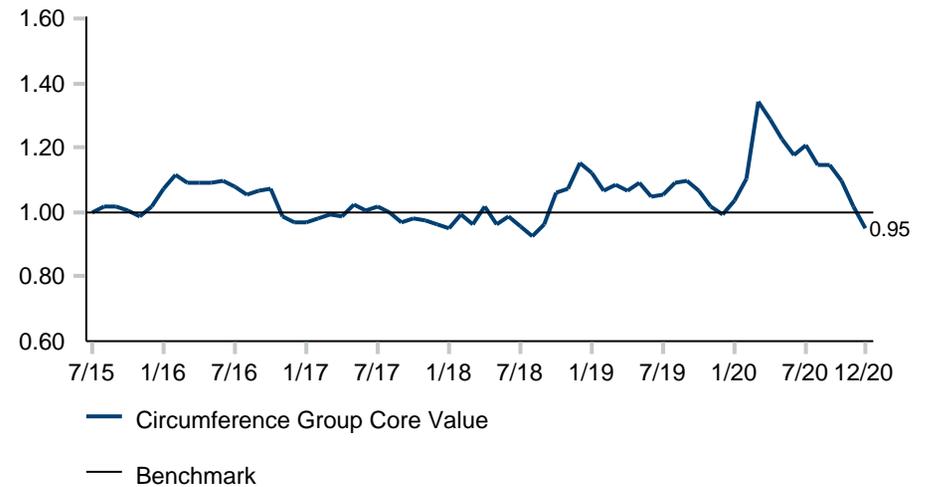
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

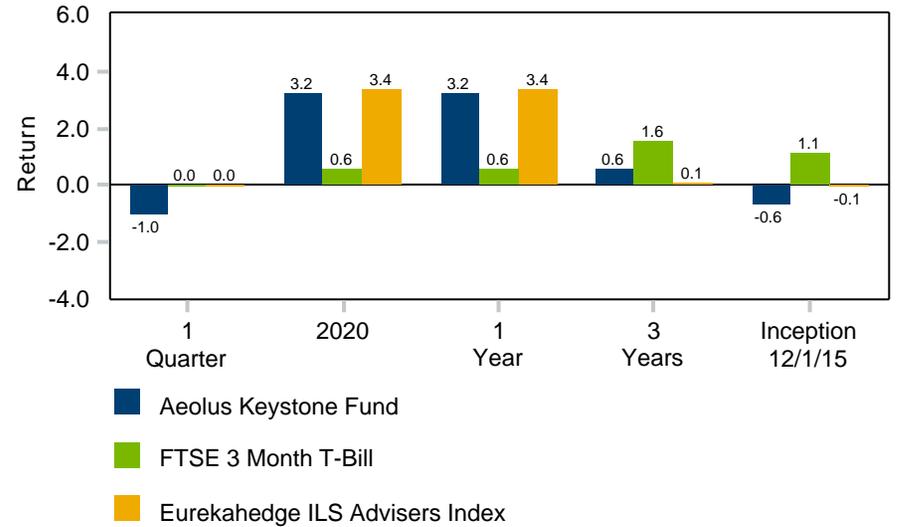


**Aeolus Keystone Fund Performance Summary**

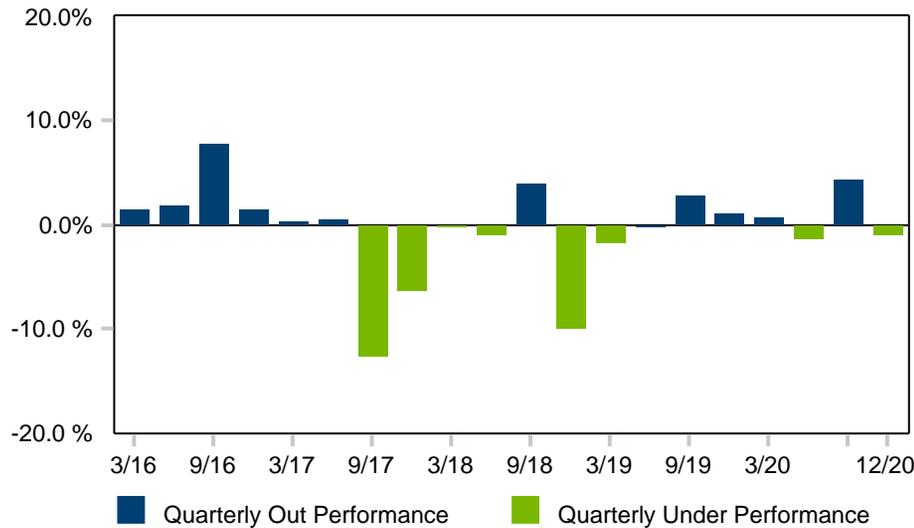
**Account Information**

Account Name: Aeolus Keystone Fund  
 Inception Date: 12/01/2015  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: FTSE 3 Month T-Bill  
 Peer Group:

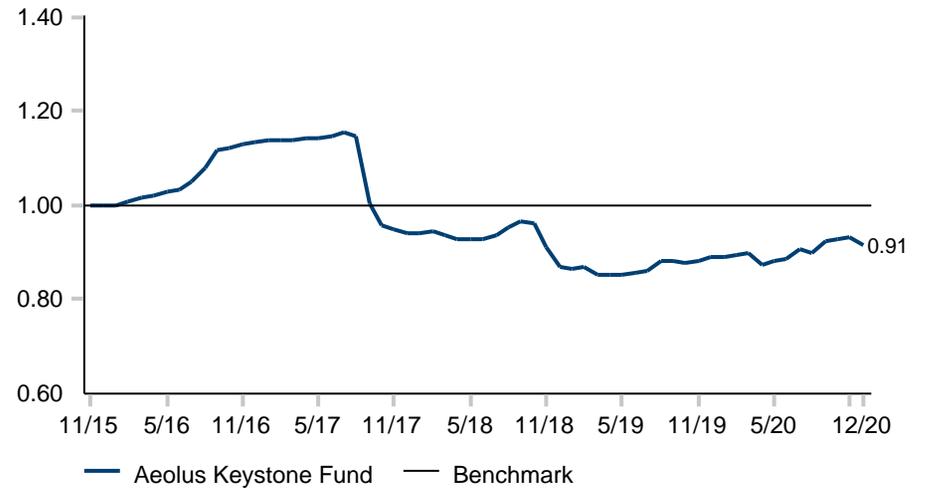
**Return Summary**



**Quarterly Excess Performance**



**Ratio of Cumulative Wealth - Since Inception**

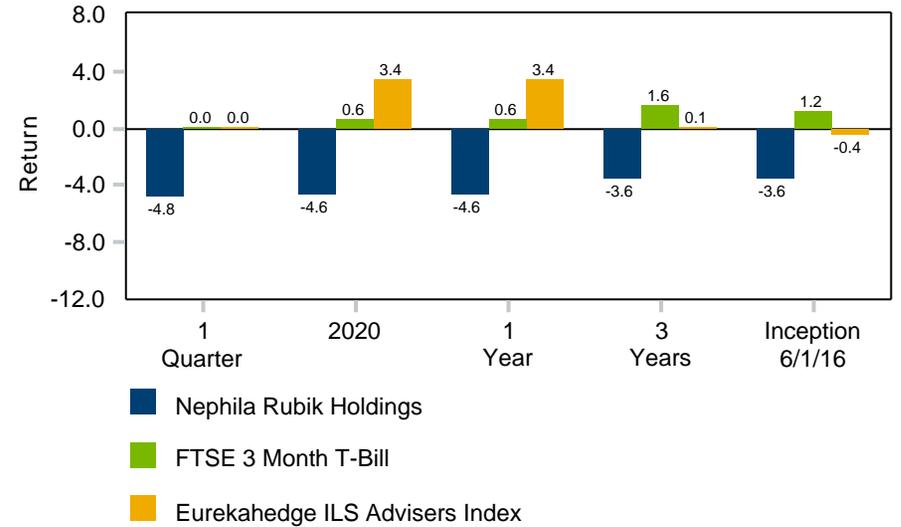


## Nephila Rubik Holdings Performance Summary

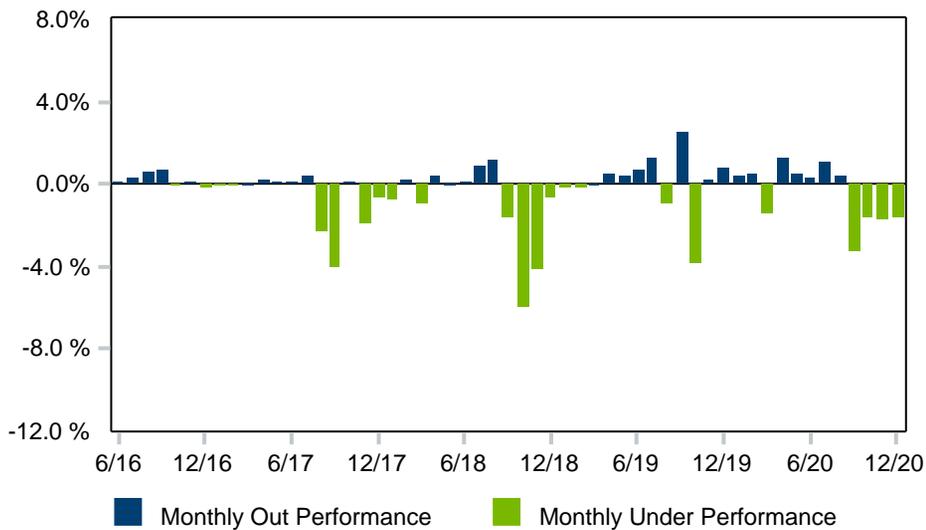
### Account Information

Account Name: Nephila Rubik Holdings  
 Inception Date: 06/01/2016  
 Account Structure:  
 Asset Class: Hedge Fund  
 Benchmark: FTSE 3 Month T-Bill  
 Peer Group:

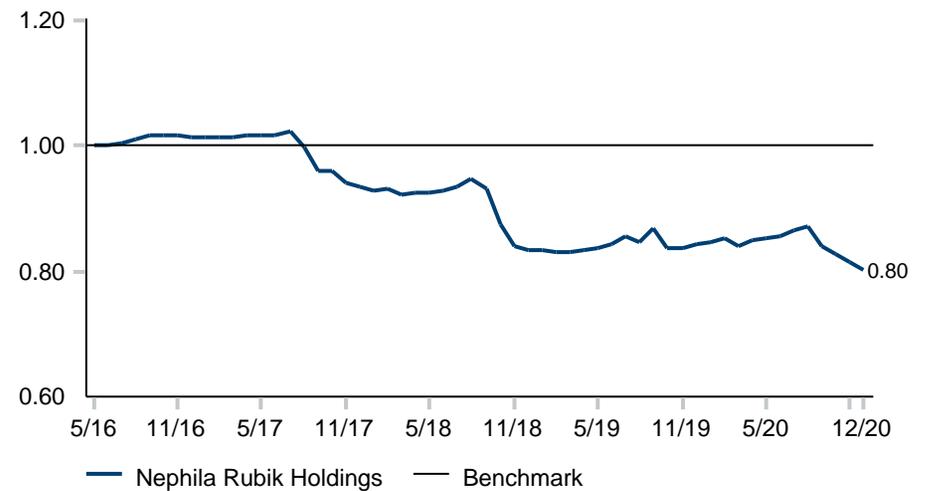
### Return Summary



### Monthly Excess Performance



### Ratio of Cumulative Wealth - Since Inception

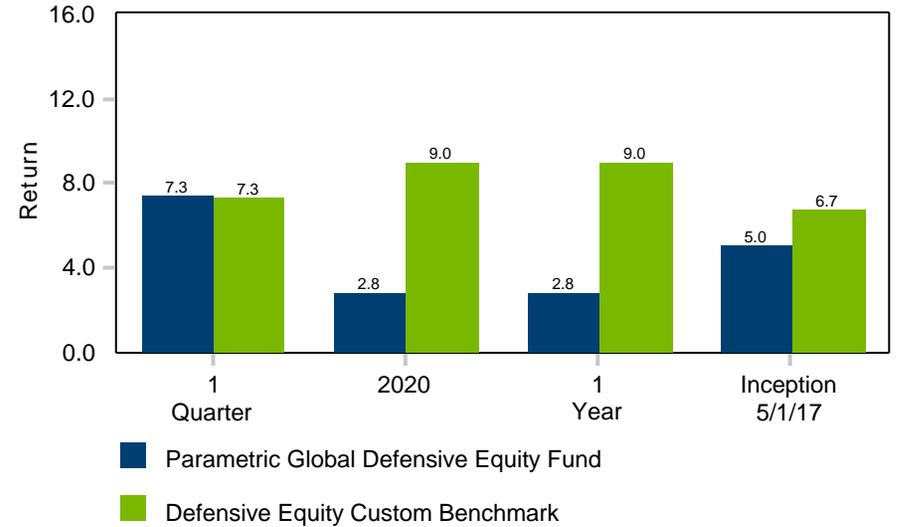


Parametric Global Defensive Equity Fund Performance Summary

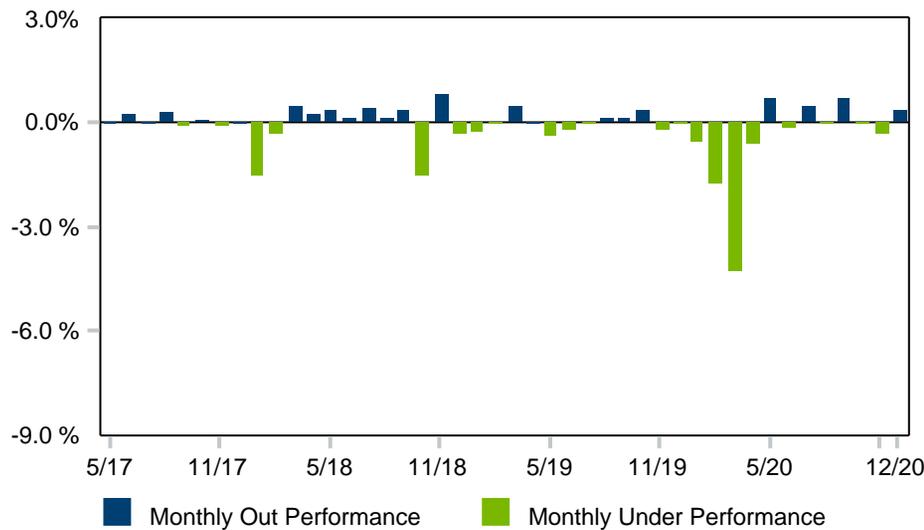
Account Information

Account Name: Parametric Global Defensive Equity Fund  
 Inception Date: 06/01/2017  
 Account Structure: Commingled Fund  
 Asset Class: Global Equity  
 Benchmark: Defensive Equity Custom Benchmark  
 Peer Group:

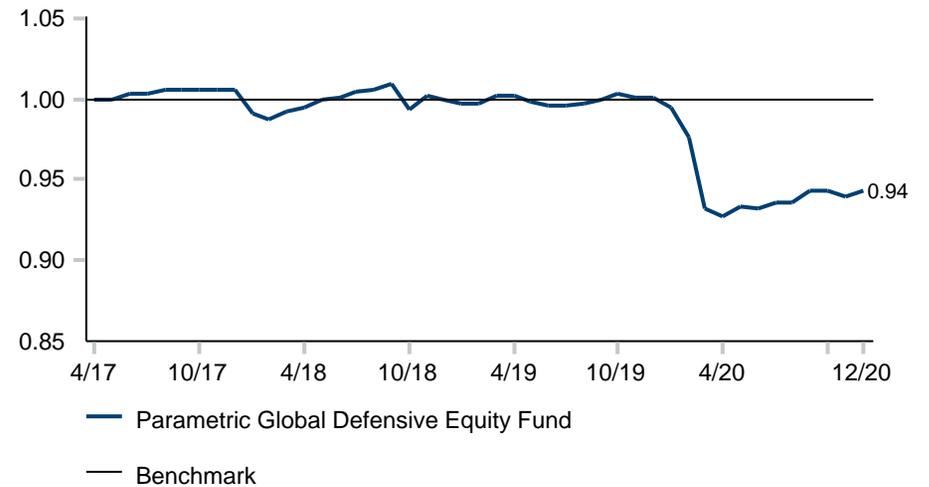
Return Summary



Monthly Excess Performance



Ratio of Cumulative Wealth - Since Inception

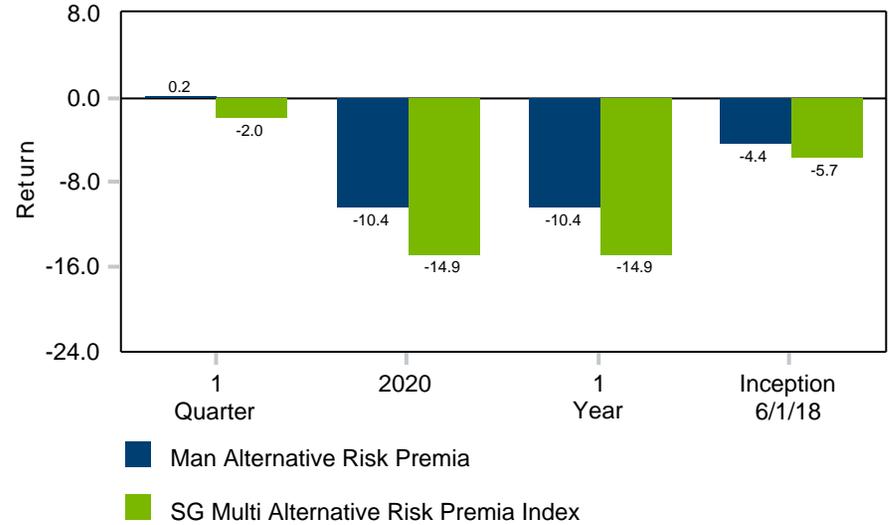


Man Alternative Risk Premia Performance Summary

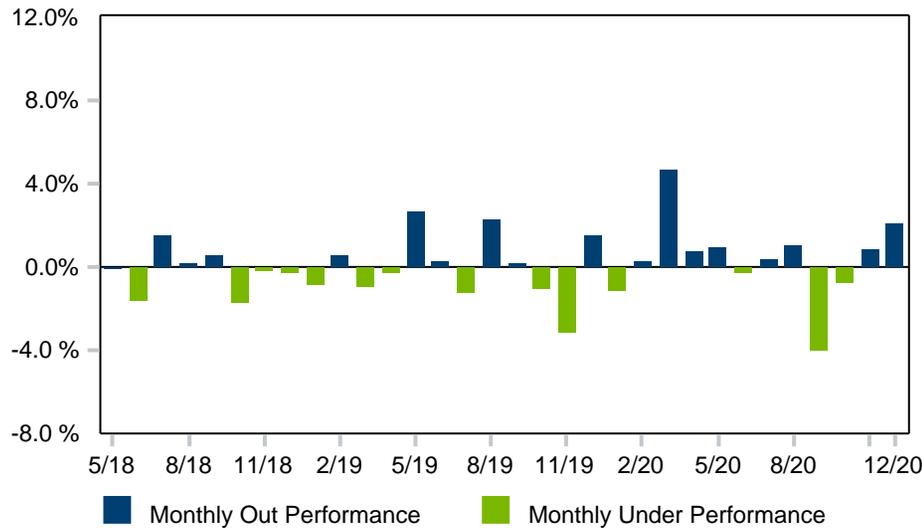
Account Information

Account Name: Man Alternative Risk Premia  
 Inception Date: 06/01/2018  
 Account Structure: Commingled Fund  
 Asset Class: US Equity  
 Benchmark: SG Multi Alternative Risk Premia Index  
 Peer Group:

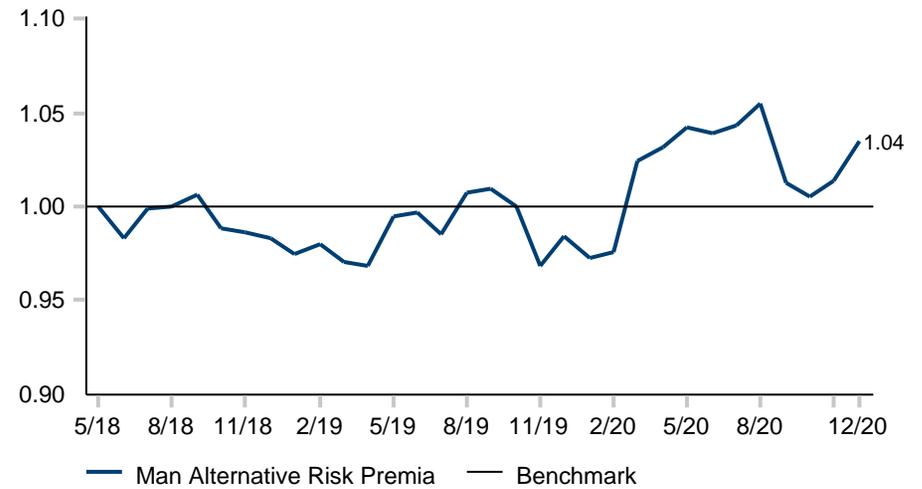
Return Summary



Monthly Excess Performance



Ratio of Cumulative Wealth - Since Inception

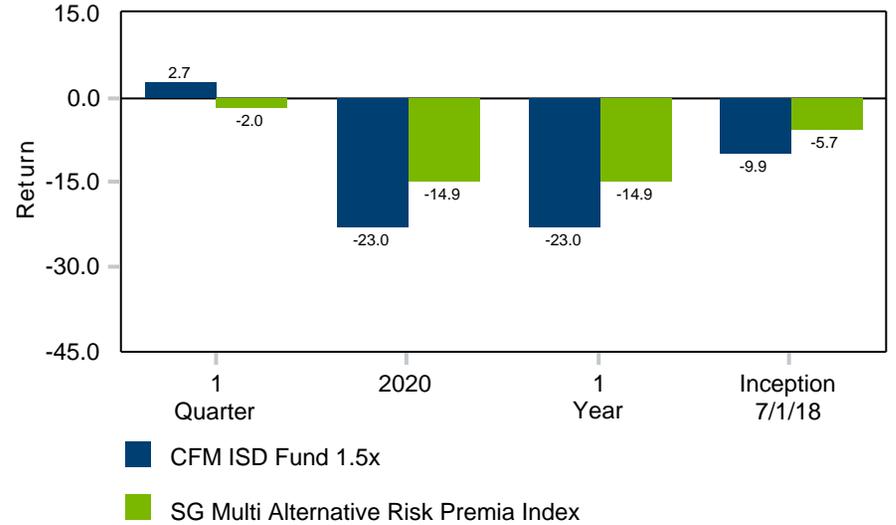


CFM ISD Fund 1.5x Performance Summary

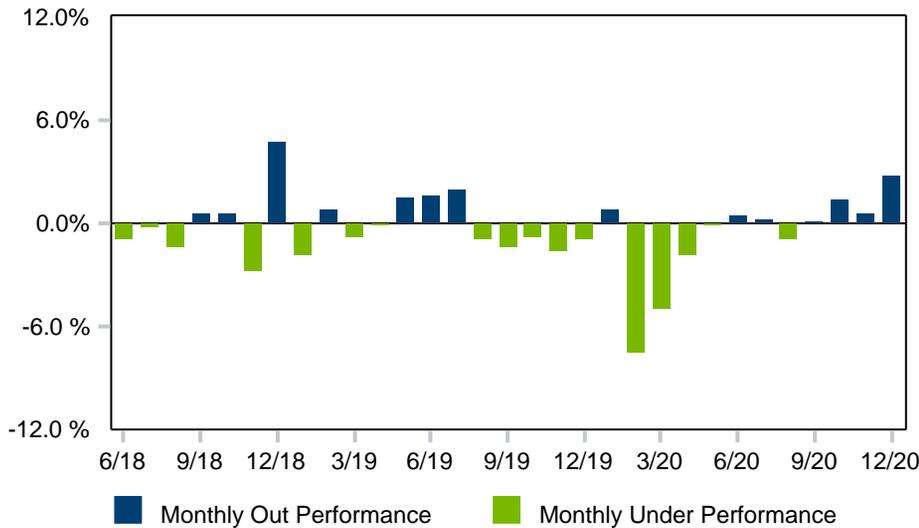
Account Information

Account Name: CFM ISD Fund 1.5x  
 Inception Date: 07/01/2018  
 Account Structure: Commingled Fund  
 Asset Class: US Equity  
 Benchmark: SG Multi Alternative Risk Premia Index  
 Peer Group:

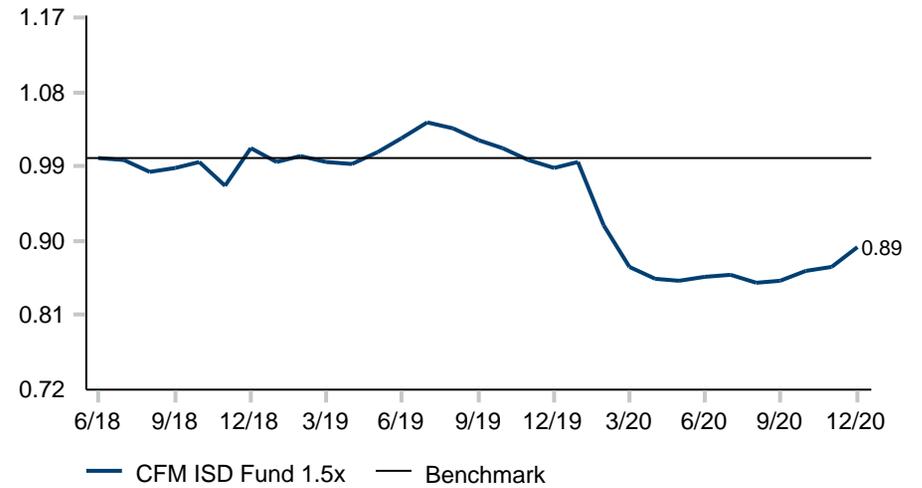
Return Summary

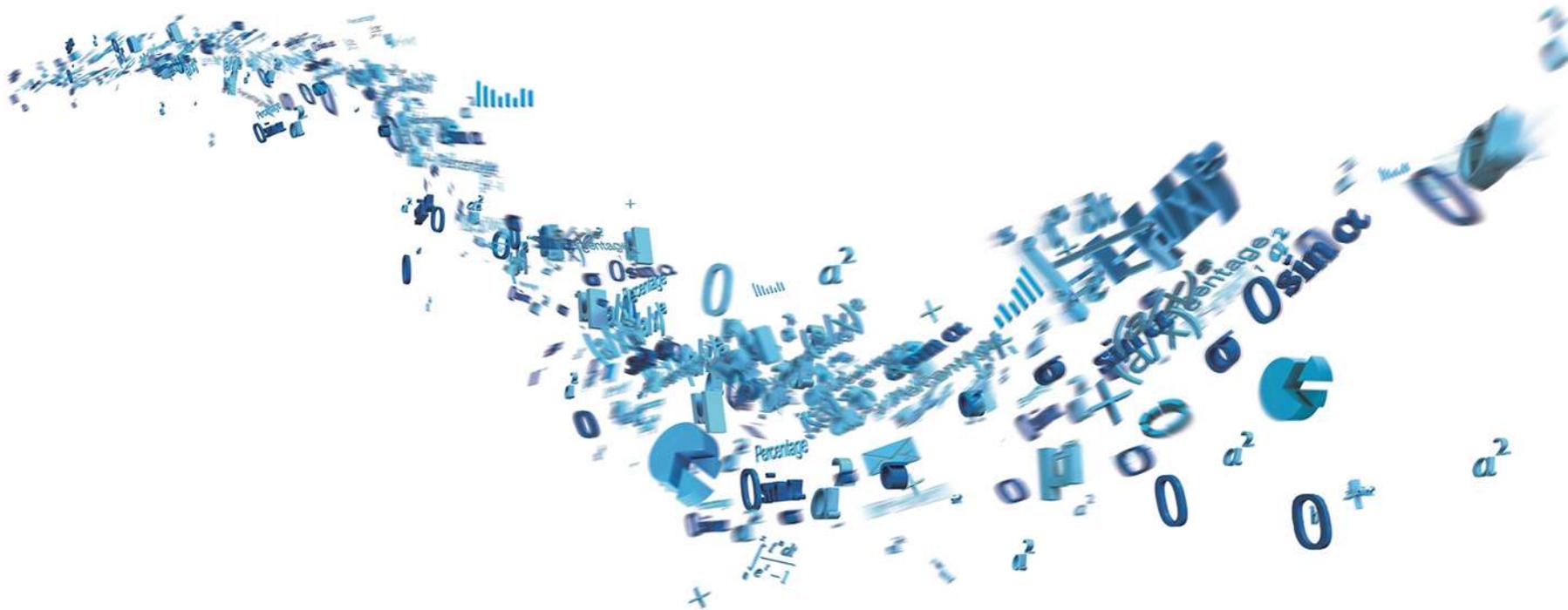


Monthly Excess Performance



Ratio of Cumulative Wealth - Since Inception





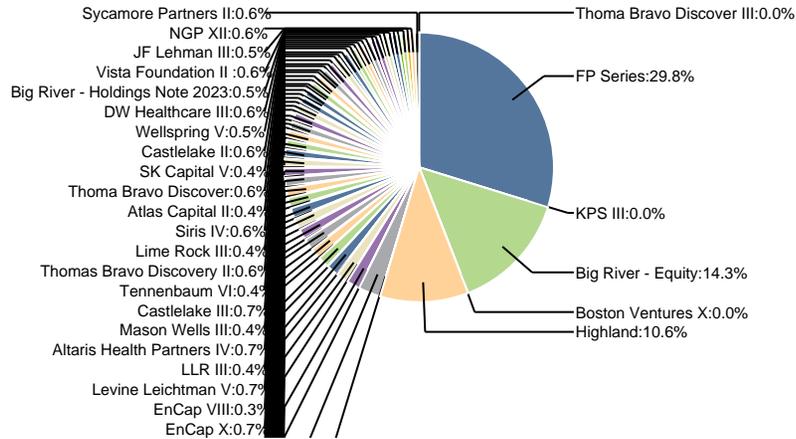
## Private Equity

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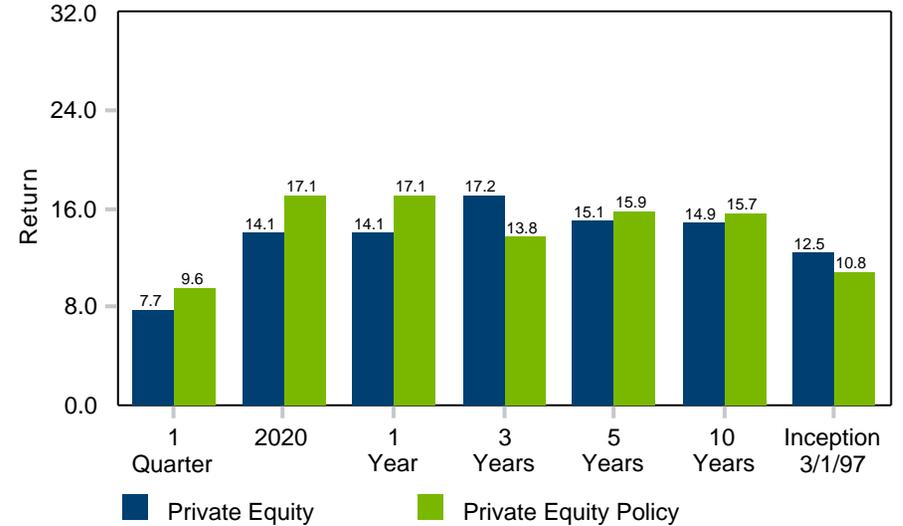
Private Equity Portfolio Overview

Current Allocation

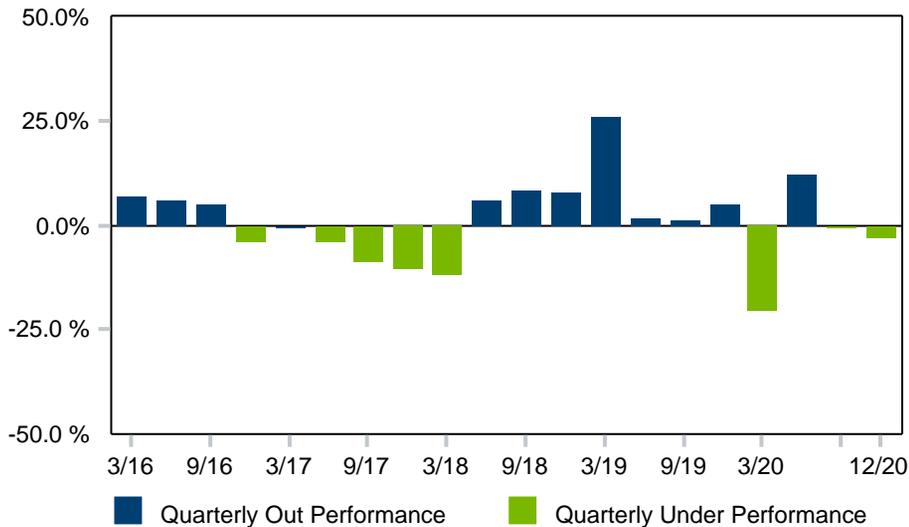
December 31, 2020 : \$2,641M



Return Summary

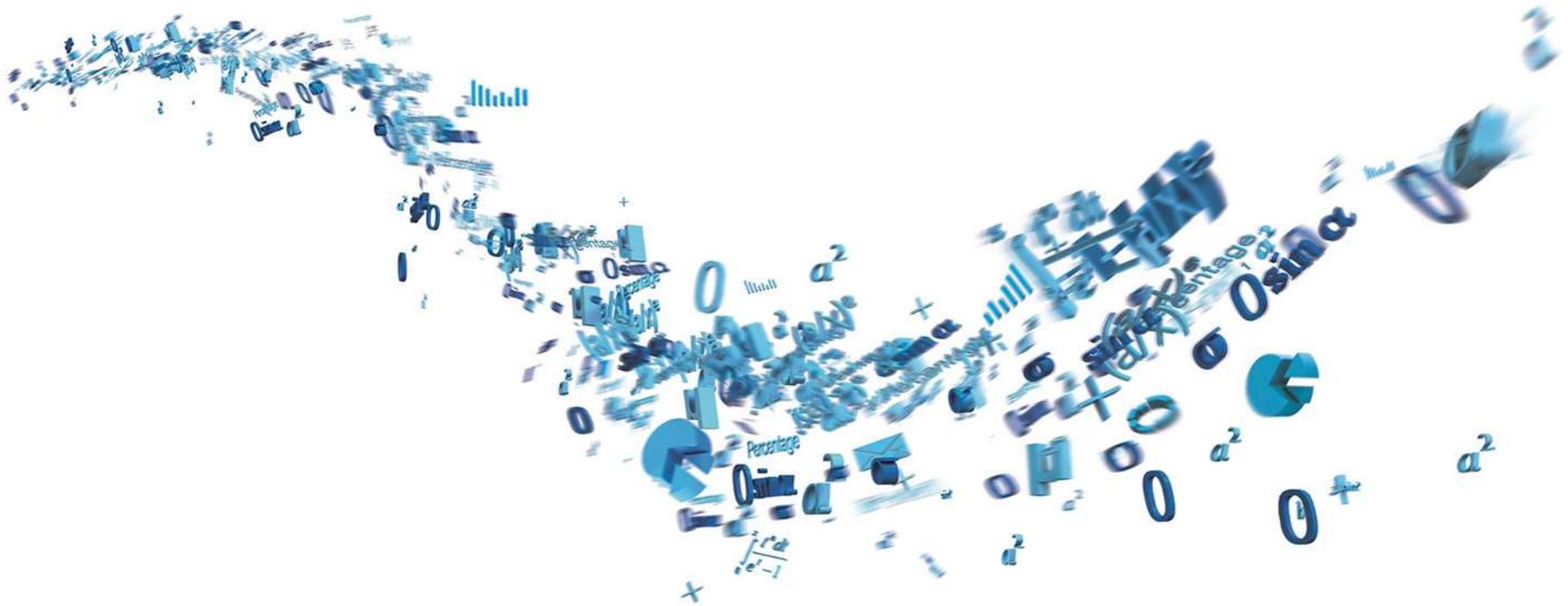


Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception





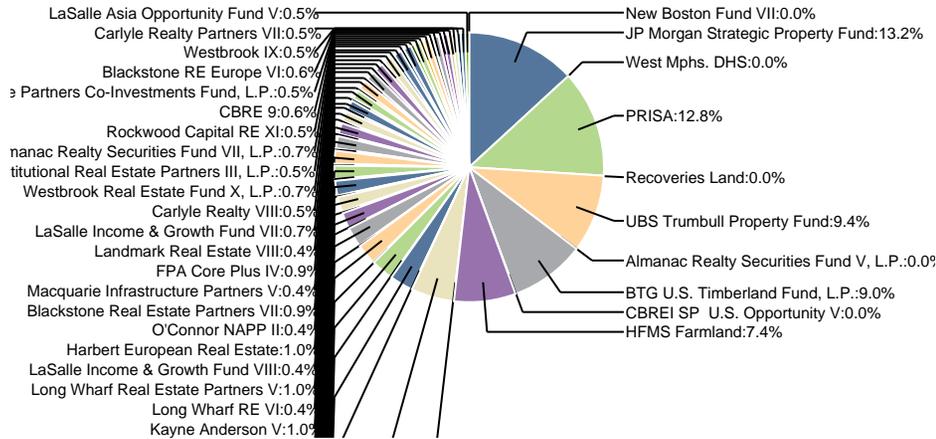
## Real Assets

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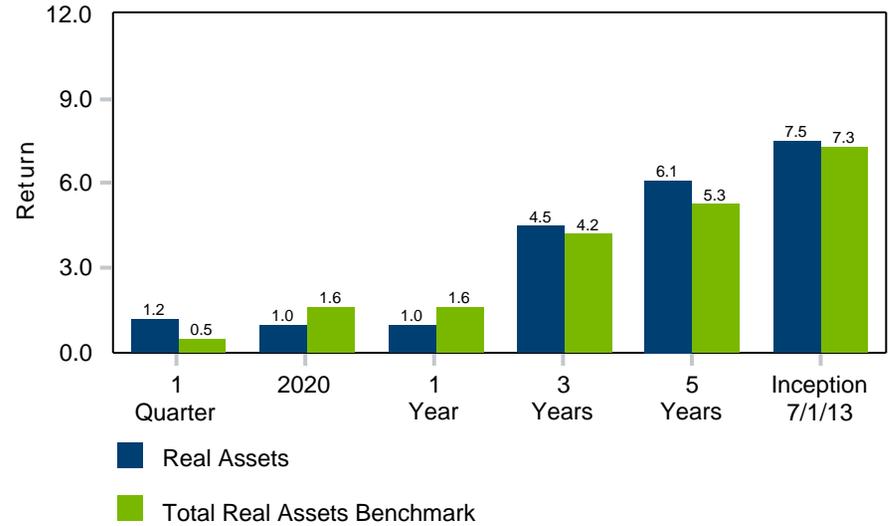
Real Assets Portfolio Overview

Current Allocation

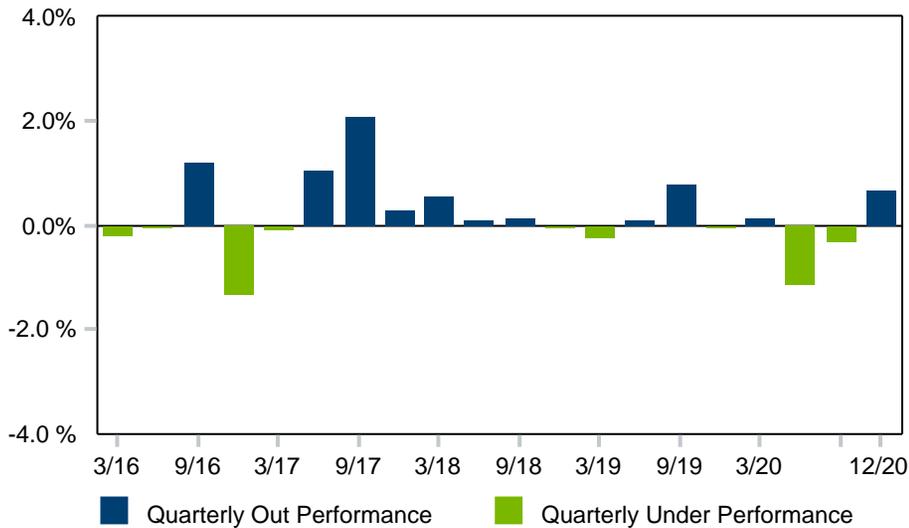
December 31, 2020 : \$2,095M



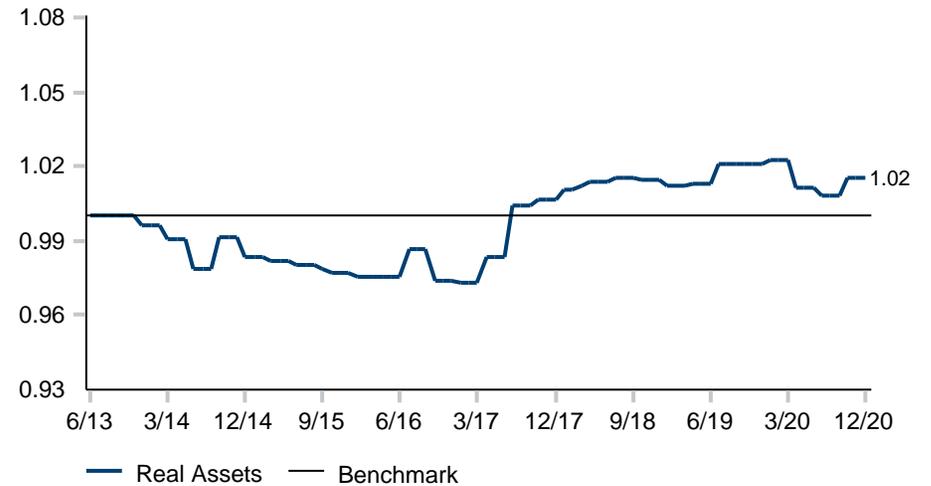
Return Summary

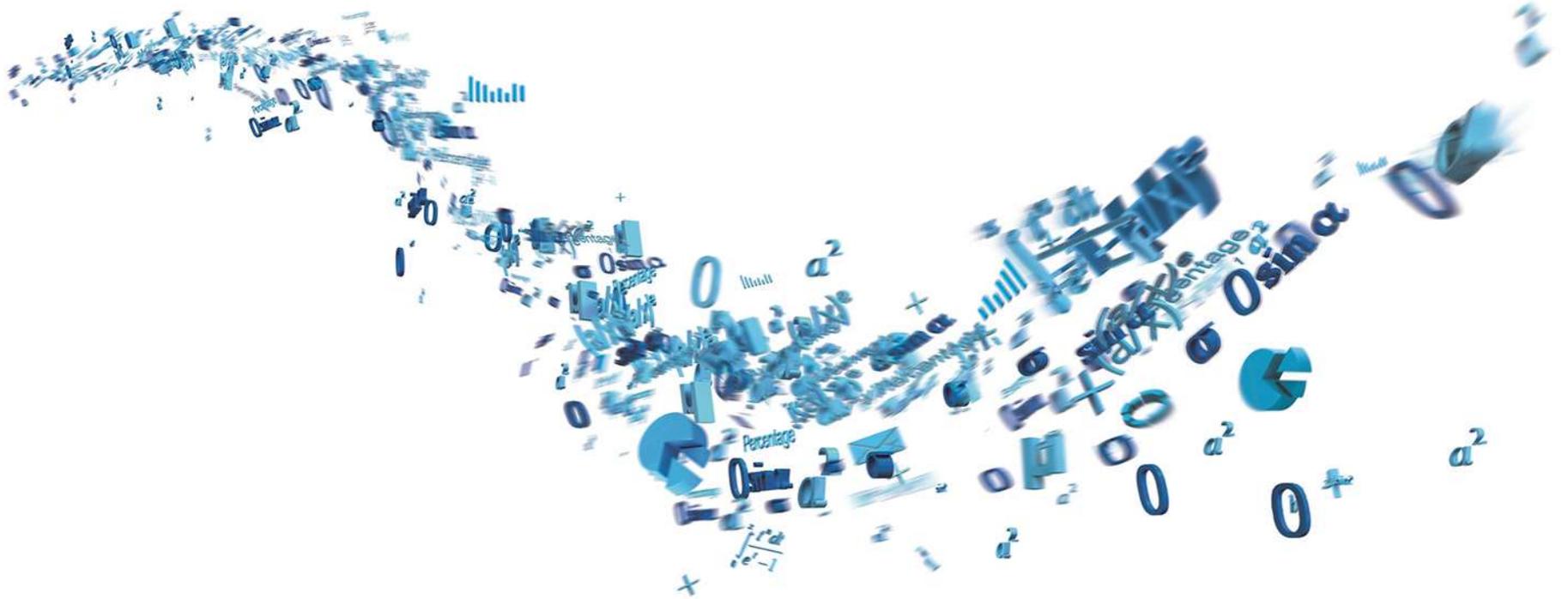


Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception





# Fee Schedule

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## Total Equity

As of December 31, 2020

## Fee Schedule

	Fee Schedule	Market Value As of 12/31/2020 \$000	Estimated Annual Fee \$000	Estimated Annual Fee (%)
Total Equity		11,306,057	52,216	0.46
Jacobs Levy 130/30	0.60 % of First \$200 M 0.35 % of Next \$300 M 0.30 % Thereafter	771,774	3,065	0.40
Kennedy Capital Management	0.60 % of First \$100 M 0.50 % Thereafter	610,689	3,153	0.52
Stephens	0.75 % of First \$150 M 0.70 % of Next \$50 M 0.65 % Thereafter	598,627	4,066	0.68
Voya Absolute Return	0.60 % of First \$250 M 0.40 % Thereafter	696,474	3,286	0.47
Allianz (Nicholas Applegate)	0.40 % of First \$100 M 0.30 % of Next \$100 M 0.25 % of Next \$100 M 0.20 % Thereafter	1,003,782	2,358	0.23
Pershing Square International	1.50 % of Assets	47,647	715	1.50
Pershing Square Holdings	1.50 % of Assets	250,652	3,760	1.50
Triam Partners	1.50 % of Assets	79,198	1,188	1.50
Triam Co-Investments	0.50 % of Assets	99,100	495	0.50
SSgA Global Index	0.04 % of First \$1000 M 0.03 % Thereafter	1,129,355	439	0.04
BlackRock MSCI ACWI IMI Fund	0.05 % of First \$250 M 0.04 % Thereafter	1,141,906	482	0.04
Wellington Global Perspectives	0.80 % of Assets	654,804	5,238	0.80
T. Rowe Price Global Equity	0.43 % of First \$500 M 0.40 % Thereafter	1,524,746	6,224	0.41
Lazard	0.68 % of First \$300 M 0.65 % Thereafter	780,822	5,165	0.66
D.E. Shaw	0.84 % of First \$100 M 0.80 % of Next \$100 M 0.76 % Thereafter	869,530	6,728	0.77
GMO Global All Country Equity	0.64 % of Assets	495,604	3,172	0.64
Harris Global Equity	0.60 % of First \$100 M 0.50 % of Next \$100 M 0.45 % Thereafter	551,272	2,681	0.49

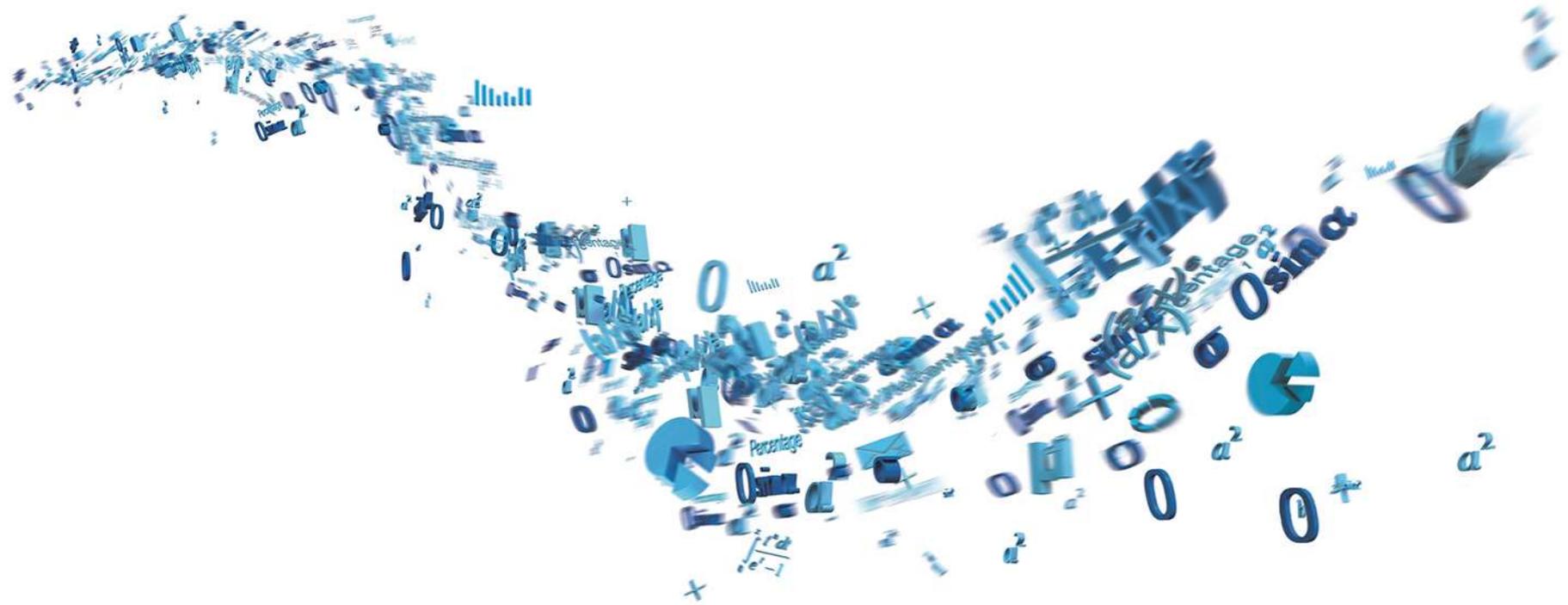
2020  
 Above fees reflect only the current base management fee and excludes any performance fee arrangement.

## Fee Schedule

	Fee Schedule	Market Value As of 12/31/2020 \$000	Estimated Annual Fee \$000	Estimated Annual Fee (%)
<b>Fixed Income</b>		<b>2,368,584</b>	<b>5,323</b>	<b>0.22</b>
BlackRock	0.20 % of First \$200 M 0.15 % of Next \$200 M 0.10 % of Next \$400 M 0.08 % Thereafter	284,939	527	0.19
Loomis Sayles	0.50 % of First \$20 M 0.40 % of Next \$30 M 0.30 % Thereafter	494,621	1,554	0.31
Putnam	0.40 % of First \$100 M 0.35 % of Next \$150 M 0.30 % of Next \$250 M 0.25 % Thereafter	385,900	1,333	0.35
SSgA Aggregate Bond Index	0.04 % of First \$100 M 0.02 % Thereafter	197,152	54	0.03
Wellington Global Total Return	0.30 % of Assets	348,991	1,047	0.30
Reams Core Plus Bond Fund	0.20 % of Assets	403,950	808	0.20
BRS Recycling Tax Credit		176,000	-	-
BRS Recycling Tax Credit Phase 2		77,032	-	-
<b>Opportunistic/Alternatives</b>		<b>915,222</b>	<b>12,841</b>	<b>1.40</b>
Anchorage	2.00 % of Assets	77,280	1,546	2.00
York	1.50 % of Assets	23,826	357	1.50
Capula	2.00 % of Assets	90,175	1,803	2.00
Graham	2.00 % of Assets	66,707	1,334	2.00
Circumference Group Core Value	1.50 % of Assets	33,092	496	1.50
Aeolus Keystone Fund	2.00 % of Assets	237,933	4,759	2.00
Nephila Rubik Holdings	1.50 % of Assets	42,360	635	1.50
Parametric Global Defensive Equity Fund	0.40 % of First \$150 M 0.35 % Thereafter	179,568	703	0.39
Man Alternative Risk Premia	0.85 % of Assets	88,324	751	0.85
CFM ISD Fund 1.5x	0.60 % of Assets	75,957	456	0.60

207 Above fees reflect only the current base management fee and excludes any performance fee arrangement.

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## Disclaimers and Notes

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## Arkansas Teacher Retirement System

## Appendix

## Description of Benchmarks

Total Fund - The Performance Benchmark for the Total Fund reflects a weighted average of the underlying asset class benchmarks, weighted as follows: Opportunistic/Alternatives and Real Assets at the weight of the previous month's ending market values, Fixed Income at its long-term Policy Target of 15%, and Total Equity at its long-term Policy Target of 55% plus the balance of the unfunded or uncommitted assets of the Opportunistic/Alternatives and Real Assets categories. These targets can be found on page 21 of this report. From October 2007 to July 2013, the Performance Benchmark was the performance of the asset class benchmarks as a weighted average of the previous month's ending market values. The historical components of the benchmark are shown in the table below. Returns prior to September 30, 1996, consist of the actual allocations to the seven different asset classes included in the Arkansas Teacher Retirement System over time. The historical benchmarks used for each asset class are noted below.

Date	DJ Total Stock Market Index	Russell 3000 Index	MSCI ACW ex-U.S. Index	MSCI All Country World Index	BC Universal Bond Index	BC Aggregate Bond Index	Alternative Policy*
03/2004-9/2007	40.0 %	--	17.5 %	--	25.0 %	--	17.5 %
06/2003-02/2004	40.0	--	17.5	--	--	25.0 %	17.5
10/2001-07/2003	--	40.0 %	17.5	--	--	25.0	17.5
08/1998-09/2001	--	40.0	17.0	--	--	28.0	15.0
10/1996-07/1998	--	40.0	20.0	--	--	28.0	12.0

\*Historically, the Alternative Policy was comprised of the weighted averages of the Private Equity, Real Estate, and Alternatives policy benchmarks. Prior to July 31, 2003 the alternative benchmark consisted of 57.0% of the Russell 3000 + a 2% Premium per year, 8.5% of the NCREIF Southeast Timberland Index, 28.5% of the Real Estate Index, 6% of the EnnisKnupp STIF Index.

## Benchmark Descriptions

**Total Equity** - A weighted average of the Dow Jones U.S. Total Stock Market Index and the MSCI All Country World IMI Index based on weights of the underlying investment manager allocations. As of December 1, 2020, the Total Equity Performance Benchmark was comprised of 30.2% DJ U.S. Total Stock Market Index and 69.8% MSCI ACWI IMI.

**Fixed Income** - The Barclays U.S. Universal Bond Index as of March 1, 2004.

**Opportunistic/Alternatives** - A custom benchmark consisting of 25% DJ/CS Event-Driven Index, 25% HFR Macro Index, and 50% South Timberland NCREIF Index until June 30, 2013; 60% HFRI Macro Index and 40% DJ/CS Event-Driven Index until July 31, 2015; 56% HFRI Macro Index, 38% DJ/CS Event-Driven Index, and 6% Russell 2000 Index until March 31, 2016; 45% HFRI Macro Index, 30% DJ/CS Event-Driven Index, 5% Russell 2000 Index, and 20% Citigroup 3 Month T-bill until May 31, 2016; 37% HFRI Macro Index, 25% DJ/CS Event-Driven Index, 5% Russell 2000 Index, and 33% Citigroup 3 Month T-bill until May 31, 2017; 28% HFRI Macro Index, 20% DJ/CS Event-Driven Index, 4% Russell 2000 Index, 25% Citigroup 3 Month T-bill, and 23% Parametric Performance Benchmark thereafter.

**Real Assets** - A custom benchmark consisting of a weighted average of the net asset values at previous month's end of the sub-categories' benchmarks, defined as Real Estate Benchmark, Timber Benchmark, Agriculture Benchmark and Infrastructure Benchmark.

**Real Estate- NFI-ODCE** - NCREIF Fund Index Open-end Diversified Core Equity Index is an index of investment returns reporting on both a historical and current basis the results of 33 open-end commingled funds pursuing a core investment strategy; underlying funds are leveraged with gross and net returns available.

**Timber Property Benchmark** - NCREIF Timberland Property Index (NTPI) weighted according to ATRS' regional exposure based on net asset value.

**Agriculture Benchmark** - NCREIF Farmland Index (NFI) weighted according to ATRS' regional and crop type exposure based on net asset value.

**Infrastructure Benchmark** - Consumer Price Index (CPI) plus 500 basis points annually.

**Private Equity** - The Dow Jones U.S. Total Stock Market Index + a 2% premium per year.

**Cash Equivalents** - The Citigroup 90 day T-bill.

## Benchmark Descriptions

Allianz (Convertibles) Performance Benchmark - On January 1, 2005, the benchmark for the portfolio was changed to the Merrill Lynch Convertible Bond (All Quality) Index. Prior to January 1, 2005, the performance benchmark for the Allianz (previously Nicholas Applegate) portfolio was the CSFB Convertible Securities Index. Prior to May 1, 2004, the performance benchmark consisted of 90% CSFB Convertible Securities Index and 10% Salomon High Yield Index.

BlackRock Performance Benchmark - The Barclays Universal Bond Index as of March 1, 2004. Previously it was the Barclays Aggregate Bond Index.

Jacobs Levy Performance Benchmark - On January 1, 2008, the benchmark for the portfolio was changed to the Russell 3000 Index. Prior to January 1, 2008, the portfolio benchmark was the Russell 1000 Growth Index.

Loomis Sayles Performance Benchmark - An Index that splices 65% of the Barclays Government/Credit Index and 35% Barclays High Yield Index.

Nicholas Applegate Performance Benchmark - On January 1, 2005, the benchmark for the portfolio was changed to the Merrill Lynch Convertible Bond (All Quality) Index. Prior to January 1, 2005, the performance benchmark for the Nicholas Applegate portfolio was the CSFB Convertible Securities Index. Prior to May 1, 2004, the performance benchmark consisted of 90% CSFB Convertible Securities Index and 10% Salomon High Yield Index.

Parametric Performance Benchmark - 50% MSCI All Country World Index (net) and 50% Citigroup 90 day T-Bill Index as of June 1, 2017.

Wellington Global Performance Benchmark - As of July 1, 2012 the benchmark was changed to MSCI All Country World Small Cap Index. Prior to July 1, 2012, the benchmark was MSCI All Country World Small/Mid Cap Index.

Voya Absolute Return Performance Benchmark - As of December 1, 2015 the benchmark was changed to MSCI All Country World Index. Prior to December 1, 2015, the benchmark was the S&P 500 Stock Index.

Barclays Aggregate Bond Index - A market-value weighted index consisting of the Barclays Corporate, Government and Mortgage-Backed Securities Indices. The Index also includes credit card-, auto- and home equity loan-backed securities, and is the broadest available measure of the aggregate U.S. fixed income market.

Barclays Government/Credit Index - The Barclays Government/Credit Index measures the investment return of all medium and larger public issues of U.S. Treasury, agency, investment-grade corporate, and investment-grade international dollar-denominated bonds.

Barclays High Yield Index - The Barclays High Yield Index covers the universe of fixed rate, non-investment grade debt. Pay-in-kind (PIK) bonds, Eurobonds, and debt issues from countries designated as emerging markets (e.g., Argentina, Brazil, Venezuela, etc.) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included.

Barclays U.S. Universal Bond Index - A market-value weighted index consisting of the components of the Barclays Aggregate Bond Index, plus EuroDollar bonds, emerging markets bonds, 144A fixed income securities, and U.S. corporate high yield securities.

## Benchmark Descriptions

Barclays Mortgage Index - A market value-weighted index consisting of the mortgage pass-through securities of Ginnie Mae (GNMA), Fannie Mae (FNMA) and Freddie Mac (FHLMC).

Citigroup 90 day T-bill Index - Treasury bill rates of return, as reported by Citigroup (Salomon Smith Barney), for bills with a maximum time remaining to maturity of 90 days.

Dow Jones U.S. Total Stock Market Index - A capitalization-weighted stock index representing all U.S. common stocks traded regularly on the organized exchanges. The Index is the broadest measure of the aggregate U.S. stock market.

FTSE Europe - A tradable index, designed to represent the performance of the 100 most highly capitalized blue chip companies in Europe.

Merrill Lynch Convertible Bond (All Quality) Index -The Merrill Lynch All Convertibles All Qualities Index is a widely used index that measures convertible securities' performance. It measures the performance of U.S. dollar-denominated convertible securities not currently in bankruptcy with a total market value greater than \$50 million at issuance.

MSCI All Country World ex-U.S. Index - A capitalization-weighted index consisting of 22 developed and 23 emerging countries, but excluding the U.S. Covers approximately 85% of global equity opportunity set outside of the U.S.

MSCI All Country World Index - A capitalization-weighted index of stocks representing 46 stock markets in Europe, Australia, the Far East, the Middle East, Latin America and North America.

MSCI All Country World IMI Index - A capitalization-weighted index representing large and small cap stock from 46 stock markets in Europe, Australia, the Far East, the Middle East, Latin America and North America.

MSCI Europe, Australasia, Far East (EAFE) Non-U.S. Stock Index - A capitalization-weighted index of stocks representing 21 developed and emerging country markets in Europe, Australia, Asia and the Far East.

MSCI World Index - A capitalization-weighted index of stocks representing 22 developed stock markets in Europe, Asia and Canada.

NFI-ODCE Index- NCREIF Fund Index Open-end Diversified Core Equity Index is an index of investment returns reporting on both a historical and current basis the results of 33 open-end commingled funds pursuing a core investment strategy; underlying funds are leveraged with gross and net returns available

DJ/CS Event-Driven Index - Event driven funds typically invest in various asset classes and seek to profit from potential mispricing of securities related to a specific corporate or market event. Such events can include: mergers, bankruptcies, financial or operational stress, restructurings, asset sales, recapitalizations, spin-offs, litigation, regulatory and legislative changes as well as other types of corporate events. Event driven funds can invest in equities, fixed income instruments (investment grade, high yield, bank debt, convertible debt and distressed), options and various other derivatives. Many event driven fund managers use a combination of strategies and adjust exposures based on the opportunity sets in each subsector.

## Benchmark Descriptions

LIBOR Index - London Interbank Offered Rate. A filtered average of the world's most creditworthy banks' interbank deposit rates with maturities between overnight and one full year.

Russell 3000 Index - An index that measures the performance of the 3,000 stocks that make up the Russell 1000 and Russell 2000 Indices.

Russell 1000 Index - An index that measures the performance of the largest 1,000 stocks contained in the Russell 3000 Index.

Russell 1000 Value Index - An index that measures the performance of those Russell 1000 companies with lower price-to-book ratios and lower I/B/E/S growth forecasts.

Russell 2000 Index - An index that measures the performance of the smallest 2,000 companies contained in the Russell 3000 Index.

Russell 2000 Growth Index - An index that measures the performance of those Russell 2000 companies with greater price-to-book ratios and greater I/B/E/S growth forecasts.

Russell 2000 Value Index - An index that measures the performance of those Russell 2000 companies with lower price-to-book ratios and lower I/B/E/S growth forecasts.

Russell Mid Cap Value Index - An index that measures the performance of those Russell 1000 companies with lower price-to-book ratios and lower forecasted growth values.

S&P 500 Stock Index - A capitalization-weighted stock index consisting of the 500 largest publicly traded U.S. stocks.

South Timberland Index - The largest regional subindex of the NCREIF Timberland Index, consisting of timberland properties held in the U.S. South. This includes close to 300 properties with more than 10 million cumulative acres of timberland in the following states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Calculations are based on quarterly returns at the individual property level. Performance is reported on an all-cash, unlevered basis, gross of investment management fees.

HFR Macro Index - Macro: Investment Managers which trade a broad range of strategies in which the investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed income, hard currency and commodity markets. Managers employ a variety of techniques, both discretionary and systematic analysis, combinations of top down and bottom up theses, quantitative and fundamental approaches and long and short term holding periods. Primary investment thesis is predicated on predicted or future movements in the underlying instruments.

HFR Distressed/Restructuring Index - Distressed Restructuring Strategies employ an investment process focused on corporate fixed income instruments, primarily on corporate credit instruments of companies trading at significant discounts to their value at issuance or obliged (par value) at maturity as a result of either formal bankruptcy proceeding or financial market perception of near term proceedings. Distressed Strategies employ primarily debt (greater than 60%) but also may maintain related equity exposure. Hedge Fund Research, Inc. (HFR) utilizes a UCITSIII compliant methodology to construct the HFR Hedge Fund Indices. The methodology is based on defined and predetermined rules and objective criteria to select and rebalance components to maximize representation of the Hedge Fund Universe.

## Arkansas Teacher Retirement System

## Appendix

## Historical U.S. Equity and Global Equity composite returns

<b>As of June 30, 2015</b>	<b>1 Year</b>	<b>3 Years</b>	<b>5 Years</b>	<b>10 Years</b>	<b>Since Inception</b>	<b>Inception Date</b>
U.S. Equity	6.7	18.1	16.4	9.4	10.5	04/01/1986
Dow Jones U.S. Total Stock Market Index	7.2	17.6	17.5	8.3	-	
Global Equity	1.8	14.6	12.1	-	2.5	11/01/2007
MSCI AC World Index (Net)	0.7	13.0	11.9	6.4	2.1	

In June 2015, the ATRS Board approved the combination of the U.S. and Global equity asset classes to a single Total Equity asset class. Total Equity performance reporting began in July 2015. In the table above, we show the historical returns for the U.S. Equity and Global Equity asset classes since inception through June 2015. Performance for the Total Equity asset class prior to July 2015 represents a weighted average of the U.S. Equity and Global Equity historical performance.

## Benchmark Descriptions

**Bloomberg Barclays Corporate High Yield Bond Index** - An index that covers the U.S.D-dominated, non-investment grade, fixed rate, taxable corporate bond market. Debt issues from emerging market countries are excluded. Securities are classified as high-yield if the middle rating is Ba1/BB+ or below.

**Bloomberg Barclays Emerging Markets Index** - An unmanaged index that tracks total returns for external-currency-denominated debt instruments of the emerging markets.

**Bloomberg Barclays Global Aggregate** - Provides a broad-based measure of the global investment-grade fixed income markets. The three major components of this index are the U.S. Aggregate, the Pan-European Aggregate, and the Asian-Pacific Aggregate Indices. The index also includes Eurodollar and Euro-Yen corporate bonds, Canadian government, agency and corporate securities, and U.S.D investment grade 144A securities.

**Bloomberg Barclays Global Treasury Ex-U.S.** - The Barclays Global Treasury ex U.S. Index is a subset of the flagship Global Treasury Index that does not have any exposure to U.S. debt. This multi-currency benchmark includes investment grade, fixed-rate bonds issued by governments in their native currencies.

**Bloomberg Barclays Inflation Index** - Measures the performance of the U.S. Treasury Inflation Protected Securities ("TIPS") market.

**Bloomberg Barclays Universal Index** - A market value-weighted index which is the union of the U.S. Aggregate Index, U.S. High Yield Corporate Index, Eurodollar Index, U.S. Emerging Markets Index and the CMBS High Yield Index. The Index is appropriate for core plus fixed income mandates.

**Bloomberg Barclays U.S. Aggregate Bond Index** - A market value-weighted index consisting of government bonds, SEC-registered corporate bonds and mortgage-related and asset-backed securities with at least one year to maturity and an outstanding par value of \$250 M or greater. This index is a broad measure of the performance of the investment grade U.S. fixed income market.

**Bloomberg Barclays U.S. Government/Credit Index** - A subcomponent of the Barclays Capital Aggregate Index, this benchmark includes treasury securities, government related issues, and high quality corporate bonds with an outstanding par value of \$250 M or greater and at least one year of maturity remaining.

**Bloomberg Barclays U.S. Government Index** - A market value weighted index of U.S. government and government agency securities (other than mortgage securities) with maturities of one year or more.

**Bloomberg Barclays U.S. High Yield Index** - An index composed of non-investment grade corporate debt denominated in U.S. dollars. The issues have to have an outstanding par value of \$150 M or greater and at least one year of maturity remaining.

**Bloomberg Barclays U.S. Intermediate Aggregate Bond Index** - A market value-weighted index consisting of U.S. Treasury securities, corporate bonds and mortgage-related and asset-backed securities with one to ten years to maturity and an outstanding par value of \$250 M or greater.

**Bloomberg Barclays U.S. Intermediate Government Bond Index** - An unmanaged index considered representative of intermediate-term fixed-income obligations issued by the U.S. Treasury, government agencies and quasi-federal corporations.

**Bloomberg Barclays U.S. Intermediate Government/Credit Index** - A market-value weighted index consisting of U.S. government bonds and SEC-registered corporate bonds with one to ten years to maturity and an outstanding par value of \$150 M or greater.

**Bloomberg Barclays U.S. Intermediate Treasury** - An unmanaged index considered representative of intermediate-term fixed-income obligations issued by the U.S. Treasury.

**Bloomberg Barclays U.S. Long Credit Bond Index** - An unmanaged index considered representative of long-term fixed-income obligations issued by U.S. corporate, specified foreign debentures, and secured notes that meet the specified maturity, liquidity, and quality requirements. To qualify, bonds must be SEC-registered.

## Benchmark Descriptions

**Bloomberg Barclays U.S. Long Gov't/Credit Index** - The Barclays Capital U.S. Government/ Credit Bond Index measures performance of U.S. dollar denominated U.S. treasuries, government-related, and investment grade U.S. corporate securities that have a remaining maturity of greater than or equal to 1 year. In addition, the securities have \$250 M or more of outstanding face value, and must be fixed rate and non-convertible.

**Bloomberg Barclays U.S. Long Government Bond Index** - An unmanaged index considered representative of long-term fixed- income obligations issued by the U.S. Treasury, government agencies and quasi-federal corporations.

**Bloomberg Barclays U.S. TIPS** - A market value-weighted index consisting of U.S. Treasury Inflation Protected Securities with one or more years remaining until maturity with total outstanding issue size of \$500m or more.

**Bloomberg Barclays U.S. Treasury 20-30 Year STRIPS Index** - A subcomponent of the Barclays Aggregate Index, this benchmark includes long-term treasury STRIPS.

**Bloomberg Commodity Index** - Consists of 22 exchange-traded futures on physical commodities, which are weighted to account for economic significance and market liquidity. Performance is calculated on an excess return basis and reflects commodity future price movements.

**BofA Merrill Lynch 3 Month Treasury Bill** - An index that measures the average return of the last three-month U.S. Treasury Bill issues.

**BofA Merrill Lynch High Yield Master** - A market-capitalization weighted index that tracks the performance of U.S. dollar- denominated, below investment grade corporate debt publicly issued in the U.S. domestic market.

**Citigroup 90-Day T-Bill Index** - An index that measures the average return of the last three-month U.S. Treasury Bill issues.

**Credit Suisse Leveraged Loan Index** - Designed to mirror the investable universe of the U.S. dollar denominated leveraged loan market.

**CRSP U.S. Large Cap Index** - an index comprised of nearly 640 U.S. large cap companies and includes securities traded on NYSE, NYSE Market, NASDAQ, or ARCA, representing nearly 85% of the U.S. investable equity market. The index is reconstituted quarterly after the market close on the third Fridays of March, June, September, and December.

**CRSP U.S. Total Market Index** - an index comprised of nearly 4,000 constituents across mega, large, small, and micro capitalizations and includes securities traded on NYSE, NYSE Market, NASDAQ, or ARCA, representing nearly 100% of the U.S. investable equity market. The index is reconstituted quarterly after the market close on the third Fridays of March, June, September, and December.

**DJ U.S. Completion Total Stock Market Index** - A capitalization-weighted index that consists of the stocks in the Dow Jones U.S. Total Stock Market Index less the stocks in the S&P 500 Stock Index.

**DJ U.S. Total Stock Market Index** - A capitalization-weighted stock index representing all domestic common stocks traded regularly on the organized exchanges. The index is the broadest measure of the aggregate domestic stock market and includes approximately 5,000 stocks.

**FTSE 4Good U.S. Select Index** - a socially responsible investment (SRI) index of U.S. stocks that excludes companies with certain business activities such as weapons, tobacco, gambling, alcohol, nuclear power, and adult entertainment.

**FTSE All-World ex-U.S. Index** - A capitalization-weighted stock index representing 46 developed market countries and emerging market countries excluding the U.S.

## Benchmark Descriptions

**FTSE EPRA NAREIT Global ex-U.S. Index** - Designed to represent general trends in eligible real estate equities worldwide. Relevant real estate activities are defined as the ownership, disposal and development of income-producing real estate.

**FTSE Global All Cap ex U.S. Index** - a market-capitalization weighted index representing the performance of roughly 5350 large, mid and small cap companies in 46 Developed and Emerging markets worldwide, excluding the USA.

**FTSE Global Core Infrastructure Index** - Represents the performance of infrastructure and infrastructure-related securities companies in a set of industries that FTSE defines as being involved in infrastructure. The series is based on the FTSE Global Equity Index Series and both developed and emerging markets are included.

**FTSE NAREIT U.S. Equity REITS** - Free float adjusted, market capitalization weighted index of U.S. based equity real estate investment trusts (REITs).

**Goldman Sachs Commodity Index** - A composite index of commodity sector returns which represents a broadly diversified, unleveraged, long-only position in commodity futures.

**HFRI Fund-of-Fund Index** - This index is equal-weighted including 800 constituents. It includes both domestic and offshore accounts and is valued in U.S. dollars. Only fund-of-fund products are included in the index that have at least \$50 M under managements and have been actively trading for at least one year. All funds report net monthly returns.

**HFRI Fund Weighted Composite Index** - The HFRI Fund Weighted Composite Index is a global, equal-weighted index of over 2,000 single-manager funds that report to HFR Database. Constituent funds report monthly net of all fees performance in U.S. Dollar and have a minimum of \$50 M under management or a twelve (12) month track record of active performance. The HFRI Fund Weighted Composite Index does not include Funds of Hedge Funds.

**Hueler Stable Value Index** - The Hueler Analytics Stable Value Pooled Fund Comparative Universe represents investment strategies of \$96 billion in stable value assets, across 24 pooled funds, invested in contracts universe across a universe of 16 general account issuers and 14 synthetic wrap providers. The allocation of pooled fund assets is dominated by synthetic contracts issued by insurance companies and banks.

**iMoneyNet All Taxable Money Funds Index** - An index made up of the entire universe of money market mutual funds. The index currently represents over 1,300 funds, or approximately 99 percent of all money fund assets.

**iMoneyNet Money Fund Average** - An index made up of the entire universe of money market mutual funds. The index currently represents over 1,300 funds, or approximately 99 percent of all money fund assets.

**J.P. Morgan EMBI Global Diversified** - Comprised of dollar-denominated Brady bonds, traded loans and Eurobonds issued by emerging market sovereign and quasi-sovereign entities. The Diversified version limits the weights of the index countries by only including a specified portion of those countries' eligible current face amounts of debt outstanding, providing for a more even distribution of weights within the countries in the index.

**MSCI All Country World ex-U.S. Index** - A capitalization-weighted index of stocks representing 44 stock markets in Europe, Australia, the Far East, the Middle East, Latin America and North America. Index consists of 23 developed and 21 emerging countries, but excludes the U.S.

**MSCI All Country World ex-U.S. Index IMI** - A capitalization-weighted index of large, mid and small cap stocks representing 22 developed (excluding the United States) and 24 emerging market countries. The index is the broadest measure of the aggregate non-U.S. stock market, covering approximately 99% of the global equity investment opportunity set outside of the United States.

## Benchmark Descriptions

**MSCI All Country World ex-U.S. Small Cap Index** - Covers all investable small cap securities with a market capitalization below that of the companies in the MSCI Standard Indices (excluding U.S.), and target approximately 14% of each market's free-float adjusted market capitalization.

**MSCI All Country World Index** - A capitalization-weighted index of stocks representing 46 stock markets in Europe, Australia, the Far East, the Middle East, Latin America and North America.

**MSCI All Country World Index IMI** - A capitalization-weighted index of large, mid and small cap stocks representing 23 developed and 24 emerging market countries. The index is the broadest measure of the aggregate global stock market, covering approximately 99% of the global equity investment opportunity set.

**MSCI EAFE Growth Index** - A capitalization-weighted index of 21 stock markets in Europe, Australia, Asia and the Far East designed to capture the growth-oriented companies.

**MSCI EAFE Index** - A capitalization-weighted index of stocks representing 22 developed countries in Europe, Australia, Asia, and the Far East.

**MSCI EAFE Small Cap Index** - A capitalization-weighted index of small cap stocks representing 23 developed country markets in Europe, Australia, Asia, and the Far East.

**MSCI EAFE Value Index** - A capitalization-weighted index of 21 stock markets in Europe, Australia, Asia and the Far East designed to capture the value-oriented companies.

**MSCI Emerging Markets Index** - A capitalization-weighted index of stocks representing 22 emerging country markets.

**MSCI Emerging Markets Value Index** - A capitalization-weighted index considered representative of value stocks across 46 stock markets in Europe, Australia, the Far East, the Middle East, Latin America and North America.

**MSCI U.S. Broad Market Index** - A capitalization-weighted stock index that aggregates the MSCI U.S. Large Cap 300, Mid Cap 450, Small Cap 1,750 and Micro Cap Indices. This index represents approximately 99.5% of the capitalization of the U.S. Equity market and includes approximately 3,562 companies.

**MSCI U.S. REIT Index** - A broad index that fairly represents the equity REIT opportunity set with proper investability screens to ensure that the index is investable and replicable. The index represents approximately 85% of the U.S. REIT universe.

**MSCI World Index** - A free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets, representing 24 developed market country indices.

**NCREIF Property Index** - A capitalization-weighted index of privately owned investment grade income-producing properties representing approximately \$269 billion in assets.

**NFI ODCE Index** - A capitalization weighted index comprised of open-end, Core funds investing in commercial real estate properties. The funds that constitute the index are subject to certain geographic and property type diversification requirements as well as leverage restrictions. The index reflects the impact of leverage on investment results. The returns shown in this report are net of management fees of the respective funds included in the index.

**Rolling 3-year Constant Maturity Treasury Index** - An index published by the Federal Reserve Board based on the monthly average yield of a range of Treasury securities, all adjusted to the equivalent of a three-year maturity.

**Russell 1000 Growth Index** - An index that measures the performance of those Russell 1000 companies with higher price-to- book ratios and higher I/B/E/S growth forecasts.

**Russell 1000 Index** - A capitalization-weighted index of the 1,000 largest publicly traded U.S. stocks by capitalization.

## Benchmark Descriptions

**Russell 1000 Value Index** - An index that measures the performance of those stocks included in the Russell 1000 Index with lower price-to-book ratios and lower I/B/E/S earnings growth forecasts.

**Russell 2000 Growth Index** - A capitalization-weighted index of those stocks in the Russell 2000 Index with higher price-to-book ratios and higher I/B/E/S earnings growth forecasts.

**Russell 2000 Index** - A capitalization-weighted index of the smallest 2,000 stocks in the Russell 3000 Index. The index excludes the largest- and smallest-capitalization issues in the domestic stock market.

**Russell 2000 Value Index** - An index that measures the performance of those stocks included in the Russell 2000 Index with lower price-to-book ratios and lower I/B/E/S earnings growth forecasts.

**Russell 2500 Growth Index** - A capitalization-weighted index representing those companies within the Russell 2500 Index with higher price-to-book ratios and higher I/B/E/S earnings growth forecasts.

**Russell 2500 Index** - The Index is constructed by first identifying the 3,000 largest-capitalization U.S. stocks and ranking them by market capitalizations, choosing the bottom 2,500 names on the list.

**Russell 2500 Value Index** - An index that measures the performance of those stocks included in the Russell 2500 Index with lower price-to-book ratios and lower I/B/E/S earnings growth forecasts.

**Russell 3000 Growth Index** - A capitalization-weighted index consisting of those Russell 3000 Index stocks that have higher price-to-book ratios and higher I/B/E/S earnings growth forecasts.

**Russell 3000 Index** - A capitalization-weighted index consisting of the 3,000 largest publicly traded U.S. stocks by capitalization. This index is a broad measure of the performance of the aggregate domestic equity market.

**Russell 3000 Value Index** - A capitalization-weighted index consisting of those Russell 3000 Index stocks that have lower price-to-book ratios and lower I/B/E/S earnings growth forecasts.

**Russell Mid Cap Growth Index** - A capitalization-weighted index representing those stocks in the Russell MidCap Index with higher price-to-book ratios and higher I/B/E/S earnings growth forecasts.

**Russell Mid Cap Index** - A capitalization-weighted index of the 800 smallest stocks in the Russell 1000 Index. This index is a broad measure of mid-capitalization stocks.

**Russell Mid Cap Value Index** - A capitalization-weighted index consisting of those Russell MidCap Index stocks that have lower price-to-book ratios and lower I/B/E/S earnings growth forecasts.

**S&P 500 Index** - A capitalization-weighted index representing stocks chosen by Standard & Poor's, Inc. for their size, liquidity, stability and industry group representation. The companies in the S&P 500 Index are generally among the largest in their industries.

## Benchmark Descriptions

**S&P Completion Index** -The S&P Completion Index is a sub-index of the S&P Total Market Index, including all stocks eligible for the S&P TMI and excluding all current constituents of the S&P 500. The index covers approximately 4,000 constituents, offering investors broad exposure to mid, small, and micro cap companies.

**S&P Leverage Loan Index** - A daily total return index that uses LSTA/LPC Mark-to-Market Pricing to calculate market value change.

**S&P MidCap 400 Index** - A market-capitalization-weighted index of stocks in all major industries in the mid-range of the U.S. stock market.

**Wilshire REIT** - A measure of the types of U.S. real estate securities that represent the ownership and operation of commercial or residential real estate. To be included in the index, a company must have a market capitalization of \$200 M and have at least 75% of the total revenue derived from the ownership and operation of the real estate assets.

- Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect our fees or expenses.
- Past performance is no guarantee of future results.
- Please feel free to contact us at [retirement@aon.com](mailto:retirement@aon.com) for more index information.

## Notes

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- Universe percentiles are based upon an ordering system in which 1 is the best ranking and 100 is the worst ranking.
- Due to rounding throughout the report, percentage totals displayed may not sum to 100%. Additionally, individual fund totals in dollar terms may not sum to the plan total.

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Past performance is not necessarily indicative of future results.

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# Arkansas Teachers Retirement System Third Quarter 2020 Real Assets Performance Review

PROPRIETARY & CONFIDENTIAL

February 2021

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# Agenda

<b>Section 1</b>	<b>Executive Summary</b>
Section 2	Market Overview
Section 3	Real Assets Portfolio Update
Section 4	Glossary

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## Real Assets Markets Performance and Overview

Performance Summary	Quarter (%)		1 Year (%)		3 Year (%)		5 Year (%)	
	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET
NFI-ODCE Value Weight	0.5	0.3	1.4	0.5	5.2	4.2	6.6	5.7
NCREIF Property Index "NPI"	0.7		2.0		5.1		6.3	
NCREIF Timberland Property Index "NTI"	0.0		0.2		2.1		2.6	
NCREIF Farmland Property Index "NFI"	1.0		2.6		4.9		5.9	

- In the third quarter of 2020, the NFI-ODCE (net) returned 0.3%, up 202 basis points quarter-over-quarter. NFI-ODCE returns have fallen below long-term expectations of 7% to 9% gross due to the maturity of the real estate cycle, as well as distress created by the COVID-19 pandemic
- The NCREIF Timberland Index ("NTI") returned 4 basis points for the quarter and 19 basis points for the trailing one-year return. Both total returns were driven by the positive income offsetting the negative appreciation. Regionally, the Lake States were the NTI's top performer while the Northwest and Northeast regions lagged for the quarter.
- The NCREIF Farmland Index ("NFI") returned 1.0%, up 35 basis points from the prior quarter. Annual crops drove performance with a return of 1.1%. For the trailing one-year, permanent crops returned 3.6% compared to row crops' 4.1%.

## Portfolio Funding Status and Composition

As of September 30, 2020	ATRS' Portfolio \$ in Millions
Number of Investments	69
Total Commitments	2,946.6
Unfunded Commitments	581.0
Total Paid-In Capital	2,544.1
Total Distributions	1,742.5
Net Asset Value	2,125.4
Gross Asset Value	2,955.3
DPI	0.7x
TVPI	1.5x
Since Inception IRR	7.0%
<i>*Active and Liquidated</i>	

PORTFOLIO COMPOSITION TO TARGETS (As of 9/30/2020)		
	Target	Actual Funded
<b>Target Real Asset Allocation</b>	15%	12.2%
<b>Portfolio Style Composition</b>		
<b>Real Estate</b>	10%	7.5%
<b>Core*</b>	50%-70%	70.6%
<b>Non-Core</b>	30%-50%	29.4%
<b>Value-Added**</b>	N/A	16.3%
<b>Opportunistic**</b>	N/A	14.2%
<b>Agriculture</b>	1%	1.2%
<b>Timber</b>	2%	1.7%
<b>Infrastructure</b>	2%	1.7%
<b>Leverage</b>	50%	28.1%

\* Includes Arkansas Investments

\*\* No stated targets

- Recent infrastructure and real estate commitments will help the portfolio continue to move towards its target allocation irrespective of liquidating investments
- In general, the portfolio is in compliance with its Statement of Investment Policy. There are a few exceptions:
  - Slight overweight to core real estate, which will correct over time as noncore commitments are fully funded
  - An overallocation to hotels though still less than 5% of the real estate portfolio
  - Timber geographic concentration remains out of compliance though significantly improved with recent BTG OEF commitment
  - Infrastructure is currently overweight Non-U.S., however Townsend and Staff are actively pursuing US focused managers

# ATRS' Real Assets Performance

Performance Summary	Quarter (%)		1 Year (%)		3 Year (%)		5 Year (%)		10 Year (%)		Net IRR	Equity Multiple
	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET		
ATRS Total Portfolio	1.5	1.2	2.1	1.1	5.9	4.5	7.4	6.1	9.2	7.9	7.0	1.5
Total Real Assets Benchmark		0.5		1.6		4.2		5.3		7.9		

- The table shows the returns for ATRS' Total Real Assets Portfolio and the Real Assets Benchmark.
- ATRS has outperformed over most periods, with the exception of the 1-Year where COVID-19 distress impacted the commercial real estate asset class. Also impacting the 1-Year return was a cash out refinance on the American Center property of the Arkansas Investments.

## ATRS' Real Estate Performance

Performance Summary	Quarter (%)		1 Year (%)		3 Year (%)		5 Year (%)		10 Year (%)		Net IRR	Equity Multiple
	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET		
Real Estate	0.6	0.3	-0.7	-1.4	4.5	3.3	7.0	5.7	10.5	9.2	7.6	1.5
NFI-ODCE Value Weight	0.5	0.3	1.4	0.5	5.2	4.2	6.6	5.7	10.3	9.3		

- The table shows the time-weighted, net of fee returns for ATRS' Total Real Estate Portfolio and the NFI-ODCE benchmark
- There are a number of Non-Core Funds that have entered the J-curve and performance is expected to have a more meaningful impact as newer funds move out of the J-Curve and investments are realized
- The real estate portfolio outperformed the benchmark by 8 basis points for the quarter; however, the 1- and 3-Year periods continue to underperform largely due in part to a large distribution from the Arkansas Investments that was a result of a cash out refinance

## ATRS' Timberland and Agriculture Performance

Performance Summary	Quarter (%)		1 Year (%)		3 Year (%)		5 Year (%)		10 Year (%)		Net IRR	Equity Multiple
	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET		
Timberland	1.3	1.1	2.3	1.3	5.0	4.0	5.1	4.2	5.5	4.3	5.1	1.8
Timberland Property Benchmark*	0.0		1.3		1.6		2.2			3.3		
Agriculture	1.3	1.0	3.4	2.3	4.2	3.0	4.5	3.4	N/A	N/A	4.8	1.3
Agriculture Benchmark*	1.0		3.3		4.1		4.1					

- The timber portfolio is outperforming the benchmark over all measurable time periods
- The agriculture portfolio overperformed the benchmark over the quarter, returning 1.3%. The portfolio also overperforms over the trailing one-, three-, and five-year time periods

## ATRS' Infrastructure Performance

Performance Summary	Quarter (%)		1 Year (%)		3 Year (%)		5 Year (%)		10 Year (%)		Net IRR	Equity Multiple
	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET		
Infrastructure	6.6	5.8	14.3	12.6	16.1	13.2	16.5	12.9	N/A	N/A	12.6	1.4
Infrastructure Benchmark*	1.7		5.9		6.7		6.8					

- The infrastructure portfolio outperformed the Infrastructure benchmark over the quarter, returning 5.8% net, primarily driven by strong performance from Macquarie Infrastructure Partners III (10.1% net) and Antin Infrastructure Partners II (15.6% net)
- ATRS' Infrastructure portfolio is outperforming the Infrastructure benchmark over all measurement periods

## ATRS' Real Assets Portfolio Highlights

- Commitment activity update
  - ATRS made the following commitments during the quarter or subsequent to quarter end
    - PGIM Real Estate Capital VII: \$40 million
    - Kayne Anderson Real Estate Partners VI: \$50 million
    - AxInfra NA II, LP: \$50 million
    - Mesa West Real Estate Income Fund V: \$40 million
  - ATRS is in the queue for a partial redemption of UBS TPF
    - TPF's queue is up to \$8.2 billion
    - As of October, only \$450 million in redemption payments were made for calendar year 2020

## Significant Events

- During the quarter, CBRE announced that Vance Maddock (President, Americas Real Estate Division) will step down from his role at the end of the year and serve as non-executive Vice Chairman, Americas. Robert Perry, who serves as the Head of the Strategic Partners fund series, will replace Mr. Maddock at the beginning of 2021. Townsend has reviewed this and is comfortable with the change in leadership.
- Subsequent to quarter end, LaSalle announced that Jeff Jacobson (Global CEO) will transition to LaSalle Chairman as of January 1<sup>st</sup>, 2021. Mark Gabby (CEO and CIO of Asia Pacific), will become the new Global CEO as of the same date. Townsend has reviewed this and is comfortable with the change in leadership.

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# United States Real Estate Market Update (3Q20)

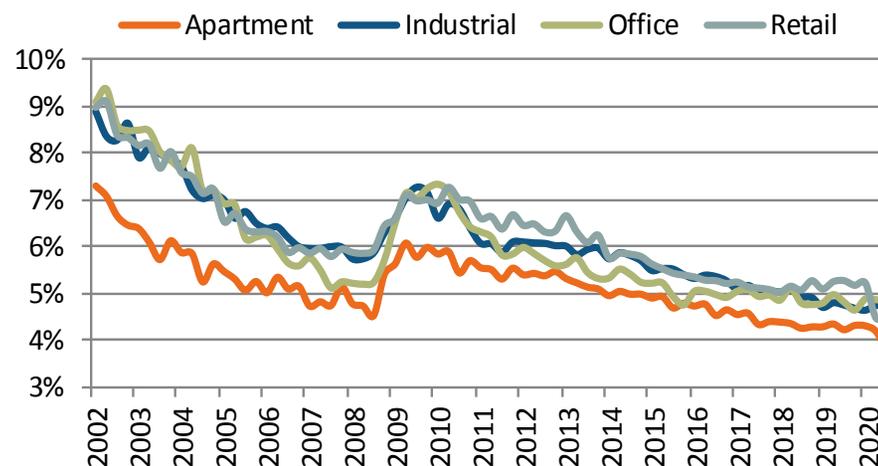
## General

- On March 13<sup>th</sup>, President Trump declared a national emergency. National, state, and local governments across the world implemented stay-at-home orders, which caused a near complete halt of the world economy. governments have dramatically expanded expenditures in order to protect people and businesses from large-scale disruption. In the 3<sup>rd</sup> quarter, equity markets continued to bounce back from the March rout, and the S&P 500 produced a gross total return of 8.9%. The MSC US REIT index continued to rebound and produced a return of 1.6% but remains down -17.1% YTD.
- The U.S. entered a recession in February; GDP contracted at an annualized rate of -31.4% in the 2<sup>nd</sup> quarter but rebounded and grew at an annualized rate 33.1% in the 3<sup>rd</sup> quarter. The unemployment rate peaked in April at 14.7% and has since declined to 8.8% at quarter end. The Federal Reserve has acted aggressively via quantitative easing and rate cuts, thus far financial markets have stabilized. The CARES Act provided \$1.5 trillion of stimulus to the economy. The Bloomberg average forecast has projected that the world economy will shrink by -3.9% in 2020.

## Commercial Real Estate

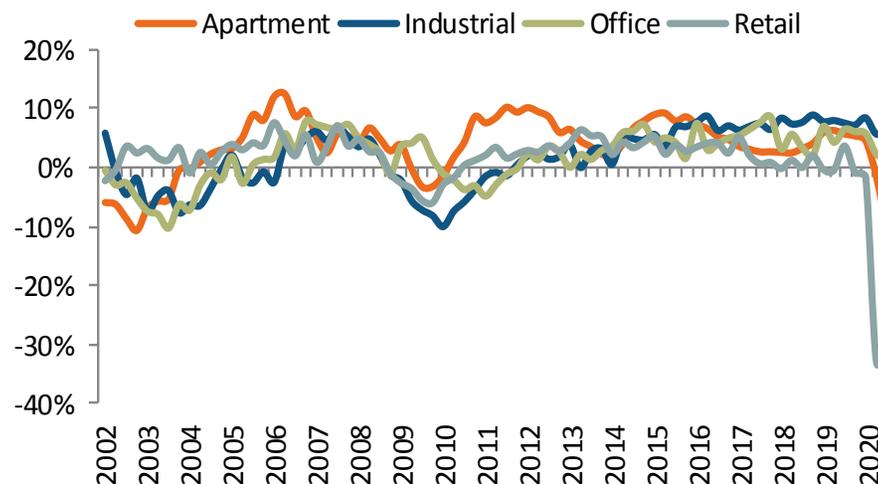
- Shelter in place orders and social distancing have restricted the ability to complete due diligence and acquire assets. Through Q3 2020, transaction volume has declined by 52% YoY. Transactions have primarily occurred in the apartment and industrial sectors.
- Transaction cap rates (4.9%) contracted -76 bps during the quarter. Current valuation cap rates declined for apartments (-42 bps), office (-2 bps), and industrial (-3 bps). A lack of transactions continues to limit evidence to revalue real estate.
- NOI growth has substantially diverged between property sectors due to the impacts of COVID-19. Retail NOI contracted substantially (-27%) as rent collections declined and retailers were shutdown. Apartment NOI contracted (-10%), primarily driven by declines in effective market rents and a nearly 2% increase in vacancy rates YoY. Public market signals have been divergent by property type.
- In the third quarter of 2020, \$26 bn of aggregate capital was raised by real estate funds. There continues to be substantial dry powder, ~\$342 billion, seeking exposure to private real estate.
- 10-year treasury bond yields remained approximately flat 0.7% during the quarter.

Current Value Cap Rates by Property Type



Source: NCREIF

4 Qtr Rolling NOI Growth



Source: NCREIF

# United States Property Matrix (3Q20)

## INDUSTRIAL

- In 3Q20, industrial properties were the highest returning sector at 3.0% and outperformed the NPI by 230 bps.
- Transaction volumes increased to \$16.5 billion in the third quarter of the year, still resulting in a 61.0% year-over-year decrease. Individual asset sales were down 21.1% year-over-year, while portfolio purchases turned in a year-over-year volume decrease of 85.7%. The portfolio transaction volume fell to slightly below mean quarterly transaction volume; the large year-over-year decrease is due to an abnormally large transaction volume in the second half of 2019.
- The industrial sector turned in NOI growth of 6.6% over the past year, an increase from the prior periods TTM growth of 5.6% in 2Q20. Market rent growth is expected to decelerate compared to its recent pace but remains strong.
- Vacancy increased by 10 bps year-over-year to 3.5%, remaining close to all-time historic lows. E-commerce continues to drive demand.
- Industrial cap rates compressed approximately 4 bps from a year ago, to 4.71%. Industrial fundamentals still top all property sectors.

## MULTIFAMILY

- The apartment sector delivered a 0.5% return during the quarter, underperforming the NPI by 20 bps.
- Transaction volume in the third quarter of 2020 rose to \$25.9 billion, still resulting in a decrease of 47.0% year-over-year. This volume continues to make multifamily the most actively traded sector for the thirteenth straight quarter.
- Cap rates decreased to 3.78%, compressing 46 bps year-over-year. Multifamily cap rates continue falling to their lowest in years, driven by continued decrease in NOI.
- The multifamily sector has seen increasing vacancy rates due to the pandemic but continues to hold steady relatively speaking, vacancy has increased 210 bps from a year ago. Various rent concessions have helped managers to maintain tenants through out the pandemic, these concessions will have various impacts on NOI over the next few quarters. The aging millennials have begun shifting their desires to suburban living, but continued home price appreciation has deterred the full effect of this migratory trend.

## OFFICE

- The office sector returned 0.3% in 3Q20, 40 bps below the NPI return over the period
- Transaction volumes decreased by 60% year-over-year in Q3. Annual sales volumes equaled \$14.3 billion for the quarter. Single asset transactions accounted for 79% of volume.
- Occupancy growth within the office sector has slowed, decreasing by 118 bps year-over-year. Office continues to be the highest vacancy property type at close to 10.8%.
- NOI growth continued to fall for the office sector to 1.7% in the last year, a decrease of 50 bps and 400 bps from 2Q20 and 1Q20, respectively. Due to work from home orders and rent deferrals/relief, NOI growth is expected to continue being compressed.
- Office cap rates expanded from a year ago to approximately 4.87% in the third quarter, an expansion of just 3 bps. Office-using job growth has been stunted significantly in 2020 due to many work from home orders.

## RETAIL

- As of 3Q20, the retail sector delivered a quarterly return of -0.5%, performing 120 bps below the NPI.
- Transaction volumes totaled \$7.0 billion in the third quarter, falling 56% year-over-year. Single asset transactions accounted for just over 90% of all sales volume.
- Cap rates have compressed approximately 61 bps within the sector over the last year, to 4.66%. The current valuation cap rate did expand quarter-over-quarter by 20 bps due to downward valuation adjustments made across the sector in general.
- NOI growth slightly increased though still significantly negative, -27.0% over the last year. This is a 5.7% increase from last quarter. Retail is expected to continue to suffer from the shift towards e-commerce, hesitance of the consumer, and the re-emerging shelter in place orders.
- Retail vacancy rates increased 130 bps over the past year to 8.3%. Many big box stores have closed as the need for retail space shrinks, translating to a negative outlook for rent growth. Paired with the global economic crisis that has had a significant negative impact on this sector.

# Global Real Estate Market Update (3Q20)

- Global investment activity during the third quarter of 2020 was down significantly relative to the same period in 2019, but on par with 2Q20. Although transaction volumes were flat during 3Q20, the sale of development sites increased 42%.
- Rising COVID cases across the world caused lockdowns across major economies resulting in a short but deep recession and affecting all sectors of the real estate industry. Uncertainty about the state of the economy threw some doubts on the future needs for certain property types.
- Investment activity in the Americas witnessed a sharp decline and fell by 42% year-over-year. COVID cases continued to increase in the US, putting plans of fully reopening the economy on hold. However, transaction volume in the US increased 43% relative to 2Q20.
- In the Asia Pacific region, volumes increased year-over-year, but transaction activity was mixed across the region. China, Japan, Hong Kong and Australia saw large drops in volume, while South Korea was flat at 0% year-over-year growth, likely due to superior efforts in the country to combat COVID-19.
- Although investment activity dropped in the EMEA region, it dropped substantially less than the Americas, with a 19% year-over-year decline. Germany, the largest market, witnessed only a 7% decline.
- All sectors were impacted by the spread of the pandemic, but the hotel and retail sectors were affected the most, and apartment and industrial the least.
- In the office sector, global leasing activity declined by over 50% year-over-year and vacancy rates began to increase in all regions. The declines represent an uncertainty about future office space needs. The US witnessed a 48% decline in leasing activity. Across the main European markets, demand for office space is down 20-30%. In the APAC region, volume decreased 38%.
- The retail sector continued to suffer globally as the shutdowns and social distancing measures of the COVID-19 outbreak posed challenges for operators. Vacancy rates increased as rents and NOI continued to compress. Retailers that were able to adapt their strategy to the digital world witnessed a recovery in sales.
- Despite the multifamily market recording a significant decrease in investments globally, the sector remains the most liquid in commercial real estate highlighting its attractiveness. In the U.S., rents fell more significantly in urban areas (upwards of 10% in some regions), but much less in suburban areas. However, in Europe effective rent rates were stable. In APAC, a resurgence of demand occurred as lockdowns ebbed.
- While the industrial market was affected by short-term headwinds from the recession as transaction volume decreased, valuations have strengthened, with a 20 bps increase in the U.S., and similar increases in Europe. The sector remains resilient despite the slowdown in the construction of industrial properties at the beginning of the year, new development resumed during the second quarter.

## Global Total Commercial Real Estate Volume - 2019 - 2020

\$ US Billions	Q3 2020	Q3 2019	% Change		% Change	
			Q3 20 - Q3 19	YTD 2020	Q1-Q3 2019	YTD 2020/Q1-Q3 2019
Americas	59	144	-59%	222	370	-40%
EMEA	51	85	-40%	188	232	-19%
Asia Pacific	188	179	5%	533	642	-17%
<b>Total</b>	<b>298</b>	<b>408</b>	<b>-27%</b>	<b>943</b>	<b>1244</b>	<b>-24%</b>

Source: Real Capital Analytics, Inc., Q3' 20

## Global Outlook - GDP (Real) Growth % pa, 2020-2022

	2020	2021	2022
<b>Global</b>	<b>-3.9</b>	<b>5.2</b>	<b>3.6</b>
<b>Asia Pacific</b>	<b>-0.6</b>	<b>4.7</b>	<b>4.7</b>
Australia	-3.6	3.0	3.2
China	2.0	8.0	5.4
India	-9.0	8.6	
Japan	-5.4	2.5	1.7
<b>North America</b>	<b>-4.0</b>	<b>3.8</b>	<b>2.9</b>
US	-3.6	3.8	2.9
<b>Middle East</b>	<b>-4.0</b>	<b>3.2</b>	<b>3.5</b>
<b>European Union</b>	<b>-7.7</b>	<b>4.7</b>	<b>3.3</b>
France	-9.4	6.2	3.1
Germany	-5.7	3.9	3.0
UK	-11.0	5.2	4.0

\*\* Annual %

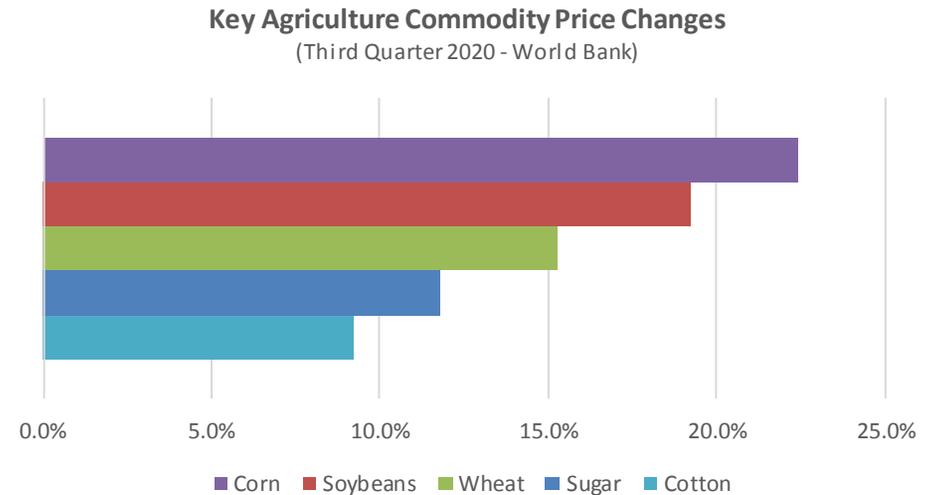
Source: Bloomberg

# Farmland - Third Quarter 2020 Market Update

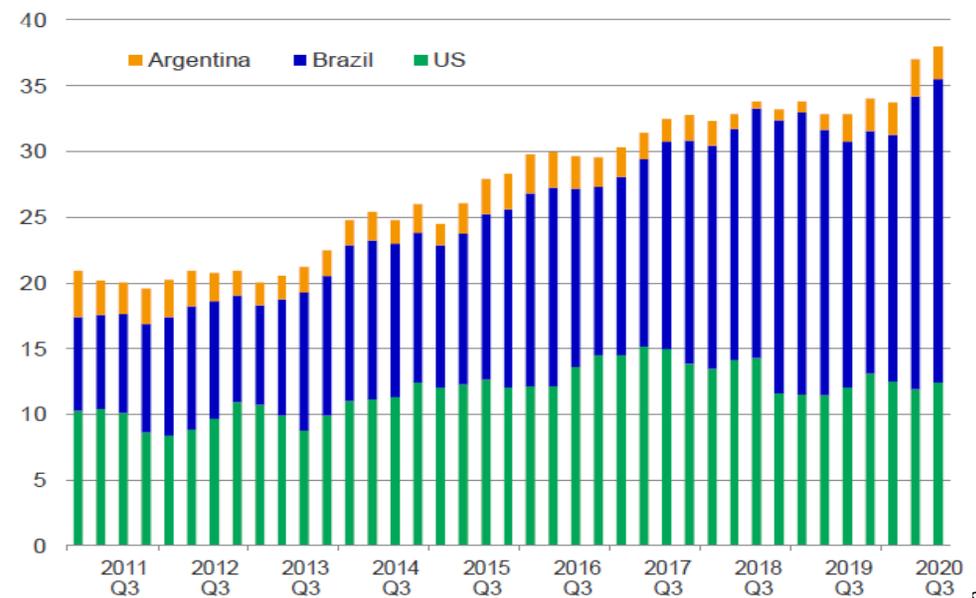
## FARMLAND MARKETS

- Agricultural commodity prices increased over the quarter as export demand continued to improve, driven in large part by China's continued purchasing of agricultural goods from both the U.S. and Brazil, along with a downward revision in the broader crop supply outlook during the quarter. **(FIGURE 1)**
- The end of many countries' lockdowns in June spurred increased economic activity, helping stabilize demand for ethanol and oil prices, which in turn drove biofuel prices back to pre-COVID levels. The improvement in ethanol demand also helped improve demand for various other commodities.
- Prices for almonds and walnuts are projected to decline due to record crops, with almonds 20% higher than the 2019 crop and walnuts 19% higher. However, both have experienced strong exports that may help limit any declines; almond exports up 40% over same time last year and walnut exports up 30% over same time last year.
- In Brazil, soybean exports hit record levels during the quarter driven by strong Chinese demand along with a weaker Brazilian currency; Brazil's soybean exports were approx. 24% higher than last year. **(FIGURE 2)**
- In Australia, farmland has performed strongly helped by continued growth in investor appetite; total returns for managed farmland investments during 3Q20 was 12.35%.

**FIGURE 1: Key Commodity Prices 1Q20**



**FIGURE 2: Soybean Exports - Major Producer 4-qrt avg. (Mil Metric Tons)**



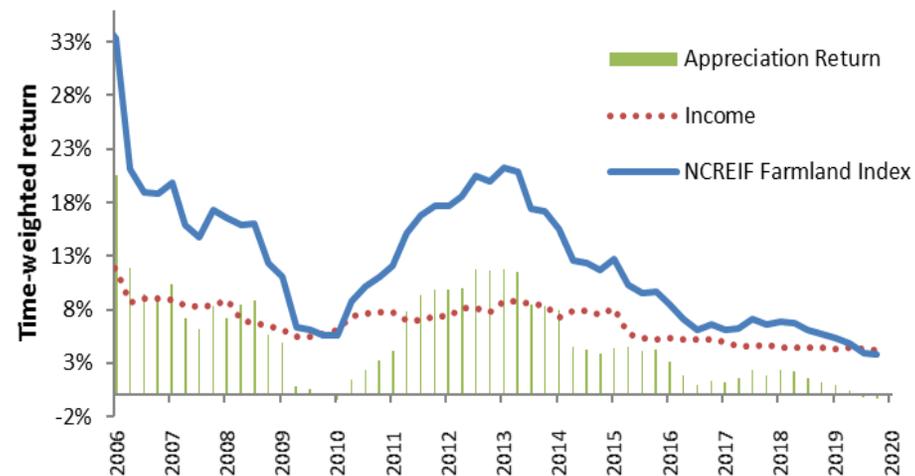
# Farmland - Third Quarter 2020 Market Update

## FARMLAND PERFORMANCE

- The NCREIF Farmland Index (“NFI”) returned 0.96% for 3Q20, up from last quarter’s 0.61% return and effectively flat over 3Q 2019’s 0.97%. The quarterly return consisted of a 0.76% income return and appreciation of 0.2%.
- Farmland values were up modestly during the quarter with annual cropland posting appreciation of 0.30% and permanent cropland posting appreciation of 0.06%, after registering appreciation of 0.03% and 0.01%, respectively, in Q2.
- The trailing 12-month total return was 3.84%, compared to 5.33% for the four-quarters ending 2Q 2020. The TTM total return was comprised of a 4.0% income return and -0.15% appreciation.
- Row crops outperformed permanent crops for the third consecutive quarter, returning a 1.1% return versus a 0.8% return for permanent crops. Performance for both was driven primarily by income as with the last few quarters, although row crop values experienced a slight uptick with a 0.3% appreciation return; permanent crop appreciation was 0.06%.
- Performance between farm types continues to converge and since the last commodity markets peak in 2012/2013. Permanent crops remain an outperformer over longer periods however, with the exception of the one-year period in which row crops over-took permanent crops during the quarter.

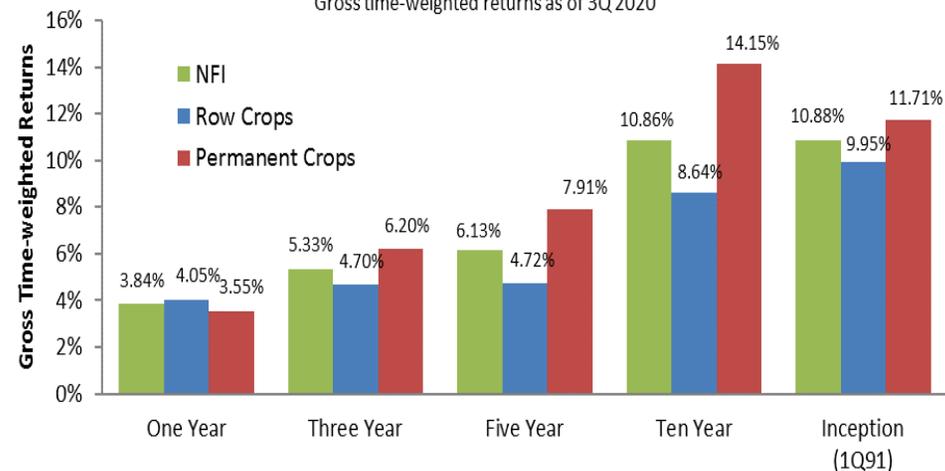
### NCREIF Farmland Index Performance

(Rolling 1-year total returns through 3Q 2020)



### NCREIF Farmland Index Farm Type Returns

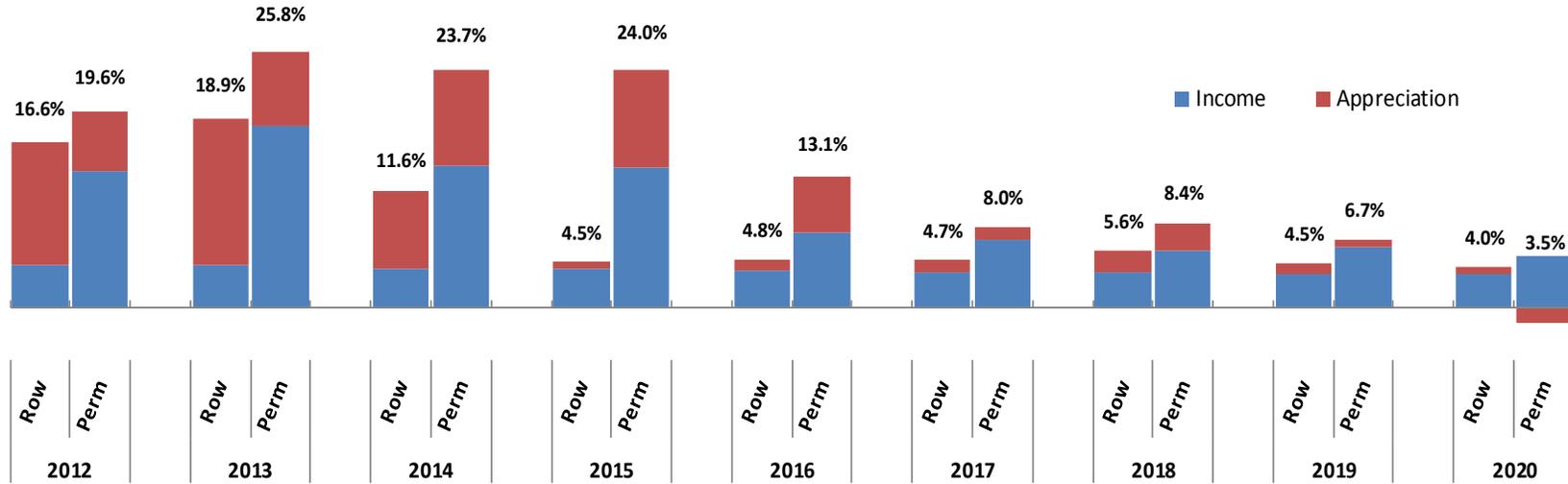
Gross time-weighted returns as of 3Q 2020



# Farmland - Third Quarter 2020 Market Update

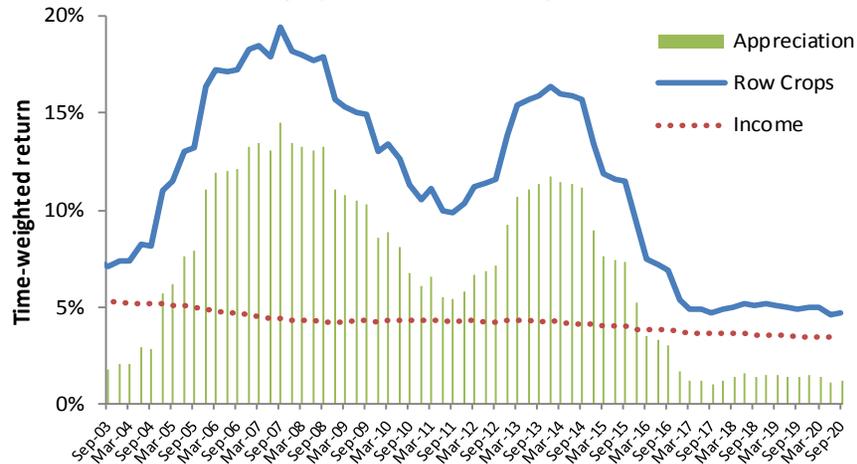
## FARMLAND PERFORMANCE

**NCREIF Farm Type Performance Attribution**  
(Trailing Twelve Month time-weighted returns as of 3Q 2020)



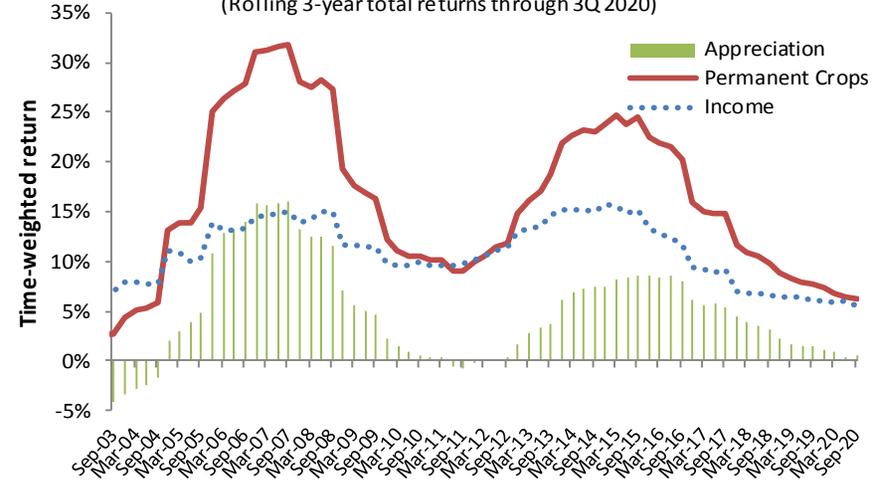
**NCREIF Row Crop Performance**

(Rolling 3-year total returns through 3Q 2020)



**NCREIF Permanent Crop Performance**

(Rolling 3-year total returns through 3Q 2020)

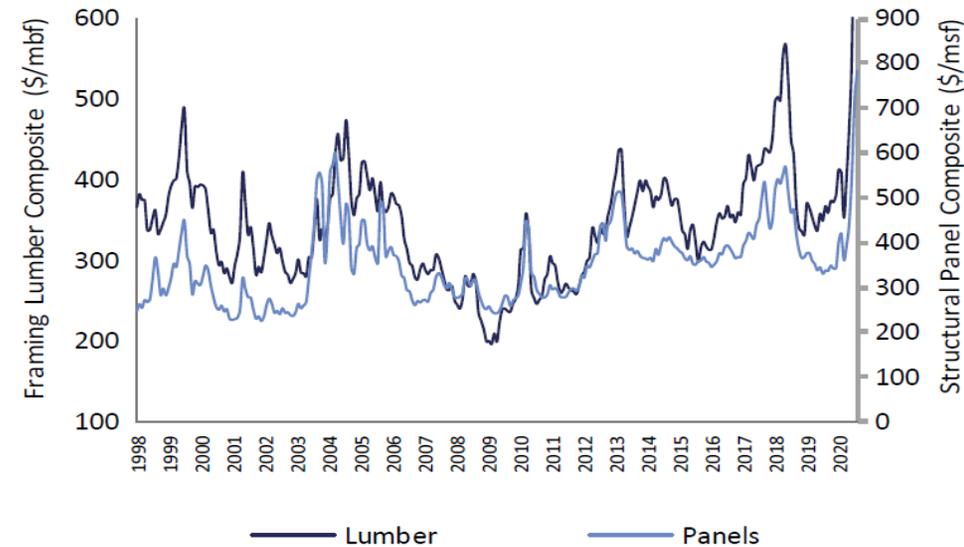


# Timberland – Third Quarter 2020 Market Update

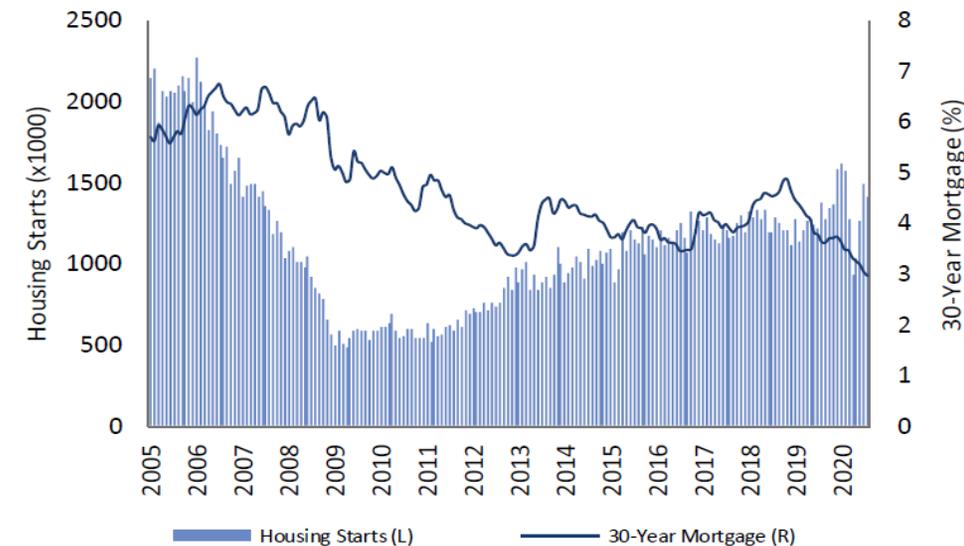
## TIMBERLAND MARKETS

- The extent of the COVID-19 impact on forest products remained relatively minimal during the quarter, as the U.S. sector was bolstered by strong housing starts combined with robust repair and remodel activity over the quarter. Framing lumber and structural panel pricing reached all-time highs with the lumber index increasing nearly 100%. (**FIGURE 1**) However, improvements in lumber demand has not impacted regional log and stumpage values yet.
- Housing starts continued to rebound since the beginning of the pandemic with the U.S. housing market trending higher towards the end of the quarter, reaching an SARR<sup>1</sup> of 1.42 million units. There was a notable shift to increased levels of single-family home construction reaching the highest level since July of 2007. Multifamily starts remained volatile and declined over 16%. (**FIGURE 2**)
- Pricing was mixed in the U.S. south and regional/end-market dependent, while prices in the Pacific Northwest began improving during the quarter as domestic demand continued to increase.
- Brazilian markets were mixed and varied by region and product; pig iron exports saw strong export demand increases, while pulpwood (paper products/packaging) demand softened. Australian markets were generally flat to down primarily driven by lower export volume as the Aus dollar appreciated over 8% against the USD, making its forest products less attractive on a relative value basis.

**FIGURE 1: U.S. Framing Lumber Index and Panel Composite Index**



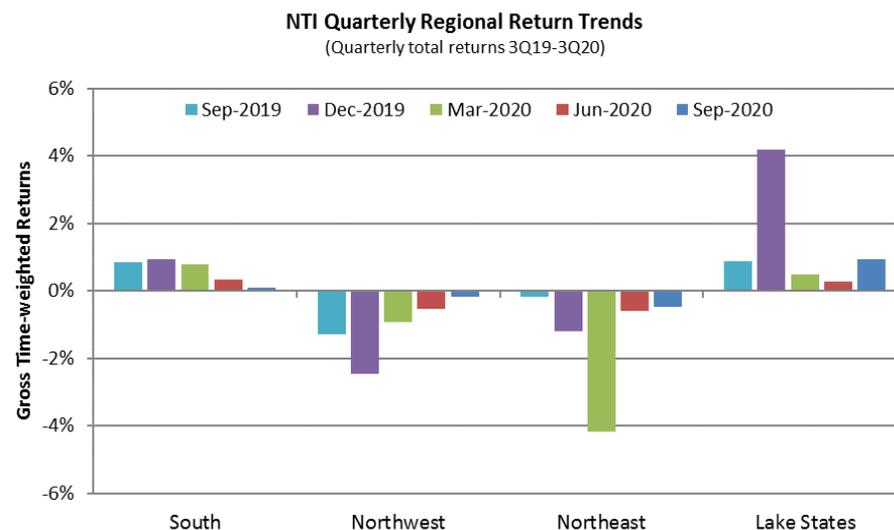
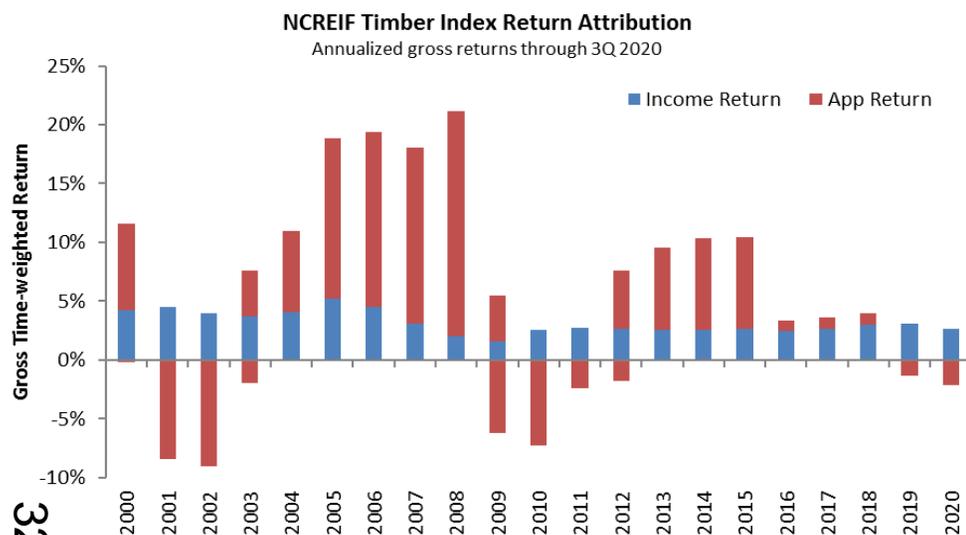
**FIGURE 2: U.S. Housing Starts SAAR and 30-year Mortgage Rates**



# Timberland – Third Quarter 2020 Market Update

## TIMBERLAND PERFORMANCE

- The NCREIF Timberland Index (“NTI”) returned 0.04% for the quarter, declining slightly from last quarter’s 0.08% return and 3Q19’s 0.18% return. The return was comprised of a 0.6% income return and a negative appreciation return of -0.54% marking the fifth straight quarter of value declines. All but the Lake States region declined in value during the quarter, similar to 2Q20.
- The NFI’s largest timberland region - the U.S. South – returned 0.09% for the quarter consisting of a 0.6% income return and a -0.5% appreciation return as land values continued to retreat slightly amidst a general COVID-driven slowdown in forestry activity and more notably transaction activity. The South continues to remain relatively resilient with only one negative quarterly return since 2011 coupled with consistent income returns averaging over 2.0% per year over the last ten years.
- The Northwest returned -0.2% for the quarter, as timberland values continued to remain pressured and retreating from several years of historic highs. The return consisted of 0.5% income and -0.7% appreciation. This marks the fifth straight quarter for a negative return out of the Northwest and all driven by declines in values; declining 6.1% over the past 12-months.
- Timberland per acre values also declined slightly to \$1,761/acre versus last quarter’s value of \$1,769/acre.

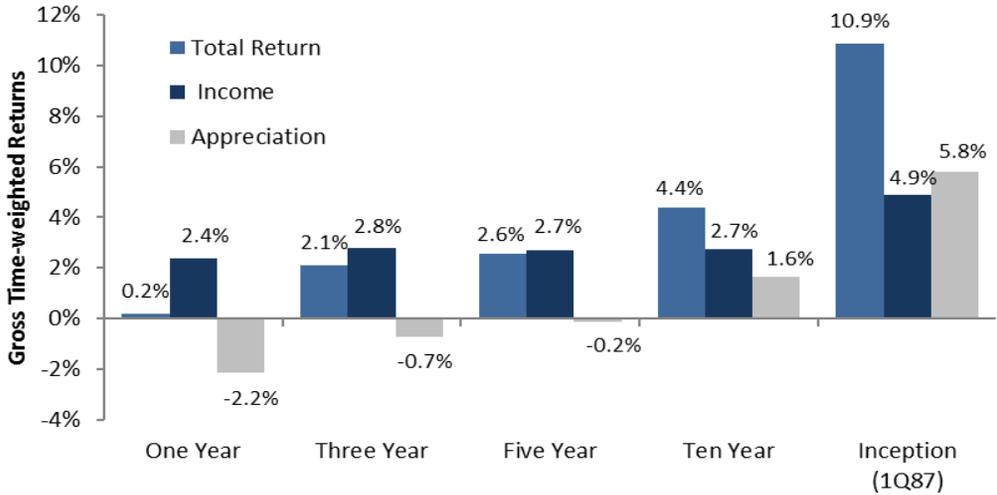


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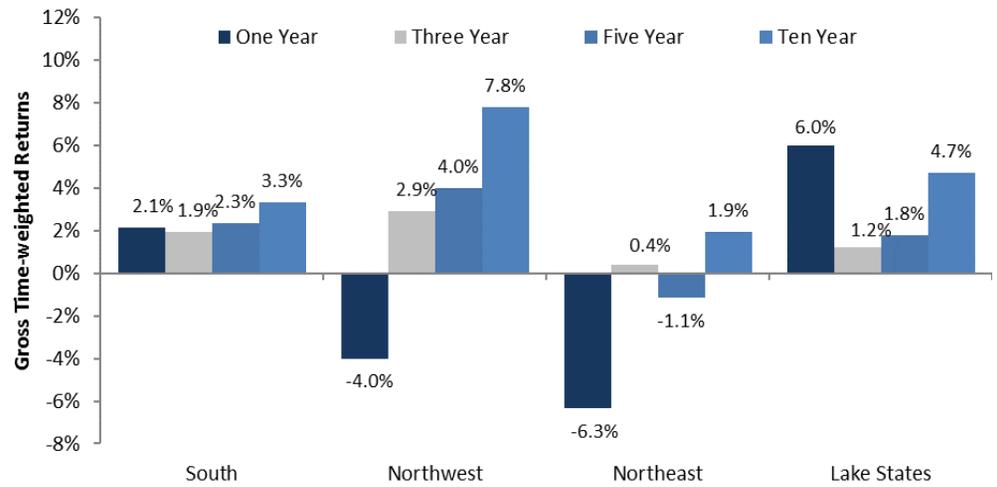
# Timberland – Third Quarter 2020 Market Update

## TIMBERLAND PERFORMANCE

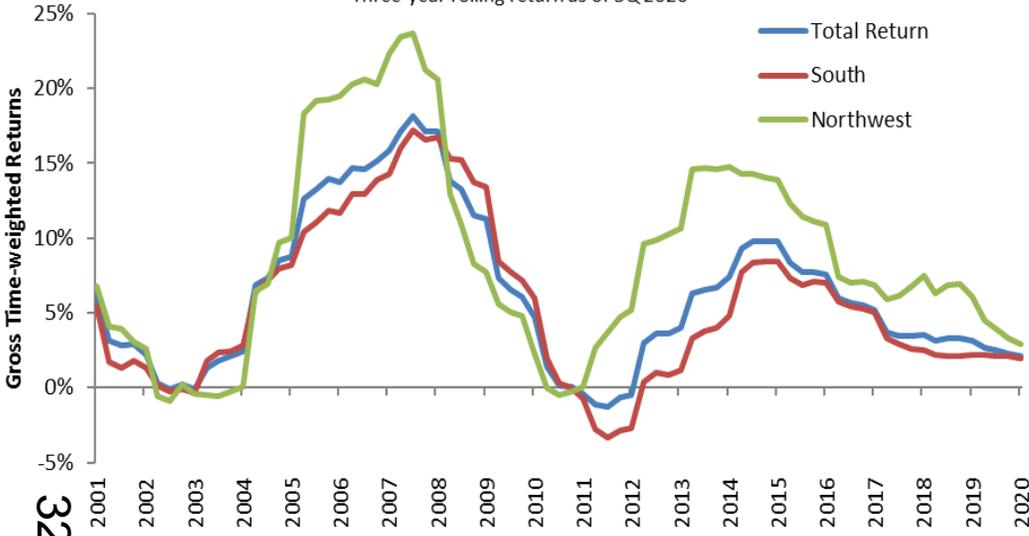
**NCREIF Timber Index Returns**  
Gross time-weighted returns as of 3Q 2020



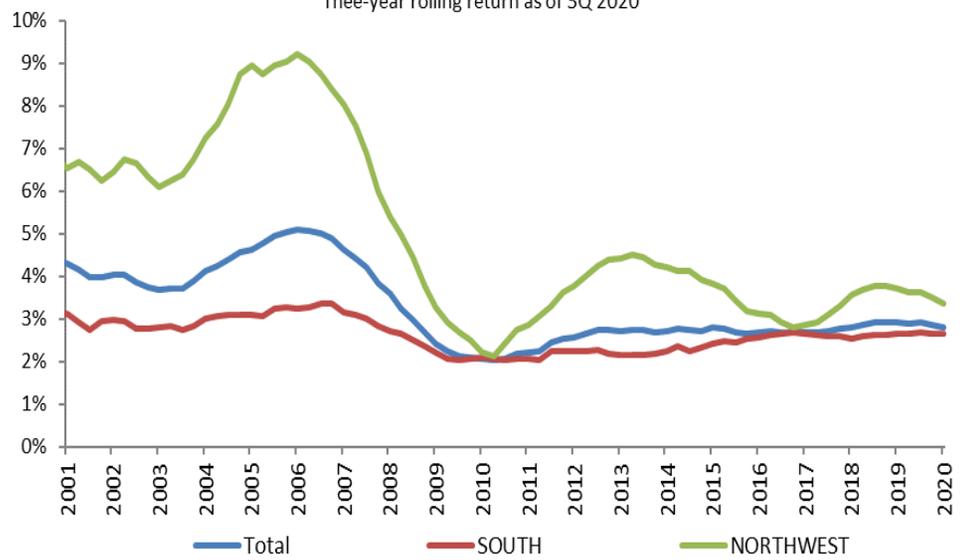
**NCREIF Timber Index Regional Returns**  
Gross time-weighted returns as of 3Q 2020



**Total Returns by Region**  
Three-year rolling return as of 3Q 2020



**EBITDA Returns by Region**  
Three-year rolling return as of 3Q 2020





# Infrastructure – Third Quarter 2020 Market Update

## GENERAL

- Despite depressed activity due to the short-term implications of COVID-19, deal count and values have seen a slight recovery on Q2 levels. Deal count increased by 22% and estimated aggregate deal value increased by 18%. In terms of fundraising, 17 funds dosed over Q3 2020, representing a 40% decrease compared to the previous quarter. However aggregate capital raised increased, representing a 72% increase compared to the same quarter last year and a 56% increase compared to the previous quarter.

## EUROPE

- Notable transactions that dosed in the quarter included the sale of a UK-based energy-from-waste company Viridor, to KKR infrastructure for US\$3.7bn. Other notable transactions included the sale of Orsted’s Danish power distribution business Radius, which operates the power grid in the region around Copenhagen, the business sold for US\$3.4bn. Renewable energy investment for the third quarter was dominated by the Viridor sale and the sale of a 25.1% stake of Walney 367MW offshore wind farms based in Scotland, the stake was sold for US\$0.5bn.

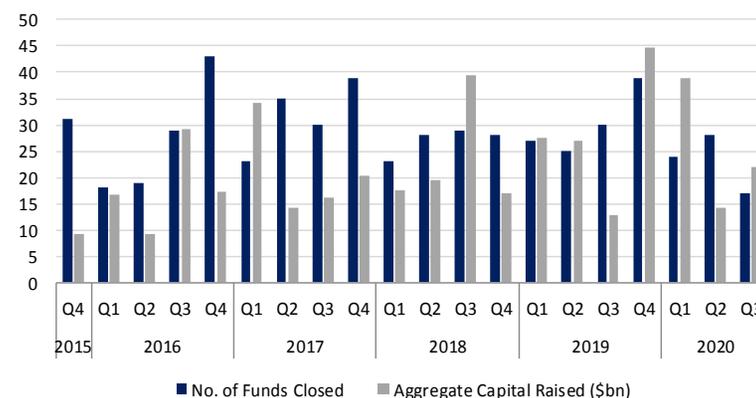
## NORTH AMERICA

- Deal flow was dominated by a number of transactions, notably Blackstone’s sale of Chenier Energy Partners, which operates the Sabine Pass LNG export terminal in Louisiana, the 42% stake was sold for US\$6.9bn. Another notable transaction included the sale of El Paso Electric, a regulated electric utility serving 417,000 retail and wholesale customers, the business was sold for US\$4.3bn. Renewable deal flow was limited over the third quarter, the only notable transaction was the financial close of a 500MW solar project for US\$0.6bn, Highlander, located in Spotsylvania.

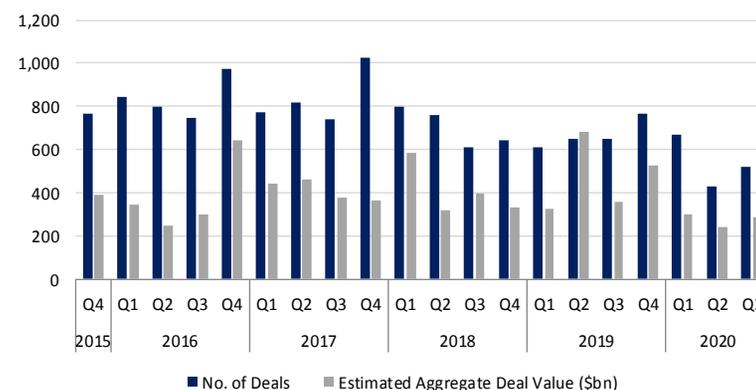
## ASIA PACIFIC

- Deal flow over the quarter included the acquisition of a 51% stake in Reliance Jio Infratel Private Limited, the owner of tower assets for US\$3.4bn. Other notable transactions include the financial close of a 19.9% stake in Transgrid, the power grid in New South Wales in Australia for US\$1.7bn. On the renewables side, a 100% stake in a renewable developer and manager China Development Bank (CDB) Energy Technology was sold for US\$1.0bn.

Unlisted Infrastructure Fundraising



Infrastructure Deals Completed



Source: Preqin

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## Agenda

Section 1	Executive Summary
<b>Section 2</b>	Market Overview
<b>Section 3</b>	<b>Real Assets Portfolio Update</b>
Section 4	Glossary

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# ATRS' Real Estate Performance: Core Portfolio

As of 9/30/2020

Funding Status (\$)	Investment Vintage Year	Commitment Amount	Funded Amount	Unfunded Commitments	Capital Returned	Market Value	Market Value (%)	Market Value + Unfunded Commitments (%)
<b>Core</b>								
Arkansas Investments	2007	142,694,200	144,624,546	0	193,334,846	78,013,371	3.7	2.9
JP Morgan Strategic Property Fund	2006	170,000,000	170,000,000	0	70,724,258	277,436,832	13.1	10.3
Metlife Commercial Mortgage Income Fund	2018	50,000,000	50,000,000	0	2,750,561	49,179,513	2.3	1.8
PRISA SA	2005	170,000,000	184,182,196	0	107,973,056	271,177,426	12.8	10.0
UBS Trumbull Property Fund	2005	170,000,000	190,587,980	0	140,396,146	197,897,432	9.3	7.3
UBS Trumbull Property Income Fund	2016	50,000,000	50,000,000	0	4,850,311	52,070,349	2.4	1.9
<b>Core</b>	<b>2005</b>	<b>752,694,200</b>	<b>789,394,723</b>	<b>0</b>	<b>520,029,177</b>	<b>925,774,922</b>	<b>43.6</b>	<b>34.2</b>

Returns (%)	Quarter				1 Year				3 Year				5 Year				Inception		TWR Calculation Inception	Net IRR	Equity Multiple
	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	TGRS	TNET			
<b>Core</b>																					
Arkansas Investments	0.0	1.3	1.3	1.3	0.0	14.7	14.7	14.7	0.0	-3.5	-3.5	-3.5	0.0	8.0	8.0	8.0	7.5	7.5	1Q08	8.3	1.9
JP Morgan Strategic Property Fund	0.9	-0.9	0.0	-0.2	3.8	-2.0	1.8	0.9	3.9	0.6	4.5	3.6	4.1	2.0	6.1	5.2	6.1	5.2	2Q07	6.4	2.0
Metlife Commercial Mortgage Income Fund	1.2	0.2	1.4	1.2	5.3	-1.8	3.4	2.6									4.0	3.1	3Q19	3.1	1.0
PRISA SA	1.0	-0.5	0.5	0.3	4.1	-1.6	2.4	1.6	4.3	1.6	6.0	5.2	4.4	2.6	7.1	6.3	6.9	6.1	3Q05	6.3	2.1
UBS Trumbull Property Fund	1.0	-1.2	-0.2	-0.4	4.3	-6.2	-2.1	-2.8	4.5	-2.8	1.6	0.9	4.6	-0.8	3.7	2.9	5.6	4.7	2Q06	5.3	1.8
UBS Trumbull Property Income Fund	0.9	-0.2	0.7	0.5	3.6	-1.8	1.7	0.9	3.9	1.2	5.2	4.4					5.1	4.4	3Q17	4.5	1.1
<b>Core</b>	<b>0.9</b>	<b>-0.6</b>	<b>0.3</b>	<b>0.1</b>	<b>3.7</b>	<b>-4.1</b>	<b>-0.6</b>	<b>-1.3</b>	<b>3.7</b>	<b>-0.3</b>	<b>3.4</b>	<b>2.7</b>	<b>3.9</b>	<b>2.2</b>	<b>6.1</b>	<b>5.4</b>	<b>7.8</b>	<b>7.0</b>	<b>3Q05</b>	<b>6.3</b>	<b>1.8</b>

Note: Arkansas Investments are included in Core portfolio

## ATRS' Real Estate Performance: Value-Add Portfolio

As of 9/30/2020

Funding Status (\$)	Investment Vintage Year	Commitment Amount	Funded Amount	Unfunded Commitments	Capital Returned	Market Value	Market Value (%)	Market Value + Unfunded Commitments (%)
<b>Value Added</b>								
Almanac Realty Securities V, LP	2008	50,000,000	21,787,314	0	48,380,466	122,276	0.0	0.0
Almanac Realty Securities VI	2012	30,000,000	19,102,008	0	21,006,051	3,824,321	0.2	0.1
Almanac Realty Securities VII	2015	30,000,000	27,978,973	7,946,045	22,206,994	14,779,484	0.7	0.8
Almanac Realty Securities VIII	2018	30,000,000	5,053,012	24,946,988	128,193	4,422,237	0.2	1.1
Calmwater Real Estate Credit Fund III	2017	30,000,000	23,113,383	7,427,676	2,709,213	23,903,937	1.1	1.2
CBRE Strategic Partners U.S. Value 8	2016	25,000,000	22,826,523	2,173,477	3,408,228	24,821,867	1.2	1.0
CBRE Strategic Partners U.S. Value 9	2020	50,000,000	11,234,085	38,990,190	0	10,158,206	0.5	1.8
FPA Core Plus Fund IV	2018	30,000,000	19,500,000	10,500,000	1,312,735	18,997,907	0.9	1.1
Harbert European Real Estate Fund IV	2016	25,011,918	23,920,550	1,783,496	10,424,723	20,471,955	1.0	0.8
LaSalle Income & Growth Fund VI	2013	20,000,000	19,047,619	952,381	21,551,268	6,545,212	0.3	0.3
LaSalle Income & Growth Fund VII	2017	20,000,000	19,571,839	3,614,553	8,420,223	14,166,105	0.7	0.7
LaSalle Income & Growth Fund VIII	2018	50,000,000	8,773,406	41,226,594	0	7,418,823	0.3	1.8
Long Wharf Real Estate Partners V	2016	30,000,000	29,828,371	0	13,228,965	23,275,306	1.1	0.9
Long Wharf Real Estate Partners VI, L.P.	2020	50,000,000	7,025,055	42,933,598	0	5,839,185	0.3	1.8
New Boston Real Estate Investment Fund VII	2008	10,000,000	9,668,685	0	7,966,530	49,590	0.0	0.0
Rockwood Capital Real Estate Partners Fund IX	2012	30,000,000	27,422,960	2,577,040	31,097,878	5,501,224	0.3	0.3
Rockwood Capital Real Estate Partners Fund XI	2019	40,000,000	264,638	39,735,362	0	-228,605	0.0	1.5
Walton Street Real Estate Debt Fund II, L.P.	2019	40,000,000	5,061,741	36,475,283	1,548,340	3,840,855	0.2	1.5
Westbrook Real Estate Fund IX	2012	40,000,000	46,164,592	3,603,488	45,995,329	10,429,023	0.5	0.5
Westbrook Real Estate Fund X	2015	25,000,000	23,943,876	2,016,766	12,412,281	15,218,775	0.7	0.6
<b>Value Added</b>	<b>2007</b>	<b>655,011,918</b>	<b>371,288,629</b>	<b>266,902,938</b>	<b>251,797,417</b>	<b>213,557,681</b>	<b>10.0</b>	<b>17.8</b>

## ATRS' Real Estate Performance: Value-Add Portfolio (Cont.)

### Time Weighted Returns:

Returns (%)	Quarter				1 Year				3 Year				5 Year				Inception		TWR Calculation Inception	Net IRR	Equity Multiple
	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	TGRS	TNET			
<b>Value Added</b>																					
Almanac Realty Securities V, LP	-9.5	1.9	-7.6	-7.8	-10.1	-2.0	-11.8	-12.5	11.0	-7.1	4.6	3.3	17.1	-9.0	8.6	7.2	10.7	9.0	4Q09	11.9	2.2
Almanac Realty Securities VI	2.6	-1.7	0.9	0.6	11.3	-36.1	-28.1	-28.9	9.4	-18.9	-10.9	-11.6	8.5	-8.3	-0.2	-1.0	5.3	3.7	1Q13	9.7	1.3
Almanac Realty Securities VII	2.1	0.7	2.8	2.5	8.4	4.9	13.5	12.3	8.2	6.9	15.5	13.9	8.7	7.1	16.3	13.4	16.1	12.8	3Q15	13.2	1.3
Almanac Realty Securities VIII	0.9	8.0	8.9	6.6	8.1	-3.8	3.9	-10.1									33.0	-70.9	1Q19	-11.9	0.9
Calmwater Real Estate Credit Fund III	2.9	0.0	2.9	2.0	10.4	0.0	10.4	7.2									11.6	7.5	1Q18	7.3	1.2
CBRE Strategic Partners U.S. Value 8	1.8	0.4	2.3	2.1	6.9	0.1	7.0	6.6	6.9	5.8	13.0	11.4					11.8	10.2	2Q17	9.3	1.2
CBRE Strategic Partners U.S. Value 9																			4Q20	-9.7	0.9
FPA Core Plus Fund IV	1.1	0.0	1.1	0.9	4.9	0.0	4.9	4.2									4.0	3.2	4Q18	2.6	1.0
Harbert European Real Estate Fund IV	0.2	6.0	6.3	6.0	10.8	-9.2	1.6	8.3	6.4	1.9	8.6	8.0					9.3	8.0	3Q16	7.9	1.3
LaSalle Income & Growth Fund VI	1.2	0.0	1.2	1.0	3.9	-8.5	-4.8	-3.7	3.7	-2.6	1.1	1.1	4.4	1.4	5.8	5.0	9.8	8.3	4Q13	11.3	1.5
LaSalle Income & Growth Fund VII	0.2	0.1	0.3	0.0	-0.4	-4.0	-4.4	-4.1	1.0	6.0	7.0	5.5					7.5	6.1	3Q17	7.1	1.2
LaSalle Income & Growth Fund VIII	0.3	-0.5	-0.2	-2.2													-3.8	-7.5	2Q20	-17.9	0.8
Long Wharf Real Estate Partners V	0.4	1.2	1.6	1.2	1.1	-3.1	-2.0	1.0	1.9	9.6	11.5	9.9					10.5	7.0	1Q16	8.1	1.2
Long Wharf Real Estate Partners VI, L.P.	0.6	1.1	1.8	-1.6													-3.1	-9.5	2Q20	-18.8	0.8
New Boston Real Estate Investment Fund VII	-1.1	0.0	-1.1	-1.1	-4.5	-39.5	-41.9	-41.9	-3.0	-15.0	-17.3	-18.6	-1.4	-7.4	-8.5	-9.9	-2.0	-4.2	1Q09	-2.8	0.8
Rockwood Capital Real Estate Partners Fund IX	-0.1	1.0	0.9	0.3	1.0	-29.2	-28.5	-31.0	2.5	-9.5	-7.3	-10.0	2.4	-0.5	1.9	-0.6	9.1	6.0	4Q13	10.6	1.3
Rockwood Capital Real Estate Partners Fund XI <sup>1</sup>	N/M	N/M	N/M	N/M													N/M	N/M	1Q20	N/M	N/M
Walton Street Real Estate Debt Fund II, L.P.	2.7	0.0	2.7	2.2	9.9	-0.1	9.8	7.6									9.9	7.7	3Q19	8.7	1.1
Westbrook Real Estate Fund IX	-0.1	-5.0	-5.1	-5.4	-0.9	-20.7	-21.5	-22.5	-0.6	-3.1	-3.7	-4.9	0.0	2.6	2.6	1.3	7.6	4.6	3Q13	8.1	1.2
Westbrook Real Estate Fund X	0.2	2.3	2.5	2.2	0.5	3.8	4.3	2.8	-0.8	14.6	13.8	10.6					16.5	9.0	4Q16	10.3	1.2
<b>Value Added</b>	<b>1.0</b>	<b>0.9</b>	<b>1.8</b>	<b>0.9</b>	<b>4.9</b>	<b>-5.0</b>	<b>-0.2</b>	<b>-1.5</b>	<b>4.7</b>	<b>3.0</b>	<b>7.8</b>	<b>5.5</b>	<b>5.1</b>	<b>4.7</b>	<b>10.0</b>	<b>7.5</b>	<b>6.5</b>	<b>4.1</b>	<b>2Q07</b>	<b>6.6</b>	<b>1.3</b>

<sup>1</sup> Rockwood Capital Real Estate Partners Fund XI's N/M designation is the result of small AIC leading to a negative NAV, which has led to negative appreciation due to new acquisitions being market below asset value due to closing costs, as well as negative income attributable to the closing costs expensed being greater than the net income generated during the period

# ATRS' Real Estate Performance: Opportunistic Portfolio

As of 9/30/2020

Funding Status (\$)	Investment Vintage Year	Commitment Amount	Funded Amount	Unfunded Commitments	Capital Returned	Market Value	Market Value (%)	Market Value + Unfunded Commitments (%)
<b>Opportunistic</b>								
Blackstone Real Estate Partners Europe VI (EURO Vehicle)	2019	49,096,184	10,078,776	41,356,693	0	9,963,851	0.5	1.9
Blackstone Real Estate Partners VII	2011	50,000,000	63,715,719	6,287,502	80,931,174	19,416,065	0.9	0.9
Carlyle Realty Partners VII	2014	30,000,000	28,398,242	20,640,181	28,821,384	11,853,232	0.6	1.2
Carlyle Realty Partners VIII	2018	25,000,000	10,121,076	16,445,153	1,566,227	9,312,080	0.4	1.0
CBRE Strategic Partners U.S. Opportunity 5	2008	50,000,000	48,619,340	1,643,033	57,378,777	10,227,185	0.5	0.4
Cerberus Institutional Real Estate Partners III	2013	30,000,000	37,777,980	7,307,395	40,517,038	12,384,388	0.6	0.7
Heitman European Property Partners IV	2009	44,089,700	34,546,944	3,404,770	24,346,022	3,208,197	0.2	0.2
Kayne Anderson Real Estate Partners V	2018	25,000,000	18,500,000	6,500,000	669,027	20,420,369	1.0	1.0
Landmark Real Estate Fund VI	2010	40,000,000	35,090,608	4,909,392	52,405,721	2,095,440	0.1	0.3
Landmark Real Estate Fund VIII	2017	25,000,000	10,430,713	18,319,287	4,151,134	7,765,465	0.4	1.0
LaSalle Asia Opportunity Fund IV	2014	30,000,000	28,674,871	2,013,173	38,913,010	2,116,015	0.1	0.2
LaSalle Asia Opportunity V	2016	30,000,000	22,604,406	14,782,208	14,608,269	10,654,624	0.5	0.9
Lone Star Real Estate Fund IV	2015	24,260,817	19,445,848	4,814,970	19,341,705	6,747,020	0.3	0.4
Metropolitan Real Estate Partners Co-Investments Fund	2015	20,000,000	19,132,876	867,124	15,045,535	10,357,173	0.5	0.4
O'Connor North American Property Partners II, L.P.	2008	50,000,000	58,229,919	5,000,000	40,129,867	8,502,318	0.4	0.5
Torchlight Debt Fund VII, LP	2020	50,000,000	5,000,000	45,000,000	0	4,834,235	0.2	1.8
Torchlight Debt Opportunity Fund IV	2013	30,000,000	29,369,211	0	37,327,322	4,770,642	0.2	0.2
Torchlight Debt Opportunity Fund V	2015	25,000,000	20,001,024	5,000,000	18,313,820	6,926,558	0.3	0.4
Torchlight Debt Opportunity Fund VI	2017	25,000,000	24,979,558	0	0	25,080,432	1.2	0.9
<b>Opportunistic</b>	<b>1998</b>	<b>652,446,701</b>	<b>524,717,111</b>	<b>204,290,881</b>	<b>474,466,030</b>	<b>186,635,289</b>	<b>8.8</b>	<b>14.4</b>

## ATRS' Real Estate Performance: Opportunistic Portfolio (Cont.)

### Time Weighted Returns:

Returns (%)	Quarter				1 Year				3 Year				5 Year				Inception		TWR Calculation Inception	Net IRR	Equity Multiple
	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	TGRS	TNET			
<b>Opportunistic</b>																					
Blackstone Real Estate Partners Europe VI (EURO Vehicle)	-1.7	8.6	6.8	4.6													-9.1	-13.1	1Q20	-2.3	1.0
Blackstone Real Estate Partners VII	0.3	0.0	0.3	0.0	2.9	-24.9	-22.6	-19.0	3.2	-4.3	-1.2	-1.6	3.4	0.8	4.2	2.6	15.5	10.8	2Q12	14.8	1.6
Carlyle Realty Partners VII	0.1	1.5	1.6	1.0	17.4	-14.7	1.3	3.2	22.0	-4.8	16.7	15.6	13.2	5.4	19.7	15.8	17.5	11.9	1Q15	14.3	1.4
Carlyle Realty Partners VIII	1.9	5.4	7.3	6.2	8.1	18.5	27.7	20.9									21.0	8.0	4Q18	8.0	1.1
CBRE Strategic Partners U.S. Opportunity 5	-0.3	5.1	4.9	4.9	-0.5	9.7	9.1	9.1	-0.4	10.8	10.4	9.9	2.6	6.9	9.9	9.2	-11.2	-12.9	4Q08	5.3	1.4
Cerberus Institutional Real Estate Partners III	-0.3	-9.3	-9.6	-4.0	-0.4	1.0	0.6	1.3	-0.2	7.2	7.0	6.2	0.5	6.2	6.7	5.5	13.9	10.2	4Q13	11.5	1.4
Heitman European Property Partners IV	-1.2	4.3	3.1	3.1	4.2	24.4	28.8	28.6	4.9	-22.1	-18.1	-19.4	5.8	-16.3	-11.3	-12.7	-3.9	-5.5	1Q11	-3.6	0.8
Kayne Anderson Real Estate Partners V	1.2	2.6	3.8	2.5	6.3	14.7	21.7	17.8									14.6	9.8	3Q18	9.0	1.1
Landmark Real Estate Fund VI	9.3	-13.2	-3.8	-4.1	-19.8	-2.6	-17.2	-18.2	5.4	-17.2	-9.1	-10.2	10.9	-16.8	-4.8	-6.0	29.5	26.7	3Q10	18.9	1.6
Landmark Real Estate Fund VIII	3.4	0.7	4.0	2.8	5.9	-1.9	4.0	0.7	14.2	-13.7	0.3	-4.0					25.1	16.4	3Q17	10.7	1.1
LaSalle Asia Opportunity Fund IV	-3.4	2.5	-0.9	-1.1	-34.3	12.0	-23.2	-23.7	-8.4	9.3	4.4	-8.3	-3.3	14.0	13.4	4.2	19.6	10.4	4Q14	33.0	1.4
LaSalle Asia Opportunity V	-3.7	4.6	0.8	0.1	-2.8	7.0	4.4	1.3	-1.7	18.2	17.8	10.4					13.9	6.7	4Q16	10.5	1.1
Lone Star Real Estate Fund IV	-0.2	6.3	6.1	3.9	2.7	-15.9	-13.6	-15.8	10.3	-4.7	5.7	2.6	12.9	-2.3	10.8	8.2	10.8	8.2	4Q15	12.8	1.3
Metropolitan Real Estate Partners Co-Investments Fund	1.0	-5.5	-4.5	-4.2	1.3	-15.1	-13.8	-13.1	1.5	6.9	8.7	7.0					7.7	5.7	1Q16	10.7	1.3
O'Connor North American Property Partners II, L.P.	0.0	-14.6	-14.6	-14.8	-0.2	-14.0	-14.2	-14.8	-0.3	-11.9	-12.1	-12.8	2.0	-7.5	-5.7	-6.9	-6.0	-8.9	2Q08	-3.3	0.8
Torchlight Debt Fund VII, LP																			4Q20	-3.4	1.0
Torchlight Debt Opportunity Fund IV	0.7	-1.9	-1.2	-0.1	3.0	-18.1	-15.5	-5.9	6.1	-4.7	1.2	3.5	7.5	-2.1	5.2	6.0	8.4	8.0	4Q13	9.8	1.4
Torchlight Debt Opportunity Fund V	1.0	-1.2	-0.3	0.7	5.1	-10.1	-5.4	0.4	8.4	-0.2	8.1	7.3	12.6	1.3	13.9	9.6	13.8	8.5	3Q15	10.3	1.3
Torchlight Debt Opportunity Fund VI	1.3	0.2	1.6	1.2	8.8	-8.7	-0.4	-3.0									14.1	3.6	2Q18	0.5	1.0
<b>Opportunistic</b>	<b>0.4</b>	<b>-0.1</b>	<b>0.3</b>	<b>0.1</b>	<b>2.9</b>	<b>-5.3</b>	<b>-2.5</b>	<b>-2.8</b>	<b>5.7</b>	<b>0.6</b>	<b>6.3</b>	<b>3.8</b>	<b>6.1</b>	<b>1.9</b>	<b>8.1</b>	<b>5.6</b>	<b>8.8</b>	<b>6.6</b>	<b>1Q98</b>	<b>10.2</b>	<b>1.3</b>



# ATRS' Timberland, Agriculture, and Infrastructure Performance

As of 9/30/2020

Funding Status (\$)	Investment Vintage Year	Commitment Amount	Funded Amount	Unfunded Commitments	Capital Returned	Market Value	Market Value (%)	Market Value + Unfunded Commitments (%)
<b>Agriculture</b>								
Agrivest Farmland Fund	2013	50,000,000	50,000,000	0	6,335,175	55,343,209	2.6	2.0
HFMS Farmland Separate Account	2011	125,000,000	154,218,170	15,463,892	44,682,061	151,105,359	7.1	6.2
<b>Agriculture</b>	<b>2011</b>	<b>175,000,000</b>	<b>204,218,170</b>	<b>15,463,892</b>	<b>51,017,236</b>	<b>206,448,568</b>	<b>9.7</b>	<b>8.2</b>
<b>Timber</b>								
BTG Pactual Open Ended Core U.S. Timberland Fund, LP	2019	182,930,629	182,930,628	0	0	189,135,002	8.9	7.0
BTG Timber Separate Account	1998	133,069,371	155,633,388	0	309,750,000	107,154,384	5.0	4.0
<b>Timber</b>	<b>1998</b>	<b>316,000,000</b>	<b>338,564,017</b>	<b>0</b>	<b>309,750,000</b>	<b>296,289,386</b>	<b>13.9</b>	<b>10.9</b>

Funding Status (\$)	Investment Vintage Year	Commitment Amount	Funded Amount	Unfunded Commitments	Capital Returned	Market Value	Market Value (%)	Market Value + Unfunded Commitments (%)
<b>Infrastructure - Core</b>								
DIF Infrastructure V	2018	47,762,784	32,344,229	16,862,802	3,334,779	33,522,768	1.6	1.9
IFM Global Infrastructure	2017	50,000,000	50,000,000	0	1,422,315	56,816,558	2.7	2.1
KKR Global Infrastructure Investors II	2015	50,000,000	53,639,009	1,816,921	42,284,186	39,075,829	1.8	1.5
Macquarie Infrastructure Partners III	2013	50,000,000	47,444,572	7,304,366	21,631,262	50,960,987	2.4	2.2
Macquarie Infrastructure Partners V	2020	50,000,000	0	50,000,000	0	-201,477	0.0	1.8
<b>Infrastructure - Core</b>	<b>2015</b>	<b>247,762,784</b>	<b>183,427,810</b>	<b>75,984,090</b>	<b>68,672,542</b>	<b>180,174,665</b>	<b>8.5</b>	<b>9.5</b>
<b>Infrastructure - Non-Core</b>								
Antin Infrastructure Partners Fund II	2014	47,696,920	35,953,565	5,332,865	19,703,402	43,089,653	2.0	1.8
Global Energy & Power Infrastructure Fund II	2014	50,000,000	52,581,034	2,481,334	39,905,746	33,044,700	1.6	1.3
Global Infrastructure Partners III	2016	50,000,000	43,923,680	10,534,973	7,163,264	40,345,898	1.9	1.9
<b>Infrastructure - Non-Core</b>	<b>2014</b>	<b>147,696,920</b>	<b>132,458,279</b>	<b>18,349,172</b>	<b>66,772,412</b>	<b>116,480,251</b>	<b>5.5</b>	<b>5.0</b>
<b>Infrastructure</b>	<b>2014</b>	<b>395,459,704</b>	<b>315,886,089</b>	<b>94,333,261</b>	<b>135,444,954</b>	<b>296,654,916</b>	<b>14.0</b>	<b>14.4</b>

# ATRS' Timberland, Agriculture, and Infrastructure Performance (Cont.)

## Time Weighted Returns:

Returns (%)	Quarter				1 Year				3 Year				5 Year				Inception		TWR Calculation Inception	Net IRR	Equity Multiple
	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	TGRS	TNET			
<b>Agriculture</b>																					
Agrivest Farmland Fund	0.7	0.6	1.3	1.1	3.2	1.1	4.4	3.4	3.3	1.3	4.7	3.7	3.5	1.8	5.4	4.3	5.5	4.5	2Q15	4.4	1.2
HFMS Farmland Separate Account	1.0	0.3	1.3	1.0	4.0	-0.8	3.1	1.9	3.8	0.1	4.0	2.8	3.7	0.4	4.1	3.0	6.6	5.3	3Q11	5.0	1.3
<b>Agriculture</b>	<b>1.0</b>	<b>0.3</b>	<b>1.3</b>	<b>1.0</b>	<b>3.8</b>	<b>-0.3</b>	<b>3.4</b>	<b>2.3</b>	<b>3.7</b>	<b>0.5</b>	<b>4.2</b>	<b>3.0</b>	<b>3.7</b>	<b>0.8</b>	<b>4.5</b>	<b>3.4</b>	<b>6.6</b>	<b>5.4</b>	<b>3Q11</b>	<b>4.8</b>	<b>1.3</b>
Agriculture Benchmark*			1.0				3.3				4.1				4.1		8.5		3Q11		
<b>Timber</b>																					
BTG Pactual Open Ended Core U.S. Timberland Fund, LP	-0.4	1.8	1.5	1.2													4.2	3.4	1Q20	3.4	1.0
BTG Timber Separate Account	0.3	0.8	1.0	0.9	54.0	-54.5	-3.0	-3.7	16.3	-20.5	3.2	2.3	10.7	-12.0	4.0	3.1	7.2	6.5	2Q98	5.2	2.7
<b>Timber</b>	<b>-0.2</b>	<b>1.5</b>	<b>1.3</b>	<b>1.1</b>	<b>52.1</b>	<b>-50.7</b>	<b>2.3</b>	<b>1.3</b>	<b>15.8</b>	<b>-18.3</b>	<b>5.0</b>	<b>4.0</b>	<b>10.4</b>	<b>-10.6</b>	<b>5.1</b>	<b>4.2</b>	<b>7.5</b>	<b>6.7</b>	<b>2Q98</b>	<b>5.1</b>	<b>1.8</b>
Timberland Property Benchmark*			0.0				1.3				1.6				2.2		5.3		2Q98		

Returns (%)	Quarter				1 Year				3 Year				5 Year				Inception		TWR Calculation Inception	Net IRR	Equity Multiple
	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	TGRS	TNET			
<b>Infrastructure - Core</b>																					
DIF Infrastructure V	1.1	5.8	6.9	6.4	3.9	14.1	18.6	16.1									11.8	8.2	3Q18	9.2	1.1
IFM Global Infrastructure	0.7	1.4	2.1	1.9	2.9	2.5	5.5	4.1									9.8	8.0	4Q18	8.0	1.2
KKR Global Infrastructure Investors II	1.2	-1.3	-0.2	-0.4	37.8	-16.8	26.6	27.5	12.4	0.4	16.8	15.5	6.0	3.8	12.6	12.3	17.5	13.0	1Q15	15.6	1.5
Macquarie Infrastructure Partners III	0.2	12.6	12.8	10.1	0.3	21.4	21.8	16.3	0.9	19.3	20.4	15.1	1.6	17.3	19.2	14.1	18.5	13.6	2Q15	13.8	1.5
Macquarie Infrastructure Partners V																			1Q21	0.0	0.0
<b>Infrastructure - Core</b>	<b>0.8</b>	<b>4.6</b>	<b>5.3</b>	<b>4.4</b>	<b>13.2</b>	<b>4.0</b>	<b>18.6</b>	<b>16.5</b>	<b>5.3</b>	<b>10.1</b>	<b>16.2</b>	<b>13.0</b>	<b>3.5</b>	<b>11.0</b>	<b>15.1</b>	<b>12.2</b>	<b>15.2</b>	<b>11.3</b>	<b>1Q15</b>	<b>12.9</b>	<b>1.4</b>
<b>Infrastructure - Non-Core</b>																					
Antin Infrastructure Partners Fund II	0.0	15.8	15.8	15.6	0.3	23.9	24.4	23.5	1.6	18.9	20.7	19.9	1.9	13.1	15.2	14.0	14.5	12.8	4Q14	12.1	1.7
Global Energy & Power Infrastructure Fund II	1.3	3.4	4.6	3.5	19.0	-16.8	1.4	-0.4	9.8	3.2	14.1	9.8	17.4	1.4	29.2	21.8	22.6	11.2	1Q15	23.2	1.4
Global Infrastructure Partners III	1.1	4.1	5.1	4.6	6.2	-9.2	-3.1	-4.0	5.2	2.8	8.4	5.3					8.4	3.6	4Q16	3.4	1.1
<b>Infrastructure - Non-Core</b>	<b>0.7</b>	<b>7.9</b>	<b>8.6</b>	<b>8.0</b>	<b>7.9</b>	<b>-0.6</b>	<b>7.4</b>	<b>6.2</b>	<b>5.0</b>	<b>9.5</b>	<b>15.0</b>	<b>12.6</b>	<b>7.9</b>	<b>7.7</b>	<b>16.9</b>	<b>13.0</b>	<b>15.5</b>	<b>11.0</b>	<b>4Q14</b>	<b>12.3</b>	<b>1.4</b>
<b>Infrastructure</b>	<b>0.7</b>	<b>5.8</b>	<b>6.6</b>	<b>5.8</b>	<b>11.7</b>	<b>2.1</b>	<b>14.3</b>	<b>12.6</b>	<b>5.5</b>	<b>10.0</b>	<b>16.1</b>	<b>13.2</b>	<b>6.0</b>	<b>9.8</b>	<b>16.5</b>	<b>12.9</b>	<b>15.1</b>	<b>10.6</b>	<b>4Q14</b>	<b>12.6</b>	<b>1.4</b>
Infrastructure Benchmark*			1.7				5.9				6.7				6.8		6.5		4Q14		

\*The Timberland Property Benchmark was comprised of the NCREIF Timberland returns weighted according to ATRS' regional exposure based on Net Asset Value prior to 3Q20, gross of fees. The Agriculture Benchmark was comprised of the NCREIF Farmland returns weighted according to ATRS' regional and crop type exposure based on Net Asset Value prior to 3Q20, gross of fees. As of 3Q20, the Timberland and Agriculture benchmarks going forward will no longer be weighted and are just the NCREIF Timberland and NCREIF Farmland returns, gross of fees. Additionally, the Infrastructure Benchmark of CPI plus 500 bps has been adjusted to CPI plus 300 bps as of 3Q20 and the new Infrastructure Benchmark will be a blend of the two going forward.



## Portfolio Performance Detail: By Vintage Year

As of 9/30/2020

Investment Vintage Year	Commitment Amount	Funded Amount	Unfunded Commitments	Capital Returned	Market Value	Market Value (%)	Market Value + Unfunded Commitments (%)
1997	75,000,000	80,737,536	0	120,795,230	0	0.0	0.0
1998	233,069,371	268,496,037	0	457,689,777	107,154,384	5.0	4.0
1999	178,794,401	189,842,518	0	316,052,650	0	0.0	0.0
2000	209,242,960	228,396,220	0	289,418,462	355,396	0.0	0.0
2005	340,000,000	374,770,177	0	248,369,202	469,074,858	22.1	17.3
2006	220,000,000	219,970,569	0	134,923,620	277,436,832	13.1	10.3
2007	197,694,200	198,972,143	0	242,061,194	78,013,371	3.7	2.9
2008	220,000,000	195,081,350	9,866,941	235,749,389	18,901,369	0.9	0.9
2009	44,089,700	34,546,944	3,404,770	24,346,022	3,208,197	0.2	0.2
2010	40,000,000	35,090,608	4,909,392	52,405,721	2,095,440	0.1	0.3
2011	175,000,000	217,933,889	21,751,394	125,613,235	170,521,424	8.0	7.1
2012	130,000,000	130,467,540	13,487,923	138,616,296	32,138,956	1.5	1.7
2013	150,000,000	145,861,402	8,256,747	86,845,027	117,620,050	5.5	4.7
2014	157,696,920	145,607,712	30,467,553	127,343,542	90,103,600	4.2	4.5
2015	204,260,817	193,969,976	22,461,826	142,833,486	116,380,145	5.5	5.1
2016	180,011,918	163,275,159	29,274,154	40,454,794	148,364,693	7.0	6.6
2017	150,000,000	128,095,493	29,361,516	16,702,885	127,732,496	6.0	5.8
2018	257,762,784	144,291,722	116,481,538	9,761,522	143,273,697	6.7	9.6
2019	312,026,813	198,335,782	117,567,338	1,548,340	202,711,103	9.5	11.8
2020	200,000,000	23,259,140	176,923,788	0	20,630,149	1.0	7.3
<b>Total Portfolio (Including Current &amp; Historical Activity)</b>							
	<b>3,674,649,884</b>	<b>3,317,001,919</b>	<b>584,214,879</b>	<b>2,811,530,393</b>	<b>2,125,716,158</b>	<b>100</b>	<b>100</b>

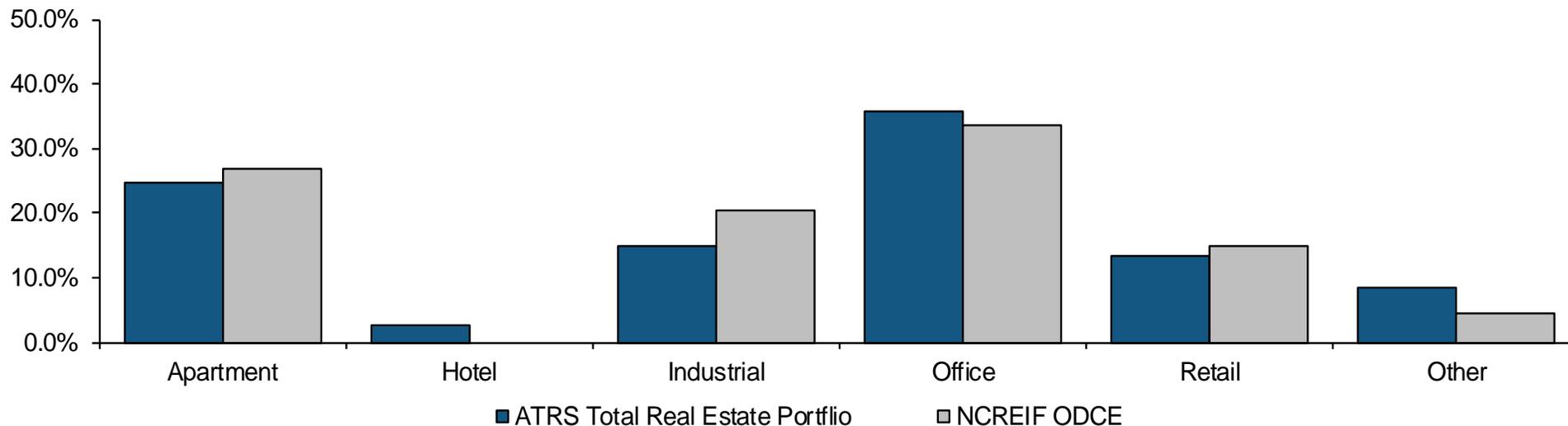
## Portfolio Performance Detail: By Vintage Year (Cont.)

### Time Weighted Returns:

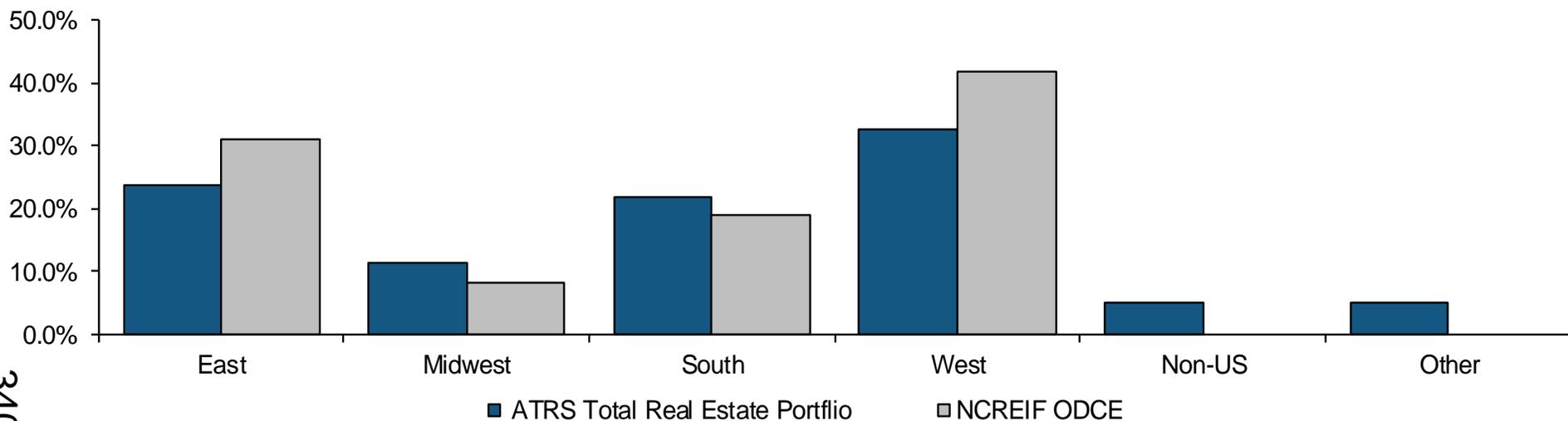
Investment Vintage Year	Quarter				1 Year				3 Year				5 Year				Inception		TWR Calculation Inception	Net IRR	Equity Multiple
	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	INC	APP	TGRS	TNET	TGRS	TNET			
1997																	4.1	3.5	1Q98	13.4	1.5
1998	0.3	0.8	1.0	0.9	54.0	-54.5	-3.0	-3.7	16.3	-20.5	3.2	2.3	10.7	-12.0	4.0	3.1	7.3	6.3	2Q98	5.5	2.1
1999																			4Q99	15.9	1.7
2000																			4Q00	8.5	1.3
2005	1.0	-0.8	0.2	0.0	4.2	-3.6	0.4	-0.3	4.4	-0.4	3.9	3.2	4.5	1.0	5.5	4.7	6.6	5.7	3Q05	5.8	1.9
2006	0.9	-0.9	0.0	-0.2	3.8	-2.0	1.8	0.9	3.9	0.6	4.5	3.6	4.1	2.0	6.1	5.2	5.7	4.7	2Q07	5.8	1.9
2007		1.3	1.3	1.3		-14.7	-14.7	-14.7	0.4	-3.8	-3.4	-3.4	0.5	6.2	6.8	6.7	6.3	6.2	1Q08	6.2	1.6
2008	-0.2	-4.8	-5.0	-5.1	-0.4	-2.7	-3.1	-3.5	1.4	-1.3	0.0	-0.7	4.7	-1.6	3.1	2.0	0.8	-2.3	2Q08	5.1	1.3
2009	-1.2	4.3	3.1	3.1	4.2	24.4	28.8	28.6	4.9	-22.1	-18.1	-19.4	5.8	-16.3	-11.3	-12.7	-3.9	-5.5	1Q11	-3.6	0.8
2010	9.3	-13.2	-3.8	-4.1	-19.8	-2.6	-17.2	-18.2	5.4	-17.2	-9.1	-10.2	10.9	-16.8	-4.8	-6.0	29.5	26.7	3Q10	18.9	1.6
2011	1.0	0.2	1.2	0.9	3.8	-4.3	-0.6	-1.1	3.8	0.0	3.8	2.5	3.7	1.2	4.9	3.5	9.7	7.3	3Q11	7.3	1.4
2012	0.1	-5.3	-5.2	-3.2	1.1	-16.9	-16.0	-16.7	1.6	-3.1	-1.6	-2.9	1.9	2.0	3.8	2.4	11.0	7.5	1Q13	10.0	1.3
2013	0.6	5.4	5.9	4.7	2.1	7.5	9.7	7.7	2.9	7.5	10.5	8.0	3.8	6.8	10.8	8.4	12.5	9.9	4Q13	9.0	1.4
2014	0.4	8.6	9.0	8.4	8.8	1.4	10.6	9.8	8.1	8.8	17.5	14.6	8.9	10.2	20.2	16.4	19.3	14.6	4Q14	16.6	1.5
2015	0.9	-0.1	0.8	0.6	17.8	-8.6	9.8	10.6	8.8	4.4	14.2	12.4	7.5	6.3	14.6	11.7	16.8	10.8	1Q15	12.4	1.3
2016	0.6	2.3	2.9	2.6	5.4	-3.7	1.6	1.6	4.7	3.6	8.4	6.7					7.3	4.4	3Q16	5.9	1.2
2017	1.3	0.7	2.1	1.6	4.8	-0.2	4.6	2.8	6.9	2.1	9.1	5.8					14.9	10.7	3Q17	7.2	1.1
2018	1.2	2.3	3.4	2.8	5.1	4.8	10.1	7.7									7.0	2.9	3Q18	4.7	1.1
2019	-0.4	2.2	1.8	1.4	-1.4	8.2	6.7	0.4									7.4	1.9	3Q19	4.1	1.0
2020	-1.0	-0.8	-1.7	-7.1													-6.5	-14.6	2Q20	-22.8	0.9

# Portfolio Diversification – Real Estate

**Property Type Diversification  
(As of 09/30/2020)**

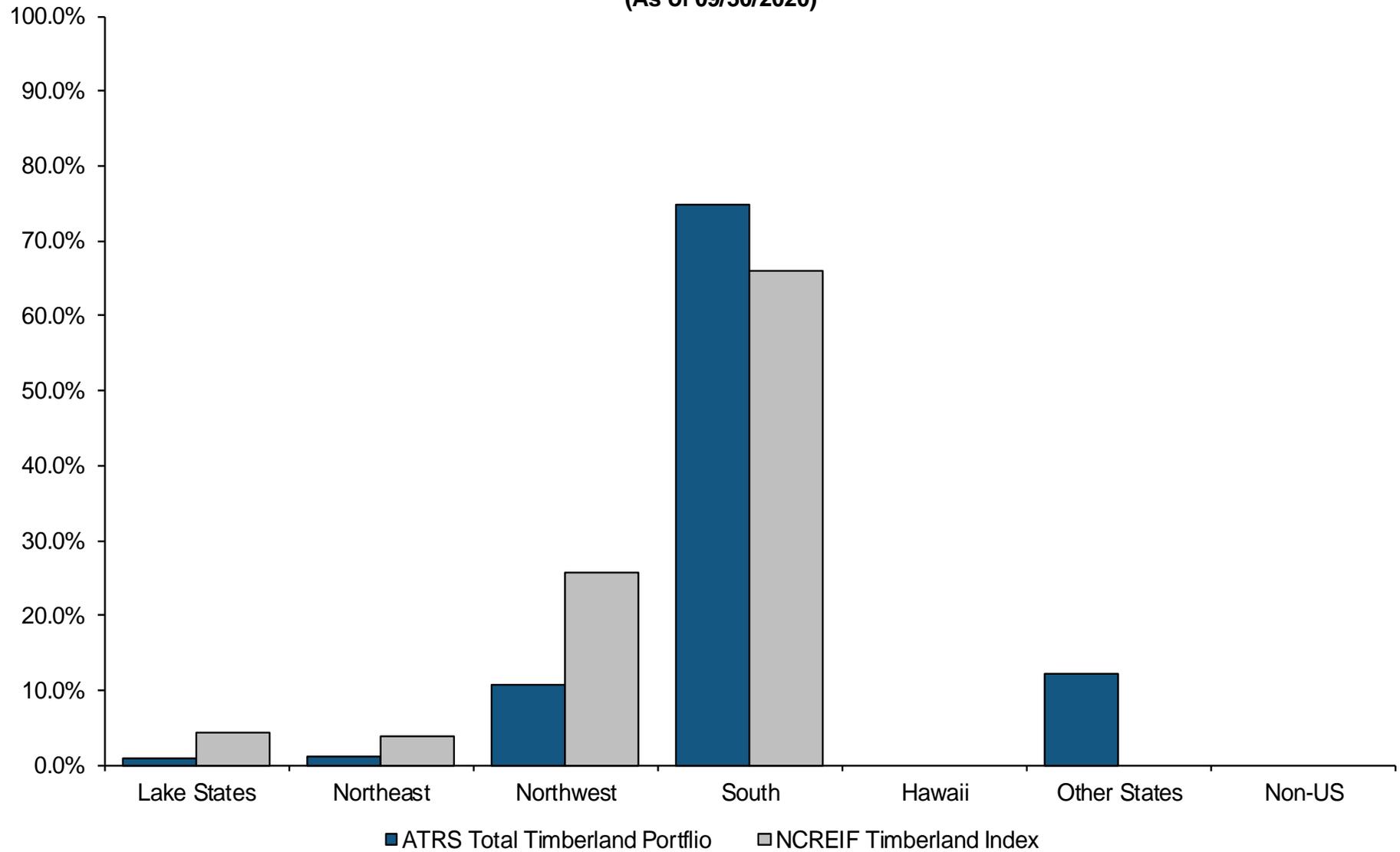


**Geographic Type Diversification  
(As of 09/30/2020)**



# Portfolio Diversification – Timberland

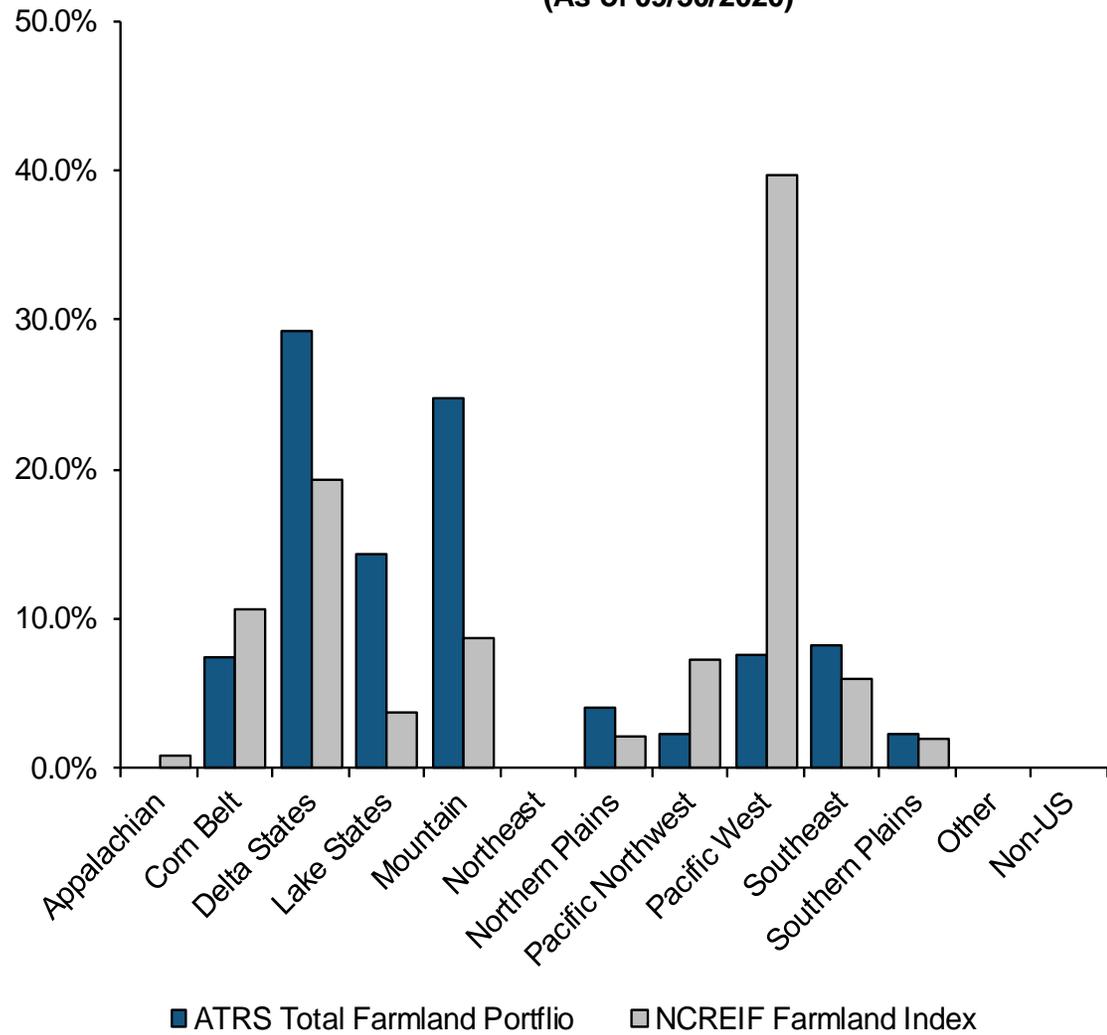
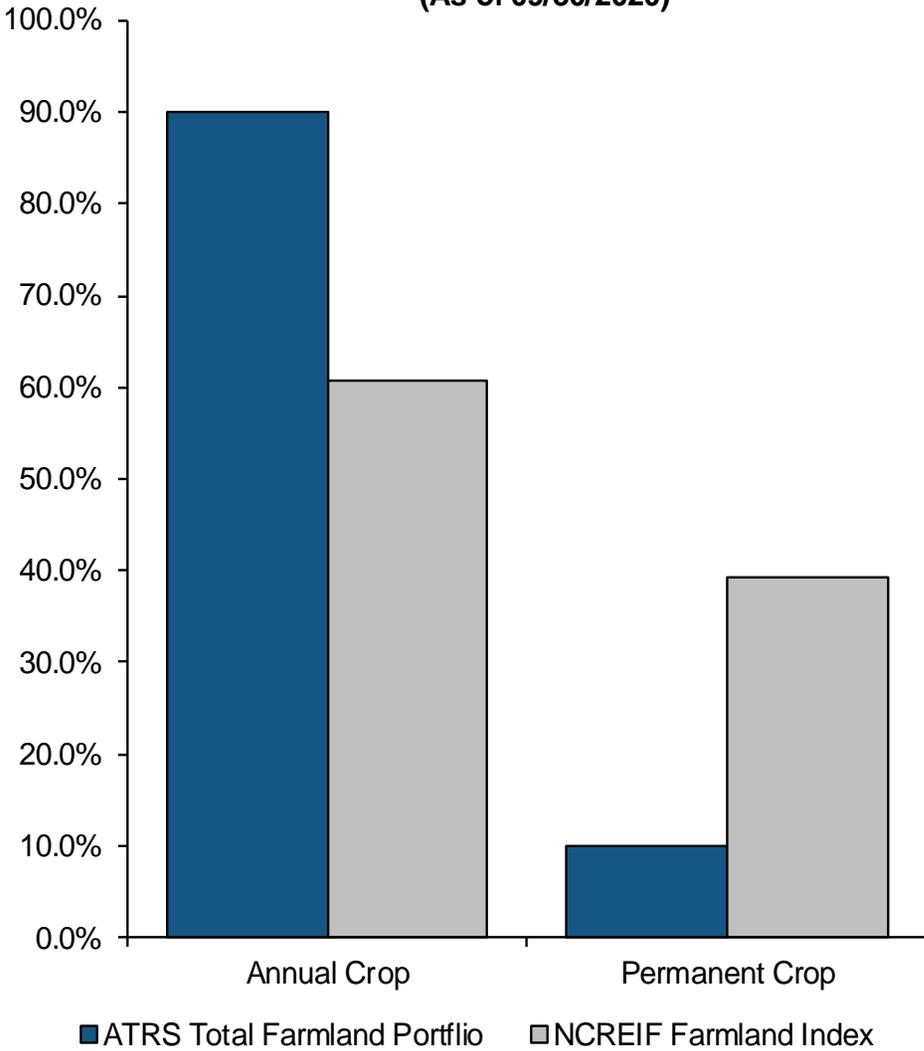
**Geographic Type Diversification  
(As of 09/30/2020)**



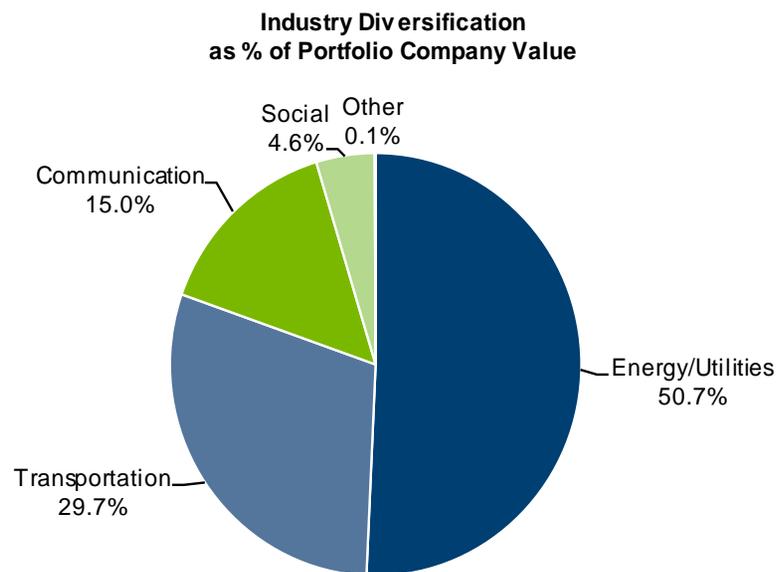
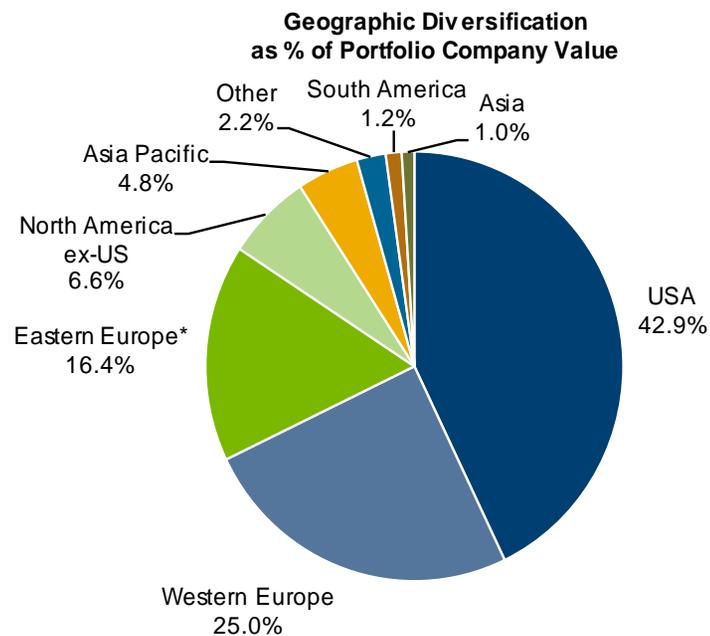
# Portfolio Diversification – Agriculture

**Crop Type Diversification  
(As of 09/30/2020)**

**Geographic Type Diversification  
(As of 09/30/2020)**

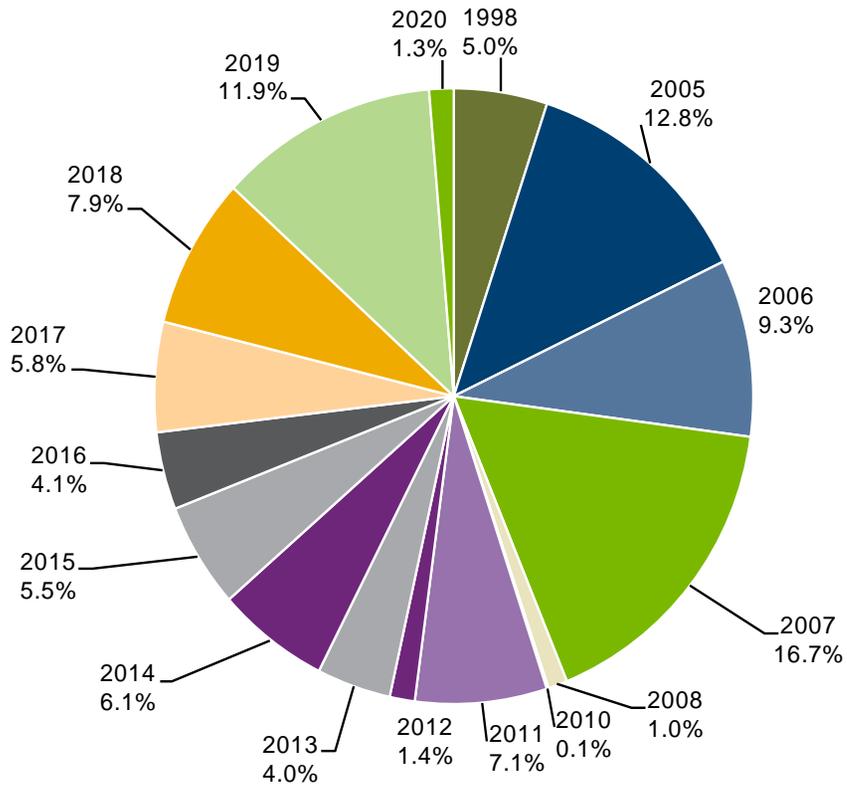


# Portfolio Diversification – Infrastructure

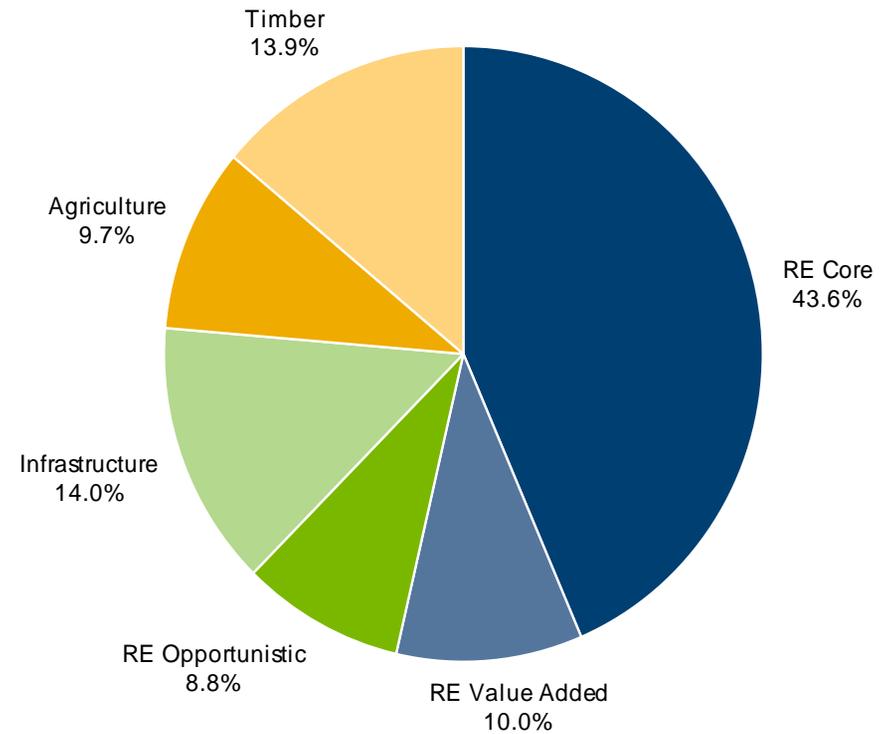


# Portfolio Diversification (cont'd)

**Vintage Year Diversification by Net Asset Value  
(As of 09/30/2020)**

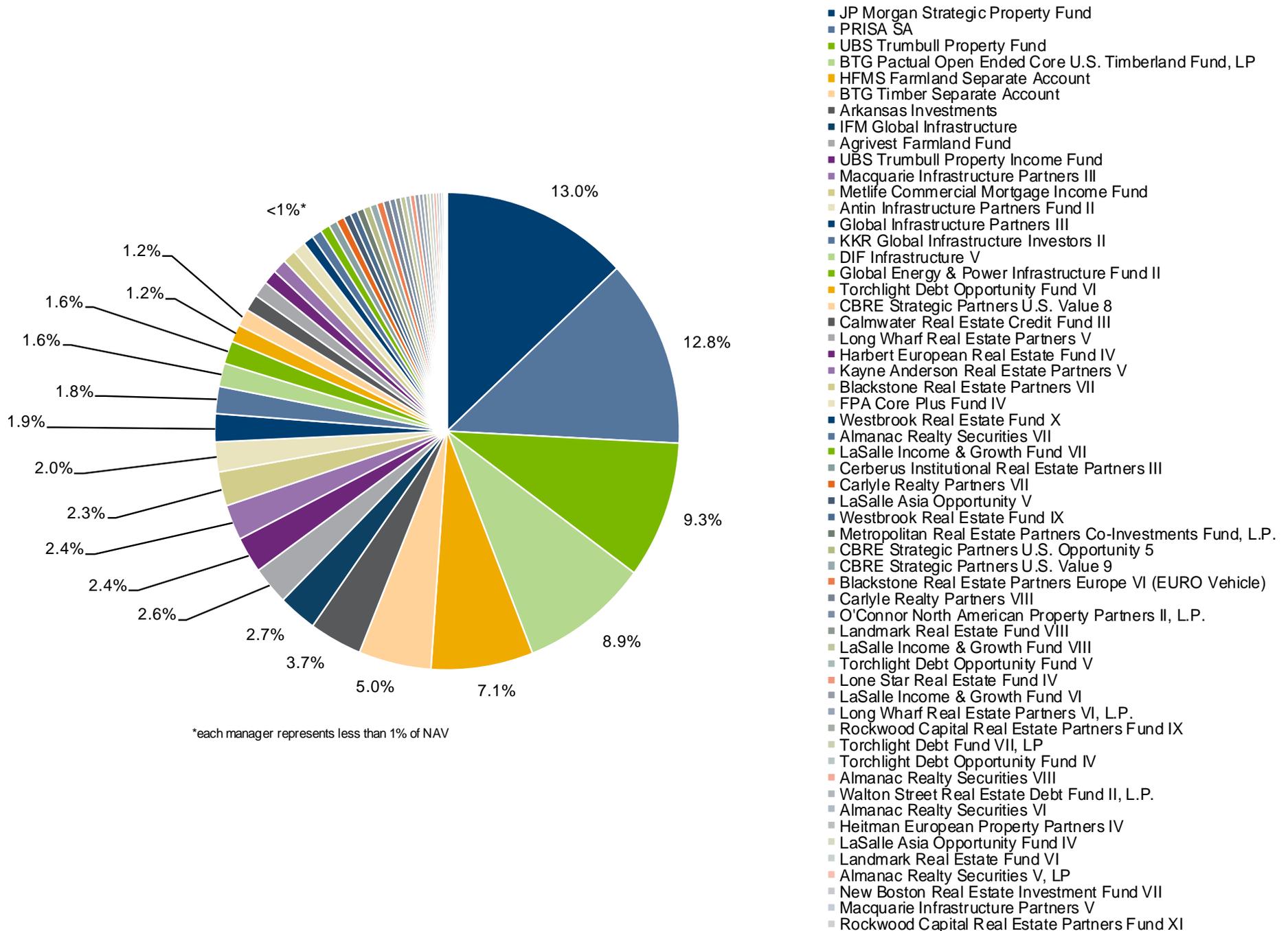


**Style Diversification by Net Asset Value  
(As of 09/30/2020)**



Note: Arkansas Investments are included in Core portfolio

# Manager Diversification



# Management Fees

Partnership Name	Current Quarter Management Fees	YTD Management Fees
<b>Core</b>		
Arkansas Investments	0	0
JP Morgan Strategic Property Fund	-597,709	-1,807,408
Metlife Commercial Mortgage Income Fund	-100,000	-300,000
PRISA SA	-538,279	-1,625,943
UBS Trumbull Property Fund	-353,419	-1,102,757
UBS Trumbull Property Income Fund	-104,378	-316,887
<b>Core</b>	<b>-1,693,785</b>	<b>-5,152,995</b>
<b>Value Added</b>		
Almanac Realty Securities V, LP	-239	-711
Almanac Realty Securities VI	-11,231	-33,451
Almanac Realty Securities VII	-42,344	-118,725
Almanac Realty Securities VIII	-94,262	-280,738
Calmwater Real Estate Credit Fund III	-92,378	-276,894
CBRE Strategic Partners U.S. Value 8	-53,793	-159,125
CBRE Strategic Partners U.S. Value 9	-673,513	-673,513
FPA Core Plus Fund IV	-29,773	-94,154
Harbert European Real Estate Fund IV	-64,423	-200,957
LaSalle Income & Growth Fund VI	-15,169	-45,177
LaSalle Income & Growth Fund VII	-48,178	-138,104
LaSalle Income & Growth Fund VIII	-125,683	-374,317
Long Wharf Real Estate Partners V	-87,112	-241,945
Long Wharf Real Estate Partners VI, L.P.	-188,525	-1,179,969
New Boston Real Estate Investment Fund VII	0	0
Rockwood Capital Real Estate Partners Fund IX	-31,037	-151,847
Rockwood Capital Real Estate Partners Fund XI	-108,035	-313,538
Walton Street Real Estate Debt Fund II, L.P.	-18,879	-47,957
Westbrook Real Estate Fund IX	-32,731	-102,801
Westbrook Real Estate Fund X	-49,006	-147,897
<b>Value Added</b>	<b>-1,766,310</b>	<b>-4,581,821</b>

## Management Fees (cont'd)

Partnership Name	Current Quarter Management Fees	YTD Management Fees
<b>Opportunistic</b>		
Blackstone Real Estate Partners Europe VI (EURO Vehicle)	-193,390	-300,482
Blackstone Real Estate Partners VII	-62,581	-185,913
Carlyle Realty Partners VII	-44,662	-133,994
Carlyle Realty Partners VIII	-87,978	-262,022
CBRE Strategic Partners U.S. Opportunity 5	0	0
Cerberus Institutional Real Estate Partners III	8,913	-33,366
Heitman European Property Partners IV	0	0
Kayne Anderson Real Estate Partners V	-109,375	-328,125
Landmark Real Estate Fund VI	-5,571	-19,468
Landmark Real Estate Fund VIII	-62,500	-187,500
LaSalle Asia Opportunity Fund IV	-3,893	-11,595
LaSalle Asia Opportunity V	-86,857	-263,123
Lone Star Real Estate Fund IV	-6,331	-18,569
Metropolitan Real Estate Partners Co-Investments Fund, L.P.	-24,347	-75,774
O'Connor North American Property Partners II, L.P.	-17,424	-52,533
Torchlight Debt Fund VII, LP	-143,818	-143,818
Torchlight Debt Opportunity Fund IV	-14,870	-43,897
Torchlight Debt Opportunity Fund V	-21,555	-68,074
Torchlight Debt Opportunity Fund VI	-79,688	-239,064
<b>Opportunistic</b>	<b>-955,927</b>	<b>-2,367,317</b>
<b>Real Estate</b>	<b>-4,416,023</b>	<b>-12,102,133</b>

## Management Fees (cont'd)

Partnership Name	Current Quarter Management Fees	YTD Management Fees
<b>Infrastructure - Core</b>		
DIF Infrastructure V	-165,280	-479,733
IFM Global Infrastructure	-108,769	-324,684
KKR Global Infrastructure Investors II	-91,530	-347,526
Macquarie Infrastructure Partners III	-114,963	-342,369
Macquarie Infrastructure Partners V	-117,347	-117,347
<b>Infrastructure - Core</b>	<b>-597,889</b>	<b>-1,611,659</b>
<b>Infrastructure - Non-Core</b>		
Antin Infrastructure Partners Fund II	-69,870	-204,865
Global Energy & Power Infrastructure Fund II	-174,728	-495,635
Global Infrastructure Partners III	-201,227	-633,490
<b>Infrastructure - Non-Core</b>	<b>-445,825</b>	<b>-1,333,990</b>
<b>Infrastructure</b>	<b>-1,043,714</b>	<b>-2,945,649</b>
<b>Agriculture</b>		
Agrivest Farmland Fund	-138,146	-409,428
HFMS Farmland Separate Account	-438,534	-1,311,305
<b>Agriculture</b>	<b>-576,680</b>	<b>-1,720,734</b>
<b>Timber</b>		
BTG Pactual Open Ended Core U.S. Timberland Fund, LP	-495,523	-1,404,801
BTG Timber Separate Account	-185,694	-562,694
<b>Timber</b>	<b>-681,217</b>	<b>-2,648,712</b>
<b>Total Real Assets</b>	<b>-2,301,610</b>	<b>-7,315,094</b>
<b>Total Portfolio</b>		
<b>Arkansas Teachers Retirement System</b>	<b>-6,717,633</b>	<b>-18,736,011</b>

# Compliance Matrix

RISK MANAGEMENT						
<b>Property Type - Real Estate</b>	<b>NFI-ODCE</b>	<b>Target/Constraint</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Actual</b>	<b>Compliant?</b>
Office	33.54	NFI-ODCE +/- 50%	16.77	50.00	35.86	Yes
Retail	14.80	NFI-ODCE +/- 50%	7.40	22.20	13.27	Yes
Industrial	20.40	NFI-ODCE +/- 50%	10.20	30.60	14.97	Yes
Multifamily	26.84	NFI-ODCE +/- 50%	13.42	40.26	24.78	Yes
Lodging/Hotel	0.00	NFI-ODCE +/- 50%	0.00	0.00	2.77	No
Other	4.40	n/a	0.00	20.00	8.36	Yes
<b>Geography - Real Estate</b>	<b>NFI-ODCE</b>	<b>Target/Constraint</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Actual</b>	<b>Compliant?</b>
West	41.70	NFI-ODCE +/- 50%	20.85	62.55	32.80	Yes
East	31.00	NFI-ODCE +/- 50%	15.50	46.50	23.75	Yes
Midwest	8.20	NFI-ODCE +/- 50%	4.10	12.30	11.55	Yes
South	19.10	NFI-ODCE +/- 50%	9.55	28.65	21.84	Yes
Other	0.00	n/a	n/a	n/a	4.93	Yes
Non-U.S.	0.00	n/a	0.00	40.00	5.13	Yes
<b>Geography - Timber</b>	<b>NCREIF Timberland</b>	<b>Target/Constraint</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Actual</b>	<b>Compliant?</b>
Lake States	4.40	NCREIF Timberland +/- 15%	0.66	5.06	0.80	Yes
Northeast	3.98	NCREIF Timberland +/- 15%	0.60	4.57	1.28	Yes
Northwest	25.66	NCREIF Timberland +/- 15%	3.85	29.51	10.85	Yes
South	65.97	NCREIF Timberland +/- 15%	9.90	75.86	74.96	Yes
Other	0.00	NCREIF Timberland +/- 15%	0.00	0.00	12.12	No

## Compliance Matrix (cont'd)

RISK MANAGEMENT						
<b>Geography - Agriculture</b>	<b>NCREIF Farmland</b>	<b>Target/Constraint</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Actual</b>	<b>Compliant?</b>
Appalachian	0.78		0.00	50.00	0.00	Yes
Corn Belt	10.62		0.00	50.00	7.32	Yes
Delta States	19.29		0.00	50.00	29.25	Yes
Lake States	3.64		0.00	50.00	14.37	Yes
Mountain	8.76		0.00	50.00	24.75	Yes
Northeast	0.00		0.00	50.00	0.00	Yes
Northern Plains	2.04		0.00	50.00	4.05	Yes
Pacific Northwest	7.24		0.00	50.00	2.33	Yes
Pacific West	39.65		0.00	50.00	7.59	Yes
Southeast	6.02		0.00	50.00	8.15	Yes
Southern Plains	1.98		0.00	50.00	2.19	Yes
Other	0.00		0.00	50.00	0.00	Yes
Non-U.S.	0.00		0.00	50.00	0.00	Yes
<b>Geography - Infrastructure</b>	<b>Target/Constraint</b>		<b>Minimum</b>	<b>Maximum</b>	<b>Actual</b>	<b>Compliant?</b>
U.S.			n/a	n/a	42.90	No
Non-U.S.			0.00	50.00	57.10	No
<b>Asset Type - Infrastructure</b>	<b>Target/Constraint</b>		<b>Minimum</b>	<b>Maximum</b>	<b>Actual</b>	<b>Compliant?</b>
Energy/Utilities			0.00	70.00	50.72	Yes
Transportation			0.00	70.00	29.67	Yes
Social			0.00	70.00	14.95	Yes
Communications			0.00	70.00	4.59	Yes
Other			0.00	70.00	0.08	Yes
<b>Manager</b>	<b>Target/Constraint</b>		<b>Minimum</b>	<b>Maximum</b>	<b>Max</b>	<b>Compliant?</b>
Energy/Utilities			0.00	30.00	14.59	Yes
<b>Style - Real Estate</b>	<b>Target/Constraint</b>		<b>Minimum</b>	<b>Maximum</b>	<b>Actual</b>	<b>Compliant?</b>
Core			50.00	70.00	70.60	No
Non-Core			30.00	50.00	30.52	Yes

## Agenda

Section 1	Executive Summary
Section 2	Market Overview
Section 3	Real Assets Portfolio Update
<b>Section 4</b>	<b>Glossary</b>

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## Glossary of Terms

- Catch-up - The provision that dictates how cash flows from the fund will be allocated between the investors and the manager in order for the manager to receive their performance fee. This allocation of cash flows occurs once the investors have collected their capital and preferred return
- Core - The most conservative institutional real estate investing style
- Core-Plus - A style whereby investments have a slightly higher level of risk and expected return than Core, primarily through use of leverage
- Development - The construction of buildings from breaking the ground through building completion. This may also include entitlement of the land and the pursuit of permits prior to construction
- DPI – Distributions to Paid In; the ratio of distributions from investments to total invested capital
- First Closing - The point at which a manager receives and executes the subscription documents and can begin drawing capital from investors
- Final Closing - The final date at which new investors can subscribe to a fund
- Internal Rate of Return (IRR) - A method of measuring the performance of a portfolio from inception through a particular point in time. This method weights returns according to the dollars invested at each point in time. Hence, this is known as dollar-weighted return. This is a better measure when the manager controls when dollars must be invested and is the most commonly used method of real estate performance evaluation; Gross IRR is gross of fee and Net IRR is net of fee
- NFI-ODCE – NCREIF Fund Index Open-end Diversified Core Equity Index is an index of investment returns reporting on both a historical and current basis the results of 33 open-end commingled funds pursuing a core investment strategy; underlying funds are leveraged with gross and net returns available
  - NCREIF changed the basis of diversification for the NFI ODCE from NREA to GRE effective 1Q20
- NPI – NCREIF Property Index is a quarterly time series composite total rate of return measure of investment performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only; it is reported unlevered and gross of fee

## Glossary of Terms (Cont'd)

- FTSE-NAREIT Equity REIT – An unmanaged capitalization-weighted index of all equity real estate investment trusts
- FTSE EPRA/NAREIT Global REIT – An unmanaged market-weighted total return index, which consists of many companies from Global markets whose floats are larger than \$100 million and derive more than half of their revenue from property-related activities
- Opportunistic - A style that is the riskiest form of real estate investing. The name derives from when such funds were formed after the early 1990s real estate market crash to take advantage of opportunities in unwanted properties. Such investments include ground-up development, highly-leveraged purchases, or transactions involving highly complicated legal or environmental situations
- Pre-Specified Deals – Investments that are purchased for a fund before its final close. The assets are typically warehoused on a line of credit
- Promote (Carried Interest) -The performance fee a manager receives once the investors have received their return of capital and the preferred return (return promised by the manager)
- RVPI – Residual Value to Paid In; the ratio of the residual value of an investment to total invested capital
- Time-Weighted Return - A method of measuring the performance of a portfolio over a particular period of time. Effectively, it is the return of one dollar invested in the portfolio at the beginning of the measurement period. This is a better return measure when the manager does not control when the dollars must be invested
- TVPI – Total value to paid-in ratio; the ratio of total value from an investment, including distributions, to total invested capital
- Value-Added - A style that represents moderate-risk real estate. A manager typically increases the future value of the investment by undertaking activities such as leasing, improving an existing building, or taking some risk through operating intensive assets, such as hotels or self-storage
- Vintage Year - The year in which a fund has its final closing. Typically coincides with the year a fund begins making investments

## Glossary of Terms (Cont'd)

- NCREIF Timberland Index- The National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Index is a quarterly time series composite return measure of investment performance of a large pool of individual timber properties acquired in the private market for investment purposes only.
- NCREIF Farmland Index- The National Council of Real Estate Investment Fiduciaries (NCREIF) Farmland Index is a quarterly time series composite return measure of investment performance of a large pool of individual agricultural properties acquired in the private market for investment purposes only.

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There can be no assurance that any account will achieve results comparable to those presented. Past performance is not indicative of future results.



950 Main Avenue  
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Cleveland, OH 44113

## Memorandum

**To:** Arkansas Teacher Retirement System (“ATRS”)  
**From:** Chae Hong; Iftikhar Ahmed  
**CC:** PJ Kelly; Jack Dowd; Richard Ferguson  
**Date:** February 1, 2021  
**Re:** ISQ Global Infrastructure Fund III – \$50 million Commitment Recommendation

---

### Background and Recommendation

Global Infrastructure Fund III, L.P. (“ISQ III”, “Fund III” or the “Fund”) is targeting to raise \$12.0 billion in total commitments. The Fund is sponsored by I Squared Capital (“ISQ”, the “Firm” or the “Manager”), an independent infrastructure investment firm focused on core+ / value-add mid-market and large transactions across utilities, transportation, communication, power and renewables, midstream energy and social infrastructure businesses located in North America, Europe and select growth economies, mainly in Asia and Latin America. ISQ is headquartered in Miami with other offices in New York, London, New Delhi, Singapore, and Hong Kong.

Aon Investments, USA is satisfied with the strategy of the Fund and its appropriateness for ATRS. Additionally, we believe that the merits of this offering outweigh its risks. An ISQ III InDetail is attached for reference. We recommend that ATRS invest \$50 million in the Fund to fulfill ATRS’ 2021 infrastructure allocation, in accordance with the previously approved 2021 ATRS Real Asset Pacing Schedule.



Infrastructure InDetail

# ISQ Global Infrastructure Fund III, L.P.

June 2020

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# EXECUTIVE SUMMARY

## OVERVIEW

Review Date	Rating	Previous Rating
April 2020	Buy	Buy

Global Infrastructure Fund III, L.P. (“ISQ III”, “Fund III” or the “Fund”) is targeting to raise \$12.0 billion in total commitments. The Fund is sponsored by I Squared Capital (“ISQ”, the “Firm” or the “Manager”), an independent infrastructure investment firm focused on core+ / value-add mid-market and large transactions across utilities, transportation, communication, power and renewables, midstream energy and social infrastructure businesses located in North America, Europe and select growth economies, mainly in Asia and Latin America. ISQ is headquartered in Miami with other offices in New York, London, New Delhi, Singapore, and Hong Kong.

ISQ has been actively investing capital in its target infrastructure sub-sectors and geographies since 2014. Across its prior funds, the Firm has raised \$10.0 billion in total commitments, invested \$6.6 billion and realized \$2.3 billion as of March 31, 2020. The Fund is a continuation of its predecessor funds listed below;

- ISQ Global Infrastructure Fund I (“ISQ I” or “Fund I”), a \$3.0 billion 2014 vintage fund that is fully invested across 15 investments, five of which have been fully realized and four have been partially realized. ISQ I is tracking to 16.4% net internal rate of return (“IRR”) and 1.3x net total value to paid-in (“TVPI”) in U.S. Dollars (“USD”) terms.
- ISQ Global Infrastructure Fund II (“ISQ II” or “Fund II”), a \$7.0 billion 2017 vintage fund that is substantially invested across twelve assets. ISQ II is tracking to 14.2% net IRR and 1.1x net TVPI in USD terms.

**Strategy:** ISQ’s strategy has broadly been consistent across the two predecessor funds that focused on creating a global diversified portfolio with emphasis on downside protection and value-creation. The Fund will primarily make brownfield, core+ and value-add investments in companies across utilities, transportation, communication, power and renewables, midstream energy and social infrastructure businesses located in North America, Europe and select growth economies, mainly in Asia and Latin America. ISQ focuses on developing investment platforms (“Platform Investments”) that acquires, aggregates (through add-on acquisitions) small and mid-market assets with an ability to develop new assets and capacities as well. The Fund will also opportunistically target larger single company investments (“Company Investments”) where the focus generally is on operational value-add to improve performance and / or risk profile. Similar to its predecessor funds, ISQ will target to allocate at least 50-60% of its committed capital to Platform Investments and not more than 40-50% into Company Investments. Similar to predecessor funds, ISQ III will target gross internal rate of return (“IRR”) of 15-20% and will seek to generate an annual cash yield of 6% by the end of the Fund’s commitment period.

### Sponsor:

<b>HQ Location</b>	Miami, United States	<b>Parent</b>	I Squared Capital
<b>Ownership</b>	80% by Employees	<b>Founded</b>	2012
<b>Employees</b>	139 total employees	<b>Team</b>	79 investment professionals <sup>1</sup>
<b>AUM (Dec 31, 2019)</b>	\$14.0 billion <sup>2</sup>		

### Performance (as of March 31, 2020):

Fund	Vintage Year	Fund Size	Capital Invested	# of Inv.	Inv. Realized	Realized Value	Unrealized Value	Total Value	Loss Ratio	Ave. Hold Period	Gross TVPI	Net TVPI	Gross IRR	Net IRR
ISQ I	2014	\$3,000.0	\$2,982.6	15	5	\$2,081.6	\$3,031.3	\$5,112.9	0.0%	3.8	1.7x	1.6x	22.7%	16.4%
ISQ II	2017	7,000.0	3,639.6	12	0	179.3	4,462.3	4,641.6	0.0%	N/A	1.3	1.1	19.3%	14.2%
<b>Total</b>		<b>\$10,000.0</b>	<b>\$6,622.2</b>	<b>27</b>	<b>5</b>	<b>\$2,260.9</b>	<b>\$7,493.5</b>	<b>\$9,754.5</b>	<b>0.0%</b>	<b>3.8</b>	<b>1.5x</b>	<b>1.3x</b>	<b>21.6%</b>	<b>15.9%</b>

<sup>1</sup> Including 47 investment professionals, 21 asset management and operating professionals, 12 in policy and regulatory functions, and 8 in investor relations

<sup>2</sup> Aggregate fair value of ISQ I and II, co-investment capital, and employees fund, plus remaining capital that ISQ is entitled to call as of December 31, 2019.

## Portfolio Characteristics and Terms:

<b>Structure</b>	Closed-End Fund	<b>Risk Segment</b>	Moderate / Core+ and Value-Add
<b>Size</b>	\$12.0 billion target	<b>Sponsor Commitment</b>	2.0 %
<b>Target Sectors</b>	Transportation, Utilities, Energy, Communications, Social Infrastructure	<b>Target Geography</b>	Global
<b>Target Stage</b>	Mainly Brownfield	<b>Diversification Guidelines</b>	<ul style="list-style-type: none"> <li>• 25% for a single investment</li> <li>• 25% in Greenfield</li> <li>• 33.3% outside OECD countries</li> </ul>
<b>Target Return (USD)</b>	15-20% Gross IRR / 11-14% net IRR	<b>Partnership Level Leverage</b>	Lesser of 40% of the capital commitments and undrawn commitments (with maturity of up to 24 months)
<b>Fund Term</b>	10 years from final close Two 1-year extension by GP Two 1-year extension by LPAC	<b>Investment Period</b>	5 years from final close
<b>Minimum Commitment</b>	\$25.0 million		

## Fees and Timing:

<b>Management Fee<sup>3</sup></b>	1.6% p.a. on uninvested capital 1.6% p.a. on invested capital	<b>Carried Interest</b>	20.0% (Calculated on the whole fund basis)
<b>Hurdle Rate</b>	8.0% p.a.	<b>Catch-Up</b>	80 GP / 20 LP
<b>Organization Expenses</b>	Up to 0.1% of aggregate commitments	<b>Fee Income</b>	100% offset against management fee for all transaction, break-up, directors', monitoring, financing and other fees
<b>Co-invest Rights</b>	Offered to LPs in order of priority and co-investment policy	<b>Valuations</b>	Quarterly internal valuations, annual independent valuations, audited by external auditor
<b>Status/Timing</b>	First Close: A) in August 2020, and B) end of September 2020 Final Close: Q2 2021		

<sup>3</sup> 1.60% on the first \$100 million of a Limited Partner's Commitment, 1.45% on the next \$100 million of such Limited Partner's Commitment; 1.25% on the next \$150 million of such Limited Partner's Commitment; and 1.00% in respect of such Limited Partner's Commitment greater than \$350 million.

## COMPETITIVE ADVANTAGES

### 1. Large, on-the-ground, stable and cohesive team with complementary skills set

Sadek Wahba (Chairman and Managing Partner), Gautam Bhandari (Managing Partner) and Adil Rahmathulla (Managing Partner) (collectively the “Principals”) in addition to three other Partners (collectively the “Partners”) have worked together for over 15 years. The strategy is executed by on-the-ground team spread across U.S. London, Singapore, Hong Kong and Delhi which enables ISQ to source exclusive investment opportunities through local relationships (outside auctions or sell-side financial advisors network), appropriately evaluate risks with local knowledge, actively implement strategic initiatives and manage investments utilizing local operational and policy expertise.

We believe ISQ has developed and maintained a strong inhouse investment, asset management and operational capabilities that allows it to more actively implement business plans and disintermediate the value-creation process. The overall team is comprised of 140 professionals who present a strong mix of complementary skills set including 47 investment professionals (the “Investment Team”), 21 asset management and operating professionals, 12 senior policy / regulatory advisors, 8 investor relations staff, and remaining in finance, compliance and other back office functions. The Investment Team, asset management and operating professions collectively have over \$60 billion of infrastructure investing experience and senior policy advisors have over 700 years of collective operating and policy experience globally.

#### On-the-ground Team

Team	Miami	London	New Delhi	Singapore	Hong Kong
Investment Team	25	10	7	2	4
Operating Directors and Asset management	6	6	3	3	3
Senior Policy Advisors	1	5	-	-	-
<b>Total</b>	<b>32</b>	<b>21</b>	<b>10</b>	<b>5</b>	<b>7</b>

### 2. Compelling track record

ISQ has been actively investing capital in its target infrastructure sub-sectors and geographies since 2014. Across its two prior funds, the Firm has raised \$10.0 billion in total commitments, invested \$6.6 billion across 26 deals, realized \$2.3 billion with remaining portfolio marked at \$7.5 billion, as of March 31, 2020. This reflects combined net internal rate of return (“IRR”) of 15.9% and net total value to paid-in (“TVPI”) of 1.3x in U.S. Dollars (“USD”) terms.

- ISQ I, a \$3.0 billion 2014 vintage fund, is fully invested across 15 investments, five of which have been fully realized and three other have been partially realized. It is tracking to a net IRR of 16.4%, net TVPI of 1.6x and net distribution to paid-in (“DPI”) of 0.5x, in USD terms as of March 31, 2020. This ranks ISQ I as first quartile<sup>4</sup> on most metrics among its vintage peers. The eight, fully or partially realized investments generated 30.8% gross IRR and 2.0x gross TVPI, as of March 31, 2020.
- ISQ II, a \$7.0 billion 2017 vintage fund, is substantially invested / committed across twelve assets. It is tracking to a net IRR of 14.2% and net TVPI of 1.1x in USD terms as of March 31, 2020. While the benchmark analysis is not yet too meaningful for ISQ II, it ranked 1<sup>st</sup> quartile<sup>4</sup> on net IRR basis and 2<sup>nd</sup> quartile<sup>4</sup> on net TVPI basis.

### 3. Differentiated strategy with mid-market focus and platform investment approach

ISQ’s strategy is a mix of Platform Investments and Company Investments. It focuses on mid-market segment of infrastructure by developing investment platforms that acquires, aggregates (through add-on acquisitions) small and mid-market assets with an ability to also develop new assets and capacities using the platforms. The platforms do not only

<sup>4</sup> Based on December 31, 2019 performance. Benchmark data for March 31, 2019 is not yet available.

serve as aggregator of assets but ISQ seeks to put a dedicated in-house management team in place for each platform with deep industry knowledge and expertise that sources and executes deals within the platform's mandate.

In addition to mid-market focus, this platform approach of investing results in less competitive deal flow for ISQ where returns are generated from bilateral deal negotiations and achieving scalability through organic growth, add-ons as well as active operational value creation instead of relying on continuous expansion in valuation multiples. We believe this approach allows for the acquisition of smaller assets and effectively disintermediates the value creation process to create larger, more integrated portfolios with significant operating synergies and scale that are of greater interest to strategic buyers and large pension and sovereign funds. This was evident in ISQ I portfolio that closed 12 of the 15 investments (representing 75.5% of the capital invested) on proprietary basis and has so far realized 5 investments (all platform investments) to strategic buyers. Fund II also closed 11 of the 12 transactions (representing 89.1% of capital invested) on bilateral negotiations.

Like its predecessor funds, ISQ III will target to allocate at least 60% of its committed capital to Platform Investments.

#### 4. Evidence of skills-based value creation

An analysis of fully and partially realized investments indicates that bulk of the returns were contributed by operational improvements, de-risking, and achieving scalability (platform value creation). These factors contributed over 70% of the total returns on average across 8 realizations (full and partial) in ISQ I. Following are few examples of active management and skill-based value creation in ISQ I portfolio.

Cube Hydro began with the acquisition a single facility with only six megawatts ("MW") in capacity, the platform grew to 19 hydro plants with 385 MW in total capacity acquired at an average entry EBITDA multiple of 15.6x. Achieving such scalability allowed ISQ to be able to exit the platform to Ontario Power Generation at 21.1x multiple. The platform also achieved over \$8.8 million in recurring EBITDA increase through several cost-saving and revenue enhancement initiatives (automation and turbine upgrades, etc.) as well as cumulative capex savings of \$28.2 million.

Lincoln Clean Energy, another partnership and platform investment to develop renewable projects successfully scaled the business from 10 MW in capacity at inception to over 800 MW in capacity at exit with over 2 gigawatts ("GW") of development pipeline. Scalability allowed ISQ to exit the platform to a strategic buyer (Orsted) at 16.4x EBITDA multiple vs average of <10x at entry.

Amplus, a distributed solar platform grew from only 1.6 MW of installed capacity across 9 sites, 6 customers, and 7 employees to over 340 MW of installed capacity across 360 sites, over 140 customers and over 240 employees. The platform was eventually sold to Petronas.

Cube Highway, a toll road platform in India, initially acquired 5 assets over the period of 2 years between 2015 and 2017, developed a strong pipeline for future acquisitions, significantly reduced toll exemptions and violations from a historical 7% pre-acquisition to about 3% by automating toll monitoring and improving audit system, generating additional revenues.

Following table presents value-creation bridge for full and partial realizations;

Realized Investments	Invested Capital	Operation Improvements	Platform Value Creation	Yield and other	Gross TVPI at Exit	Sold to
Cube Hydro	1.0x	0.4x	0.7x	0.2x	2.3x	Ontario Power Generation
Lincoln Clean Energy	1.0x	0.1x	0.9x	0.1x	2.1x	Orsted
Amplus	1.0x	0.2x	0.5x	0.2x	1.9x	Petronas
Cube Highway	1.0x	0.2x	0.6x	0.1x	2.0x	Sovereign Fund
Cube District Energy - Kendall	1.0x	1.0x	1.0x	0.8x	3.8x	Veolia
Cube District Energy - Cool Co	1.0x	0.5x	-0.1x	0.0x	1.4x	Harrison Street Infra Fund
Chenya Energy	1.0x	0.4x	0.2x	0.2x	1.8x	Marubeni
T-Solar	1.0x	0.4x	0.1x	0.6x	2.1x	N.A.

## 5. Highly diversified portfolios

We believe ISQ's global and cross-sectoral strategy results in a highly diversified portfolio that brings greater protection against downside risk. ISQ I portfolio was diversified across 15 individual investments and various sub-sectors including power, renewables, utilities, transportation and midstream energy with no single investment accounting for more than 14% (median 5.9%) of the capital invested and no single sector accounting for more than 25% of the capital invested. While ISQ II is still investing, it added communication and social infrastructure to the portfolio with overall a very similar diversification profile. On geography, both ISQ I and ISQ II deployed roughly 2/3<sup>rd</sup> of the committed capital in U.S. and Europe while remaining 1/3<sup>rd</sup> in Asia and LATAM, and in companies that operate assets in 44 countries.

We believe that the Firm's global and cross-sectoral approach results in a highly diversified portfolio that offers greater protection against downside risk than more concentrated portfolios. The level of diversification has also proven to be helpful in protecting the portfolio value against extreme events, such as the ongoing COVID-19, that has caused market dislocation.

Diversification will continue to remain a core of ISQ strategy and portfolio construction approach for ISQ III. In addition to formal concentration limits in the Fund's legal documents (please refer to Investment Guidelines on page 9 of this report for more details), ISQ generally targets that individual investments do not exceeds 10% of the aggregate commitments.

## 6. Valuation discipline

While most managers in the market have either been paying high multiples for infrastructure assets or drifting in strategy into larger deals and / or riskier segments, ISQ's strategy remains focused on assets with strong infrastructure characteristics that offer scope for growth and value-add, low entry valuation multiples and downside protection. Acquisition multiples to date have averaged less than 10.0x. overwhelming majority of deals ISQ has closed in Fund I and II (23 of 27 deals that represent 83% of the capital invested) were negotiated on exclusive and bilateral basis.

For reporting purpose, ISQ produces quarterly internal valuations and engages an external independent valuation firm to conduct the valuations at least annually. This further adds credibility to the valuations reported for unrealized investments post acquisition.

## POTENTIAL ISSUES AND CONCERNS

Although we believe ISQ III offers a compelling investment opportunity, below we have listed concerns that should be considered prior to the investment decision. Following each is a discussion of mitigating factors that help reduce our level of concern.

### 1. COVID-19 Impact

Performance of the prior funds may deteriorate due to potential implications of the ongoing COVID-19 pandemic.

**Discussion:** We believe there has been a disproportionate impact on various infrastructure sub-sectors or assets. While some mid-stream energy assets (e.g. pipelines, gathering and processing systems) and transportation assets (e.g. airports and toll roads) are most impacted, other sectors like utilities, power and renewables, communications, and social infrastructure have proven to be more resilient. Declines in crude oil have further impacted performance of some mid-stream energy assets.

ISQ's portfolios have proven to be less impacted due to no exposure to GDP sensitive assets like airports, ports and transit assets that have been heavily impacted by the travel bans and other restrictions / disruptions. Mid-stream energy assets (Whiptail in Fund I and Eagle Claw in Fund II) were negatively impacted but such impact was offset by renewable, communication and social infrastructure assets, concluding overall impact across two portfolios to be quite muted with no immediate liquidity, covenant and other debt related issues at any portfolio company.

We believe diversification across sub-sectors, geographies, and individual investments also played a critical role in protecting the portfolio value.

We have estimated the COVID-19 impact on total fund performance resulting from revaluation of individual portfolio companies over Q1 2020. Fund I gross IRR decreased by approximately 90 basis points from 23.6% to 22.7% and Fund II gross IRR decreased by 140 basis points from 20.7% to 19.3%. The revaluation incorporates a revised forecast for 2020 and change in risk premium used within the calculation of appropriate discount rates. However, this is based on the information available at the time of writing this report and we note that there is a risk of further downside depending on the magnitude and duration of the on-going COVID-19 pandemic and the consequential recessionary conditions.

## 2. Fund II invested status

ISQ II has invested \$3.6 billion or approximately 52% of the committed capital as of March 31, 2020. This means the fund has another \$3.3 billion to be invested in parallel with ISQ III that may create conflict.

**Discussion:** As of 06/12/2020, ISQ II has committed total of \$4.8 billion (or 70% of the total commitments), \$3.6 billion of which had been invested as of 03/31/2020 and \$1.2 billion has been committed but not yet invested. Bulk of this additional committed capital will go into existing portfolio investments including Cube Highway I, Cube Highway II, Think Gas, Eagle Claw, Inkia, and Nanjing and to fund new investment in Rubis Terminal that was closed in Q1 2020 but has not yet been funded. Fund II is also expected to close two more deals in the next 6 to 9 months to reach 85-90% invested status and will keep the remaining capital for add-on opportunities and expenses only. The table below provides details of the committed capital to portfolio companies.

Fund II asset	Invested	Committed	Committed /Not Invested
EagleClaw	\$615.5	\$681.7	\$66.3
Inkia	566.4	651.3	84.9
Venture Global LNG	464.5	464.5	0.0
TIP	679.9	679.2	0.0
HGC	395.5	395.5	0.0
BDX / Nanjing	62.7	94.4	31.7
Think Gas	54.2	118.8	64.6
Cube Highways II	6.9	116.1	109.2
Cube Highways III	2.1	340.3	338.3
Cube Mobility	0.0	278.5	278.5
Domidep	668.9	668.9	0.0
Rubis Terminal	0.0	223.0	223.0
OSCENSA	123.0	123.0	0.0
<b>Total</b>	<b>\$3,639.6</b>	<b>\$4,835.2</b>	<b>\$1,196.3</b>
<b>% of Fund Size</b>	<b>52.0%</b>	<b>69.1%</b>	<b>17.1%</b>

## 3. Increase in Fund Size

ISQ III is targeting to raise \$12.0 billion in total commitments that represent 71.4% increase in size over its predecessor fund that closed on \$7.0 billion. This significant increase in fund size may lead to larger average investment size and drift the portfolio away from mid-market focus, deal stress on investment team considering many of the Fund I and all of the Fund II investments are still unrealized and need to be actively managed by the same team.

In addition, ISQ is also raising a separate growth market fund, targeting additional \$4 billion in total commitments, managed by the same team.

**Discussion:** ISQ II closed on \$7.0 billion that was 130% larger than its predecessor first fund that closed on \$3.0 billion. Despite being larger fund, ISQ II has so far committed an average equity of just over \$300 million vs average equity investment of \$198 million in ISQ I. Average enterprise value of the portfolio companies in ISQ II stands around \$2.5 billion (within mid-market range), although higher than ISQ I at \$600 million. However, many of these investments are platform investments (for example Domidep and TIP) and represent a combined enterprise value of several underlying assets / add-on deals. ISQ also leveraged its co-investment partners to execute larger deals to mitigate risk. While the average equity check for Fund III will likely be larger than that of Fund II, we believe ISQ is capable to build a portfolio largely comprised of mid-market companies utilizing its platform approach with an ability to opportunistically execute few larger deals as well.

Given the expected geographic composition of 1/3<sup>rd</sup> in the U.S. and Europe each and 1/3<sup>rd</sup> combined in Asia and LATAM, ISQ is looking to deploy \$4.0 billion in each target geography. This compares reasonably to many other single region managers that are raising larger funds. Our review of investment pipeline of deals at advance stage of ISQ's due diligence process indicates average deal size (expected average fund's equity) of \$450 million in the U.S., \$475 million in Europe, and \$190 million in Asia, and \$365 million in LATAM.

On deal team burden, it is worth noting that ISQ's team was comprised of only 30 professionals (including 3 partners) at the launch of ISQ I, which grew to 76 members for Fund II and is currently at 140 professionals (including 6 partners). The Firm hired over 30 professionals in 2019 alone, more than half of those were investment professionals across Americas, Europe and Asia. This means that ISQ's AUM per deal team member has stayed around \$220 million since Fund I.

With respect to potential conflict between the growth market fund and ISQ III, the allocation will generally be 2:1 between ISQ III and growth market fund. However, the growth market fund will have priority over less than \$100 million deals (excluding platform investment opportunities).

#### 4. Fee Terms

While carried interest of 20% over 8% hurdle and applicable on fund-as-whole basis is in line with market, the standard management fee of 1.6% is higher than the market average.

**Discussion:** While the standard management fee at 1.6% is certainly higher than market average, it is somewhat reasonable for the type of strategy ISQ pursues with higher target returns. The management fee also compares reasonable to its closest strategy peers that charge similar or slightly higher standard management fee.

ISQ offers a blended management fee on larger than \$100 million commitments. The Fund would apply 1.60% on the first \$100 million commitment, 1.45% on the next \$100 million commitment; 1.25% on the next \$150 million commitment; and 1.00% in respect of commitment greater than \$350 million. Although it is not relevant for all clients, this blended management fee rate at greater than \$350 million commitment would be 1.32%.

#### 5. Sale of minority stake in ISQ to third party

In October 2019, ISQ sold a minority 20% stake in the Firm to vehicles managed by Dyal Capital ("Dyal"), a division of Neuberger Berman. Dyal has 20% equity in the Firm and 20% share in the carried interest as well.

**Discussion:** While Dyal has 20% equity interest in the Firm and 20% share in the carried interest of Fund III as well as in the future funds, the Firm is still 100% controlled by the three managing partners. Dyal will not be involved in the management of ISQ and will have no role in its investments or decision-making process. The selling managing partners are investing the proceeds from the sale back into the growth of business. The proceeds will partially also fund the GP commit.

# STRATEGY

## OVERVIEW

ISQ's strategy has broadly been consistent across the two predecessor funds that focused on creating a global diversified portfolio with emphasis on downside protection and value-creation. The Fund will primarily make brownfield, core+ and value-add investments in companies across utilities, transportation, communication, power and renewables, midstream energy and social infrastructure businesses located in North America, Europe and select growth economies, mainly in Asia and Latin America.

ISQ focuses on mid-market segment of infrastructure by developing investment platforms ("Platform Investments") that acquires, aggregates (through add-on acquisitions) small and mid-market assets with an ability to develop new assets and capacities as well. The Fund will also opportunistically target larger single company investments ("Company Investments") where the focus generally is on operational value-add to improve performance and / or risk profile. Similar to its predecessor funds, ISQ will target to allocate at least 50-60% of its committed capital to Platform Investments and not more than 40-50% into Company Investments.

The Fund will seek to invest in infrastructure assets with all or most of the following characteristics:

- Stable and well-defined regulation and policy framework;
- High barriers to entry with low price elasticity;
- Well defined operational structure with attractive upside;
- Insulation from the business cycle with low income elasticity;
- Long duration assets, typically ten years or more;
- Stable cashflows that grow with inflation;
- Positive long-term variables such as demographics that provide downside mitigation; and
- Moderate leverage.

Similar to prior funds, Fund III will target to deploy approximately 2/3<sup>rd</sup> of the its capital in assets located in North America, Europe and OECD Asia, and not more than 1/3<sup>rd</sup> in non-OECD countries (mainly in Asia and LATAM). Fund I invested approximately 68% of its aggregate capital commitments in North America and Europe and approximately 31% in non-OECD countries. Fund II, so far has invested (or committed) 67% in North America and Europe, and about 33% in non-OECD countries.

Fund III will seek to develop a portfolio of 15-17 portfolio investments across sub-sectors with the following guidelines;

- **Transportation and Logistics (20%):** In North America and Europe, we expect the possible opportunity set will include logistics, asset leasing, and intermodal (supply chain complexity and increase in E-commerce) with some possibilities of availability transit in Scandinavian countries. Airports, toll roads and parking assets are of less interest to ISQ. In Asia Pacific, the target opportunity set includes toll roads, transit and logistics (increasing car penetration, E-commerce uptick and privatization) and in LATAM, the Fund may invest in ports, logistics, and rail segments (backed by privatization initiatives, overburdened infrastructure and E-commerce uptick) and opportunistically in airports.

Overall, transportation exposure will likely be a combination of Platform (more likely) and Company Investments.

- **Power and Utilities (20%):** In North America, the opportunity set may include select utilities and renewables and credit positions in some independent power producers ("IPPs"). In Europe, the opportunity set of interest is limited to waste management (mainly in the UK), and select renewables. In Asia Pacific, ISQ III may invest in renewables, waste management, and select utilities. And Lastly, in LATAM, ISQ is looking at deals that involve IPPs carve out and renewables.

While there is possibility of Platform Investments in power and renewables, exposure to utilities is expected through Company Investments. Greenfield merchant power generation and utility privatizations are of less priority to ISQ for Fund III.

- **Energy (20%):** In North America, the opportunity set will likely include LNG export facilities, storage and logistics (backed by increase demand for gas exports). In Europe, the opportunity set of interest seems to be limited to some storage assets mainly in Western Europe. In Asia, the Fund may look to allocate capital to natural gas distribution and storage assets (mainly in India, Indonesia, and Thailand).
- **Communication (20%):** The opportunity set in communication spans across towers, fiber networks, and data centers in all geographies on back of increase in data usage and continued migration to cloud. ISQ will seek to avoid wholesale data centers and mass market fiber build-out in this sector. These may include Platform Investments and Company Investments.
- **Midstream (10%):** The opportunity may include some credit positions in gathering and processing assets in North America (commodity price and COVID-19 dislocation). Focus will be on Tier I basins, structural protection, and avoiding direct commodity price risk.
- **Social infrastructure (10%):** The opportunity in social infrastructure mainly reside in Europe. This mainly includes elderly homes, diagnostic labs and imaging centers. In LATAM, ISQ will opportunistically look at deals in the education space. This will likely be a consolidation / scale play through Platform Investments.

ISQ III will target gross internal rate of return (“IRR”) of 15-20% and will seek to generate an annual cash yield of 6% by the end of the Fund’s commitment period.

## LEVERAGE

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The Fund may obtain one or more credit facilities (including by pledging its unfunded commitments, assets and collateral accounts) and incur borrowings with maturity of 24 months or less, not to exceed of 40% of Commitments. The debt to NAV ratio of the Fund will not exceed 70% following the incurrence of any borrowing.

There are no formal limitations on leverage employed at the level of underlying portfolio companies. However, leverage (based on gross debt to enterprise value) across all unrealized investments as of Dec 31, 2019 averaged less than 60%.

## HEDGING

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ISQ manages currency risk by actively hedging the value and cash flows of all of its non-USD investments to the extent commercially feasible. As of December 31, 2019, ISQ had hedges in place to protect 100% of the cost basis and 75% of the unrealized value of ISQ’s non-USD denominated assets.

## INVESTMENT GUIDELINES

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The Investment Limitations for ISQ III are as follows:

- The total investment by the Fund in a single portfolio company may not exceed 25% of the aggregate commitments.
- The Fund will not invest more than 33.33% of the aggregate commitments outside of OECD member states, Singapore and Taiwan.
- The Fund will not invest more than 25% of the aggregate commitments in greenfield projects.
- The Fund will not make open market purchases of publicly traded securities unless such purchases are (i) made in connection with, or with a view to, a transaction in which the Fund would obtain a controlling position, or (ii) in an amount in the aggregate at the time of the purchase not in excess of 40% of the aggregate commitments (excluding securities purchased in accordance with (i)).

## PIPELINE

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No pre-specified assets have closed to-date. ISQ highlighted several transactions that are well advanced that could be the first investments for Fund III. Since A short list of active pipeline opportunities for each of the target geographies is attached as **Exhibit I**.

## SPONSOR

### OVERVIEW

Founded by Sadek Wahba (Chairman and Managing Partner), Gautam Bhandari (Managing Partner) and Adil Rahmathulla (Managing Partner) (collectively the “Principals”) in 2012, I Squared Capital is a specialist global infrastructure firm headquartered in Miami with other offices in New York, London, New Delhi, Singapore, and Hong Kong. Before establishing ISQ, the Principals all worked together previously at Morgan Stanley Infrastructure Partners (“MSIP”), led by Sadek Wahba, where they were responsible for deploying capital of Morgan Stanley Infrastructure Partners I (“MSIP I”), a \$4.0 billion global infrastructure fund.

The Firm is 80% owned by its employees (mainly the Principals and other partners) who control and manage it and passive 20% by funds affiliated with Dyal Capital, a division of Neuberger Berman. Dyal is not and will not be involved in the management of I Squared Capital and will have no role in its investments or decision-making process.

ISQ has been actively investing capital in its target infrastructure sub-sectors and geographies since 2014 with approximately \$14.0 billion of infrastructure assets under management (including co-investment capital). Across its prior funds, the Firm has raised \$10.0 billion in total commitments, invested \$6.6 billion and realized \$2.3 billion as of March 31, 2020.

ISQ team is comprised of 140 professionals who present a strong mix of complementary skills set including 47 investment professionals (the “Investment Team”), 21 asset management and operating professionals, 12 senior policy / regulatory advisors, 8 investor relations staff, and remaining in finance, compliance and other back office functions.

### TURNOVER

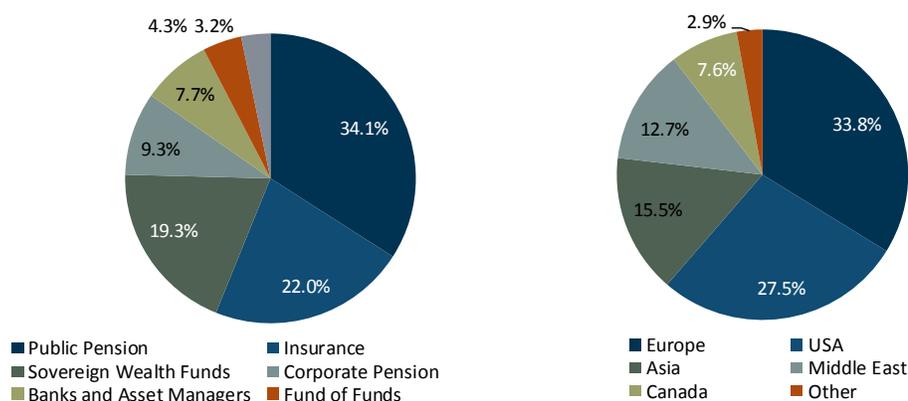
ISQ team has been very stable and growing with no material turnover in the investment team over the past 5 years. No senior member of the investment team has left the Firm over the past 5 years.

### COMPENSATION AND RETENTION

The compensation of the investment team is comprised of two elements: (i) salary and annual bonus and (ii) participation in fund carry arrangements. The majority of the compensation for the investment team members is intended to be delivered through the carry arrangements. While the level of participation in the carried interest arrangements will depend on the seniority of the professionals, 60% of the carried interest is distributed to the Principals, 20% is distributed to the Investment Team (excluding the Principals and including some non-investment team members). Dyal has 20% share in carry for Fund III and future funds.

### CLIENT BASE

The investor base of prior funds is comprised predominantly of institutional investors and include public and corporate pension plans, insurance companies, fund of funds and Taft-Hartley / unions. In terms of geography, the investor base is diversified across regions.



## COMPLIANCE / LITIGATION DISCLOSURES

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As of December 31, 2019, there were no pending litigation or regulatory investigations.

## OPERATIONAL DUE DILIGENCE

### SUMMARY

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I Squared Capital Advisors (US), LLC (“ISQ”) is a private equity manager primarily focused in global infrastructure assets. ISQ has generally implemented institutional levels of controls across its operating construct including comprehensive investment approval, asset management, and risk management processes. Aon identified the lack of a formalized management oversight function as an item of risk. Additionally, the fund under review does not operate with a Board Directors with independent representation; however, this is market practice for a private equity fund.

# INVESTMENT PROCESS

## OVERVIEW

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The investment process of ISQ is comprised of four stages, sourcing, investment due diligence and approval, asset management and exit.

### Sourcing

The strategy is executed by on-the-ground team that consists of investment professionals, asset management and operating professionals and policy advisors spread across U.S. London, Singapore, Hong Kong and Delhi. This enables ISQ to source and execute exclusive investment opportunities on bilateral negotiations by utilizing on-the-ground team's local industry relationships (outside auctions or sell-side financial advisors network). This was evident in ISQ I portfolio that closed 12 of the 15 investments (representing 75.5% of the capital invested) on proprietary basis and has so far realized 5 investments (all platform investments) to strategic buyers. Fund II also closed 11 of the 12 transactions (representing 89.1% of capital invested) on bilateral negotiations. In addition, ISQ also maintains a deal depository and active calling program for investment origination.

### Investment Due Diligence and Approval

ISQ has a well-defined and established due diligence process called Review, Evaluations and Approval Process ("REAP"). It is a multi-stage process that begins with review by on-the-ground-team. After initial review by the on-the-ground team, the opportunity is also reviewed by other investment team members outside the region of opportunity to avoid any regional biases, before it is presented to the investment committee (the "Investment Committee").

On-the-ground review: A typical deal team is comprised of one senior investment professional, one senior operating director and a senior policy advisor that will conduct detailed assessment of risk, scope of value creation, and policy and regulatory aspects of the deal under review. Typically, on-the-ground deal team looks for the following characteristics in an opportunity;

- Stable and well-defined regulation and policy framework;
- High barriers to entry with low price elasticity;
- Well defined operational structure with attractive upside;
- Insulation from the business cycle with low income elasticity;
- Long duration assets, typically ten years or more;
- Stable cashflows that grow with inflation;
- Positive long-term variables such as demographics that provide downside mitigation; and
- Moderate leverage.

The team prepares initial investment memorandum that also incorporates ISQ's proprietary risk model ("ISQ Risk Model") with detailed assessment of operational and policy issues and preliminary offer. ISQ Risk Model is a ten-factor risk model that allows comparative asset valuation and analysis at acquisition as well as monitoring and asset management on an on-going basis. The model assigns a score on all ten factors that include barriers to entry, regulations, operations, growth, business cycles, leverage, governance, pricing, liquidity, and inflation. The investment memo requires a detailed plan on how risk profile of each deal will be improved over the planned holding period.

Independent evaluation: A separate review committee is formed with up to two investment professionals and at least one operating director from outside the region of the deal under review. This independently challenges the assumptions and assessment conducted by on-the-ground deal team and supports them with complex aspects of the due diligence. The independent evaluation team assesses the ISQ Risk Model, operating and policy issues and preliminary offer prepared by on-the-ground deal team. They also compare the risk adjusted returns for each deal with other similar opportunities in the pipeline in the same and other regions to conduct a relative analysis.

Investment Committee Approval: This brings both the teams together for a more interactive discussion and allows other members of the investment team to participate as well. A detailed Investment Committee checklist is submitted along with the investment memo and includes all related to financial, investments, research, market consultants' reports, ISQ Risk Model, tax diligence, financial and operational projections, 100-day plan, hedging, legal, compliance, etc.

All deals are presented at least twice to the Investment Committee and require majority vote for approval.

Since inception, ISQ has reviewed deals representing \$225 billion in potential equity value, 62.6% of which were retained for further due diligence, 9% were presented to the Investment Committee, and only 3.5% were acquired.

### **Asset Management and Exit**

ISQ implements an active life-cycle management approach that focuses on value creation and downside mitigation through a dedicated asset team that is comprised of investment, operating, and policy professionals.

ISQ seeks to employ variety of asset management strategies to create value in its portfolio companies. These typical include revenue optimization, cost savings initiatives, regulatory improvements, capital structure improvements, strategic acquisitions, governance, capex, human capital, technology, and ESG.

### **INVESTMENT COMMITTEE**

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The Investment Committee is composed of six voting members that include Sadek Wahba, Adil Rahmathulla, Gautam Bhandari, Thomas Lefebvre, Harsh Agarwal, Mohammed El Gazzar.

### **LIMITED PARTNER ADVISORY COMMITTEE**

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ISQ will establish a committee (the "Limited Partner Advisory Committee" or "LPAC") composed minimum of three and maximum of fifteen representatives of selected Limited Partners. The LPAC will provide advice in connection with potential conflicts of interest, including any conflicts for which approval under the Advisers Act may be required, and other matters related to the Fund. During the Commitment Period, the LPAC will meet at least twice a year and annually thereafter. ISQ will consult with the LPAC in connection with the exercise of the Limited Partners' no-fault termination right and right to remove the General Partner.

### **VALUATIONS**

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The value of any securities to be disclosed in reports to Limited Partners will be determined as follows: (i) with respect to any marketable security, the average of the closing prices for such security on the principal exchange on which such security is traded for the 10 business days prior to the date of determination (or, in connection with any distribution in kind, the 5 business days prior to and 5 business days subsequent to the date of determination) or, if no sales occurred on any such day, the mean between the closing "bid" and "asked" prices for such security on such day, and (ii) with respect to all other securities or other assets of or interests in the Fund, other than cash, the value determined by the General Partner in good faith considering all factors, information and data deemed to be pertinent (including, for the avoidance of doubt, with respect to any valuation of an interest in the Fund, any discount relating to the market for secondary private equity fund interests generally).

ISQ will engage one or more unaffiliated valuation providers (the "Valuation Advisor") to evaluate the fair value of the Fund's assets on an annual basis.

### **ENVIRONMENTAL, SOCIAL AND GOVERNANCE**

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Environmental, social and governance ("ESG") is incorporated and imbedded in ISQ's investment process. The Firm strongly emphasizes on the importance of ESG issues in investment decisions and long-term performance and is a signatory to the United Nations inspired Principles for Responsible Investing ("PRI").

## FUND STRUCTURE

### OVERVIEW

ISQ Global Infrastructure Fund III, will be a Delaware limited partnership. There will also be several parallel funds and feeder vehicles established to meet the requirements of certain limited partners. Below is a summary of the key terms sourced from the PPM dated May 2020. These terms are subject to change.

### REVIEW OF TERMS & CONDITIONS

Key Terms		Townsend Comment	
<b>Target Return:</b>	15-20% Gross IRR 11-14% Net IRR	Neutral	Consistent with strategy and predecessor fund
<b>Fund Size:</b>	Target: \$12.0 billion Hard-cap: (TBD)	Negative	71% increase over Fund II (\$7.0 billion)
<b>Sponsor Commitment:</b>	2.0% of the aggregate commitments	Neutral	Higher than predecessor funds and consistent with market.
<b>Commitment Period:</b>	5 years from the final close	Neutral	Consistent with Townsend's preference (4 to 5 years) and prior ISQ funds
<b>Term:</b>	10 years from the final close subject to two 1-year extensions by GP discretion and two 1-year extensions by LPAC	Neutral	Consistent with market and prior ISQ funds
<b>Key Person Provision:</b>	Any two of Sadek Wahba, Gautam Bhandari and Adil Rahmathulla ceasing to devote substantially all business time to ISQ, the Fund and the Other ISQ Funds during the Commitment Period	Negative	Should apply to the Fund term and not only commitment period.
<b>No-Fault Provisions</b>	At any time after the second anniversary of the Final Closing Date, (i) 90% in interest of the Limited Partners may elect to terminate the Fund and (ii) 75% in interest of the Limited Partners may elect to	Negative	Higher approval threshold to terminate the Fund (higher than market and prior ISQ fund)

	terminate the Commitment Period		
<b>For Cause GP Removal Provisions</b>	A simple majority in interest of Limited Partners may elect to remove the General Partner for "cause." In addition, at any time after the second anniversary of the Final Closing Date, 90% in interest of the Limited Partners may elect to remove the General Partner without "cause."	Negative	Higher approval threshold to remove GP without cause (higher than market and prior ISQ fund)

**Placement Agent:** Evercore

#### Fees and Distribution Waterfall

<b>Organizational Expenses:</b>	Up to 0.1% of the aggregate commitments
<b>Investment Management Fee:</b>	<p><b>Standard Fee</b></p> <p>1.60% on the first \$100 million of a Limited Partner's Commitment, 1.45% on the next \$100 million of such Limited Partner's Commitment; 1.25% on the next \$150 million of such Limited Partner's Commitment; and 1.00% in respect of such Limited Partner's Commitment greater than \$350 million.</p> <p><b>Incentives</b></p> <p>First Close Discount:</p> <ul style="list-style-type: none"> <li>• 5% management fee reduction on commitments \$0-350 million;</li> <li>• 10% management fee reduction on commitments \$350-500 million;</li> <li>• 1.0% flat blended fee on commitments of \$500 million or larger</li> </ul> <p>Loyalty Discount:</p> <ul style="list-style-type: none"> <li>• 5% management fee reduction on commitment equal to or larger than previous commitment</li> </ul> <p>Note: All discounts are for the duration of 2 years.</p>
<b>Distributions / Incentive Waterfall:</b>	<ul style="list-style-type: none"> <li>• Whole of fund incentive structure</li> <li>• 8% preferred return</li> <li>• 80/20 GP/LP catch-up</li> <li>• 20% Carried Interest</li> </ul>
<b>Clawback:</b>	Yes, individually guaranteed.

## FEE AND EXPENSE ANALYSIS

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While carried interest of 20% over 8% hurdle and applicable on fund-as-whole basis is in line with market, the standard management fee of 1.6% is higher than the market average.

ISQ offers a blended management fee on larger than \$100 million commitments. The Fund would apply 1.60% on the first \$100 million commitment, 1.45% on the next \$100 million commitment; 1.25% on the next \$150 million commitment; and 1.00% in respect of commitment greater than \$350 million. The means a blended management fee rate at greater than \$350 million commitment would be around 1.32%.

## PERFORMANCE

### SUMMARY

Fund	Vintage Year	Fund Size	Capital Invested	# of Inv.	Inv. Realized	Realized Value	Unrealized Value	Total Value	Loss Ratio	Ave. Hold Period	Gross TVPI	Net TVPI	Gross IRR	Net IRR
ISQ I	2014	\$3,000.0	\$2,982.6	15	5	\$2,081.6	\$3,031.3	\$5,112.9	0.0%	3.8	1.7x	1.6x	22.7%	16.4%
ISQ II	2017	7,000.0	3,639.6	12	0	179.3	4,462.3	4,641.6	0.0%	N/A	1.3	1.1	19.3%	14.2%
<b>Total</b>		<b>\$10,000.0</b>	<b>\$6,622.2</b>	<b>27</b>	<b>5</b>	<b>\$2,260.9</b>	<b>\$7,493.5</b>	<b>\$9,754.5</b>	<b>0.0%</b>	<b>3.8</b>	<b>1.5x</b>	<b>1.3x</b>	<b>21.6%</b>	<b>15.9%</b>

ISQ has been actively investing capital in its target infrastructure sub-sectors and geographies since 2014. Across its two prior funds, the Firm has raised \$10.0 billion in total commitments, invested \$6.6 billion across 26 deals, realized \$2.3 billion with remaining portfolio marked at \$7.5 billion, as of March 31, 2020. This reflects combined net internal rate of return (“IRR”) of 15.9% and net total value to paid-in (“TVPI”) of 1.3x in U.S. Dollars (“USD”) terms.

- ISQ I, a \$3.0 billion 2014 vintage fund, is fully invested across 15 investments, five of which have been fully realized and three other have been partially realized. It is tracking to a net IRR of 16.4%, net TVPI of 1.6x and net distribution to paid-in (“DPI”) of 0.5x, in USD terms as of March 31, 2020. This ranks ISQ I as first quartile<sup>5</sup> on most metrics among its vintage peers.
- ISQ II, a \$7.0 billion 2017 vintage fund, is substantially invested / committed across twelve assets. It is tracking to a net IRR of 14.2% and net TVPI of 1.1x in USD terms as of March 31, 2020. While the benchmark analysis is not yet too meaningful for ISQ II, it ranked 1<sup>st</sup> quartile<sup>4</sup> on net IRR basis and 2<sup>nd</sup> quartile<sup>4</sup> on net TVPI basis.

### VINTAGE COMPARISON

The following chart compares ISQ funds’ since inception net returns to the Burgiss Private iQ Global Infrastructure Benchmark (“Benchmark”). Please note that Burgiss’ infrastructure peer universe’s sample size is limited, thus does not provide a very useful analysis. All returns are based on realized and fair market value of unrealized investments as of Dec 31, 2019.

While benchmarking for ISQ II is not yet too meaningful, ISQ I ranks 1<sup>st</sup> quartile among 2014 vintage peers on the basis of net IRR and net TVPI, and 2<sup>nd</sup> quartile on the basis of net DPI.

As of December 31, 2019

Fund	Vintage Year	Net IRR	Sample Size	1st	2nd	3rd	Benchmark Quartile
ISQ I	2014	<b>17.4%</b>	<b>20</b>	16.6%	10.9%	7.4%	1st
ISQ II	2017	<b>16.8%</b>	<b>18</b>	15.2%	6.5%	3.4%	1st

Fund	Vintage Year	Net TVPI	Sample Size	1st	2nd	3rd	Quartile
ISQ I	2014	<b>1.6x</b>	<b>20</b>	1.5x	1.3x	1.2x	1st
ISQ II	2017	<b>1.1</b>	<b>18</b>	1.2x	1.1x	1.1x	2nd

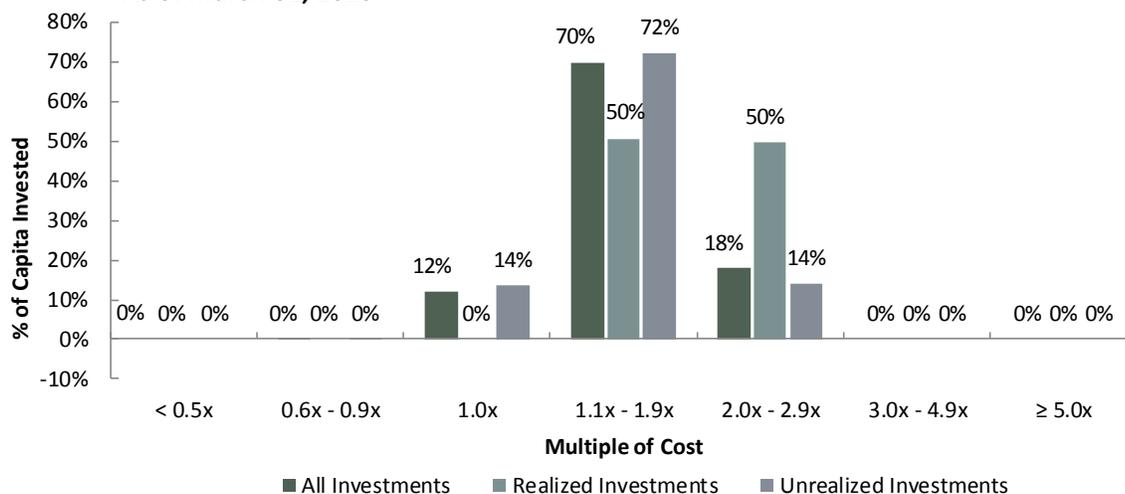
Fund	Vintage Year	Net DPI	Sample Size	1st	2nd	3rd	Quartile
ISQ I	2014	<b>0.6x</b>	<b>20</b>	0.7x	0.4x	0.2x	2nd
ISQ II	2017	<b>0.0</b>	<b>18</b>	0.3x	0.1x	0.1x	4th

<sup>5</sup> Based on December 31, 2019 performance. Benchmark data for March 31, 2019 is not yet available.

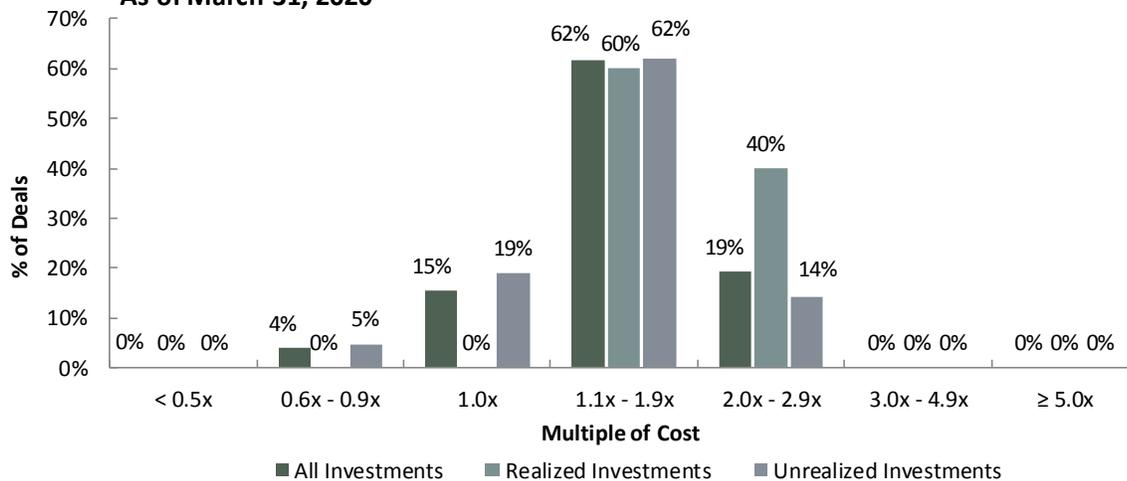
**DISPERSION OF RETURNS**

The following charts display the dispersion of individual investment returns across the series.

**Dispersion of Total Returns by Amount Invested  
As of March 31, 2020**



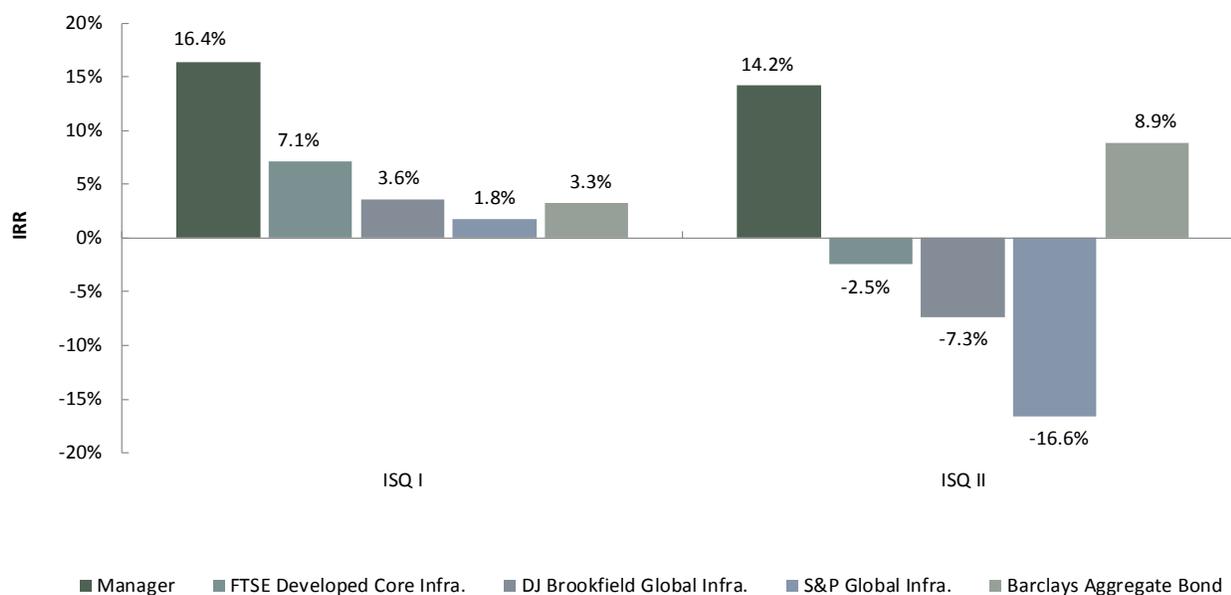
**Dispersion of Total Returns by Percentage of Deals  
As of March 31, 2020**



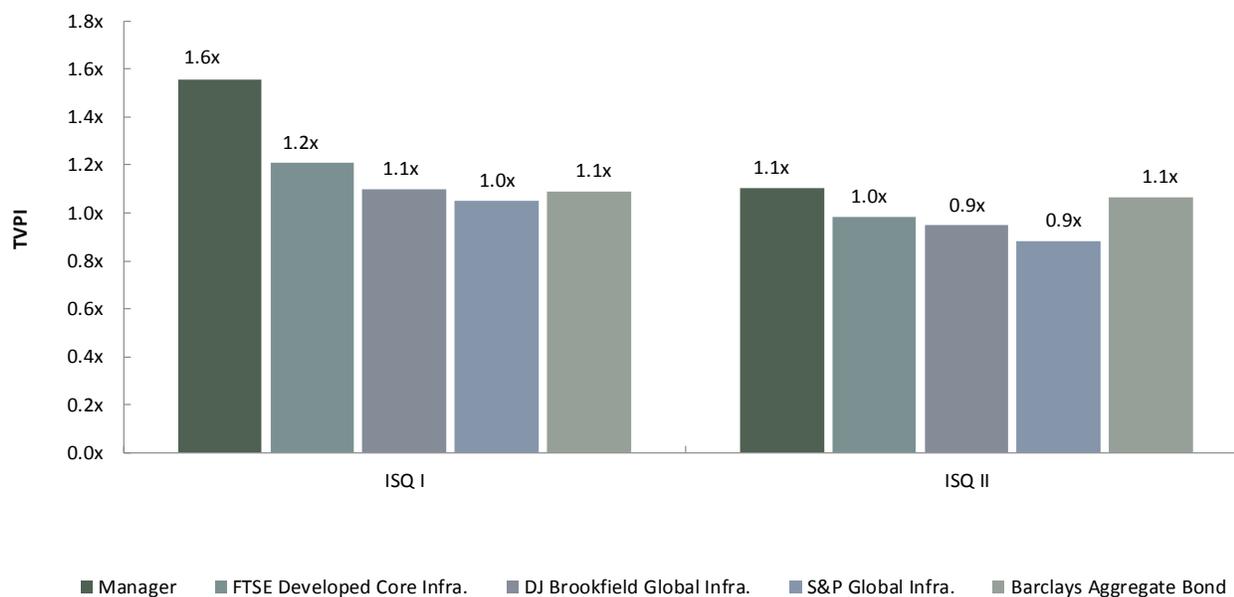
## PUBLIC MARKET COMPARISON

The charts below compare performance of ISQ funds to public infrastructure market indices: Barclays Aggregate Bond Index, FTSE Developed Core Infrastructure Index, DJ Brookfield Infrastructure Index, and S&P Global Infrastructure Index. We are comparing the manager's prior performance against the opportunity cost represented by the multiples and IRRs that would have been generated by investing in the public market indices highlighted. The fund series' net cash flows are assumed to be invested into and redeemed out of the index to create a comparable IRR.

**Public Market Comparison Performance by IRR  
As of March 31, 2020**



**Public Market Comparison Performance by TVPI  
As of March 31, 2020**



## EXHIBITS

## EXHIBIT A: INVESTMENT SCHEDULE

## ISQ I

(in millions)

Company	Entry Date	Exit Date	Capital Invested	Realized Value	Unrealized Value	Total Value	Ownership %	% of Gain	Gross TVPI	Gross IRR
Cube District Energy	Feb-14	Aug-19	\$141.0	\$199.8	\$30.9	\$230.7	72%	4.2%	1.6x	13.3%
Cube Hydro	Aug-14	Oct-19	156.1	357.8	3.0	360.8	45%	9.6%	2.3	20.8%
Lincoln Clean Energy	Dec-15	Oct-18	194.2	413.5	0.0	413.5	90%	10.3%	2.1	62.9%
Public Yieldco	Dec-15	Sep-17	84.7	107.7	0.0	107.7	n.a.	1.1%	1.3	16.7%
Amplus Energy	Jun-15	Apr-19	128.6	239.9	0.0	239.9	99%	5.2%	1.9	31.7%
<b>Total Realized</b>	<b>N/A</b>	<b>N/A</b>	<b>\$704.5</b>	<b>\$1,318.8</b>	<b>\$33.8</b>	<b>\$1,352.6</b>	<b>N/A</b>	<b>30%</b>	<b>1.9</b>	<b>25.2%</b>
Whiptail Midstream	Dec-15	n.a.	152.1	38.4	221.7	260.1	80%	5.1%	1.7	14.4%
Oregon Clean Energy	Nov-14	n.a.	161.7	47.6	128.0	175.7	37%	0.7%	1.1	2.5%
Asia Cube Water	Nov-14	n.a.	84.8	-1.9	99.6	97.6	100%	0.6%	1.2	3.9%
Cube Highways	May-15	Dec-18	243.1	218.2	257.4	475.7	45%	10.9%	2.0	28.0%
Energia Group	Apr-16	n.a.	393.8	192.9	655.7	848.6	65%	21.3%	2.2	25.4%
American Intermodal Management	Jul-16	n.a.	415.0	0.0	505.8	505.8	98%	4.3%	1.2	31.0%
Asia Cube Energy	Jul-16	n.a.	218.6	18.0	291.3	309.2	100%	4.3%	1.4	20.5%
Inkia Energy	Dec-16	n.a.	252.9	100.8	375.4	476.3	19%	10.5%	1.9	21.7%
T Solar	Dec-16	n.a.	201.5	148.8	278.0	426.8	100%	10.6%	2.1	39.4%
Conrad Energy	Jul-17	n.a.	154.6	0.0	184.6	184.6	98%	1.4%	1.2	18.1%
<b>Total Unrealized</b>	<b>N/A</b>	<b>N/A</b>	<b>\$2,278.1</b>	<b>\$762.8</b>	<b>\$2,997.4</b>	<b>\$3,760.2</b>	<b>N/A</b>	<b>69.6%</b>	<b>1.7</b>	<b>21.6%</b>
<b>Total</b>			<b>\$2,982.6</b>	<b>\$2,081.6</b>	<b>\$3,031.3</b>	<b>\$5,112.9</b>	<b>N/A</b>	<b>100.0%</b>	<b>1.7x</b>	<b>22.7%</b>

## ISQ II

(in millions)

Company	Entry Date	Exit Date	Capital Invested	Realized Value	Unrealized Value	Total Value	Ownership %	% of Gain	Gross TVPI	Gross IRR
<b>Total Realized</b>	<b>N/A</b>	<b>N/A</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>N/A</b>	<b>0%</b>	<b>0.0</b>	<b>0.0%</b>
EagleClaw	Dec-17	n.a.	\$615.5	\$0.0	\$634.2	\$634.2	24%	1.9%	1.0x	1.9%
Inkia	Dec-17	n.a.	566.4	161.2	810.1	971.3	61%	40.4%	1.7	28.9%
HGC	Oct-17	n.a.	395.5	17.4	520.9	538.3	39%	14.3%	1.4	13.2%
TIP	Jul-18	n.a.	679.9	0.7	916.2	916.9	72%	23.7%	1.3	23.7%
Nanjing	Jun-18	n.a.	62.7	0.0	63.1	63.1	76%	0.0%	1.0	1.4%
Think Gas	Jul-18	n.a.	54.2	0.0	74.8	74.8	87%	2.1%	1.4	83.8%
Cube Highways II	Dec-18	n.a.	6.9	0.0	7.0	7.0	45%	0.0%	1.0	2.2%
Cube Highways III	Dec-18	n.a.	2.1	0.0	1.9	1.9	45%	0.0%	0.9	-5.6%
Venture Global LNG	Jun-19	n.a.	464.5	0.0	566.2	566.2	0%	10.1%	1.2	29.6%
Domidep	Oct-19	n.a.	668.9	0.0	744.8	744.8	99%	7.6%	1.1	27.8%
Rubis Terminal	Jan-20	n.a.	0.0	0.0	0.0	0.0	45%	0.0%	n.a.	n.a.
Ocensa	Feb-20	n.a.	123.0	0.0	123.0	123.0	50.0% / 11.2%	0.0%	1.0	n.a.
<b>Total Unrealized</b>	<b>N/A</b>	<b>N/A</b>	<b>\$3,639.6</b>	<b>\$179.3</b>	<b>\$4,462.3</b>	<b>\$4,641.6</b>	<b>N/A</b>	<b>100.0%</b>	<b>1.3</b>	<b>19.3%</b>
<b>Total</b>			<b>\$3,639.6</b>	<b>\$179.3</b>	<b>\$4,462.3</b>	<b>\$4,641.6</b>	<b>N/A</b>	<b>100.0%</b>	<b>1.3x</b>	<b>19.3%</b>

## EXHIBIT B: REALIZED AND UNREALIZED INVESTMENT SCHEDULE

Fund	# of Inv.	Capital Invested	Realized Value	Unrealized Value	Gross TVPI	Gross IRR
ISQ I - Realized	5	\$704.5	\$1,318.8	\$33.8	1.9x	25.2%
ISQ I - Unrealized	10	\$2,278.1	\$762.8	\$2,997.4	1.7	21.6%
	<b>15</b>	<b>\$2,982.6</b>	<b>\$2,081.6</b>	<b>\$3,031.3</b>	<b>1.7x</b>	<b>22.7%</b>
ISQ II - Realized	0	\$0.0	\$0.0	\$0.0	0.0x	0.0%
ISQ II - Unrealized	11	\$3,639.6	\$179.3	\$4,462.3	1.3	19.3%
	<b>11</b>	<b>\$3,639.6</b>	<b>\$179.3</b>	<b>\$4,462.3</b>	<b>1.3x</b>	<b>19.3%</b>
All Prior Funds - Realized	5	\$704.5	\$1,318.8	\$33.8	1.9x	25.2%
All Prior Funds - Unrealized	21	\$5,917.7	\$942.1	\$7,459.7	1.4x	20.7%
<b>All Prior Funds - Total</b>	<b>26</b>	<b>\$6,622.2</b>	<b>\$2,260.9</b>	<b>\$7,493.5</b>	<b>1.5</b>	<b>21.6%</b>

## EXHIBIT D: PERFORMANCE BY SECTORS

ISQ I										
Industry	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
Power	3	\$534.9	\$65.6	\$603.9	\$669.4	17.9%	0.0%	6.3%	1.3x	11.1%
Renewable	4	680.4	1,160.0	280.9	1,441.0	22.8%	0.0%	35.7%	2.1	33.0%
Power & Renewable	2	393.8	300.7	406.3	707.0	13.2%	0.0%	14.7%	1.8	18.0%
Utilities	3	563.2	298.7	755.3	1,054.0	18.9%	0.0%	23.0%	1.9	21.3%
Midstream	1	152.1	38.4	221.7	260.1	5.1%	0.0%	5.1%	1.7	14.4%
Transportation	2	658.2	218.2	763.2	981.4	22.1%	0.0%	15.2%	1.5	28.6%
<b>Total</b>	<b>15</b>	<b>\$2,982.6</b>	<b>\$2,081.6</b>	<b>\$3,031.3</b>	<b>\$5,112.9</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>1.7x</b>	<b>22.7%</b>

ISQ II										
Industry	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
Power	1	\$566.4	\$161.2	\$810.1	\$971.3	15.6%	0.0%	40.4%	1.7x	28.9%
Gas Distribution	1	54.2	0.0	74.8	74.8	1.5%	0.0%	2.1%	1.4	83.8%
LNG	1	464.5	0.0	566.2	566.2	12.8%	0.0%	10.1%	1.2	29.6%
Midstream	3	738.5	0.0	757.2	757.2	20.3%	0.0%	1.9%	1.0	1.9%
Transportation	3	688.9	0.7	925.1	925.9	18.9%	0.0%	23.7%	1.3	23.5%
Communication	2	458.2	17.4	584.0	601.4	12.6%	0.0%	14.3%	1.3	12.9%
Social	1	668.9	0.0	744.8	744.8	18.4%	0.0%	7.6%	1.1	27.8%
<b>Total</b>	<b>12</b>	<b>\$3,639.6</b>	<b>\$179.3</b>	<b>\$4,462.3</b>	<b>\$4,641.6</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>1.3x</b>	<b>19.3%</b>

## Investments by Industry Since Inception

Industry	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	% of Gain	Gross TVPI
Power	4	\$1,101.3	\$226.7	\$1,414.0	\$1,640.7	16.6%	17.2%	1.5x
Renewable	4	680.4	1,160.0	280.9	1,441.0	10.3%	24.3%	2.1
Power & Renewable	2	393.8	300.7	406.3	707.0	5.9%	10.0%	1.8
Utilities	3	563.2	298.7	755.3	1,054.0	8.5%	15.7%	1.9
Gas Distribution	1	54.2	0.0	74.8	74.8	0.8%	0.7%	1.4
LNG	1	464.5	0.0	566.2	566.2	7.0%	3.2%	1.2
Midstream	4	890.6	38.4	978.9	1,017.3	13.4%	4.0%	1.1
Transportation	5	1,347.0	219.0	1,688.3	1,907.3	20.3%	17.9%	1.4
Communication	2	458.2	17.4	584.0	601.4	6.9%	4.6%	1.3
Social	1	668.9	0.0	744.8	744.8	10.1%	2.4%	1.1
<b>Total</b>	<b>27</b>	<b>\$6,622.2</b>	<b>\$2,260.9</b>	<b>\$7,493.5</b>	<b>\$9,754.5</b>	<b>100.0%</b>	<b>100.0%</b>	<b>1.5x</b>

## EXHIBIT E: PERFORMANCE BY INVESTMENT TYPE

ISQ I										
Type	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
Platform Investment	10	\$1,937.5	\$1,594.1	\$1,650.4	\$3,244.5	65.0%	0.0%	61.4%	1.7x	25.6%
Company Investment	5	1,045.1	487.5	1,380.9	1,868.4	35.0%	0.0%	38.6%	1.8	19.1%
<b>Total</b>	<b>15</b>	<b>\$2,982.6</b>	<b>\$2,081.6</b>	<b>\$3,031.3</b>	<b>\$5,112.9</b>	<b>100.0%</b>	<b>0.0%</b>	<b>N/A</b>	<b>1.7x</b>	<b>22.7%</b>

ISQ II										
Type	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
Platform Investment	8	\$1,870.2	\$18.2	\$2,328.7	\$2,346.9	51.4%	0.0%	47.6%	1.3x	19.4%
Company Investment	4	1,769.4	161.2	2,133.6	2,294.7	48.6%	0.0%	52.4%	1.3	19.2%
<b>Total</b>	<b>12</b>	<b>\$3,639.6</b>	<b>\$179.3</b>	<b>\$4,462.3</b>	<b>\$4,641.6</b>	<b>100.0%</b>	<b>0.0%</b>	<b>N/A</b>	<b>1.3x</b>	<b>19.3%</b>

## Investments by Stage Since Inception

Type	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Gross TVPI	% of Gain
Platform Investment	18	\$3,807.7	\$1,612.3	\$3,979.1	\$5,591.4	57.5%	1.5x	56.9%
Company Investment	9	2,814.5	648.7	3,514.4	4,163.1	42.5%	1.5	43.1%
<b>Total</b>	<b>27</b>	<b>\$6,622.2</b>	<b>\$2,260.9</b>	<b>\$7,493.5</b>	<b>\$9,754.5</b>	<b>100.0%</b>	<b>1.5x</b>	<b>N/A</b>

## EXHIBIT F: PERFORMANCE BY GEOGRAPHIES

ISQ I										
Geography	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
United States	6	\$1,220.1	\$1,057.2	\$889.3	\$1,946.5	40.9%	0.0%	34.1%	1.6x	19.9%
LATAM	1	252.9	100.8	375.4	476.3	8.5%	0.0%	10.5%	1.9	21.7%
Europe	3	749.8	341.6	1,118.3	1,459.9	25.1%	0.0%	33.3%	1.9	28.0%
Asia	4	675.2	474.2	648.3	1,122.4	22.6%	0.0%	21.0%	1.7	22.7%
Global	1	84.7	107.7	0.0	107.7	2.8%	0.0%	1.1%	1.3	16.7%
<b>Total</b>	<b>15</b>	<b>\$2,982.6</b>	<b>\$2,081.6</b>	<b>\$3,031.3</b>	<b>\$5,112.9</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>1.7x</b>	<b>22.7%</b>

ISQ II										
Geography	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
United States	2	\$1,080.0	\$0.0	\$1,200.5	\$1,200.5	29.7%	0.0%	12.0%	1.1x	8.9%
LATAM	2	689.4	161.2	933.1	1,094.3	18.9%	0.0%	40.4%	1.6	28.6%
Europe	3	1,348.8	0.7	1,661.0	1,661.7	37.1%	0.0%	31.2%	1.2	24.5%
Asia	5	521.4	17.4	667.7	685.2	14.3%	0.0%	16.3%	1.3	14.2%
Global	0	0.0	0.0	0.0	0.0	0.0%	0.0%	0.0%	0.0	0.0%
<b>Total</b>	<b>12</b>	<b>\$3,639.6</b>	<b>\$179.3</b>	<b>\$4,462.3</b>	<b>\$4,641.6</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>1.3x</b>	<b>19.3%</b>

## Investments by Geography Since Inception

Geography	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Gross TVPI	% of Gain
United States	8	\$2,300.0	\$1,057.2	\$2,089.7	\$3,147.0	0.0%	1.4x	27.0%
LATAM	3	942.3	262.0	1,308.5	1,570.5	0.0%	1.7	20.1%
Europe	6	2,098.7	342.4	2,779.3	3,121.6	0.0%	1.5	32.7%
Asia	9	1,196.5	491.6	1,316.0	1,807.6	0.0%	1.5	19.5%
Global	1	84.7	107.7	0.0	107.7	0.0%	1.3	0.7%
<b>Total</b>	<b>27</b>	<b>\$6,622.2</b>	<b>\$2,260.9</b>	<b>\$7,493.5</b>	<b>\$9,754.5</b>	<b>0.0%</b>	<b>1.5x</b>	<b>100.0%</b>

## EXHIBIT G: PERFORMANCE BY SOURCING TYPE

ISQ I										
Deal Source	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
Proprietary	12	\$2,251.3	\$1,680.2	\$2,000.1	\$3,680.2	75.5%	0.0%	67.1%	1.6x	22.3%
Public market	1	84.7	107.7	0.0	107.7	2.8%	0.0%	1.1%	1.3	16.7%
Limited Auction	2	646.7	293.7	1,031.2	1,324.9	21.7%	0.0%	31.8%	2.0	24.1%
<b>Total</b>	<b>15</b>	<b>\$2,982.6</b>	<b>\$2,081.6</b>	<b>\$3,031.3</b>	<b>\$5,112.9</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>1.7x</b>	<b>22.7%</b>

ISQ II										
Deal Source	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
Proprietary	11	\$3,244.1	\$161.9	\$3,941.4	\$4,103.3	108.8%	0.0%	85.7%	1.3x	21.0%
Limited Auction	1	395.5	17.4	520.9	538.3	13.3%	0.0%	14.3%	1.4	13.2%
<b>Total</b>	<b>12</b>	<b>\$3,639.6</b>	<b>\$179.3</b>	<b>\$4,462.3</b>	<b>\$4,641.6</b>	<b>122.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>1.3x</b>	<b>19.3%</b>

## Investments by Source Since Inception

Deal Source	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Gross TVPI	% of Gain
Proprietary	23	\$5,495.3	\$1,842.1	\$5,941.4	\$7,783.5	83.0%	1.4x	73.1%
Public market	1	84.7	107.7	0.0	107.7	1.3%	1.3	0.7%
Limited Auction	3	1,042.2	311.1	1,552.1	1,863.2	15.7%	1.8	26.2%
<b>Total</b>	<b>27</b>	<b>\$6,622.2</b>	<b>\$2,260.9</b>	<b>\$7,493.5</b>	<b>\$9,754.5</b>	<b>100.0%</b>	<b>1.5x</b>	<b>100.0%</b>

## EXHIBIT H: PERFORMANCE BY TEAM LEAD

## ISQ I

Investor	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
Adil Rahmathulla	6	\$986.5	\$908.0	\$756.0	\$1,664.0	33.1%	0.0%	31.8%	1.7x	19.2%
Gautam Bhandari	5	1,138.7	668.9	1,389.0	2,057.9	38.2%	0.0%	43.1%	1.8	25.9%
Sadek Wahba	2	357.6	506.6	280.9	787.6	12.0%	0.0%	20.2%	2.2	26.6%
Thomas Lefebvre	1	415.0	0.0	505.8	505.8	13.9%	0.0%	4.3%	1.2	31.0%
Ping Zhuang	1	84.8	-1.9	99.6	97.6	2.8%	0.0%	0.6%	1.2	3.9%
<b>Total</b>	<b>15</b>	<b>\$2,982.6</b>	<b>\$2,081.6</b>	<b>\$3,031.3</b>	<b>\$5,112.9</b>	<b>100.0%</b>	<b>0.0%</b>	<b>N/A</b>	<b>1.7x</b>	<b>22.7%</b>

## ISQ II

Investor	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	Loss Ratio by Invested Capital	% of Gain	Gross TVPI	Gross IRR
Adil Rahmathulla	3	\$1,861.8	\$161.9	\$2,360.5	\$2,522.4	51.2%	0.0%	65.9%	1.4x	19.7%
Gautam Bhandari	2	116.9	0.0	137.9	137.9	3.2%	0.0%	2.1%	1.2	35.3%
Sadek Wahba <sup>1</sup>		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	N/A	n.a.	n.a.
Thomas Lefebvre	1	464.5	0.0	566.2	566.2	12.8%	0.0%	10.1%	1.2	29.6%
Chenhua Shen	1	395.5	17.4	520.9	538.3	10.9%	0.0%	14.3%	1.4	13.2%
Harsh Agrawal	2	9.0	0.0	9.0	9.0	0.2%	1.6%	0.0%	1.0	-0.1%
Mohamed El Gazzar	1	668.9	0.0	744.8	744.8	18.4%	0.0%	7.6%	1.1	27.8%
Chucri Hjeily	1	123.0	0.0	123.0	123.0	3.4%	0.0%	0.0%	1.0	0.0%
<b>Total</b>	<b>11</b>	<b>\$3,639.6</b>	<b>\$179.3</b>	<b>\$4,462.3</b>	<b>\$4,641.6</b>	<b>100.0%</b>	<b>0.0%</b>	<b>N/A</b>	<b>1.3x</b>	<b>19.3%</b>

1) The deal was not yet funded as of March 31, 2020

## Investments by Lead Investor Since Inception

Investor	# of Deals	Capital Invested	Proceeds	Unrealized	Total Value	% of Cost	% of Gain	Gross TVPI
Adil Rahmathulla	9	\$2,848.2	\$1,069.9	\$3,116.5	\$4,186.4	43.0%	42.7%	1.5x
Gautam Bhandari	7	1,255.6	668.9	1,526.9	2,195.8	19.0%	30.0%	1.7
Sadek Wahba	2	357.6	506.6	280.9	787.6	5.4%	13.7%	2.2
Thomas Lefebvre	2	879.6	0.0	1,072.0	1,072.0	13.3%	6.1%	1.2
Ping Zhuang	1	84.8	-1.9	99.6	97.6	1.3%	0.4%	1.2
Chenhua Shen	1	395.5	17.4	520.9	538.3	6.0%	4.6%	1.4
Harsh Agrawal	2	9.0	0.0	9.0	9.0	0.1%	0.0%	1.0
Mohamed El Gazzar	1	668.9	0.0	744.8	744.8	10.1%	2.4%	1.1
Chucri Hjeily	1	123.0	0.0	123.0	123.0	1.9%	0.0%	1.0
<b>Total</b>	<b>26</b>	<b>\$6,622.2</b>	<b>\$2,260.9</b>	<b>\$7,493.5</b>	<b>\$9,754.5</b>	<b>100.0%</b>	<b>N/A</b>	<b>1.5x</b>

## EXHIBIT I: PIPELINE

## North America

Deal	Region	Sector	Subsector	Potential Total Equity Investment	Potential Co-Investment Opportunity	Brief description
Investment A	UK	Utilities	Waste management	\$900m	\$300m	Market leading waste business with large fleet of Energy from Waste assets
Investment B	Nordics	Transport	Bus Concessions	\$530m	-	Pan-Nordic public bus service provider with more than 110 contracts
Investment C	UK	Energy	Conventional Power	\$1,100m	\$500m	Distributed power rental provider with 20%+ market share globally
Investment D	Global	Transport	Tank Containers	\$150m	-	Global tank container leasing company
Investment E	Central Europe	Energy	Integrated Energy	\$1,000m	\$500m	Vertically integrated Polish power developer with 1.4GW offshore wind pipeline
Investment F	Italy	Transport	Marinas	\$250m	-	Italian marina platform with potential roll-up strategy
Investment G	Iberia	Utilities	Water & Waste	\$2,000m	\$1,300m	Carve-out of Spanish water treatment company
Investment H	Pan-European	Telecoms	Fibre	\$1,000m	\$500m	Carve-out of a European fibre network and Atlantic subsea cables
<b>Total</b>				<b>\$6,930m</b>	<b>\$3,100m</b>	

## Europe

Deal	Sector	Subsector	Potential Total Equity Investment	Potential Co-Investment Opportunity	Brief description
Investment A	Telecoms	Fiber	\$1,200	\$700	National fiber opportunity with follow-on capex to further expand and upgrade existing networks
Investment B	Telecom	Fiber	\$250m	-	Fiber based broadband solutions platform with current operations in the Southeast with growth potential through upgradable carve-outs and M&A
Investment C	Power & Utilities	Generation	\$500m	\$150m	Platform strategy to acquire utilities across the Caribbean
Investment D	Power & Utilities	Services	\$500m	-	Roll up strategy of smart grid applications and building controls solutions
Investment E	Midstream	Downstream NGLs	\$1,200	\$500	Partnership with premier operator on pipeline-level investment with investment grade customers as well as broader corporate investment to further deleverage high-quality balance sheet
Investment F	Midstream	Logistics	\$250m	-	Public Company considering partial / full divestment of energy logistics assets across multiple geographies
Investment G	Transport	Equipment Leasing	\$500m	-	Leading equipment lessor that provides services with chassis, intermodal and trailer leasing
<b>Total</b>			<b>\$4,400m</b>	<b>\$1,350m</b>	

## Asia

Deal	Region	Sector	Subsector	Potential Total Equity Investment	Potential Co-Investment Opportunity	Brief description
Investment A	Singapore	Midstream	Oil & Gas	\$120m	-	Provide natural gas to C&I customers in Singapore and Malaysia by developing a virtual LNG pipeline/small-scale LNG distribution
Investment B	Australia	Midstream	Oil & Gas	\$150m	-	Development of a distributed LNG business in Australia
Investment C	India	Midstream	Oil & Gas	\$175m	-	Partner with a Compression Service Co. to provide City Gas Distribution compression services on an opex model
Investment D	India	Transport	Toll Roads	\$115m	-	Acquisition of operational toll roads under the Toll-Operate-Transfer in an NHAI auction
Investment E	India	Transport	Toll Roads	\$140m	-	Acquisition of 8 Hybrid Annuity Model road projects from an Indian road developer
Investment F	Pan-Asia	Telecoms	Fiber	\$700	\$300	Opportunity to acquire the majority stake of an international connectivity and solution provider in Asia and continue to have greenfield roll out and market consolidation
Investment G	Indonesia	Telecoms	Data centers	\$200m	-	Partnership opportunity with a leading telecom operator in Indonesia for greenfield development of data centres
Investment H	Pan-Asia	Utilities	Waste Management	\$500	\$100	Opportunity to acquire stake from a regional incumbent to grow the water, wastewater and waste treatment business in China, Taiwan and Hong Kong
Investment I	India	Social Infrastructure	Healthcare	\$200m	-	Acquiring majority stake in India's leading (publicly listed) oncology focused healthcare platform
Investment J	Taiwan	Renewables	Renewables (Wind, Solar, Biomass)	\$34m	-	89MW ground mounted solar greenfield development project in Pingtung Province in Taiwan
<b>Total</b>				<b>\$2,334m</b>	<b>\$100m</b>	

## LATAM

Deal	Region	Sector	Subsector	Potential Equity Investment	Potential Co-Investment Opportunity	Brief description
Investment B	Brazil	Transport	Logistics	\$1,000	\$400	Opportunity to acquire largest integrated water logistics provider in LatAm, focused primarily on soy bean, iron ore, bauxite and other grains.
Investment C	Mexico	Telecom	Telecoms Infrastructure	\$800m	\$200m	Invest in the largest data center and managed service company in Mexico.
Investment D	Chile	Midstream - Oil & Gas	Midstream - Oil & Gas	\$600m	\$200m	Acquire oil and refined products pipeline from refineries / import ports to Santiago.
Investment E	Mexico	Telecom	Telecoms Infrastructure	\$600m	\$200m	Acquire one of the largest fiber networks in Mexico.
Investment F	Regional	Social Infrastructure	Education	\$350m	-	Partner with a group to develop and acquire K-12 schools across Latin America.
Investment G	Brazil	Telecom	Telecoms Infrastructure	\$300m	-	Consolidate ISP fiber operators and invest in build-out in 2 <sup>nd</sup> and 3 <sup>rd</sup> tier cities in Brazil.
Investment H	Colombia	Energy - Power & Other	Conventional Power	\$200m	\$50m	Opportunity to acquire 300 MW of gas-fired power plants in Colombia, backed by USD capacity payments.
Investment I	Brazil	Renewables	Renewables (Wind, Solar, Biomass)	\$160m	\$40m	Partner with local companies to pursue a portfolio of 635 MW solar PVs in Brazil.
<b>Total</b>				<b>\$4,010m</b>	<b>\$1,090m</b>	

## EXHIBIT K: ORGANIZATIONAL CHART

## Organizational chart

Investment Team	Asset Management and Operating	Senior Policy Advisors	Investor Relations and Co-Investments	Finance and Administration	Legal	Compliance
<b>47</b>	<b>21</b>	<b>12</b>	<b>8</b>	<b>42</b>	<b>4</b>	<b>5</b>
Managing Partners	COO, Americas	Policy and regulation	Managing Director	CFO	General Counsel	Chief Compliance Officer
<b>3</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Partners	Managing Directors	Energy	Principal	Head of Tax	Deputy General Counsels	Managers
<b>3</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>
Managing Directors	Operating Directors	ESG	Vice President	Controllers and assistant controllers	Senior Counsel	Corporate Secretaries
<b>6</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>3</b>
Principals	Operating Advisors	Transport	Associates and Analysts	Accounting		
<b>4</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>15</b>		
Vice Presidents	Vice Presidents	Utilities	Marketing	IT		
<b>8</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>		
Associates and Analysts	Associates and Analysts			Administration		
<b>23</b>	<b>5</b>			<b>17</b>		

**EXHIBIT M: BIOGRAPHIES****Sadek Wahba, Chairman and Managing Partner, Miami**

Sadek Wahba was previously at Morgan Stanley for 14 years where he was the CEO of Morgan Stanley Infrastructure, a global platform for infrastructure investments, and CIO of MSIP, a \$4 billion infrastructure investment fund. The portfolio included investments in several countries and diverse sectors including power generation, co-generation, gas distribution, transmission and distribution companies, airports, toll roads and container ports. Prior to joining Morgan Stanley, Sadek worked on structured financings at Lehman Brothers and as an economist at the World Bank in Washington DC.

Sadek holds a Ph.D. in economics from Harvard University, a M.Sc. in economics from the London School of Economics (LSE) and a BA in economics from the American University in Cairo. He is a published author on economic research, including articles in the Journal of the American Statistical Association, Review of Economics and Statistics as well as other publications and proceedings.

**Adil Rahmathulla, Managing Partner, Miami**

Adil was previously at Morgan Stanley for several years where he was the head of Morgan Stanley Infrastructure Americas Executions at MSIP. Prior to joining Morgan Stanley, Adil worked on M&A and financings at Credit Suisse and as a consultant and auditor for several years with Arthur Andersen and PricewaterhouseCoopers.

Adil holds an M.B.A. from the Yale School of Management at Yale University, a Bachelor of Commerce from the University of Bombay, is certified as a Chartered Accountant from the Institute of Chartered Accountants of Ontario, Canada and is certified as an Intermediate Chartered Accountant from the Institute of Chartered Accountants of India, where he placed fifteenth in the country in the nationwide Chartered Accountancy examinations. Adil is a member of the board of advisors of Yale International Center of Finance at Yale University.

**Gautam Bhandari, Managing Partner, Miami / Singapore**

Gautam was previously at Morgan Stanley for 11 years in New York and Asia. He started his career in finance in New York where he worked on debt restructurings, debt and equity financings as well as M&A for some of the firms larger and more complex clients such as General Motors, Tyco, Accenture, etc. He joined MSIP in 2008 where he was a voting member of the Investment Committee and served on several of the Review Committee's for the Fund, globally. At MSIP he was Managing Director and the Head of MSIP in Asia. Prior to joining Morgan Stanley, Gautam worked at Advanced Technology Materials Inc., a semiconductor chip technology company.

Gautam holds an M.B.A. in finance from the Stern School of Business at New York University where he was an Amerada Hess Merit Scholar, a Ph.D. in chemistry from the University of Delaware, where he was the University Merit Fellow and recipient of the Joel L. Silver Award for the best doctoral dissertation work and a B.Sc. (Honors) from St. Stephens College, Delhi University. Gautam also holds 20 patents in the semiconductor industry and is the author of several published academic papers.

**Harsh Agrawal, Partner, New Delhi / Singapore**

Harsh was previously an Executive Director leading the execution team based in India with MSIP. During his 12-year career at Morgan Stanley, Harsh was involved in strategic transactions and financings for transportation and infrastructure companies in North America, in investing roles focusing on healthcare and industrial companies in the United States, evaluating growth capital opportunities for companies in India, and most recently financing infrastructure projects in India.

Harsh worked with Morgan Stanley Principal Investments (MSPI) in Mumbai, India before joining MSI and evaluated investments for Morgan Stanley's proprietary investments group. Prior to moving to India, Harsh worked on more than \$10 billion of transactions as part of Morgan Stanley's investment banking group in New York for seven years, covering the North American Transportation and Infrastructure sector for 4 years.

Earlier in his career, Harsh worked at Morgan Stanley Capital Partners (MSCP) in New York where he focused on healthcare and industrial investments and Morgan Stanley's Financial Institutions Group covering insurance companies.

Harsh holds dual degrees in Computer Science and Economics from Lafayette College in Easton, Pennsylvania.

**Mohamed El Gazzar, Partner, London**

Mohamed El Gazzar is responsible for infrastructure strategy in Europe. Since joining I Squared Capital in 2013, Mohamed has led the acquisition and development of portfolio companies encompassing thermal, renewables and utilities and has recently diversified to include transportation and social infrastructure.

In the energy sector these companies include Energia Group in Northern Ireland and the Republic of Ireland, Conrad Energy in the United Kingdom and Grupo T-Solar, serving Spain, Italy, Peru and India. In 2018 Mohamed led the acquisition of TIP Trailer Services, specializing in trailer leasing, rental, maintenance and repair across 17 countries in Europe and Canada and in 2019 secured the purchase of Domidep, one of the largest elderly residential care providers in France.

Before joining I Squared Capital, Mohamed spent 12 years at Morgan Stanley, most recently as an Executive Director of Morgan Stanley Infrastructure Partners and earlier with Morgan Stanley Principal Investments (MSPI), where he evaluated investments for Morgan Stanley's proprietary investments group and was involved in several acquisitions in the EMEA region.

Mohamed holds an L.L.B. with Honors from Warwick University in the United Kingdom.

**Thomas Lefebvre, Partner, Miami**

Thomas was formerly a portfolio manager for the Americas at MSIP. At MSIP, Thomas led the fund's investment activities in the Energy & Utilities sector across the Americas. He was involved in 5 transactions, totaling more than \$2 billion in enterprise value.

Prior to joining MSIP, Thomas was a New York-based member of Morgan Stanley Principal Investments (MSPI), the Bank's proprietary special situations fund, where he co-led investment and asset management activities in the Energy, Utilities & Commodities sector. Earlier in his career, Thomas worked out of London at Morgan Stanley's Investment Banking Division covering Industrials, Telecoms, and Aerospace & Defense. During his 16-year career at Morgan Stanley, Thomas invested, advised on, or financed over twenty transactions, with a total value in excess of \$15 billion.

Prior to commencing his financial career, Thomas was the CEO & cofounder of Natika SARL, a Paris-based software engineering company. Thomas also served as a Sub-Lieutenant in the French Navy Commandos, based in Toulon, France.

Thomas holds an M.B.A. from Harvard Business School, an M.Sc. in Engineering from École Nationale Supérieure des Télécommunications in Paris, and an M.Sc. in Engineering from École Polytechnique in Paris.

**Chenhua Shen, Managing Director, Hong Kong**

Chenhua leads the investment and asset management in Asia including deal origination, due diligence, valuation, negotiation and execution. She works closely with portfolio companies in platform rollout, operation, financing, financial reporting, human resource and communication with regulators. She set up Asia Cube Energy, one of the largest renewable energy developers in Asia, invested in Asia Cube Water, a dedicated China wastewater treatment platform, and HGC Global Communications, a leading Hong Kong and international fixed line operator.

Chenhua was previously an associate on the investment team at Morgan Stanley Infrastructure Partners, a \$4 billion infrastructure investment fund. The portfolio included investments in several countries and diverse sectors including power generation, co-generation, gas distribution, transmission and distribution companies, airports, toll roads and container ports.

Chenhua holds a Master of Economics from the New York University, a Bachelor of Finance from Peking University, and is a CFA charter holder.

**Enrico Del Prete, Managing Director, London**

Enrico joined I Squared Capital in 2016 and was instrumental in the acquisitions of Grupo T Solar in Spain and TIP Trailer Services in the Netherlands. He currently serves as a board director in both companies and has been responsible for the execution of their bolt-on strategies, including the acquisitions of Ibereolica in Spain, PEMA in Germany and Trailer Wizards in Canada.

Prior to joining I Squared Capital, Enrico spent eight years at Terra Firma Capital Partners, most recently as a Director in its Energy and Infrastructure team, leading deals with an aggregate valued of over €2 billion. While at Terra Firma Enrico served as a board director on RTR Energy and Odeon Cinemas and spent a total of three years on secondment in operating roles at EMI Music and RTR Energy.

Enrico started his career at McKinsey, where he worked as a management consultant for five years in Milan, Rome and London.

Enrico holds an MBA from INSEAD and a Bachelor of Arts in Classics from the University of Oxford. He has been a visiting lecturer on Private Equity at Imperial College, London and at the Said Business School, University of Oxford. He is married with five children and lives in London.

**Larry M. Kellerman, Managing Director, Miami**

Larry focuses on clean energy, utilities and infrastructure technology and has four decades of leadership experience in the power generation and electric utilities industry.

Prior to joining I Squared Capital, he cofounded Twenty First Century Utilities, an innovative private investment and operating platform in the North American power and utilities and power sector, which entered into a strategic partnership with I Squared Capital in July 2019.

During his career, Kellerman has also held leadership positions with Quantum Energy Partners, where he was CEO of Quantum Utility Generation; Citizens Power, the nation's first independent power marketing firm, where he served as President from formation through the firm's sale; Portland General Electric, where he was General Manager responsible for Power Supply, Power Marketing and Fuels; and Southern California Edison.

He holds a B.A. in Management from the University of California, Davis, and an MBA from West Coast University, Los Angeles.

**Peter L. Corsell, Managing Director, Miami**

Peter focuses on clean energy, electric utilities and infrastructure technology. Prior to joining I Squared Capital, Peter was co-founder and Managing Partner at Twenty First Century Utilities, a private investment firm dedicated to transforming regulated electric utilities into more sustainable, customer focused, and technology driven businesses. He is also Chairman of GridPoint, a leading clean technology company, which he founded in 2003 and led as CEO until 2010. GridPoint has deployed more than 500,000 connected devices and has saved its customers over \$400 million and 5 billion kilowatt-hours of energy.

In 2011, Peter cofounded Hubub, a digital platform for individuals and publishers to discuss and debate topics of interest. In partnership with Bell Media, Hubub developed a large following in Canada, where it was featured in a 2015 Super Bowl commercial. In 2016, Hubub was acquired by The StagwellGroup, where Peter is Senior Advisor.

Earlier in his career, Peter served with the Central Intelligence Agency and with the U.S. Department of State in Havana, Cuba.

He holds a BSFS degree from the Edmund A. Walsh School of Foreign Service at Georgetown University.

**Tom Murray, Managing Director, Miami**

Tom is responsible for infrastructure credit investments, including debt capital markets activities for I Squared Capital's portfolio companies. Tom joined I Squared Capital in 2019 to build the Firm's infrastructure credit platform after more than 20 years in leadership positions at major financial institutions, including Apollo Global Management, WestLBAG and Credit Suisse First Boston.

From 2014 to September 2018, Tom was a Managing Director and the Global Head of Infrastructure Credit at Apollo, where he developed the firm's infrastructure credit strategy, hired and led a dedicated team and invested in over 30 transactions ranging from high-yielding senior to mezzanine debt across many sub-sectors, including power, renewables, transportation, social and telecommunications infrastructure. Prior to Apollo, Tom led the Global Energy and Project Finance business at WestLB for ten years.

Tom received his B.A. from the University of Washington and his MBA from Columbia University.

**Chucri Hjeily, Managing Director, Miami**

Chucri is responsible for infrastructure investments in Latin America, representing more than \$5 billion in enterprise value. These include the acquisitions of Orazul Energy from Duke Energy in 2016 and of Inkia Energy from IC Power the following year.

Prior to joining I Squared Capital in 2015, Chucri was at Global Infrastructure Partners, where he was a Vice President of Investments in the Americas and participated in the due diligence and management of several portfolio companies. Prior to joining Global Infrastructure Partners, Chucri was a Senior Associate of Morgan Stanley Infrastructure Americas Executions, part of Morgan Stanley Infrastructure Partners.

Chucri holds an MBA from the Wharton School at the University of Pennsylvania as well as a Bachelor of Computer Science and a Bachelor of Commerce from the University of Washington in Seattle.

## APPENDIX

### RATING RATIONALE

Factor	Comments
<b>Strategy</b>	ISQ's strategy is a mix of Platform Investments and Company Investments. It focuses on mid-market segment of infrastructure by developing investment platforms that acquires, aggregates (through add-on acquisitions) small and mid-market assets with an ability to also develop new assets and capacities using the platforms. The platforms do not only serve as aggregator of assets but ISQ seeks to put a dedicated in-house management team in place for each platform with deep industry knowledge and expertise that sources and executes deals within the platform's mandate. This platform approach of investing results in less competitive deal flow for ISQ where returns are generated from bilateral deal negotiations and achieving scalability through organic growth, add-ons as well as active operational value creation instead of relying on continuous expansion in valuation multiples.
<b>Sponsor</b>	I Squared Capital is a specialist global infrastructure firm headquartered in Miami with other offices in New York, London, New Delhi, Singapore, and Hong Kong. The Firm is 80% owned by its employees (mainly the Principals and other partners) who control and manage it and passive 20% by funds affiliated with Dyal Capital. The team has grown from only 30 professionals (including 3 partners) in 2014 to 140 professionals (including 6 partners) in 2020.
<b>Investment Process</b>	The investment process of ISQ is comprised of four stages, sourcing, rigorous investment due diligence and approval, asset management and exit. The process has focused on sourcing and executing exclusive investment opportunities on bilateral negotiations by utilizing on-the-ground team's local industry relationships (outside auctions or sell-side financial advisors network). Since inception, ISQ has reviewed deals representing \$225 billion in potential equity value, 62.6% of which were retained for further due diligence, 9% were presented to the Investment Committee, and only 3.5% were acquired.
<b>ESG Policy &amp; Practices</b>	Environmental, social and governance ("ESG") is incorporated and imbedded in ISQ's investment process. The Firm strongly emphasizes on the importance of ESG issues in investment decisions and long-term performance and is a signatory to the United Nations inspired Principles for Responsible Investing ("PRI").
<b>Fund Structure</b>	The Sponsor tends to accommodate many investor types' sensitivities to tax, ERISA, etc. and has the resources and legal experience.
<b>Performance</b>	ISQ has been actively investing capital in its target infrastructure sub-sectors and geographies since 2014. Across its two prior funds, the Firm has raised \$10.0 billion in total commitments, invested \$6.6 billion across 26 deals, realized \$2.3 billion with remaining portfolio marked at \$7.5 billion, as of March 31, 2020. This reflects combined net internal rate of return ("IRR") of 15.9% and net total value to paid-in ("TVPI") of 1.3x in U.S. Dollars ("USD") terms. ISQ I and ISQ II both rank top quartile based on net IRR as of December 31, 2019.
<b>Operational Due Diligence</b>	Pass
<b>Terms &amp; Conditions</b>	Most fund terms and conditions are either in-line with market except management fee at 1.6% that is higher than market average.
<b>Overall Rating</b>	The comparative advantages described in the report outweigh those issues/concerns raised for this vintage, producing an overall Buy rating.

## INVESTMENT RATING EXPLANATION

The comments and assertions reflect Townsend views of the specific investment product and its strengths and weaknesses in general and in the context of Townsend's *View of the World* and same vintage alternative choices.

**Buy** – Townsend recommends the investment for those client portfolios where it is a fit.

**Qualified** – Townsend believes the manager to be qualified to manage client assets.

## OPERATIONAL DUE DILIGENCE RATING EXPLANATION

**A1 Pass** – No material operational concerns; firm's operations largely align with a well-controlled environment.

**A2 Pass** – The firm's operations largely align with a well-controlled environment, with limited exceptions.

**Conditional Pass** – AON identified specific operation concerns that the firm agreed to address in a reasonable time frame.

**Fail** – AON noted material operational concerns that introduce potential economic or reputational exposure.

#### About Townsend Group – An Aon Company

Founded in 1983, The Townsend Group provides custom real asset solutions that help clients worldwide achieve their unique investment goals. As an Aon company, The Townsend Group is now part of one of the top three outsourced chief investment officer (OCIO) providers in the world measured by global assets under management. Aon's investment organization, including Townsend, manages more than \$130 billion of worldwide assets under management and has advised on more than \$240 billion of real estate assets.

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**ARKANSAS TEACHER RETIREMENT SYSTEM**  
**1400 West Third Street**  
**Little Rock, Arkansas 72201**

**RESOLUTION**  
**No. 2021-09**

**Approving Investment in ISQ Global Infrastructure Fund III, L.P.  
with Imminent Need**

**WHEREAS**, the Board of Trustees (Board) of the Arkansas Teacher Retirement System (ATRS) is authorized to invest and manage trust assets for the benefits of its plan participants; and

**WHEREAS**, the ATRS Board has reviewed the recommendation of its real assets investment consultant, Aon Hewitt Investment Consulting, Inc., along with the recommendation of the Investment Committee and ATRS staff regarding a potential investment in **ISQ Global Infrastructure Fund III, L.P.**, an infrastructure fund that invests in utilities, transportation, communication, renewable power, midstream energy and social infrastructure businesses; and

**WHEREAS**, the ATRS Board approves an investment of up to **\$50 million dollars (\$50,000,000)** in **ISQ Global Infrastructure Fund III, L.P.**, and the Board, after its review of the timing in which the closing of the investment in **ISQ Global Infrastructure Fund III, L.P.** may need to occur, has determined that there is an imminent need to immediately enter into the partial equity ownership agreement prior to the next scheduled meeting of the Arkansas Legislative Council. The Board also deems it financially appropriate to enter into the partial equity ownership agreement and concludes that to forego the opportunity to promptly implement its investment directives under the prudent investor rule would be inconsistent with its fiduciary duty of care to the members and annuitants;

**NOW, THEREFORE, BE IT RESOLVED**, that the ATRS Board approves an investment of up to **\$50 million dollars (\$50,000,000)**, in **ISQ Global Infrastructure Fund III, L.P.** and agrees to immediately move to close and subscribe the approved ATRS limited partnership investment interest in **ISQ Global Infrastructure Fund III, L.P.** The total investment amount is to be determined by the real assets consultant and ATRS staff based upon the allocation available to ATRS and the overall investment objectives set by the ATRS Board; and

***FURTHER, BE IT RESOLVED***, that the ATRS staff is hereby authorized to take all necessary and proper steps to implement this investment using the Imminent Need process, if acceptable terms are reached.

**Adopted this 1st day of February, 2021.**

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**Mr. Danny Knight, *Chair***  
**Arkansas Teacher Retirement System**

# Arkansas Teacher Retirement System Private Equity Portfolio Review

September 30, 2020

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# Executive Summary

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### Portfolio Summary

Since establishing the private equity program in 1996, Arkansas Teacher Retirement System (“ATRS”) has committed approximately \$5.4 billion to 87 primary funds, 26 fund-of-funds, 1 co-investment fund, and 12 direct investments through September 30, 2020. Of the \$5.4 billion committed, 85% has been contributed, 102% of contributed capital has been returned, and a total value of 1.6 times contributed capital has been generated. ATRS’ portfolio has outperformed the Dow Jones U.S. Total Stock Market Index equivalent (“PME”) by 390 basis points since inception.

### Investment Activity

For the nine months ended September 30, 2020, ATRS made capital contributions of approximately \$308.8 million and received distributions of \$243.8 million, for net contributions of \$65.0 million.

### Commitment Activity

Since January 1, 2020, ATRS closed on commitments totaling \$245.0 million to the following eight funds:

- Thoma Bravo Explore I (\$20.0 million)
- FP Venture XIII (\$60.0 million)
- BV X (\$30.0 million)
- FP Intl X (\$30.0 million)
- Greyrock V (\$35.0 million)
- Thoma Bravo XIV (\$20.0 million)
- Thoma Bravo Discover III (\$20.0 million)
- LLR VI (\$30.0 million)

### Market Commentary

#### COVID-19 Update

The COVID-19 pandemic continues to affect private capital markets, including fund manager operations, economic conditions, capital market activity, portfolio management, and fundraising. Within the U.S. buyout market, purchase prices and leverage levels are showing signs of decline during 2020 after more than a decade of steady growth.

#### U.S. Private Equity

PE investment activity has declined modestly as a result of the COVID-19 pandemic. Aggregate investment and deal count are down 23% and 16%, respectively. As a result, pricing and leverage levels in the U.S. buyout market have shown signs of decline during 2020 after more than a decade of steady growth. Fundraising activity has seen a more substantial decline, with aggregate capital raised and fund count behind 2019 pace by 46% and 35%, respectively.

#### U.S. Venture Capital

Despite the slowdown in fundraising and investment activity across most capital markets, aggregate venture capital fundraising in 2020 has exceeded 2019 fundraising in only three quarters. VC investment activity has remained consistent and is tracking toward the 2019 pace. Exit activity, however, has slowed. Aggregate exit value and deal count are down 25% and 14%, respectively, compared to 2019.

*Franklin Park*

January 15, 2021

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# Portfolio Overview

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## Portfolio Summary



Group	Num.	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	Remaining Value (%)	Exposure (\$)	DPI	TVPI	Net IRR
<b>By Vehicle</b>											
1996-2000: Legacy Portfolio	13	1,106,390,461	1,070,676,238	0	1,639,782,207	422,298	0.0%	422,298	1.5 x	1.5 x	9.2%
2005-2006: CSFB Portfolio	2	654,300,000	687,666,531	65,091,900	974,575,025	107,533,313	4.0%	172,625,213	1.4 x	1.6 x	8.7%
Post 2006 Fund Portfolio	99	3,103,323,718	2,288,102,971	1,176,886,593	1,900,207,495	1,907,492,025	70.4%	3,084,378,618	0.8 x	1.7 x	15.8%
Big River Steel	8	257,880,449	257,940,356	0	132,006,068	396,068,813	14.6%	396,068,813	0.5 x	2.0 x	20.8%
Blue Oak Arkansas	1	18,000,000	19,740,000	0	4,717,993	0	0.0%	0	0.2 x	0.2 x	-50.5%
Highland LLC	2	218,244,727	234,114,727	0	31,674,525	279,828,392	10.3%	279,828,392	0.1 x	1.3 x	24.0%
GTLA Holdings	1	20,000,000	20,000,000	0	0	20,000,000	0.7%	20,000,000	0.0 x	1.0 x	0.0%
<b>Total</b>	<b>126</b>	<b>5,378,139,355</b>	<b>4,578,240,824</b>	<b>1,241,978,493</b>	<b>4,682,963,312</b>	<b>2,711,344,841</b>	<b>100.0%</b>	<b>3,953,323,334</b>	<b>1.0 x</b>	<b>1.6 x</b>	<b>11.1%</b>
<b>By Fund Type</b>											
Co-Investment Fund	1	263,823,718	248,680,187	165,710,940	173,261,123	247,063,582	9.1%	412,774,522	0.7 x	1.7 x	18.3%
Fund-of-Funds	26	1,304,300,000	1,052,009,927	346,079,724	1,210,624,850	666,491,416	24.6%	1,012,571,140	1.2 x	1.8 x	11.4%
Operating Company	12	514,125,176	531,795,084	0	168,398,585	695,897,205	25.7%	695,897,205	0.3 x	1.6 x	18.9%
Primary Fund	87	3,295,890,461	2,745,755,627	730,187,829	3,130,678,754	1,101,892,638	40.6%	1,832,080,467	1.1 x	1.5 x	10.5%
<b>Total</b>	<b>126</b>	<b>5,378,139,355</b>	<b>4,578,240,824</b>	<b>1,241,978,493</b>	<b>4,682,963,312</b>	<b>2,711,344,841</b>	<b>100.0%</b>	<b>3,953,323,334</b>	<b>1.0 x</b>	<b>1.6 x</b>	<b>11.1%</b>

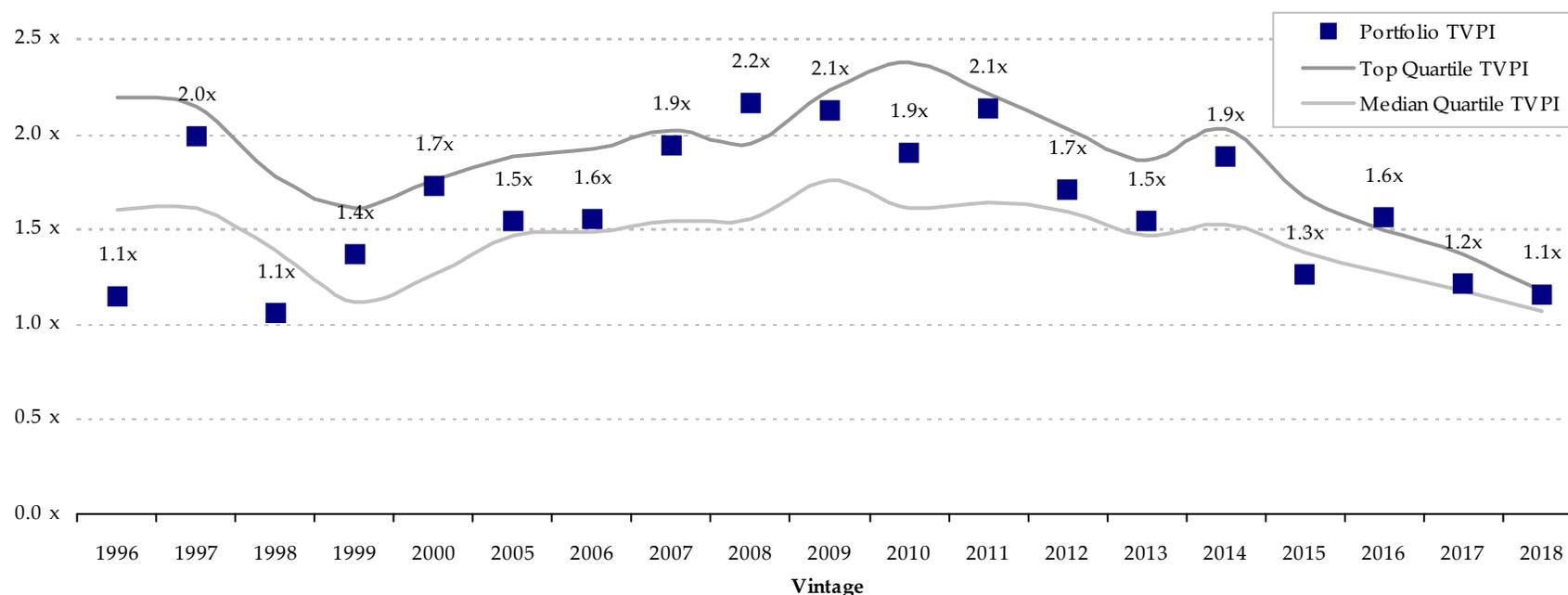
## Portfolio Summary



Group	Num.	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	Remaining Value (%)	Exposure (\$)	DPI	TVPI	Net IRR
<b>By Strategy</b>											
Buyout	62	2,392,390,461	1,941,403,669	588,470,212	2,337,038,588	868,897,028	32.0%	1,457,367,240	1.2 x	1.7 x	11.2%
Distressed Debt	3	100,000,000	93,881,464	25,486,571	81,689,678	44,502,496	1.6%	69,989,067	0.9 x	1.3 x	6.3%
Growth Equity	3	120,000,000	87,804,590	35,057,033	169,874,030	52,999,417	2.0%	88,056,450	1.9 x	2.5 x	19.8%
Hard Assets	12	545,744,727	536,746,666	46,876,521	209,722,827	392,115,146	14.5%	438,991,667	0.4 x	1.1 x	5.2%
Infrastructure	8	270,880,449	272,676,670	0	128,498,770	396,068,813	14.6%	396,068,813	0.5 x	1.9 x	18.4%
Mezzanine	7	285,000,000	182,944,104	46,453,964	211,834,459	29,407,815	1.1%	75,861,779	1.2 x	1.3 x	10.1%
Multi-Strategy	6	974,123,718	1,003,334,752	231,285,840	1,174,648,455	359,587,244	13.3%	590,873,084	1.2 x	1.5 x	8.2%
Special Assets	1	30,000,000	8,497,598	21,502,402	3,195	6,295,226	0.2%	27,797,628	0.0 x	0.7 x	NMF
Structured Capital	3	85,000,000	75,766,983	27,964,882	29,398,720	57,536,332	2.1%	85,501,214	0.4 x	1.1 x	6.3%
Turnaround	8	210,000,000	144,657,074	90,446,067	139,867,575	82,889,818	3.1%	173,335,885	1.0 x	1.5 x	15.1%
Venture Capital	13	365,000,000	230,527,252	128,435,001	200,387,015	421,045,506	15.5%	549,480,507	0.9 x	2.7 x	23.2%
<b>Total</b>	<b>126</b>	<b>5,378,139,355</b>	<b>4,578,240,824</b>	<b>1,241,978,493</b>	<b>4,682,963,312</b>	<b>2,711,344,841</b>	<b>100.0%</b>	<b>3,953,323,334</b>	<b>1.0 x</b>	<b>1.6 x</b>	<b>11.1%</b>
<b>By Sub-Asset Class</b>											
Corporate Finance	101	4,499,014,179	3,815,918,489	1,113,543,492	4,314,177,712	1,594,402,130	58.8%	2,707,945,622	1.1 x	1.5 x	10.3%
Direct Investments	12	514,125,176	531,795,084	0	168,398,585	695,897,205	25.7%	695,897,205	0.3 x	1.6 x	18.9%
Venture Capital	13	365,000,000	230,527,252	128,435,001	200,387,015	421,045,506	15.5%	549,480,507	0.9 x	2.7 x	23.2%
<b>Total</b>	<b>126</b>	<b>5,378,139,355</b>	<b>4,578,240,824</b>	<b>1,241,978,493</b>	<b>4,682,963,312</b>	<b>2,711,344,841</b>	<b>100.0%</b>	<b>3,953,323,334</b>	<b>1.0 x</b>	<b>1.6 x</b>	<b>11.1%</b>

- Remaining Value is defined as the investor's value as reported by the fund's manager.
- Exposure is defined as the sum of the investor's Remaining Value plus Unfunded Commitment.
- DPI is the ratio of Distributed Capital to Contributed Capital.
- TVPI is the ratio of Distributed Capital plus Remaining Value to Contributed Capital.
- Net IRR is defined as the annualized, compound rate of return using daily draws, distributions and Remaining Value as of the Report Date, net of fees and expenses, including late closing interest.
- Results include fully liquidated investments (if applicable).
- Commitments made in a foreign currency have been converted into U.S. dollars using an exchange rate as of the Report Date.

TVPI by Vintage



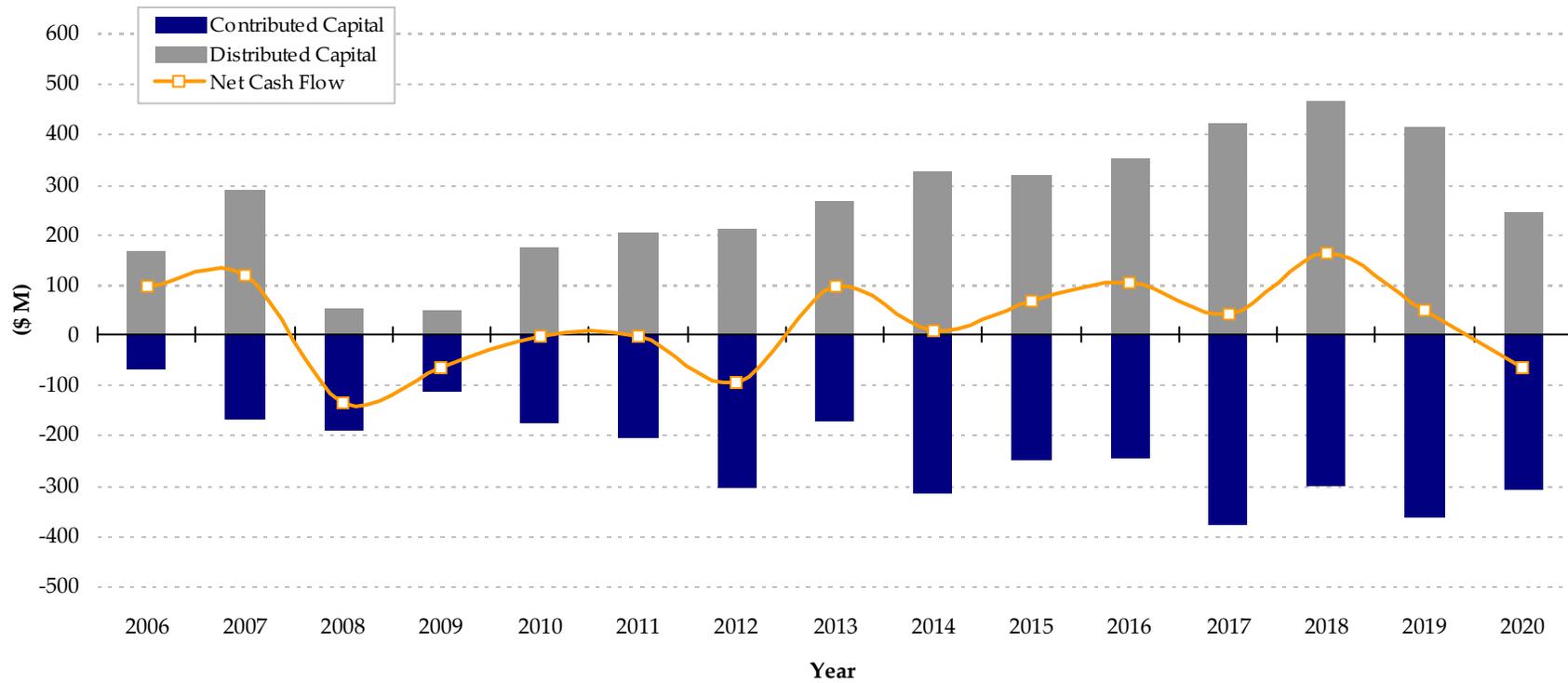
Net IRR vs. PME vs. Cambridge Associates: U.S. All Private Equity

Calculation Set	1-Year	3-Year	5-Year	10-Year	Inception
Aggregate Portfolio	16.7%	18.3%	16.2%	15.5%	11.1%
DJ US TSM TR Index* Public Market Equivalent (Aggregate Portfolio)	15.9%	11.4%	13.6%	13.5%	7.2%
Cambridge Associates: U.S. All Private Equity	7.7%	13.1%	11.1%	14.4%	N/A
Post 2006 Fund Portfolio	20.8%	18.8%	16.4%	16.5%	15.8%
DJ US TSM TR Index* Public Market Equivalent (Post 2006 Fund Portfolio)	16.6%	11.6%	13.6%	13.2%	12.6%

\* The Dow Jones U.S. Total Stock Market Total Return Index measures all U.S. equity securities that have readily available prices and is calculated with dividend reinvestment.

- 
- Benchmark TVPI represents vintage year first quartile per Cambridge Associates, as of June 30, 2020. The portfolio is compared to data compiled across multiple strategies including U.S. Buyout, Growth Equity, Venture Capital, Mezzanine, Distressed, Fund-of-funds, and Secondary funds.
  - Net IRR is defined as the annualized, compound rate of return using daily draws, distributions and Remaining Value as of the Report Date, net of fees and expenses, including late closing interest.
  - The public market equivalent (PME) represents the performance of a public market index expressed in terms of an IRR, using the same cash flows and timing as the investor's investment activity in private equity. The PME serves as a proxy for the return the investor could have achieved by investing in the public market. The PME return assumes cash flows are invested at the end of each day.
  - Cambridge Associates: U.S. All Private Equity reflects the pooled net IRR based on data compiled from Cambridge Associates as of June 30, 2020.
  - Benchmark data is not available (N/A).

# Annual Cash Flow

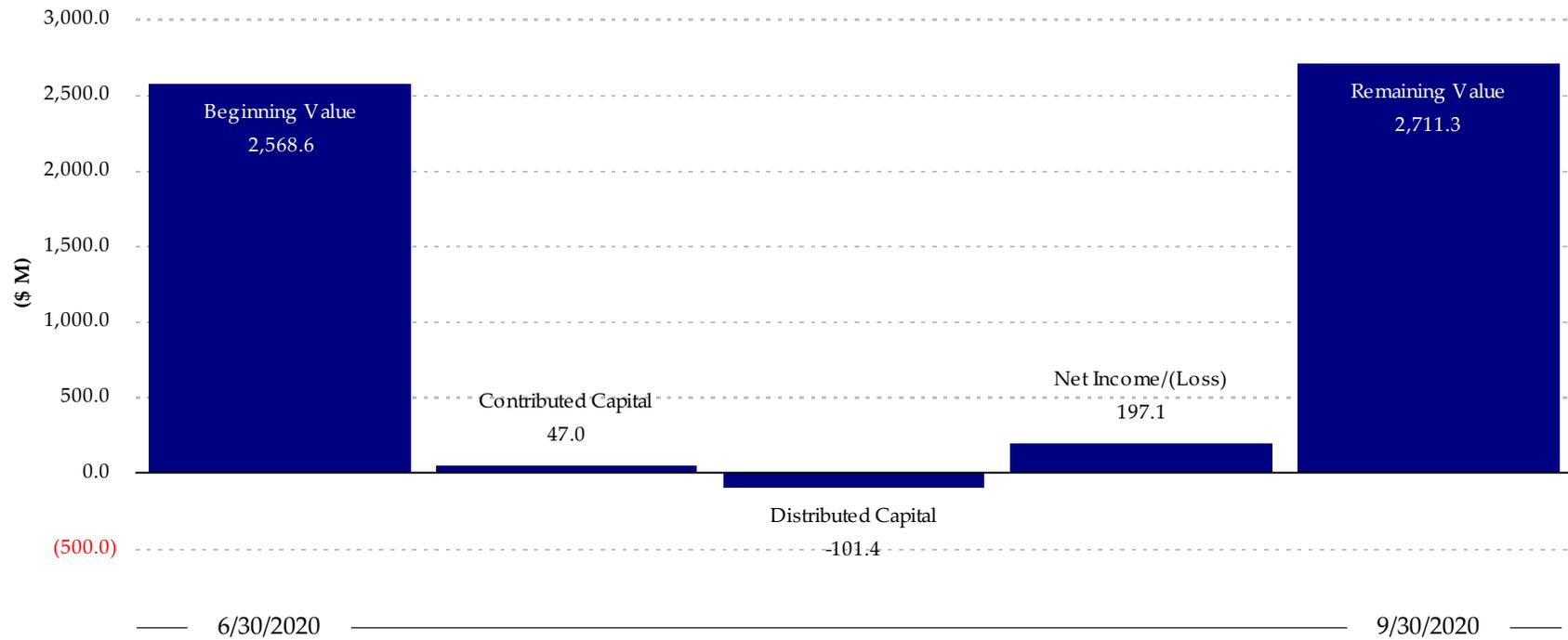


2020 (\$)		
Distributed	Contributed	Net Cash Flow
243,799,722	-308,809,803	-65,010,081

▫ Cash flow data was compiled through the Report Date.

## Capital Account Change Since Prior Quarter

### Quarterly Portfolio Activity



Percent Change in Value	7.7%
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- Beginning Value represents the aggregate Remaining Value of the portfolio as of the prior quarter-end.
- Percent Change in Value is calculated by dividing Net Income / (Loss) by Beginning Value.

## Recent Commitments



### Commitments for Year Ended December 31, 2020

Fund	Strategy	Date	Commitment (\$)
Thoma Bravo Explore I	Buyout	Jan 2020	20,000,000
FP Venture XIII	Venture Capital	Feb 2020	60,000,000
BV X	Buyout	Feb 2020	30,000,000
FP Intl X	Buyout	Mar 2020	30,000,000
Greyrock V	Mezzanine	Apr 2020	35,000,000
Thoma Bravo XIV	Buyout	May 2020	20,000,000
Thoma Bravo Discover III	Buyout	May 2020	20,000,000
LLR VI	Growth Equity	Sep 2020	30,000,000
<b>Total</b>			<b>245,000,000</b>

### Year to Date Commitments as of January 14, 2021

Not Applicable

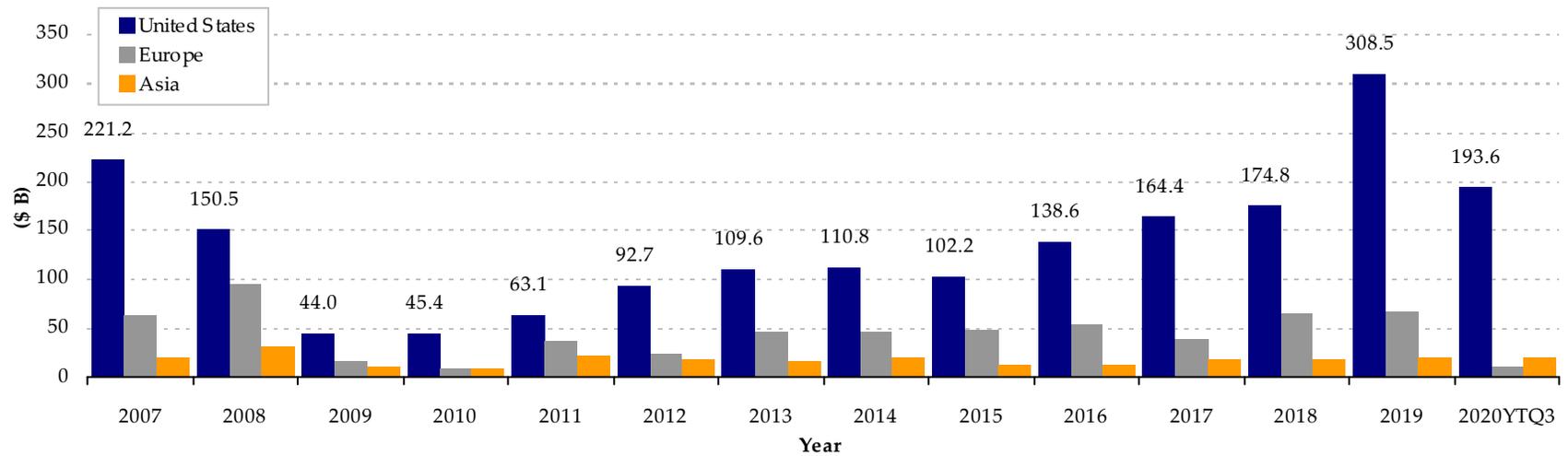
### Approved and Pending Commitments as of January 14, 2021

Not Applicable

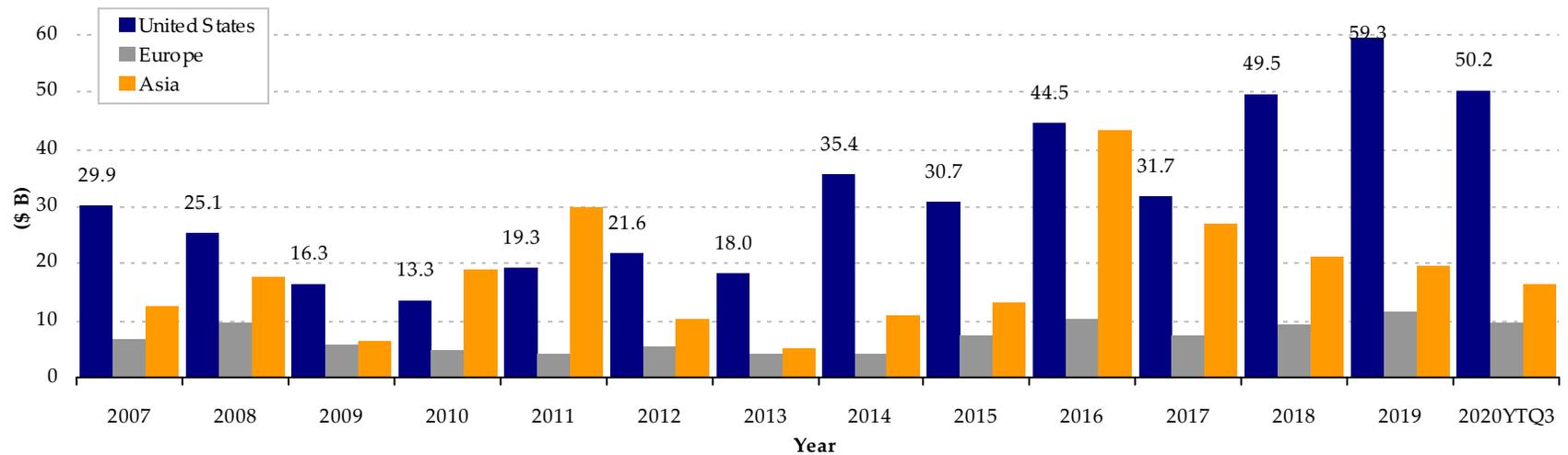
▫ Commitments made in a foreign currency have been converted into U.S. dollars using an exchange rate as of the Report Date, if applicable.

**Market Update**

Buyout Funds

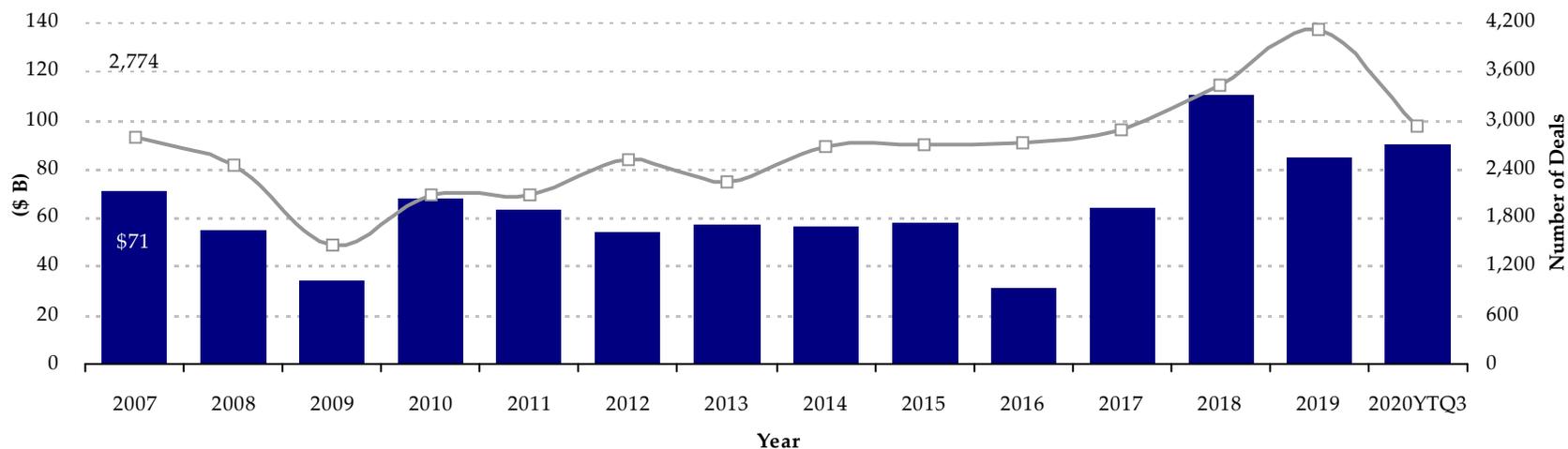


Venture Funds

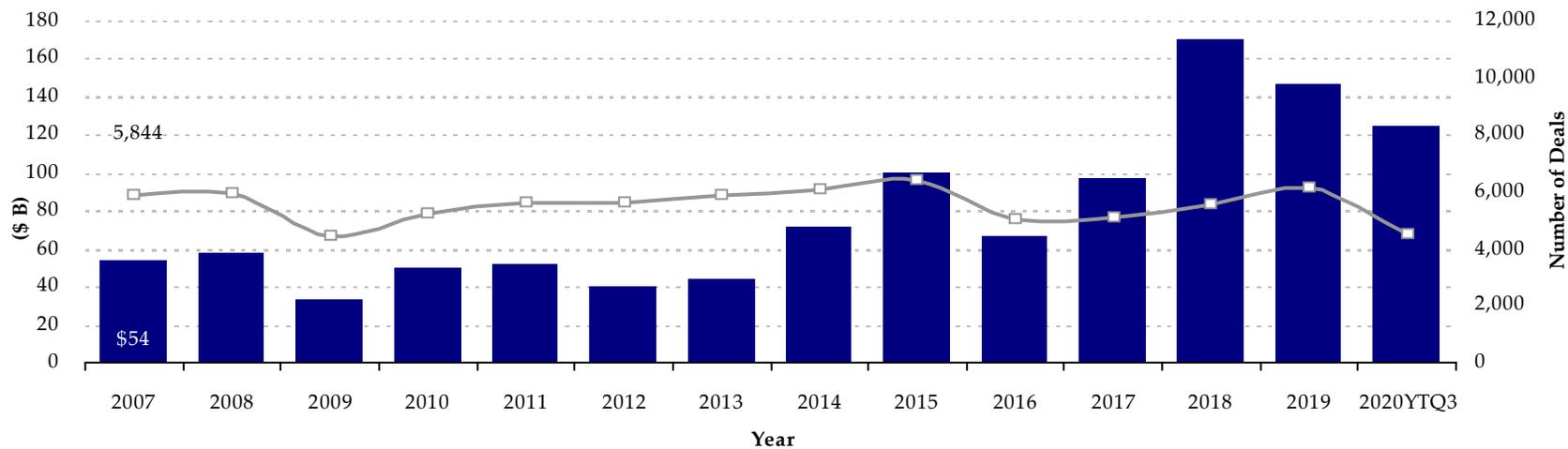


Source: Thomson One Private Equity.  
Data compiled through 3Q 2020.

**U.S. Buyout**

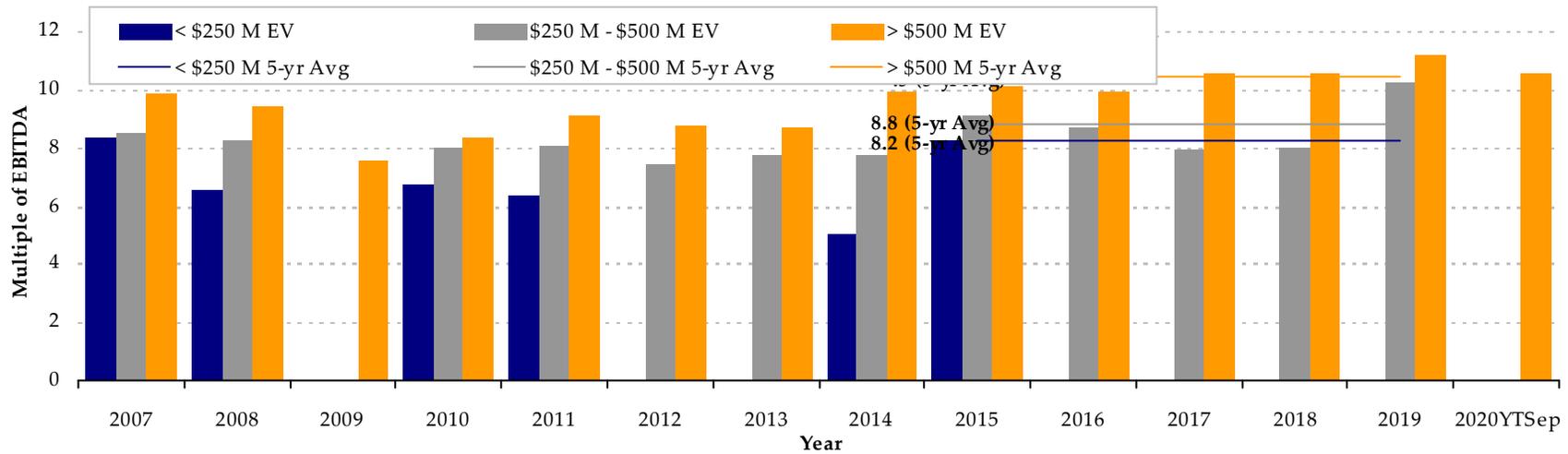


**U.S. Venture**

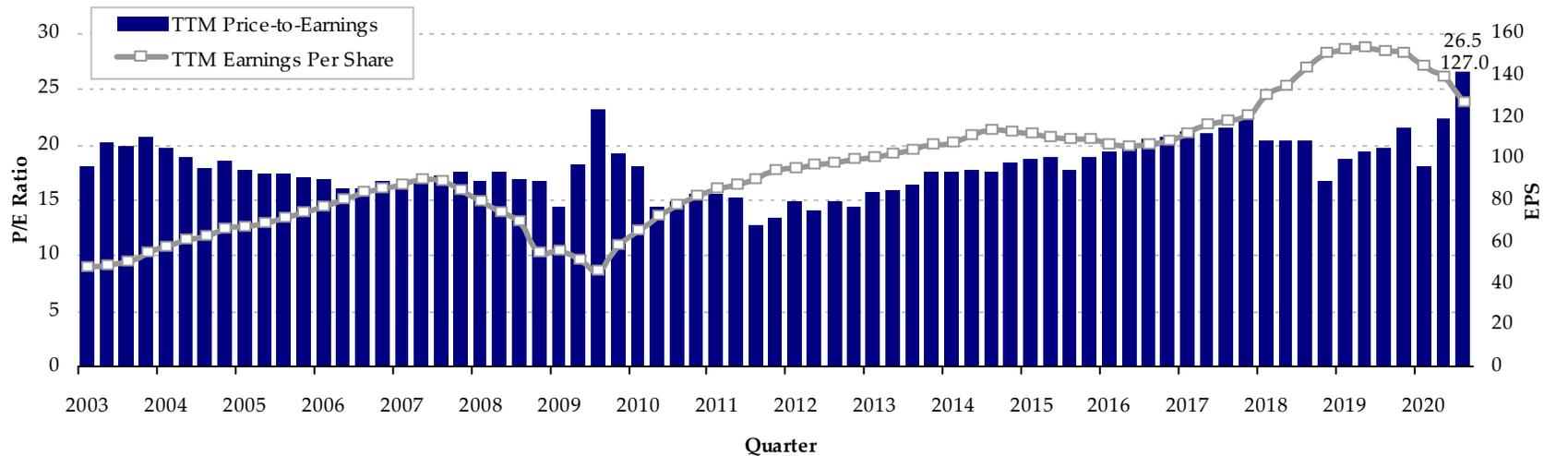


- Source: Thomson One Private Equity.
- Data compiled through 3Q 2020.

U.S. LBO Pricing Multiples

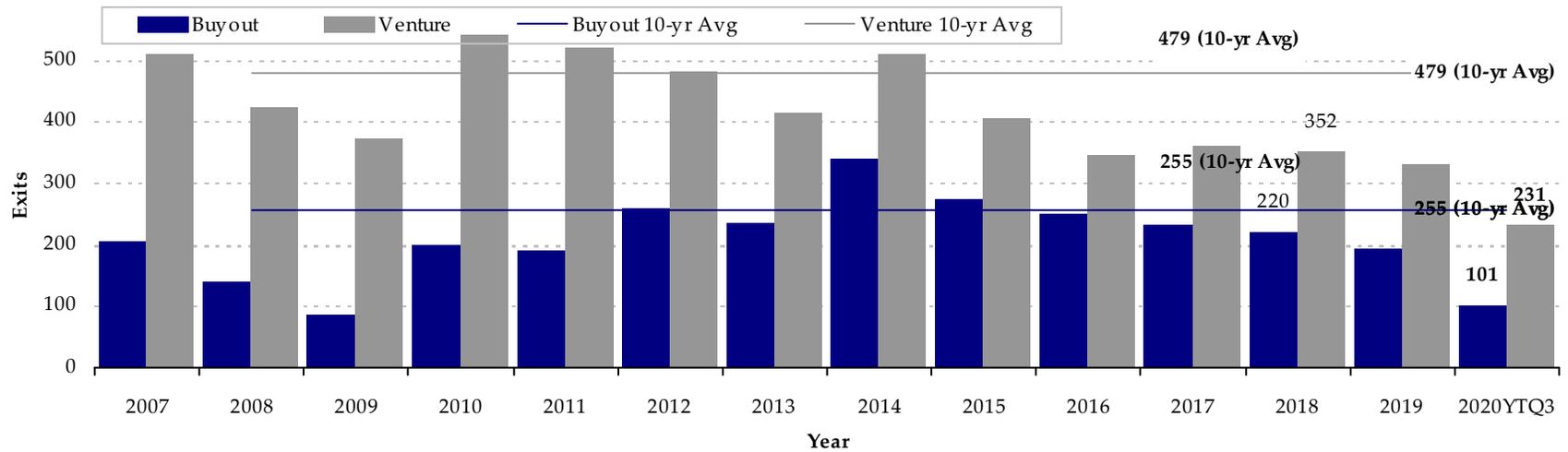


S&P 500 Valuation and Earnings

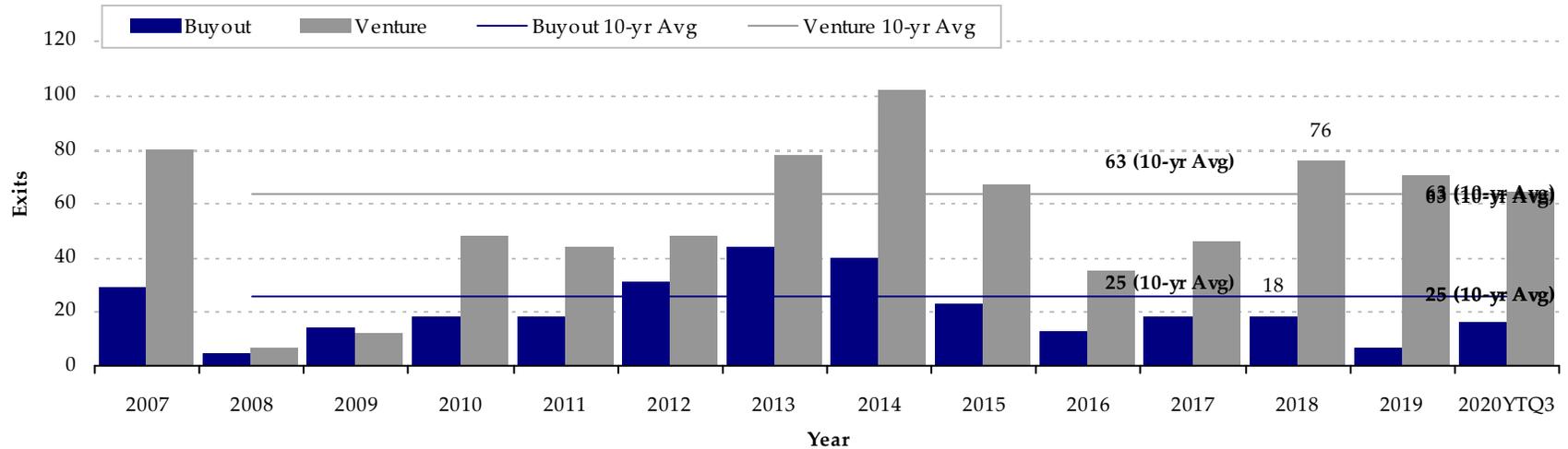


Source: Standard & Poor's Leveraged Commentary.

U.S. Mergers and Acquisitions



U.S. Initial Public Offerings



- Source: Thomson One Private Equity.
- Data compiled through 3Q 2020.

## Vintage Returns

Group	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
U.S. All PE Median	11.6%	11.8%	12.7%	12.5%	11.1%	13.5%	12.4%	11.7%	10.8%	6.3%
U.S. All PE Top Quartile	18.8%	18.7%	18.9%	18.0%	17.5%	21.2%	19.8%	19.3%	21.8%	15.2%
U.S. Buyout Median	20.3%	17.8%	16.3%	15.3%	13.4%	16.6%	15.2%	11.6%	18.2%	5.8%
U.S. Buyout Top Quartile	26.1%	22.7%	22.1%	22.5%	18.5%	22.0%	21.7%	19.9%	29.9%	12.2%
U.S. Energy Median	7.8%	9.6%	0.1%	-1.3%	3.2%	4.6%	1.1%	3.6%	-6.8%	-1.3%
U.S. Energy Top Quartile	17.6%	28.0%	7.9%	7.3%	14.0%	11.4%	10.2%	6.7%	3.7%	6.4%
U.S. Real Estate Median	14.7%	13.4%	15.2%	11.4%	11.4%	10.8%	11.0%	10.2%	6.8%	2.2%
U.S. Real Estate Top Quartile	19.8%	18.9%	20.8%	15.7%	16.0%	13.1%	13.8%	12.6%	9.8%	6.5%
U.S. Venture Median	10.9%	14.2%	15.3%	14.0%	12.8%	15.9%	14.6%	15.0%	11.0%	10.3%
U.S. Venture Top Quartile	21.9%	28.3%	22.7%	21.0%	21.3%	25.9%	22.6%	25.8%	26.0%	21.6%

▫ Source: Cambridge Associates.

▫ Data compiled through June 30, 2020.

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# Performance Analysis

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# Investment Performance by Strategy



Investment	Vintage	Fund Size	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>Buyout</b>									
21st Century Group I *	2000	\$80,365,451	25,000,000	27,141,173	0	22,841,928	0	0.8 x	-3.8%
Advent GPE VI-A	2008	\$9,000,000,000	40,000,000	40,167,228	0	78,231,051	6,018,187	2.1 x	16.7%
Altaris Constellation	2017	\$165,000,000	20,000,000	16,263,116	5,543,214	2,199,308	27,161,513	1.8 x	22.8%
Altaris IV	2018	\$1,085,000,000	24,000,000	16,043,685	7,956,315	0	18,849,655	1.2 x	12.4%
Altus Capital II	2010	\$200,000,000	20,000,000	18,555,037	4,381,151	21,881,638	6,304,608	1.5 x	11.4%
American Industrial VI	2016	\$1,845,000,000	20,000,000	22,367,562	3,007,025	5,374,586	22,093,827	1.2 x	8.8%
American Industrial VII	2019	\$3,075,000,000	30,000,000	1,764,782	28,410,569	175,351	1,485,757	0.9 x	NMF
Arlington IV	2016	\$700,000,000	23,000,000	21,833,974	1,166,026	0	34,792,593	1.6 x	22.7%
Arlington V	2019	\$1,692,000,000	25,000,000	3,351,373	21,648,627	0	4,317,913	1.3 x	NMF
Boston Ventures VII	2006	\$434,507,010	50,000,000	43,016,769	8,258,947	44,748,285	5,236,876	1.2 x	2.8%
BV IX	2017	\$750,000,000	30,000,000	20,083,883	14,918,994	5,002,485	21,802,334	1.3 x	23.0%
BV VIII	2012	\$486,800,000	30,000,000	26,817,228	3,463,958	37,904,689	19,513,692	2.1 x	52.2%
BV X	2020	\$1,122,000,000	30,000,000	544,210	29,455,790	0	224,365	0.4 x	NMF
Clearlake V	2018	\$3,623,125,000	30,000,000	27,627,305	6,573,707	8,435,222	37,883,101	1.7 x	45.7%
Clearlake VI	2020	\$7,068,000,000	30,000,000	4,119,413	25,882,209	35,116	4,560,532	1.1 x	NMF
Court Square III	2012	\$3,173,449,997	40,000,000	43,091,312	2,683,915	27,818,000	41,437,300	1.6 x	17.5%
Cypress MBP II *	1999	\$2,376,060,606	50,000,000	52,304,562	0	50,840,220	0	1.0 x	-0.5%
DLJ MBP III *	2000	\$5,304,941,647	200,000,000	215,345,711	0	458,746,671	0	2.1 x	19.4%
Doughty Hanson III *	1997	\$2,660,000,000	100,000,000	99,374,207	0	197,482,184	0	2.0 x	13.5%
DW Healthcare III	2012	\$268,147,500	40,000,000	37,138,408	2,861,592	47,048,948	24,559,505	1.9 x	19.1%
DW Healthcare IV	2016	\$294,274,000	30,000,000	27,942,263	3,586,703	11,273,132	32,522,168	1.6 x	26.7%
DW Healthcare V	2019	\$611,000,000	30,000,000	7,135,151	22,864,849	0	6,451,537	0.9 x	NMF
FP CF Access	2020	\$88,280,000	30,000,000	4,632,807	25,367,193	0	4,385,471	0.9 x	NMF
FP Intl 2011	2011	\$45,000,000	25,000,000	23,001,840	2,321,806	15,420,647	17,573,297	1.4 x	7.8%
FP Intl 2012	2012	\$70,000,000	25,000,000	16,747,990	8,448,974	9,080,134	13,295,347	1.3 x	8.1%
FP Intl 2013	2013	\$97,000,000	20,000,000	13,609,200	6,528,747	2,093,845	18,151,468	1.5 x	10.3%
FP Intl 2014	2014	\$97,000,000	25,000,000	15,850,395	9,271,211	6,859,269	14,412,701	1.3 x	10.9%
FP Intl 2015	2015	\$113,000,000	25,000,000	15,708,040	9,388,430	976,174	17,395,154	1.2 x	6.4%
FP Intl 2016	2016	\$97,000,000	25,000,000	15,206,186	9,905,337	1,215,184	16,732,979	1.2 x	7.3%
FP Intl 2017	2017	\$98,000,000	25,000,000	13,647,959	11,467,170	17,557	18,487,151	1.4 x	21.4%
FP Intl 2018	2018	\$65,500,000	25,000,000	10,305,344	14,847,871	0	12,116,774	1.2 x	18.0%
FP Intl 2019	2019	\$70,500,000	30,000,000	5,106,383	25,006,084	0	5,362,255	1.1 x	NMF
FP Intl X	2021	\$85,500,000	30,000,000	0	30,000,000	0	0	N/A	NMF
HMTF III *	1996	\$2,458,754,795	76,743,018	76,799,039	0	87,834,289	0	1.1 x	1.8%
HMTF IV *	1998	\$4,023,532,721	100,000,000	98,010,015	0	67,130,479	0	0.7 x	-6.1%
HMTF V *	2000	\$1,552,965,194	207,366,433	205,198,451	0	378,102,491	0	1.8 x	17.6%

## Investment Performance by Strategy



Investment	Vintage	Fund Size	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
JF Lehman III	2011	\$575,500,000	39,000,000	44,012,406	5,311,077	49,324,686	13,650,338	1.4 x	9.7%
JF Lehman IV	2016	\$833,000,000	30,000,000	25,807,709	4,192,292	14,756,362	35,504,753	1.9 x	30.0%
JF Lehman V	2020	\$1,312,320,000	30,000,000	5,862,558	24,137,442	0	5,400,780	0.9 x	NMF
Mason Wells III	2010	\$525,000,000	30,000,000	28,553,580	1,446,420	68,546,055	9,849,733	2.7 x	19.5%
Oak Hill I *	1999	\$1,600,000,000	50,000,000	50,786,497	0	91,264,962	0	1.8 x	10.6%
One Rock II	2017	\$964,000,000	30,000,000	26,197,038	3,802,962	0	32,028,553	1.2 x	12.8%
Riverside IV	2009	\$406,091,370	40,000,000	31,433,665	10,099,013	72,962,455	778,306	2.3 x	21.1%
Riverside V	2013	\$561,224,490	35,000,000	34,497,271	2,297,146	24,247,705	23,693,445	1.4 x	8.8%
Riverside VI	2019	\$327,916,667	30,000,000	10,035,951	19,964,049	0	8,109,406	0.8 x	NMF
Second Cinven *	1998	£904,547,000	65,281,010	65,281,010	0	104,700,661	0	1.6 x	9.3%
Siris III	2015	\$1,810,000,000	25,000,000	30,689,798	4,137,215	16,699,293	23,482,545	1.3 x	13.9%
Siris IV	2019	\$3,452,454,000	30,000,000	16,150,636	13,849,364	0	15,707,294	1.0 x	NMF
SK Capital V	2018	\$2,013,000,000	30,000,000	8,512,472	21,487,528	10,490	7,308,329	0.9 x	-10.1%
Thoma Bravo Discover	2016	\$1,074,000,000	10,000,000	11,350,409	1,767,370	9,155,280	15,941,480	2.2 x	34.6%
Thoma Bravo Discover II	2018	\$2,402,685,000	17,000,000	10,350,016	6,649,984	0	13,509,964	1.3 x	24.9%
Thoma Bravo Discover III	2021	\$4,000,000,000	20,000,000	0	20,000,000	0	-19,340	N/A	NMF
Thoma Bravo Explore I	2020	\$1,127,120,000	20,000,000	0	20,000,000	0	-75,983	N/A	NMF
Thoma Bravo XI	2014	\$3,662,000,000	20,000,000	20,785,558	2,135,646	35,314,605	33,798,563	3.3 x	31.6%
Thoma Bravo XII	2016	\$7,603,860,000	30,000,000	30,724,062	1,322,919	2,049,135	46,506,544	1.6 x	17.4%
Thoma Bravo XIII	2019	\$12,575,745,000	30,000,000	21,575,081	17,275,460	14,009,483	25,503,269	1.8 x	NMF
Thoma Bravo XIV	2021	\$15,000,000,000	20,000,000	0	20,000,000	0	0	N/A	NMF
Vista Equity III	2007	\$1,287,129,725	50,000,000	54,294,567	3,936,115	127,483,122	4,227,798	2.4 x	28.6%
Vista Foundation II	2013	\$1,145,000,000	15,000,000	15,570,569	7,564,067	10,905,347	18,096,184	1.9 x	16.1%
Vista Foundation III	2016	\$2,950,561,226	30,000,000	25,118,740	12,766,975	7,852,739	30,850,105	1.5 x	20.5%
Wellspring V	2011	\$1,194,387,756	40,000,000	45,743,660	14,521,493	52,489,186	22,415,803	1.6 x	16.7%
Wicks IV	2011	\$414,000,000	40,000,000	42,218,415	4,589,261	46,498,139	29,501,098	1.8 x	18.5%
<b>Total Buyout</b>			<b>2,392,390,461</b>	<b>1,941,403,669</b>	<b>588,470,212</b>	<b>2,337,038,588</b>	<b>868,897,028</b>	<b>1.7 x</b>	<b>11.2%</b>
<b>Distressed Debt</b>									
Castlelake II	2011	\$996,762,000	35,000,000	32,656,036	2,625,461	27,537,421	16,141,137	1.3 x	5.8%
Castlelake III	2014	\$1,421,000,000	25,000,000	23,149,741	1,864,884	14,428,076	17,701,844	1.4 x	7.1%
Tennenbaum VI	2010	\$530,000,000	40,000,000	38,075,687	20,996,226	39,724,181	10,659,515	1.3 x	6.4%
<b>Total Distressed Debt</b>			<b>100,000,000</b>	<b>93,881,464</b>	<b>25,486,571</b>	<b>81,689,678</b>	<b>44,502,496</b>	<b>1.3 x</b>	<b>6.3%</b>

## Investment Performance by Strategy



Investment	Vintage	Fund Size	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>Growth Equity</b>									
LLR III	2008	\$803,000,000	50,000,000	48,504,590	4,357,033	85,370,014	9,811,974	2.0 x	15.0%
LLR VI	2021	\$1,800,000,000	30,000,000	0	30,000,000	0	0	N/A	NMF
TA XI	2010	\$4,000,100,000	40,000,000	39,300,000	700,000	84,504,016	43,187,443	3.2 x	26.2%
<b>Total Growth Equity</b>			<b>120,000,000</b>	<b>87,804,590</b>	<b>35,057,033</b>	<b>169,874,030</b>	<b>52,999,417</b>	<b>2.5 x</b>	<b>19.8%</b>
<b>Hard Assets</b>									
EnCap IX	2013	\$5,154,639,175	25,000,000	28,503,587	1,251,858	21,673,743	6,677,572	1.0 x	-0.2%
EnCap VIII	2010	\$3,608,247,422	47,500,000	54,117,730	223,269	31,031,849	9,217,048	0.7 x	-10.1%
EnCap X	2015	\$6,701,030,928	30,000,000	27,695,706	4,312,456	6,120,700	18,857,179	0.9 x	-3.9%
EnCap XI	2017	\$6,961,190,722	35,000,000	11,070,543	23,929,457	0	6,403,338	0.6 x	-31.9%
GTLA Holdings	2018	\$20,000,000	20,000,000	20,000,000	0	0	20,000,000	1.0 x	0.0%
Highland Contingent Note	2018	\$152,244,727	152,244,727	152,244,727	0	15,000,000	152,244,727	1.1 x	23.8%
Highland Equity	2016	\$66,000,000	66,000,000	81,870,000	0	16,674,525	127,583,665	1.8 x	24.1%
Lime Rock Resources III	2014	\$762,000,000	25,000,000	25,532,623	363,997	4,687,078	11,265,145	0.6 x	-9.3%
NGP IX	2007	\$4,000,000,000	50,000,000	54,215,131	201,825	76,326,171	880,556	1.4 x	10.8%
NGP X	2012	\$3,586,000,000	35,000,000	35,960,212	733,518	28,855,568	5,536,434	1.0 x	-1.4%
NGP XI	2014	\$5,325,000,000	30,000,000	29,783,268	1,613,280	9,254,061	19,430,956	1.0 x	-1.4%
NGP XII	2017	\$4,304,081,633	30,000,000	15,753,138	14,246,862	99,132	14,018,526	0.9 x	-6.3%
<b>Total Hard Assets</b>			<b>545,744,727</b>	<b>536,746,666</b>	<b>46,876,521</b>	<b>209,722,827</b>	<b>392,115,146</b>	<b>1.1 x</b>	<b>5.2%</b>
<b>Infrastructure</b>									
Big River - Equity	2014	\$151,090,000	151,090,000	151,090,000	0	19,160,000	377,800,000	2.6 x	22.4%
Big River - Funding *	2017	\$3,750,000	3,750,000	3,750,000	0	3,812,795	0	1.0 x	4.3%
Big River - Holdings Note *	2017	\$12,000,000	12,000,000	12,000,000	0	13,343,726	0	1.1 x	11.0%
Big River - Holdings Note 2023	2018	\$12,000,000	12,000,000	12,000,000	0	0	12,871,433	1.1 x	2.8%
Big River - Holdings Note 2023-2	2018	\$5,150,000	5,150,000	5,150,000	0	62,323	5,397,380	1.1 x	2.9%
Big River - Preferred Equity *	2017	\$41,980,449	41,980,449	41,980,449	0	51,702,368	0	1.2 x	12.5%
Big River - Sr Secured Debt *	2015	\$26,910,000	26,910,000	26,966,221	0	35,699,565	0	1.3 x	14.7%
Blue Oak Arkansas *	2014	\$18,000,000	18,000,000	19,740,000	0	4,717,993	0	0.2 x	-50.5%
<b>Total Infrastructure</b>			<b>270,880,449</b>	<b>272,676,670</b>	<b>0</b>	<b>128,498,770</b>	<b>396,068,813</b>	<b>1.9 x</b>	<b>18.4%</b>

## Investment Performance by Strategy



Investment	Vintage	Fund Size	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>Mezzanine</b>									
Audax Mezzanine III	2011	\$1,002,250,000	25,000,000	24,194,863	6,648,017	27,702,531	3,827,095	1.3 x	9.3%
Big River - Mezzanine *	2014	\$5,000,000	5,000,000	5,003,686	0	8,225,290	0	1.6 x	17.3%
Blackstone Mezzanine I *	1999	\$1,141,000,000	100,000,000	73,353,517	0	96,729,026	0	1.3 x	10.2%
DLJ Investment II *	1999	\$1,600,000,000	80,000,000	43,611,022	0	60,468,989	0	1.4 x	10.4%
Greyrock IV	2017	\$275,000,000	30,000,000	26,809,546	4,326,440	6,848,445	23,956,114	1.1 x	8.1%
Greyrock V	2020	\$280,000,000	35,000,000	0	35,000,000	0	0	N/A	NMF
Insight Mezzanine I	2009	\$94,678,011	10,000,000	9,971,470	479,507	11,860,178	1,624,606	1.4 x	6.6%
<b>Total Mezzanine</b>			<b>285,000,000</b>	<b>182,944,104</b>	<b>46,453,964</b>	<b>211,834,459</b>	<b>29,407,815</b>	<b>1.3 x</b>	<b>10.1%</b>
<b>Multi-Strategy</b>									
ATRS-FP PE	2012	\$265,516,382	263,823,718	248,680,187	165,710,940	173,261,123	247,063,582	1.7 x	18.3%
CSFB-ATRS 2005-1 Series	2005	\$252,525,253	250,000,000	277,750,644	10,724,211	393,488,666	35,075,807	1.5 x	7.6%
CSFB-ATRS 2006-1 Series	2006	\$406,331,658	404,300,000	409,915,888	54,367,689	581,086,359	72,457,506	1.6 x	9.7%
DH Tech I	2000	\$236,700,000	50,000,000	61,471,034	0	20,543,107	422,298	0.3 x	-21.8%
Diamond State *	1999	\$46,000,000	2,000,000	2,000,000	0	3,097,200	0	1.5 x	5.5%
Diamond State II	2007	\$25,361,350	4,000,000	3,517,000	483,000	3,172,000	4,568,051	2.2 x	9.3%
<b>Total Multi-Strategy</b>			<b>974,123,718</b>	<b>1,003,334,752</b>	<b>231,285,840</b>	<b>1,174,648,455</b>	<b>359,587,244</b>	<b>1.5 x</b>	<b>8.2%</b>
<b>Special Assets</b>									
WNG II	2019	\$438,350,000	30,000,000	8,497,598	21,502,402	3,195	6,295,226	0.7 x	NMF
<b>Total Special Assets</b>			<b>30,000,000</b>	<b>8,497,598</b>	<b>21,502,402</b>	<b>3,195</b>	<b>6,295,226</b>	<b>0.7 x</b>	<b>NMF</b>
<b>Structured Capital</b>									
Bison V	2017	\$384,132,653	35,000,000	27,078,753	13,259,698	7,584,322	23,725,610	1.2 x	10.3%
Levine Leichtman V	2013	\$1,644,081,633	20,000,000	24,795,901	3,720,763	16,848,721	19,643,828	1.5 x	12.4%
PineBridge Structured III	2016	\$600,000,000	30,000,000	23,892,330	10,984,421	4,965,677	14,166,894	0.8 x	-10.0%
<b>Total Structured Capital</b>			<b>85,000,000</b>	<b>75,766,983</b>	<b>27,964,882</b>	<b>29,398,720</b>	<b>57,536,332</b>	<b>1.1 x</b>	<b>6.3%</b>

## Investment Performance by Strategy



Investment	Vintage	Fund Size	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>Turnaround</b>									
Atlas Capital II	2014	\$900,000,000	15,000,000	19,101,553	4,693,416	12,363,077	14,172,259	1.4 x	17.3%
Insight Equity II	2009	\$429,735,291	30,000,000	30,791,562	1,121,093	32,590,351	19,974,732	1.7 x	10.3%
KPS III Supplemental	2009	\$816,326,531	40,000,000	37,777,254	16,117,982	80,212,144	169,917	2.1 x	22.8%
KPS IV	2014	\$3,571,428,571	25,000,000	21,613,164	2,760,375	5,493,658	22,409,786	1.3 x	15.8%
KPS Mid-Market I	2019	\$1,020,408,163	20,000,000	3,617,466	16,382,534	0	3,371,776	0.9 x	NMF
KPS V	2020	\$6,122,448,980	30,000,000	5,679,607	24,320,393	0	5,621,374	1.0 x	NMF
Sycamore Partners II	2014	\$2,700,000,000	25,000,000	22,042,116	4,084,626	9,208,345	14,751,260	1.1 x	3.2%
Sycamore Partners III	2018	\$4,870,000,000	25,000,000	4,034,352	20,965,648	0	2,418,714	0.6 x	-27.8%
<b>Total Turnaround</b>			<b>210,000,000</b>	<b>144,657,074</b>	<b>90,446,067</b>	<b>139,867,575</b>	<b>82,889,818</b>	<b>1.5 x</b>	<b>15.1%</b>
<b>Venture Capital</b>									
FP Venture 2008	2008	\$102,000,000	30,000,000	29,865,855	297,710	42,584,666	34,172,453	2.6 x	17.0%
FP Venture 2009	2009	\$58,000,000	25,000,000	24,426,925	770,244	45,806,339	19,683,771	2.7 x	18.5%
FP Venture 2010	2010	\$80,000,000	25,000,000	15,984,375	1,641,963	13,993,899	30,003,839	2.8 x	17.6%
FP Venture 2011	2011	\$70,000,000	25,000,000	24,107,625	1,079,997	53,698,570	126,223,844	7.5 x	41.4%
FP Venture 2012	2012	\$80,000,000	25,000,000	22,125,000	3,013,477	17,479,159	40,091,213	2.6 x	21.0%
FP Venture 2013	2013	\$87,000,000	20,000,000	17,977,398	2,111,889	13,861,725	31,943,679	2.5 x	24.9%
FP Venture 2014	2014	\$93,000,000	25,000,000	23,521,750	1,574,637	8,830,869	43,266,903	2.2 x	21.0%
FP Venture 2015	2015	\$113,000,000	25,000,000	22,677,100	2,416,148	1,195,328	35,037,003	1.6 x	16.9%
FP Venture 2016	2016	\$82,000,000	25,000,000	18,445,122	6,660,907	1,254,993	25,028,150	1.4 x	17.9%
FP Venture 2017	2017	\$113,000,000	25,000,000	12,168,141	12,898,849	1,657,650	15,384,590	1.4 x	30.0%
FP Venture 2018	2018	\$80,500,000	25,000,000	10,403,727	14,686,582	217	11,708,709	1.1 x	11.7%
FP Venture 2019	2019	\$80,500,000	30,000,000	6,894,410	23,173,583	23,600	6,731,780	1.0 x	NMF
FP Venture XIII	2020	\$115,500,000	60,000,000	1,929,824	58,109,015	0	1,769,572	0.9 x	NMF
<b>Total Venture Capital</b>			<b>365,000,000</b>	<b>230,527,252</b>	<b>128,435,001</b>	<b>200,387,015</b>	<b>421,045,506</b>	<b>2.7 x</b>	<b>23.2%</b>
<b>Total Portfolio</b>			<b>5,378,139,355</b>	<b>4,578,240,824</b>	<b>1,241,978,493</b>	<b>4,682,963,312</b>	<b>2,711,344,841</b>	<b>1.6 x</b>	<b>11.1%</b>

- Remaining Value is defined as the investor's value as reported by the fund's manager.
- TVPI is the ratio of Distributed Capital plus Remaining Value to Contributed Capital.
- Net IRR is defined as the annualized, compound rate of return using daily draws, distributions and Remaining Value as of the Report Date, net of fees and expenses, including late closing interest.
- An asterisk indicates an investment that is fully liquidated, if applicable.
- Commitments made in a foreign currency have been converted into U.S. dollars using an exchange rate as of the Report Date, if applicable.
- Returns calculated for funds in the early years of their lives are particularly not meaningful given the J-curve effect. During these early years, due to illiquidity, stagnant valuations, fees and expenses, fund performance tends to be negative (the bottom of the "J").

## Investment Performance by Vintage Year



Investment	Strategy	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>1996</b>								
HMTF III *	Buyout	76,743,018	76,799,039	0	87,834,289	0	1.1 x	1.8%
<b>Total 1996</b>		<b>76,743,018</b>	<b>76,799,039</b>	<b>0</b>	<b>87,834,289</b>	<b>0</b>	<b>1.1 x</b>	<b>1.8%</b>
<b>1997</b>								
Doughty Hanson III *	Buyout	100,000,000	99,374,207	0	197,482,184	0	2.0 x	13.5%
<b>Total 1997</b>		<b>100,000,000</b>	<b>99,374,207</b>	<b>0</b>	<b>197,482,184</b>	<b>0</b>	<b>2.0 x</b>	<b>13.5%</b>
<b>1998</b>								
HMTF IV *	Buyout	100,000,000	98,010,015	0	67,130,479	0	0.7 x	-6.1%
Second Cinven *	Buyout	65,281,010	65,281,010	0	104,700,661	0	1.6 x	9.3%
<b>Total 1998</b>		<b>165,281,010</b>	<b>163,291,025</b>	<b>0</b>	<b>171,831,140</b>	<b>0</b>	<b>1.1 x</b>	<b>0.9%</b>
<b>1999</b>								
Blackstone Mezzanine I *	Mezzanine	100,000,000	73,353,517	0	96,729,026	0	1.3 x	10.2%
Cypress MBP II *	Buyout	50,000,000	52,304,562	0	50,840,220	0	1.0 x	-0.5%
Diamond State *	Multi-Strategy	2,000,000	2,000,000	0	3,097,200	0	1.5 x	5.5%
DLJ Investment II *	Mezzanine	80,000,000	43,611,022	0	60,468,989	0	1.4 x	10.4%
Oak Hill I *	Buyout	50,000,000	50,786,497	0	91,264,962	0	1.8 x	10.6%
<b>Total 1999</b>		<b>282,000,000</b>	<b>222,055,598</b>	<b>0</b>	<b>302,400,397</b>	<b>0</b>	<b>1.4 x</b>	<b>7.7%</b>
<b>2000</b>								
21st Century Group I *	Buyout	25,000,000	27,141,173	0	22,841,928	0	0.8 x	-3.8%
DH Tech I	Multi-Strategy	50,000,000	61,471,034	0	20,543,107	422,298	0.3 x	-21.8%
DLJ MBP III *	Buyout	200,000,000	215,345,711	0	458,746,671	0	2.1 x	19.4%
HMTF V *	Buyout	207,366,433	205,198,451	0	378,102,491	0	1.8 x	17.6%
<b>Total 2000</b>		<b>482,366,433</b>	<b>509,156,369</b>	<b>0</b>	<b>880,234,197</b>	<b>422,298</b>	<b>1.7 x</b>	<b>14.8%</b>
<b>2005</b>								
CSFB-ATRS 2005-1 Series	Multi-Strategy	250,000,000	277,750,644	10,724,211	393,488,666	35,075,807	1.5 x	7.6%
<b>Total 2005</b>		<b>250,000,000</b>	<b>277,750,644</b>	<b>10,724,211</b>	<b>393,488,666</b>	<b>35,075,807</b>	<b>1.5 x</b>	<b>7.6%</b>

## Investment Performance by Vintage Year



Investment	Strategy	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>2006</b>								
Boston Ventures VII	Buyout	50,000,000	43,016,769	8,258,947	44,748,285	5,236,876	1.2 x	2.8%
CSFB-ATRS 2006-1 Series	Multi-Strategy	404,300,000	409,915,888	54,367,689	581,086,359	72,457,506	1.6 x	9.7%
<b>Total 2006</b>		<b>454,300,000</b>	<b>452,932,657</b>	<b>62,626,636</b>	<b>625,834,644</b>	<b>77,694,382</b>	<b>1.6 x</b>	<b>9.1%</b>
<b>2007</b>								
Diamond State II	Multi-Strategy	4,000,000	3,517,000	483,000	3,172,000	4,568,051	2.2 x	9.3%
NGP IX	Hard Assets	50,000,000	54,215,131	201,825	76,326,171	880,556	1.4 x	10.8%
Vista Equity III	Buyout	50,000,000	54,294,567	3,936,115	127,483,122	4,227,798	2.4 x	28.6%
<b>Total 2007</b>		<b>104,000,000</b>	<b>112,026,698</b>	<b>4,620,940</b>	<b>206,981,293</b>	<b>9,676,405</b>	<b>1.9 x</b>	<b>20.4%</b>
<b>2008</b>								
Advent GPE VI-A	Buyout	40,000,000	40,167,228	0	78,231,051	6,018,187	2.1 x	16.7%
FP Venture 2008	Venture Capital	30,000,000	29,865,855	297,710	42,584,666	34,172,453	2.6 x	17.0%
LLR III	Growth Equity	50,000,000	48,504,590	4,357,033	85,370,014	9,811,974	2.0 x	15.0%
<b>Total 2008</b>		<b>120,000,000</b>	<b>118,537,673</b>	<b>4,654,743</b>	<b>206,185,731</b>	<b>50,002,614</b>	<b>2.2 x</b>	<b>16.1%</b>
<b>2009</b>								
FP Venture 2009	Venture Capital	25,000,000	24,426,925	770,244	45,806,339	19,683,771	2.7 x	18.5%
Insight Equity II	Turnaround	30,000,000	30,791,562	1,121,093	32,590,351	19,974,732	1.7 x	10.3%
Insight Mezzanine I	Mezzanine	10,000,000	9,971,470	479,507	11,860,178	1,624,606	1.4 x	6.6%
KPS III Supplemental	Turnaround	40,000,000	37,777,254	16,117,982	80,212,144	169,917	2.1 x	22.8%
Riverside IV	Buyout	40,000,000	31,433,665	10,099,013	72,962,455	778,306	2.3 x	21.1%
<b>Total 2009</b>		<b>145,000,000</b>	<b>134,400,876</b>	<b>28,587,839</b>	<b>243,431,467</b>	<b>42,231,332</b>	<b>2.1 x</b>	<b>17.6%</b>
<b>2010</b>								
Altus Capital II	Buyout	20,000,000	18,555,037	4,381,151	21,881,638	6,304,608	1.5 x	11.4%
EnCap VIII	Hard Assets	47,500,000	54,117,730	223,269	31,031,849	9,217,048	0.7 x	-10.1%
FP Venture 2010	Venture Capital	25,000,000	15,984,375	1,641,963	13,993,899	30,003,839	2.8 x	17.6%
Mason Wells III	Buyout	30,000,000	28,553,580	1,446,420	68,546,055	9,849,733	2.7 x	19.5%
TA XI	Growth Equity	40,000,000	39,300,000	700,000	84,504,016	43,187,443	3.2 x	26.2%
Tennenbaum VI	Distressed Debt	40,000,000	38,075,687	20,996,226	39,724,181	10,659,515	1.3 x	6.4%
<b>Total 2010</b>		<b>202,500,000</b>	<b>194,586,409</b>	<b>29,389,029</b>	<b>259,681,639</b>	<b>109,222,186</b>	<b>1.9 x</b>	<b>14.5%</b>

## Investment Performance by Vintage Year



Investment	Strategy	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>2011</b>								
Audax Mezzanine III	Mezzanine	25,000,000	24,194,863	6,648,017	27,702,531	3,827,095	1.3 x	9.3%
Castlelake II	Distressed Debt	35,000,000	32,656,036	2,625,461	27,537,421	16,141,137	1.3 x	5.8%
FP Intl 2011	Buyout	25,000,000	23,001,840	2,321,806	15,420,647	17,573,297	1.4 x	7.8%
FP Venture 2011	Venture Capital	25,000,000	24,107,625	1,079,997	53,698,570	126,223,844	7.5 x	41.4%
JF Lehman III	Buyout	39,000,000	44,012,406	5,311,077	49,324,686	13,650,338	1.4 x	9.7%
Wellspring V	Buyout	40,000,000	45,743,660	14,521,493	52,489,186	22,415,803	1.6 x	16.7%
Wicks IV	Buyout	40,000,000	42,218,415	4,589,261	46,498,139	29,501,098	1.8 x	18.5%
<b>Total 2011</b>		<b>229,000,000</b>	<b>235,934,846</b>	<b>37,097,112</b>	<b>272,671,180</b>	<b>229,332,612</b>	<b>2.1 x</b>	<b>18.3%</b>
<b>2012</b>								
ATRS-FP PE	Multi-Strategy	263,823,718	248,680,187	165,710,940	173,261,123	247,063,582	1.7 x	18.3%
BV VIII	Buyout	30,000,000	26,817,228	3,463,958	37,904,689	19,513,692	2.1 x	52.2%
Court Square III	Buyout	40,000,000	43,091,312	2,683,915	27,818,000	41,437,300	1.6 x	17.5%
DW Healthcare III	Buyout	40,000,000	37,138,408	2,861,592	47,048,948	24,559,505	1.9 x	19.1%
FP Intl 2012	Buyout	25,000,000	16,747,990	8,448,974	9,080,134	13,295,347	1.3 x	8.1%
FP Venture 2012	Venture Capital	25,000,000	22,125,000	3,013,477	17,479,159	40,091,213	2.6 x	21.0%
NGP X	Hard Assets	35,000,000	35,960,212	733,518	28,855,568	5,536,434	1.0 x	-1.4%
<b>Total 2012</b>		<b>458,823,718</b>	<b>430,560,337</b>	<b>186,916,374</b>	<b>341,447,621</b>	<b>391,497,073</b>	<b>1.7 x</b>	<b>17.6%</b>
<b>2013</b>								
EnCap IX	Hard Assets	25,000,000	28,503,587	1,251,858	21,673,743	6,677,572	1.0 x	-0.2%
FP Intl 2013	Buyout	20,000,000	13,609,200	6,528,747	2,093,845	18,151,468	1.5 x	10.3%
FP Venture 2013	Venture Capital	20,000,000	17,977,398	2,111,889	13,861,725	31,943,679	2.5 x	24.9%
Levine Leichtman V	Structured Capital	20,000,000	24,795,901	3,720,763	16,848,721	19,643,828	1.5 x	12.4%
Riverside V	Buyout	35,000,000	34,497,271	2,297,146	24,247,705	23,693,445	1.4 x	8.8%
Vista Foundation II	Buyout	15,000,000	15,570,569	7,564,067	10,905,347	18,096,184	1.9 x	16.1%
<b>Total 2013</b>		<b>135,000,000</b>	<b>134,953,926</b>	<b>23,474,470</b>	<b>89,631,086</b>	<b>118,206,176</b>	<b>1.5 x</b>	<b>12.5%</b>

## Investment Performance by Vintage Year



Investment	Strategy	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>2014</b>								
Atlas Capital II	Turnaround	15,000,000	19,101,553	4,693,416	12,363,077	14,172,259	1.4 x	17.3%
Big River - Equity	Infrastructure	151,090,000	151,090,000	0	19,160,000	377,800,000	2.6 x	22.4%
Big River - Mezzanine *	Mezzanine	5,000,000	5,003,686	0	8,225,290	0	1.6 x	17.3%
Blue Oak Arkansas *	Infrastructure	18,000,000	19,740,000	0	4,717,993	0	0.2 x	-50.5%
Castlelake III	Distressed Debt	25,000,000	23,149,741	1,864,884	14,428,076	17,701,844	1.4 x	7.1%
FP Intl 2014	Buyout	25,000,000	15,850,395	9,271,211	6,859,269	14,412,701	1.3 x	10.9%
FP Venture 2014	Venture Capital	25,000,000	23,521,750	1,574,637	8,830,869	43,266,903	2.2 x	21.0%
KPS IV	Turnaround	25,000,000	21,613,164	2,760,375	5,493,658	22,409,786	1.3 x	15.8%
Lime Rock Resources III	Hard Assets	25,000,000	25,532,623	363,997	4,687,078	11,265,145	0.6 x	-9.3%
NGP XI	Hard Assets	30,000,000	29,783,268	1,613,280	9,254,061	19,430,956	1.0 x	-1.4%
Sycamore Partners II	Turnaround	25,000,000	22,042,116	4,084,626	9,208,345	14,751,260	1.1 x	3.2%
Thoma Bravo XI	Buyout	20,000,000	20,785,558	2,135,646	35,314,605	33,798,563	3.3 x	31.6%
<b>Total 2014</b>		<b>389,090,000</b>	<b>377,213,854</b>	<b>28,362,072</b>	<b>138,542,321</b>	<b>569,009,417</b>	<b>1.9 x</b>	<b>16.4%</b>
<b>2015</b>								
Big River - Sr Secured Debt *	Infrastructure	26,910,000	26,966,221	0	35,699,565	0	1.3 x	14.7%
EnCap X	Hard Assets	30,000,000	27,695,706	4,312,456	6,120,700	18,857,179	0.9 x	-3.9%
FP Intl 2015	Buyout	25,000,000	15,708,040	9,388,430	976,174	17,395,154	1.2 x	6.4%
FP Venture 2015	Venture Capital	25,000,000	22,677,100	2,416,148	1,195,328	35,037,003	1.6 x	16.9%
Siris III	Buyout	25,000,000	30,689,798	4,137,215	16,699,293	23,482,545	1.3 x	13.9%
<b>Total 2015</b>		<b>131,910,000</b>	<b>123,736,865</b>	<b>20,254,249</b>	<b>60,691,060</b>	<b>94,771,881</b>	<b>1.3 x</b>	<b>10.1%</b>
<b>2016</b>								
American Industrial VI	Buyout	20,000,000	22,367,562	3,007,025	5,374,586	22,093,827	1.2 x	8.8%
Arlington IV	Buyout	23,000,000	21,833,974	1,166,026	0	34,792,593	1.6 x	22.7%
DW Healthcare IV	Buyout	30,000,000	27,942,263	3,586,703	11,273,132	32,522,168	1.6 x	26.7%
FP Intl 2016	Buyout	25,000,000	15,206,186	9,905,337	1,215,184	16,732,979	1.2 x	7.3%
FP Venture 2016	Venture Capital	25,000,000	18,445,122	6,660,907	1,254,993	25,028,150	1.4 x	17.9%
Highland Equity	Hard Assets	66,000,000	81,870,000	0	16,674,525	127,583,665	1.8 x	24.1%
JF Lehman IV	Buyout	30,000,000	25,807,709	4,192,292	14,756,362	35,504,753	1.9 x	30.0%
PineBridge Structured III	Structured Capital	30,000,000	23,892,330	10,984,421	4,965,677	14,166,894	0.8 x	-10.0%
Thoma Bravo Discover	Buyout	10,000,000	11,350,409	1,767,370	9,155,280	15,941,480	2.2 x	34.6%
Thoma Bravo XII	Buyout	30,000,000	30,724,062	1,322,919	2,049,135	46,506,544	1.6 x	17.4%
Vista Foundation III	Buyout	30,000,000	25,118,740	12,766,975	7,852,739	30,850,105	1.5 x	20.5%
<b>Total 2016</b>		<b>319,000,000</b>	<b>304,558,357</b>	<b>55,359,975</b>	<b>74,571,613</b>	<b>401,723,158</b>	<b>1.6 x</b>	<b>20.2%</b>

## Investment Performance by Vintage Year



Investment	Strategy	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>2017</b>								
Altaris Constellation	Buyout	20,000,000	16,263,116	5,543,214	2,199,308	27,161,513	1.8 x	22.8%
Big River - Funding *	Infrastructure	3,750,000	3,750,000	0	3,812,795	0	1.0 x	4.3%
Big River - Holdings Note *	Infrastructure	12,000,000	12,000,000	0	13,343,726	0	1.1 x	11.0%
Big River - Preferred Equity *	Infrastructure	41,980,449	41,980,449	0	51,702,368	0	1.2 x	12.5%
Bison V	Structured Capital	35,000,000	27,078,753	13,259,698	7,584,322	23,725,610	1.2 x	10.3%
BV IX	Buyout	30,000,000	20,083,883	14,918,994	5,002,485	21,802,334	1.3 x	23.0%
EnCap XI	Hard Assets	35,000,000	11,070,543	23,929,457	0	6,403,338	0.6 x	-31.9%
FP Intl 2017	Buyout	25,000,000	13,647,959	11,467,170	17,557	18,487,151	1.4 x	21.4%
FP Venture 2017	Venture Capital	25,000,000	12,168,141	12,898,849	1,657,650	15,384,590	1.4 x	30.0%
Greyrock IV	Mezzanine	30,000,000	26,809,546	4,326,440	6,848,445	23,956,114	1.1 x	8.1%
NGP XII	Hard Assets	30,000,000	15,753,138	14,246,862	99,132	14,018,526	0.9 x	-6.3%
One Rock II	Buyout	30,000,000	26,197,038	3,802,962	0	32,028,553	1.2 x	12.8%
<b>Total 2017</b>		<b>317,730,449</b>	<b>226,802,566</b>	<b>104,393,646</b>	<b>92,267,789</b>	<b>182,967,729</b>	<b>1.2 x</b>	<b>12.3%</b>
<b>2018</b>								
Altaris IV	Buyout	24,000,000	16,043,685	7,956,315	0	18,849,655	1.2 x	12.4%
Big River - Holdings Note 2023	Infrastructure	12,000,000	12,000,000	0	0	12,871,433	1.1 x	2.8%
Big River - Holdings Note 2023-2	Infrastructure	5,150,000	5,150,000	0	62,323	5,397,380	1.1 x	2.9%
Clearlake V	Buyout	30,000,000	27,627,305	6,573,707	8,435,222	37,883,101	1.7 x	45.7%
FP Intl 2018	Buyout	25,000,000	10,305,344	14,847,871	0	12,116,774	1.2 x	18.0%
FP Venture 2018	Venture Capital	25,000,000	10,403,727	14,686,582	217	11,708,709	1.1 x	11.7%
GTLA Holdings	Hard Assets	20,000,000	20,000,000	0	0	20,000,000	1.0 x	0.0%
Highland Contingent Note	Hard Assets	152,244,727	152,244,727	0	15,000,000	152,244,727	1.1 x	23.8%
SK Capital V	Buyout	30,000,000	8,512,472	21,487,528	10,490	7,308,329	0.9 x	-10.1%
Sycamore Partners III	Turnaround	25,000,000	4,034,352	20,965,648	0	2,418,714	0.6 x	-27.8%
Thoma Bravo Discover II	Buyout	17,000,000	10,350,016	6,649,984	0	13,509,964	1.3 x	24.9%
<b>Total 2018</b>		<b>365,394,727</b>	<b>276,671,628</b>	<b>93,167,635</b>	<b>23,508,252</b>	<b>294,308,786</b>	<b>1.1 x</b>	<b>15.3%</b>

## Investment Performance by Vintage Year



Investment	Strategy	Committed Capital (\$)	Contributed Capital (\$)	Unfunded Commitment (\$)	Distributed Capital (\$)	Remaining Value (\$)	TVPI	Net IRR
<b>2019</b>								
American Industrial VII	Buyout	30,000,000	1,764,782	28,410,569	175,351	1,485,757	0.9 x	NMF
Arlington V	Buyout	25,000,000	3,351,373	21,648,627	0	4,317,913	1.3 x	NMF
DW Healthcare V	Buyout	30,000,000	7,135,151	22,864,849	0	6,451,537	0.9 x	NMF
FP Intl 2019	Buyout	30,000,000	5,106,383	25,006,084	0	5,362,255	1.1 x	NMF
FP Venture 2019	Venture Capital	30,000,000	6,894,410	23,173,583	23,600	6,731,780	1.0 x	NMF
KPS Mid-Market I	Turnaround	20,000,000	3,617,466	16,382,534	0	3,371,776	0.9 x	NMF
Riverside VI	Buyout	30,000,000	10,035,951	19,964,049	0	8,109,406	0.8 x	NMF
Siris IV	Buyout	30,000,000	16,150,636	13,849,364	0	15,707,294	1.0 x	NMF
Thoma Bravo XIII	Buyout	30,000,000	21,575,081	17,275,460	14,009,483	25,503,269	1.8 x	NMF
WNG II	Special Assets	30,000,000	8,497,598	21,502,402	3,195	6,295,226	0.7 x	NMF
<b>Total 2019</b>		<b>285,000,000</b>	<b>84,128,831</b>	<b>210,077,521</b>	<b>14,211,629</b>	<b>83,336,213</b>	<b>1.2 x</b>	<b>NMF</b>
<b>2020</b>								
BV X	Buyout	30,000,000	544,210	29,455,790	0	224,365	0.4 x	NMF
Clearlake VI	Buyout	30,000,000	4,119,413	25,882,209	35,116	4,560,532	1.1 x	NMF
FP CF Access	Buyout	30,000,000	4,632,807	25,367,193	0	4,385,471	0.9 x	NMF
FP Venture XIII	Venture Capital	60,000,000	1,929,824	58,109,015	0	1,769,572	0.9 x	NMF
Greyrock V	Mezzanine	35,000,000	0	35,000,000	0	0	N/A	NMF
JF Lehman V	Buyout	30,000,000	5,862,558	24,137,442	0	5,400,780	0.9 x	NMF
KPS V	Turnaround	30,000,000	5,679,607	24,320,393	0	5,621,374	1.0 x	NMF
Thoma Bravo Explore I	Buyout	20,000,000	0	20,000,000	0	-75,983	N/A	NMF
<b>Total 2020</b>		<b>265,000,000</b>	<b>22,768,419</b>	<b>242,272,042</b>	<b>35,116</b>	<b>21,886,111</b>	<b>1.0 x</b>	<b>NMF</b>
<b>2021</b>								
FP Intl X	Buyout	30,000,000	0	30,000,000	0	0	N/A	NMF
LLR VI	Growth Equity	30,000,000	0	30,000,000	0	0	N/A	NMF
Thoma Bravo Discover III	Buyout	20,000,000	0	20,000,000	0	-19,340	N/A	NMF
Thoma Bravo XIV	Buyout	20,000,000	0	20,000,000	0	0	N/A	NMF
<b>Total 2021</b>		<b>100,000,000</b>	<b>0</b>	<b>100,000,000</b>	<b>0</b>	<b>-19,340</b>	<b>N/A</b>	<b>NMF</b>
<b>Total Portfolio</b>		<b>5,378,139,355</b>	<b>4,578,240,824</b>	<b>1,241,978,493</b>	<b>4,682,963,312</b>	<b>2,711,344,841</b>	<b>1.6 x</b>	<b>11.1%</b>

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- Remaining Value is defined as the investor's value as reported by the fund's manager.
  - TVPI is the ratio of Distributed Capital plus Remaining Value to Contributed Capital.
  - Net IRR is defined as the annualized, compound rate of return using daily draws, distributions and Remaining Value as of the Report Date, net of fees and expenses, including late closing interest.
  - An asterisk indicates an investment that is fully liquidated, if applicable.
  - Commitments made in a foreign currency have been converted into U.S. dollars using an exchange rate as of the Report Date, if applicable.
  - Returns calculated for funds in the early years of their lives are particularly not meaningful given the J-curve effect. During these early years, due to illiquidity, stagnant valuations, fees and expenses, fund performance tends to be negative (the bottom of the "J").

# Performance by Vintage Year and Quartile Group

	1996	1997	1998	1999
1st		○ Doughty Hanson III 13.5%		
2nd			○ Second Cinven 9.3%	○ Oak Hill I 10.6% ○ Diamond State 5.5%
3rd	○ HMTF III 1.8%			
4th			○ HMTF IV -6.1%	○ Cypress MBP II -0.5%

● Venture ○ Non-venture

BOLD = Realized

# Performance by Vintage Year and Quartile Group

	2000	2005	2006	2007
1st				○ Vista Equity III 28.6%
2nd	○ DLJ MBP III 19.4% ○ HMTF V 17.6%	○ CSFB-ATRS 2005-1 Series 7.6%	○ CSFB-ATRS 2006-1 Series 9.7%	○ Diamond State II 9.3%
3rd				○ NGP IX 10.8%
4th	○ 21st Century Group I -3.8%		○ Boston Ventures VII 2.8%	

● Venture ○ Non-venture

**BOLD = Realized**

# Performance by Vintage Year and Quartile Group



	2008	2009	2010	2011
1st			○ TA XI 26.2%	● FP Venture 2011 41.4%
2nd	<ul style="list-style-type: none"> <li>● FP Venture 2008 17.0%</li> <li>○ Advent GPE VI-A 16.7%</li> <li>○ LLR III 15.0%</li> </ul>	<ul style="list-style-type: none"> <li>○ KPS III Supplemental 22.8%</li> <li>○ Riverside IV 21.1%</li> <li>● FP Venture 2009 18.5%</li> </ul>	<ul style="list-style-type: none"> <li>○ Mason Wells III 19.5%</li> <li>● FP Venture 2010 17.6%</li> </ul>	<ul style="list-style-type: none"> <li>○ Wicks IV 18.5%</li> <li>○ Wellspring V 16.7%</li> </ul>
3rd				
4th		○ Insight Equity II 10.3%	<ul style="list-style-type: none"> <li>○ Altus Capital II 11.4%</li> <li>○ EnCap VIII -10.1%</li> </ul>	<ul style="list-style-type: none"> <li>○ JF Lehman III 9.7%</li> <li>○ FP Intl 2011 7.8%</li> </ul>

● Venture ○ Non-venture

BOLD = Realized

# Performance by Vintage Year and Quartile Group

	2012	2013	2014	2015
1st	<ul style="list-style-type: none"> <li>○ BV VIII 52.2%</li> </ul>	<ul style="list-style-type: none"> <li>● FP Venture 2013 24.9%</li> </ul>	<ul style="list-style-type: none"> <li>○ Thoma Bravo XI 31.6%</li> </ul>	
2nd	<ul style="list-style-type: none"> <li>● FP Venture 2012 21.0%</li> <li>○ DW Healthcare III 19.1%</li> <li>○ ATRS-FP PE 18.3%</li> <li>○ Court Square III 17.5%</li> </ul>	<ul style="list-style-type: none"> <li>○ Vista Foundation II 16.1%</li> </ul>	<ul style="list-style-type: none"> <li>● FP Venture 2014 21.0%</li> <li>○ Atlas Capital II 17.3%</li> </ul>	<ul style="list-style-type: none"> <li>● FP Venture 2015 16.9%</li> </ul>
3rd	<ul style="list-style-type: none"> <li>○ NGP X -1.4%</li> </ul>	<ul style="list-style-type: none"> <li>○ FP Intl 2013 10.3%</li> <li>○ Riverside V 8.8%</li> <li>○ EnCap IX -0.2%</li> </ul>	<ul style="list-style-type: none"> <li>○ KPS IV 15.8%</li> <li>○ FP Intl 2014 10.9%</li> <li>○ NGP XI -1.4%</li> </ul>	<ul style="list-style-type: none"> <li>○ Siris III 13.9%</li> <li>○ EnCap X -3.9%</li> </ul>
4th	<ul style="list-style-type: none"> <li>○ FP Intl 2012 8.1%</li> </ul>		<ul style="list-style-type: none"> <li>○ Sycamore Partners II 3.2%</li> <li>○ Lime Rock Resources III -9.3%</li> </ul>	<ul style="list-style-type: none"> <li>○ FP Intl 2015 6.4%</li> </ul>

● Venture ○ Non-venture

BOLD = Realized

# Performance by Vintage Year and Quartile Group

	2016	2017	2018
1st	<ul style="list-style-type: none"> <li>○ Thoma Bravo Discover 34.6%</li> <li>○ JF Lehman IV 30.0%</li> <li>○ DW Healthcare IV 26.7%</li> <li>○ Arlington IV 22.7%</li> <li>○ Vista Foundation III 20.5%</li> </ul>	<ul style="list-style-type: none"> <li>● FP Venture 2017 30.0%</li> </ul>	<ul style="list-style-type: none"> <li>○ Clearlake V 45.7%</li> <li>○ Thoma Bravo Discover II 24.9%</li> <li>○ FP Intl 2018 18.0%</li> <li>○ Altaris IV 12.4%</li> </ul>
2nd	<ul style="list-style-type: none"> <li>● FP Venture 2016 17.9%</li> <li>○ Thoma Bravo XII 17.4%</li> </ul>	<ul style="list-style-type: none"> <li>○ BV IX 23.0%</li> <li>○ Altaris Constellation 22.8%</li> <li>○ FP Intl 2017 21.4%</li> <li>○ NGP XII -6.3%</li> </ul>	<ul style="list-style-type: none"> <li>● FP Venture 2018 11.7%</li> </ul>
3rd	<ul style="list-style-type: none"> <li>○ American Industrial VI 8.8%</li> <li>○ FP Intl 2016 7.3%</li> </ul>	<ul style="list-style-type: none"> <li>○ One Rock II 12.8%</li> </ul>	
4th		<ul style="list-style-type: none"> <li>○ EnCap XI -31.9%</li> </ul>	<ul style="list-style-type: none"> <li>○ SK Capital V -10.1%</li> <li>○ Sycamore Partners III -27.8%</li> </ul>

● Venture ○ Non-venture

BOLD = Realized

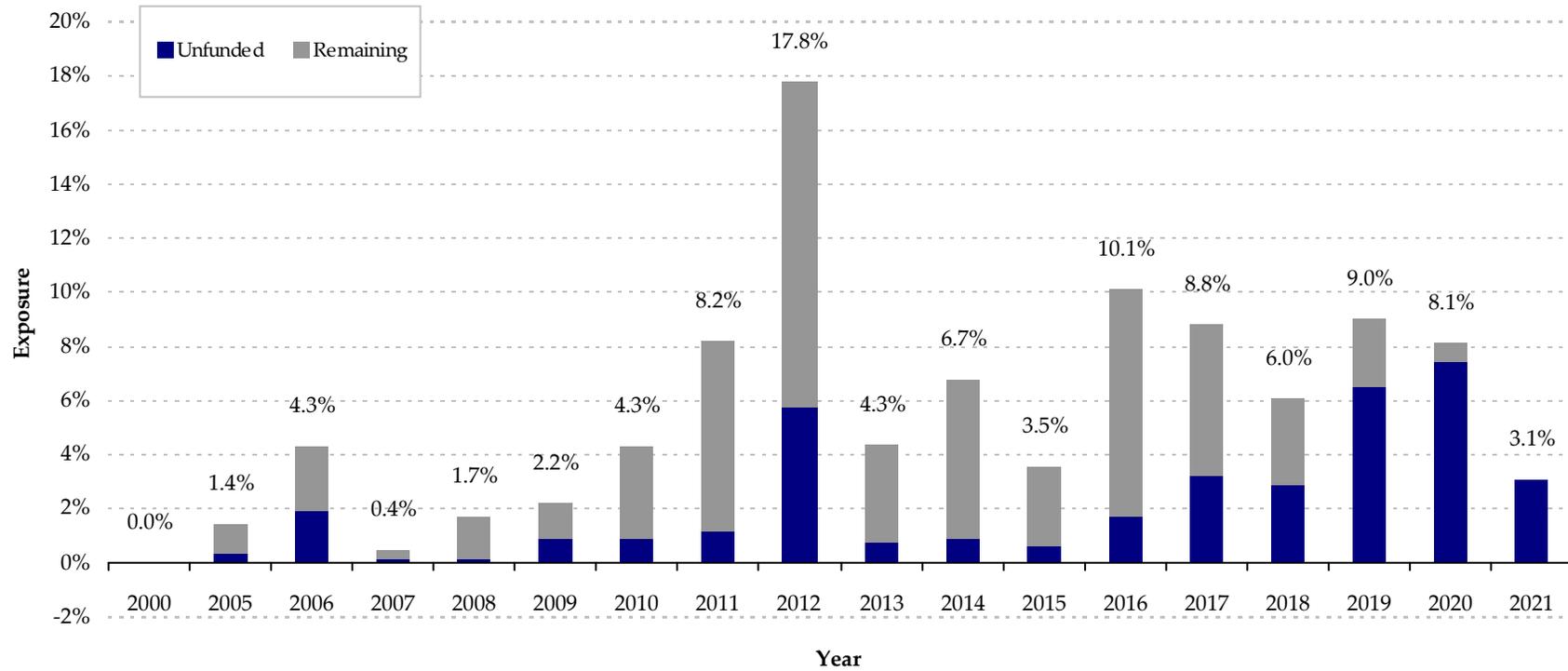
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- The analysis compares each fund's Net IRR versus its respective peer group by vintage year and strategy. Funds with a corporate finance strategy, excluding private debt, are compared to Cambridge Associates, U.S. Buyout. Funds with a venture capital strategy are compared to Cambridge Associates, U.S. Venture Capital. Multi-strategy funds are compared to data compiled by Cambridge Associates for funds across multiple strategies including U.S. Buyout, Growth Equity, Venture Capital, Mezzanine, Distressed, Fund-of-Funds, and Secondary Funds. Funds with a hard assets strategy are compared to Cambridge Associates, U.S. Private Equity Energy. Funds with a real estate strategy are compared to Cambridge Associates, U.S. Real Estate. Benchmark data is not available for funds with a private debt strategy.
  - The analysis excludes the two most recent vintage years, as fund performance is deemed not yet meaningful (NMF).
  - Net IRR is defined as the annualized, compound rate of return using daily draws, distributions and Remaining Value as of the Report Date, net of fees and expenses, including late closing interest.
  - Benchmark data was compiled from Cambridge Associates as of June 30, 2020. Hard Assets benchmark data for Vintage Years prior to 2005 is not available.

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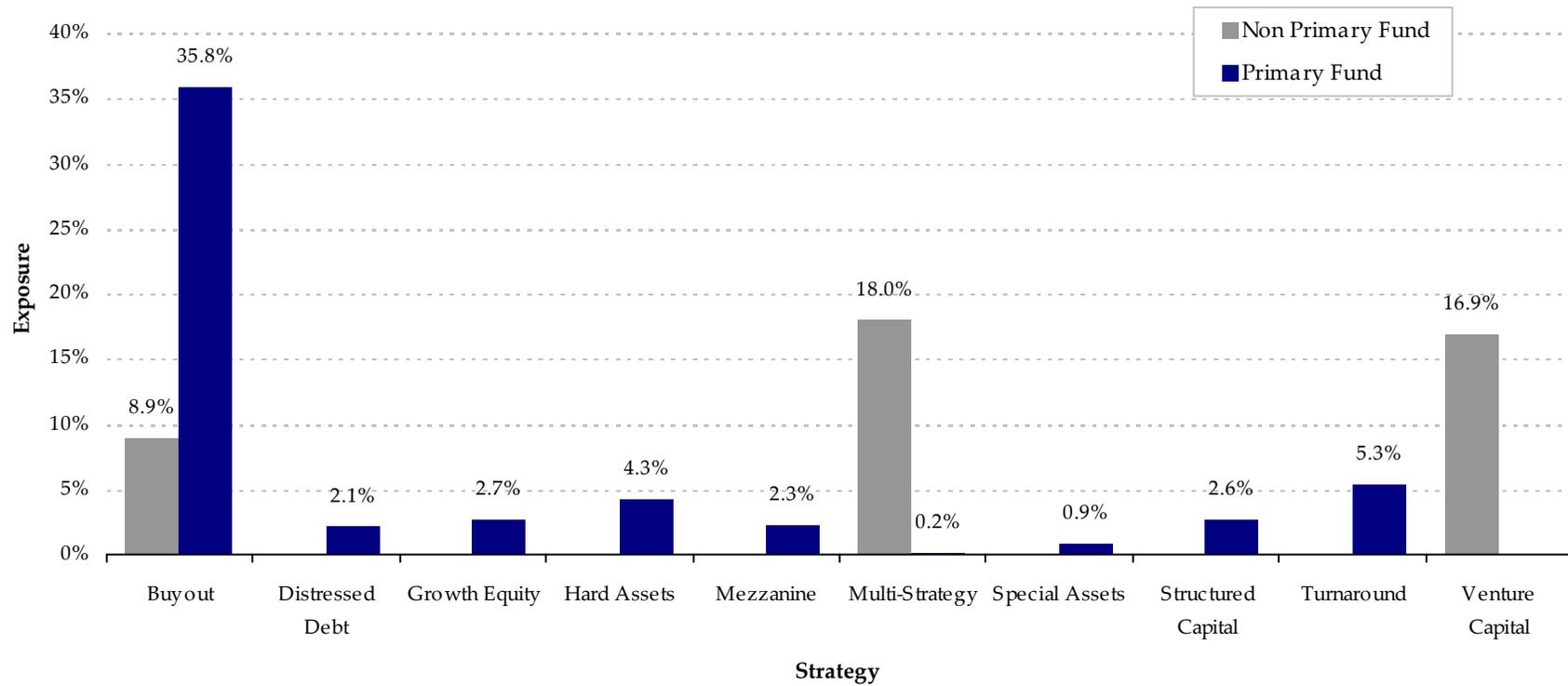
## Diversification Analysis

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## Exposure By Vintage Year



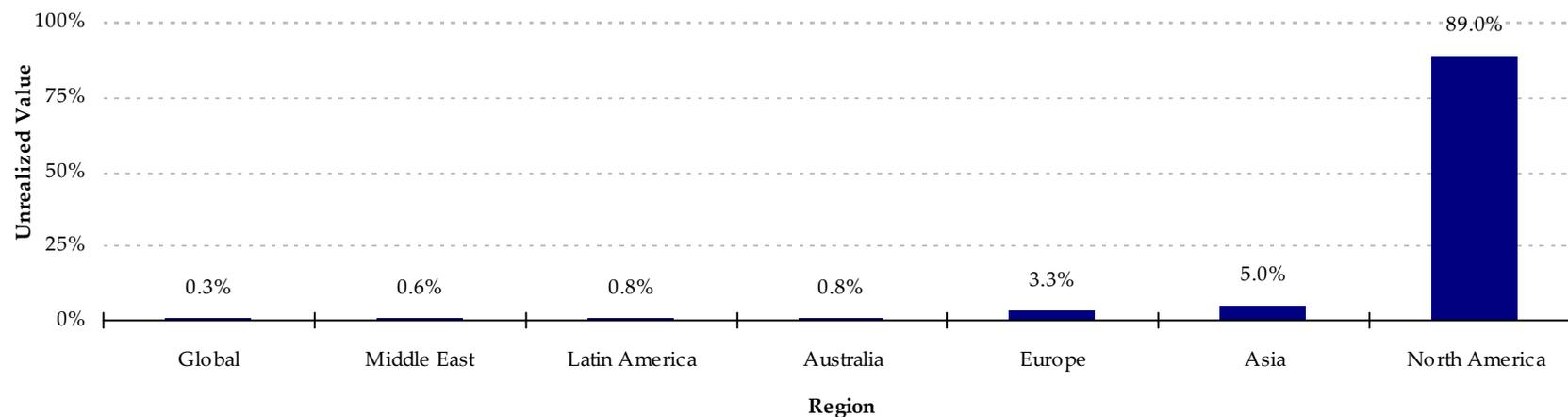
- Exposure is defined as the sum of the investor's Remaining Value plus Unfunded Commitment.
- Data includes commitments through the Report Date.



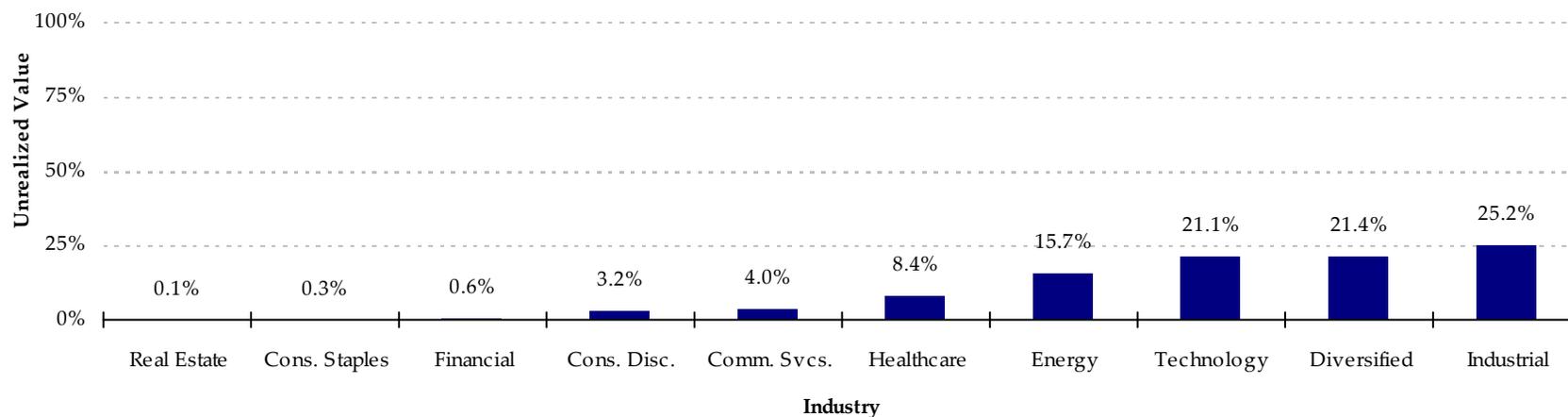
◦ Exposure is defined as the sum of the investor's Remaining Value plus Unfunded Commitment.

◦ Primary Fund represents interests in private equity funds acquired directly from the seller (i.e. fund manager). Non Primary Fund represents interests in private equity funds acquired through a commitment to a fund-of-funds or secondary fund-of-funds.

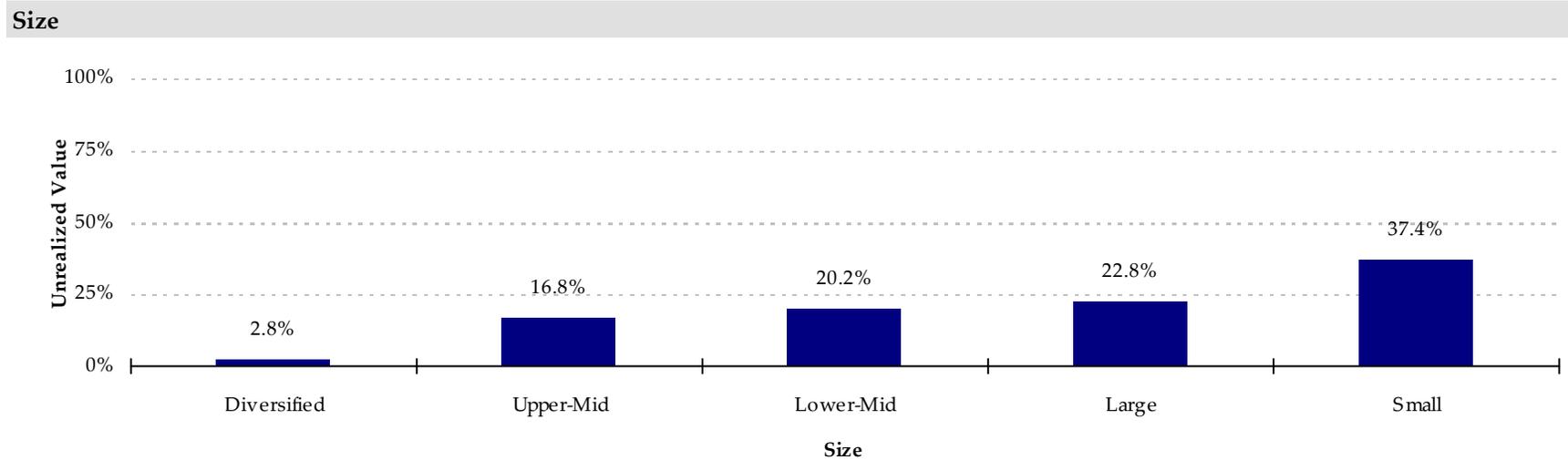
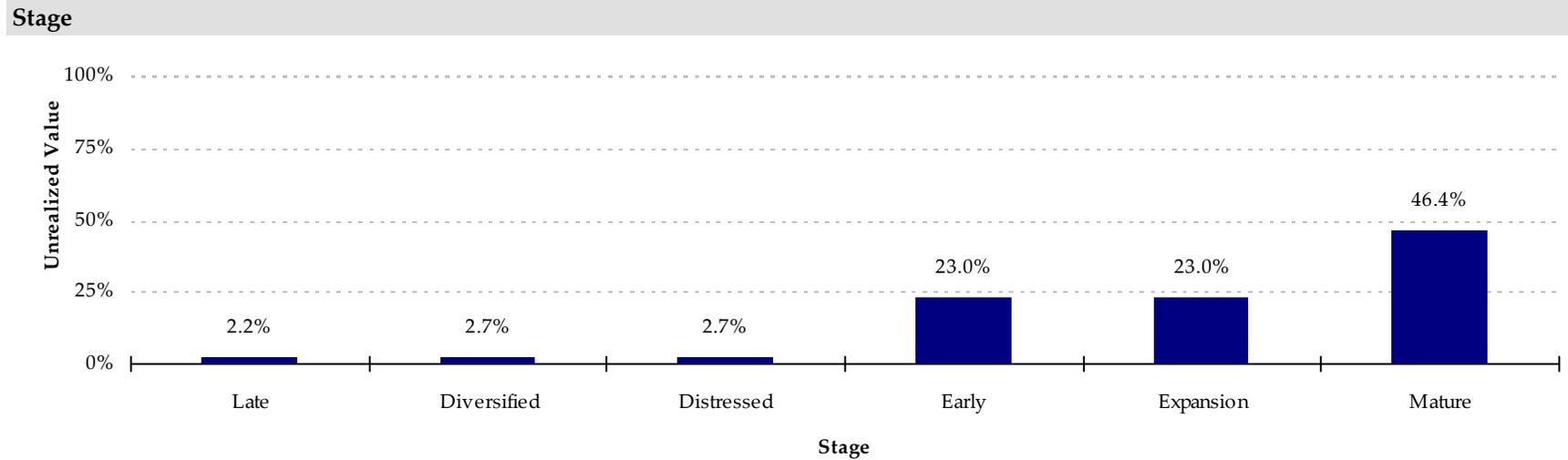
**Region**



**Industry**



- Unrealized Value represents the value of portfolio holdings as reported by fund managers.
- Values are estimated based on the investor's percent interest in each fund's portfolio holdings.
- Values are converted to the investor's currency, when applicable, as of the Report Date.

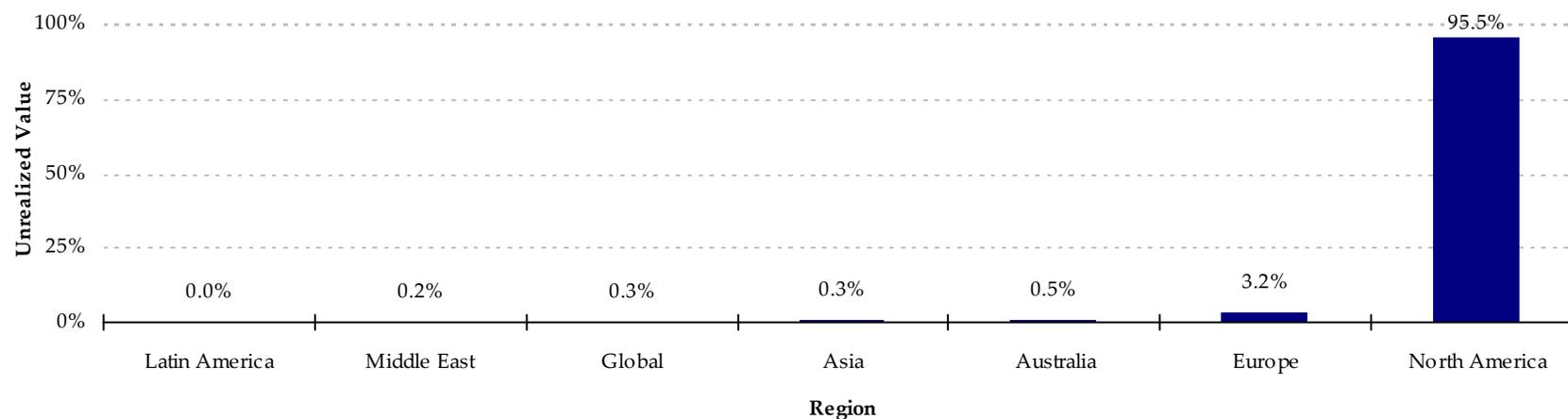


- Unrealized Value is the value of portfolio holdings as reported by the fund manager.
- Values are estimated based on the investor's percent interest in each fund's portfolio holdings.
- Values converted to the investor's currency, when applicable, as of the Report Date.

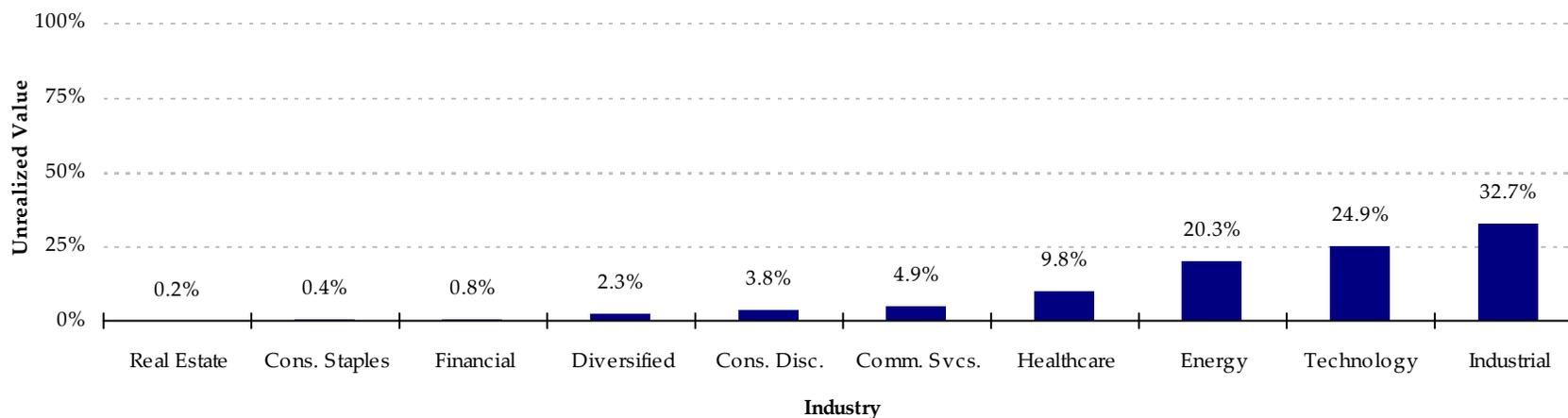
## Holdings by Region and Industry (ex Fund Holdings)



### Region

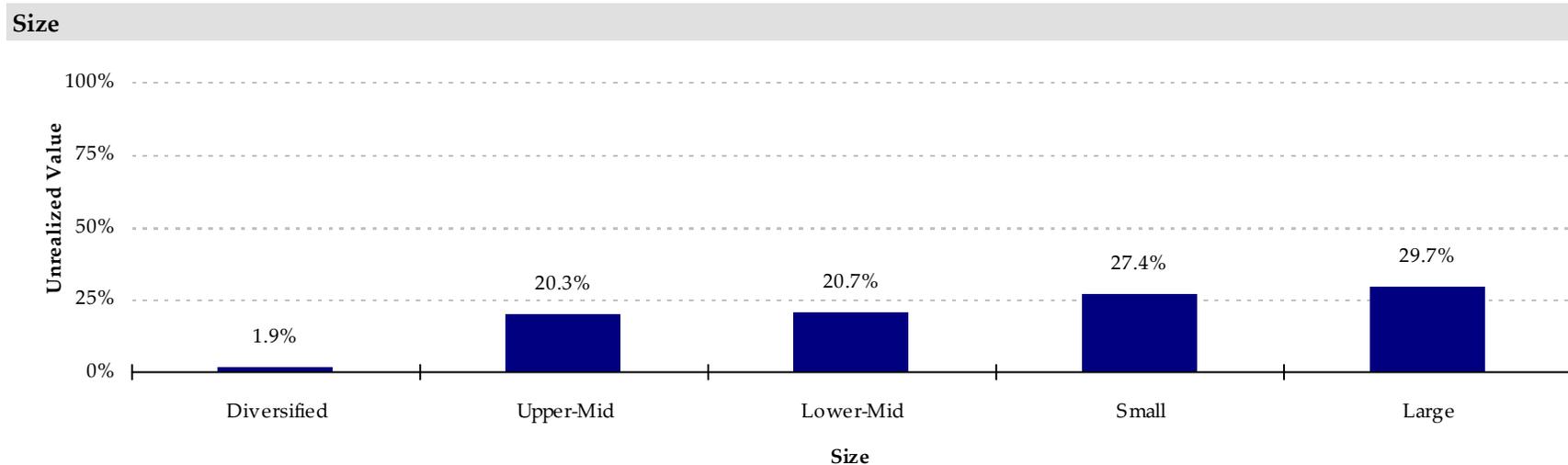
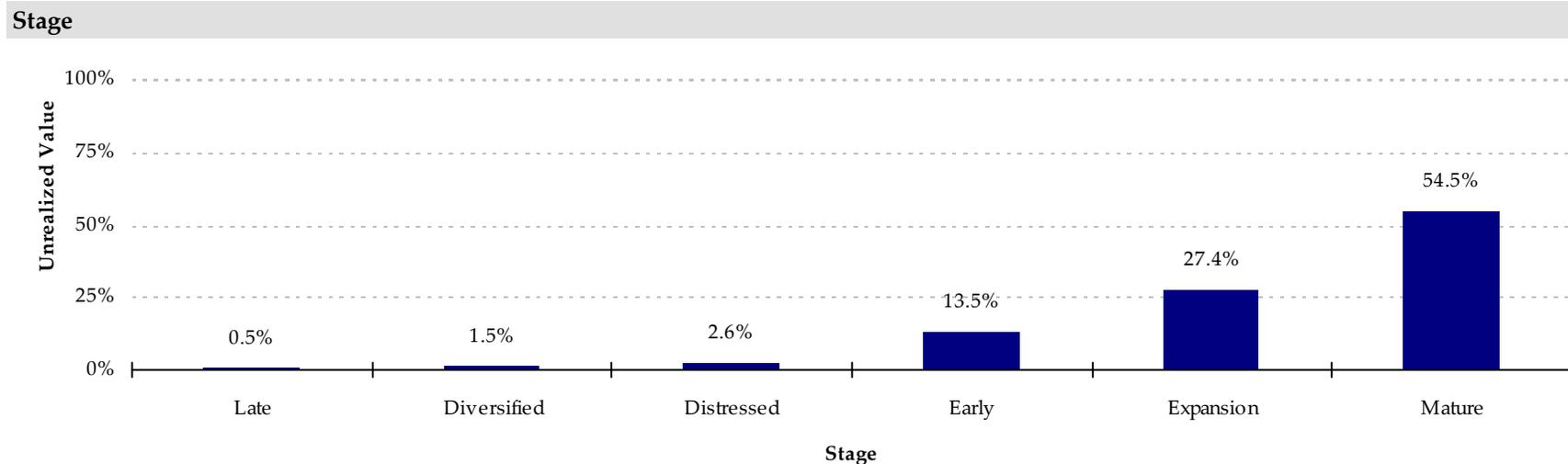


### Industry



- Fund investments in other funds were excluded from this analysis.
- Unrealized Value represents the value of portfolio holdings as reported by fund managers.
- Values are estimated based on the investor's percent interest in each fund's portfolio holdings.
- Values are converted to the investor's currency, when applicable, as of the Report Date.

## Holdings by Stage and Size (ex Fund Holdings)

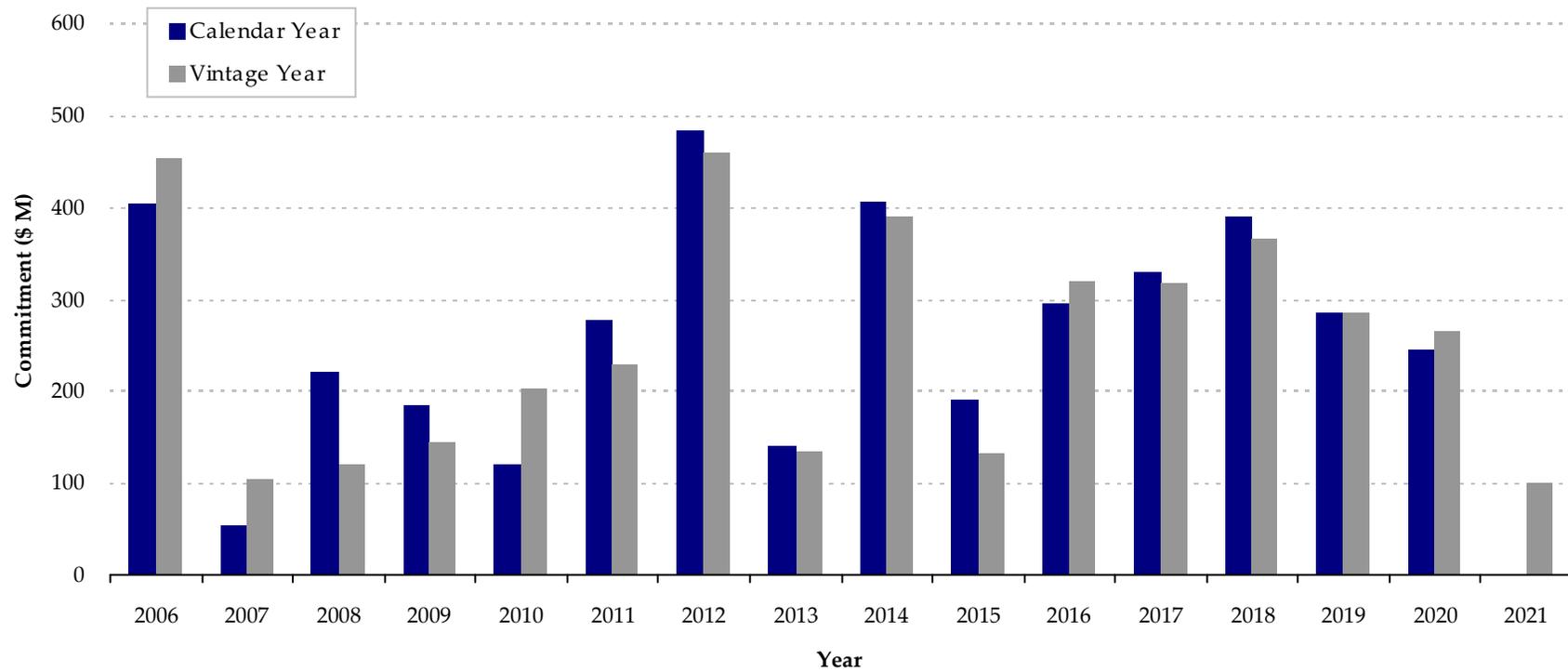


- Fund investments in other funds were excluded from this analysis.
- Unrealized Value represents the value of portfolio holdings as reported by fund managers.
- Values are estimated based on the investor's percent interest in each fund's portfolio holdings.
- Values are converted to the investor's currency, when applicable, as of the Report Date.

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**Recent Activity**

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- Vintage Year represents the year in which investors first contribute capital to a fund.
- Calendar Year represents the year in which a commitment to a fund formally closed.
- Commitments made in a foreign currency have been converted into U.S. dollars using an exchange rate as of the Report Date, if applicable.
- Commitments were compiled through the Report Date.

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## Glossary

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Term	Definition	Term	Definition
Barclays US Corporate High Yield Index	The Barclays US Corporate High Yield Bond Index measures the USD-denominated, high yield, fixed-rate corporate bond market. Securities are classified as high yield if the middle rating of Moody's, Fitch and S&P is Ba1/BB+/BB+ or below. Bonds from issuers with an emerging markets country of risk, based on Barclays EM country definition, are excluded.	Dow Jones US Total Stock Market Total Return Index	The Dow Jones US Total Stock Market Total Return Index measures all U.S. equity securities with readily available prices. It is a free float-adjusted market capitalization weighted index and is calculated with dividend reinvestment.
Bridge Financing	Temporary funding that will eventually be replaced by permanent capital from equity investors or debt lenders	DPI	Ratio of Distributed Capital to Contributed Capital
Buyout	Fund whose strategy is to acquire controlling interests in companies	Early Stage	A company's first Stage of development. Company is generally generating modest or no revenues
Co/Direct Investment	Investment made directly into a company, rather than indirectly through a fund	Equity	Security type that signifies ownership of a company (e.g. common stock, preferred stock, warrants, etc.)
Committed Capital	Total dollar amount of capital pledged to a fund	Expansion Stage	A company's third Stage of development. Company is generally experiencing high growth and nearing profitability
Contributed Capital	Total capital contributed to a fund for investments, fees and expenses, including late closing interest paid, less returns of excess capital called	Exposure	Sum of Remaining Value plus Unfunded Commitment
Cost Basis	Remaining amount of invested capital	Fund-of-Funds	Fund whose strategy is to make investments in other funds
Debt	Security type that signifies a repayment obligation by a company (e.g. senior debt, subordinated debt, bridge loan etc.)	Geographic Region	Market location of a company: North America, Western Europe, Africa/Middle East, Latin America, Asia/Pacific Rim
Distressed	A company's final Stage of development. Company is generally experiencing operational or financial distress	Growth Equity	Fund whose strategy is to invest in companies to expand or restructure operations, enter new markets or finance an acquisition without a change of control of the business
Distressed Debt	<ul style="list-style-type: none"> <li>• Distressed Trading – Fund whose strategy is to invest and trade debt of financially stressed companies</li> <li>• Distressed Restructuring – Fund whose strategy is to acquire and restructure debt of financially stressed companies</li> <li>• Opportunistic Credit – Fund whose strategy is to flexibly invest in debt securities and income-producing assets of any kind, where the issuer or holder is financially stressed</li> <li>• Structured Capital – Fund whose strategy is to issue hybrid debt and equity securities to mature companies</li> </ul>	Hard Assets	Fund whose strategy is to invest in natural resources or infrastructure
Distributed Capital	Capital distributed to the limited partners, including late closing interest earned	Infrastructure	Fund whose strategy is to acquire interests in physical structures and networks that provide the essential services for society's economic and social needs, e.g. roads, tunnels, communication networks, etc.
		Internal Rate of Return (IRR)	The discount rate that results in a net present value of zero of a series of cash flows. The IRR considers both cash flow timing and amount and is the preferred performance measure for private market funds
		Invested Capital	Capital invested by a fund in portfolio holdings
		Investment Type	Classification of an investment vehicle: Primary Fund, Secondary Fund, Fund-of-Funds

Term	Definition	Term	Definition
J-Curve	Refers to the shape of the curve illustrating a fund's performance over time. During the initial years of a fund's life, as a result of illiquidity, stagnant valuations, fees and expenses, a fund's performance tends to be negative (the bottom of the "J"). Eventually, as portfolio companies are realized or increase in value and fees become a smaller percentage of overall contributions, performance improves and investors' returns move up the "J" shaped curve	Net IRR	Annualized effective compound rate of return using daily contributions, distributions and Remaining Value as of the Report Date, net of all fees and expenses, including late closing interest
Large	Company with a Size greater than \$1 billion	Percent Interest	Represents an investor's economic interest in a fund based upon the investor's commitment divided by total fund commitments
Late Stage	A company's second Stage of development. Company is generally generating high revenue growth and high losses	Primary Investment	An interest in a private equity fund acquired directly from the fund manager during the fundraising period
Lower-Mid	Company with a Size greater than \$100 million, but less than \$250 million	Public Market Equivalent (PME)	A private equity benchmark that represents the performance of a public market index expressed in terms of an IRR, using the same cash flows and timing as the investor's investment activity in private equity. The PME serves as a proxy for the return the investor could have achieved by investing in the public market. The PME benchmark return assumes cash flows are invested at the end of each day
Mature	A company's fourth Stage of development. Company is generally generating modest to no growth and operating profitably	Publication Date	Refers to the date this report was created as reflected in the Executive Summary
Mezzanine	<ul style="list-style-type: none"> <li>• Sponsored Mezzanine – Fund whose strategy is to issue subordinated loans to companies owned by private equity fund sponsors</li> <li>• Non-Sponsored Mezzanine – Fund whose strategy is to issue subordinated loans to companies not owned by private equity fund sponsors</li> </ul>	Real Assets	Fund whose strategy is to invest in assets that are tangible or physical in nature such as land, machinery, and livestock
MSCI ACWI Index - Total Return	The MSCI ACWI Total Return is a reflection of the performance of the MSCI ACWI Index, including dividend reinvestment, as calculated by Bloomberg. The MSCI ACWI Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. The MSCI ACWI consists of 45 country indices comprising 24 developed and 21 emerging market country indices.	Real Estate	Fund whose strategy is to acquire interests in real estate property
Natural Resources	Fund whose strategy is to acquire interests in naturally-occurring, economically valuable raw materials and all physical facilities and capabilities required for the extraction, refinement, and delivery to end users, e.g. oil and gas properties, timberland, etc.	Realized Capital	Capital distributed to a fund from portfolio holdings
NCREIF Property Index	The NCREIF Property Index is a quarterly, unleveraged composite total return for private commercial real estate properties held for investment purposes only.	Recallable / Recyclable Capital	Capital that has been previously distributed by a fund to investors but may be called again for investment purposes. It is generally associated with realizations that have occurred in the early years of a fund or refers to uninvested capital that has been temporarily returned (i.e. returns of excess capital)
		Recapitalization	The reorganization of a company's capital structure
		Remaining Value	Capital account balance as reported by the General Partner, generally on a fair value basis
		Report Date	Refers to the end date of the reporting period as reflected on the cover page
		Return on Investment (ROI)	Ratio of Realized Capital plus Unrealized Value to Invested Capital

Term	Definition	Term	Definition
Russell 1000® Total Return Index	The Russell 1000® Total Return Index measures the performance, including dividend reinvestment, of the large-cap segment of the U.S. equity universe. It is a subset of the Russell 3000® Index and includes approximately 1000 of the largest securities based on a combination of their market cap and current index membership. The Russell 1000 represents approximately 92% of the U.S. market.	Size	Capitalization size of a company: Large, Upper-Mid, Lower-Mid, Small
Russell 3000® Total Return Index	The Russell 3000® Total Return Index measures the performance, including dividend reinvestment, of the largest 3000 U.S. companies representing approximately 98% of the investable U.S. equity market.	Small	Company with a Size of less than \$100 million
S&P 500 Price Index	The S&P 500 Price Index is a capitalization-weighted index of 500 stocks. The index is designed to measure performance of the broad domestic economy through changes in the aggregate market value of 500 stocks representing all major industries.	Small Business Investment Company (SBIC)	Lending and investment firms that are licensed and regulated by the Small Business Administration (SBA). The licensing enables them to borrow from the federal government to supplement the private funds of their investors
S&P 500 Total Return Index	The S&P 500 Total Return Index is a reflection of the performance of the S&P 500 Index, including dividend reinvestment. All regular cash dividends are assumed to be reinvested in the S&P 500 Index on the ex-date. Special cash dividends trigger a price adjustment in the price return index.	Small Buyout	Fund whose strategy is to acquire or recapitalize Small businesses
Secondary Investment	Investments that involve the purchase of private equity fund interests or portfolios of direct investments in privately held companies from existing institutional investors	Special Assets	<ul style="list-style-type: none"> <li>• Healthcare Royalties – Fund whose strategy is to acquire royalty or revenue interests, or issue loans, backed by approved life science products</li> <li>• Music Royalties – Fund whose strategy is to acquire royalty or revenue interests, or issue loans, backed by music copyright assets</li> <li>• Aircraft Leasing – Fund whose strategy is to acquire and lease commercial aircraft</li> <li>• Life Settlement - Fund whose strategy is to acquire life insurance policies</li> <li>• Shipping – Fund whose strategy is to acquire and charter commercial shipping vessels</li> <li>• Asset Backed Securities – Fund whose strategy is to acquire or structure securities that are backed by income-producing assets</li> </ul>
Sector	Industry in which the company operates: technology, telecommunications, healthcare, financial services, diversified, industrial, consumer, energy, etc.	Stage	The course of development through which a company passes from its inception to its termination: Early, Late, Expansion, Mature, Distressed
Senior Debt	<ul style="list-style-type: none"> <li>• Direct Lending – Fund whose strategy is to issue senior loans to mature companies</li> <li>• Unitranche – Fund whose strategy is to issue hybrid senior and subordinated loans to mature companies</li> <li>• Venture Debt – Fund whose strategy is to issue loans to venture stage companies</li> <li>• Asset Based Lending – Fund whose strategy is to issue loans to companies where the amount of allowable borrowing outstanding is based on asset collateral value</li> <li>• Rescue Financing – Fund whose strategy is to issue loans to financially stressed companies</li> </ul>	Sub-Asset Class	Private equity investments are generally classified as Buyout, Venture Capital, Mezzanine, Distressed/Turnaround, and Fund-of-Funds
		TVPI	Ratio of Distributed Capital plus Remaining Value to Contributed Capital
		Unfunded Commitment	Amount of capital that remains to be contributed to a fund as defined in a fund's limited partnership agreement
		Unrealized Value	Holding value of a portfolio company assigned by the General Partner, which generally represents fair value
		Upper-Mid	Company with a Size greater than \$250 million but less than \$1 billion
		Venture Capital	Fund whose strategy is to make investments in Early Stage and/or Late Stage companies

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<b>Term</b>	<b>Definition</b>
Vintage Year	The calendar year in which an investor first contributes capital to a fund

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## End Notes

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The information contained in this report is confidential and may contain proprietary information. The information contained herein is strictly for the use of Arkansas Teacher Retirement System and, subject to applicable law, may not be reproduced, transmitted or used in whole or in part for any other purpose without the expressed written consent of Franklin Park.

Information regarding the Arkansas Teacher Retirement System portfolio, trends and performance returns are based on or derived from information and data provided by third-party sources, including Arkansas Teacher Retirement System's historical records. Franklin Park assumes that such information is accurate and that the sources from which it has been obtained are reliable. For example, the performance figures contained within this report are calculated by Franklin Park based on information provided by the managers of Arkansas Teacher Retirement System's private equity fund investments (General Partners). The General Partners have not verified the performance figures presented by Franklin Park and such figures may differ from those calculated by General Partners or other investors.

Franklin Park presents Net IRR performance as recommended by the CFA Institute. The IRR calculation is a dollar-weighted return measurement, which considers both cash flow timing and amount, and is net of fees, expenses and carried interest. The total portfolio Net IRR presented herein is net of fees, expenses and carried interest paid by underlying private equity fund investments, but is gross of fees and expenses paid to Franklin Park. The IRR is most commonly used for measuring the performance of private equity funds. Until a fund is liquidated, typically over 10 to 12 years, the IRR is only an interim estimated return. An IRR is particularly not meaningful in the first two years of a fund's life given the J-curve effect (see footnote). The actual IRR of any private equity fund investment is not known until final liquidation.

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▫ The J-curve refers to the shape of the curve that illustrates a private equity fund's performance over time. During the initial years of a fund's life, due to fees and expenses, a fund's performance tends to be negative (the bottom of the "J"). Eventually, as portfolio company investments increase in value, fund performance improves and returns move up the "J" shaped curve.



# Franklin Park Corporate Finance Access Fund, L.P.

February 2021

## Disclaimer

This Presentation (this “Presentation”) has been prepared by Franklin Park Associates, LLC (“Franklin Park”) solely for informational purposes for the exclusive use of the party to whom Franklin Park delivers this Presentation (the “Recipient”). This Presentation is not to be construed as a solicitation, invitation or an offer by Franklin Park or any of its members, officers, employees or agents to buy or sell any securities or related financial instruments. This Presentation is furnished on a confidential and limited basis for the sole and exclusive purpose of providing general and background information concerning Franklin Park Corporate Finance Access Fund, L.P. (the “Fund”) as well as Franklin Park and its activities. This Presentation is not an offer or sale of, or a solicitation to any person to buy, any security or investment product or investment advice. Any such offer, sale or solicitation of interests in the Fund will be made only pursuant to the Fund’s definitive documents, and will be subject to the terms and conditions contained in such documents. This Presentation is qualified in its entirety by reference to the Fund’s definitive documents.

The information in this Presentation has been obtained from Franklin Park’s proprietary research and other publicly available sources and has not been independently verified by Franklin Park or any of its members, officers, employees, agents, representatives or advisers or any other person. Any valuations, projections, estimates, forecasts, targets, prospects, returns and/or opinions contained herein involve elements of subjective judgment and analysis. Any opinions expressed in this material are subject to change without notice. This Presentation may contain forward-looking statements. Any estimates or projections as to events that may occur in the future are based upon the reasonable expectation of Franklin Park. No obligation is undertaken by Franklin Park or any other person to provide the Recipient with additional information or to update, revise or reaffirm the information contained in this Presentation or to correct any inaccuracies therein which may become apparent.

Past or projected performance information contained in this Presentation is not necessarily indicative of future results. There can be no assurance that the Fund will ultimately achieve comparable performance results.

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By accepting this Presentation the Recipient agrees to be bound by the foregoing obligations and limitations.

# Franklin Park Corporate Finance Access Fund, L.P. (“FP CF Access”)

Target size of \$150 million; \$88 million in commitments raised to date



## Strong Performance

- Since 2010, Franklin Park has committed \$1.0 billion through discretionary accounts to funds consistent with the vehicle’s strategy
- Net IRR of 16.3%, as of June 30, 2020

## Highly Experienced & Cohesive Team

- Firm has been active in the target market for 17 years
- Deep relationships with established managers and proactive sourcing of newer teams

## Compelling Strategy & Market Opportunity

- Focus on less efficient segments of the market with high return potential
- Target experienced investment teams that are strongly aligned with LPs
- Focus on managers with competitive advantages

# Initial Commitments

The Fund has closed on 10 commitments to date



## MiddleGround Partners Fund I, LP, a \$459.5 million fund

- \$10 million commitment closed in August 2019
- Control investments in lower middle market businesses in the business-to-business industrial and specialty distribution sectors
- Spin out from Monomoy Capital



## Sunstone II, LP, a \$475 million fund

- \$5 million commitment closed in August 2019
- Control and significant minority investments in growth stage, technology-enabled services companies
- Spin out of growth team from Trident Capital



## Crest Rock Partners Fund I, L.P., a \$400 million fund

- \$10 million commitment closed in October 2019
- Control investments in software and technology companies undergoing operational or situational distress
- Spin out of Marlin Equity Partners



## Graycliff Private Equity Partners IV, L.P., a \$350 million fund

- \$10 million commitment closed in November 2019
- Control buyout investments in small/lower middle market companies in the niche manufacturing, business services, and value-added distribution sectors
- Former HSBC North American private equity team



## BVIP Fund X, L.P., a \$1 billion fund

- \$8 million commitment closed in February 2020
- Control buyout investments in small/lower middle market companies in the tech-enabled business services and IT services sectors
- Long established firm formed in 1983 with current leadership in place since 2011

## Initial Commitments (continued)

The Fund has closed on 10 commitments to date

### PRINCETON EQUITY GROUP

Princeton Equity Fund I, L.P., a \$250 million fund (target)

- \$10 million commitment closed in June 2020
- Control buyout investments in small franchisor and multi-unit businesses in the consumer, healthcare, and business services sectors
- Firm formed by two experienced professionals in 2019

### THOMABRAVO

Thoma Bravo Explore I, LP, a \$1.0 billion fund

- \$8 million commitment closed in October 2020
- Control investments in software and technology enabled services companies in the small and lower middle market
- Smaller buyout fund of leading software buyout firm formed in 2007

### CIVC PARTNERS

CIVC Partners Fund VI, L.P., a \$525 million fund

- \$8 million commitment closed in November 2020
- Control investments in small business services companies in the U.S. with a focus on buy and build transactions
- Firm originally formed within a bank in Chicago in 1970; now independent

### CELEBRATING TWENTY YEARS CAROUSEL CAPITAL

Carousel Capital Partners VI, L.P., a \$700 million fund

- \$8 million commitment closed in November 2020
- Control buyout investments in small companies within the business services, consumer services and healthcare services sectors in the Southeastern U.S.
- Long established firm formed in 1996

### BANNEKER PARTNERS

Banneker Partners I, L.P., a \$250 million fund (target)

- \$8 million commitment closed in November 2020
- Control buyout investments in small companies within the enterprise software sector
- Firm formed in 2010 by co-founder of Vista

## Track Record

Franklin Park's discretionary record for U.S. focused corporate finance funds \$1.0 billion and below

VINTAGE YEAR	COMMITTED	DPI	TVPI	NET IRR
2010	\$49.0	1.8	2.1	16.8%
2011	168.0	1.1	1.6	13.6%
2012	49.0	1.3	2.0	26.4%
2013	68.0	0.9	1.7	17.6%
2014	118.0	0.5	1.7	17.6%
2015	5.0	0.1	1.1	4.9%
2016	199.0	0.4	1.5	23.3%
2017	101.0	0.1	1.2	11.9%
2018	105.0	0.0	1.0	-1.8%
2019	100.0	0.0	0.8	NMF
2020	80.0	N/A	N/A	N/A
<b>Total</b>	<b>\$1,042.0</b>	<b>0.6</b>	<b>1.5</b>	<b>16.3%</b>

*Data in the table is as of June 30, 2020; \$ in millions. Past results are not necessarily indicative of future performance. There can be no assurance that investments recommended by Franklin Park will realize the rates of return indicated in this presentation. Wherever there is potential for profit, there is also potential for loss. See additional important information in the Footnotes section in the Appendix.*

## Proposal

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FP CF Access will commit over three vintages (2019, 2020, 2021) and the plan is for ATRS to make annual commitments of \$30 million to this strategy

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ATRS has committed \$60 million to FP CF Access to date (2019, 2020) and should consider committing a final \$30 million for 2021

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As an anchor investor, ATRS pays no management fees or carried interest in FP CF Access

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## Footnotes

### Executive Summary:

Net IRR represents the performance results for a portfolio of predominantly U.S. domestic private equity fund commitments made on behalf of Franklin Park's discretionary client accounts, with fund sizes of \$1.0 billion or less across various corporate finance strategies (including private debt) with vintage years 2010-2020. See Track Record notes below for further details.

### Track Record:

Based in Bala Cynwyd, Pennsylvania, Franklin Park was formed in April 2003. Franklin Park is an independent, registered investment adviser with the U.S. Securities and Exchange Commission. Franklin Park assists its clients in building and managing customized investment portfolios of private market investments.

The track record includes performance results for a portfolio of predominantly U.S. domestic private equity fund commitments made on behalf of Franklin Park's discretionary client accounts, with fund sizes of \$1.0 billion or less across various corporate finance strategies (including private debt) with vintage years 2010-2020.

The returns represent performance for Franklin Park's discretionary client accounts based upon client cash flows and capital account balances as reported by the underlying private fund managers.

The returns presented are net of underlying private fund manager fees, transaction expenses and carried interest charges, but exclusive of Franklin Park's investment advisory fees and fund-of-one vehicle expenses. The returns will be reduced by Franklin Park's investment advisory fees. As described in Part II of Form ADV, Franklin Park's fees are negotiable and are based on either a fixed fee arrangement or as a percentage of assets under management. As a representative example, a fixed fee of \$800,000 annually, compounded over 10 years, may reduce a portfolio IRR of 17.3% by 20 basis points. Franklin Park may charge performance fees to specific funds it manages if specified performance conditions, as detailed in the fund documents, are met. Fees, including performance fees, and expenses charged may result in a greater reduction to performance depending on the terms and conditions specific to the fee arrangement or fund terms.

The performance results are measured in U.S. dollars on a since-inception basis for each vintage year composite through June 30, 2020. Where more than one client account is invested in a fund, to mitigate the effect of clients' commitment size on performance results, returns are calculated on an equal-weighted basis whereby each underlying private equity fund is modeled to have received the same U.S. dollar commitment.

Certain client accounts may have differing cash flow timing, incur additional fund expenses or have other variances for a commitment to the same private fund or fund complex as other client accounts, which may impact the aggregated returns.

Vintage year is defined as year in which each underlying fund first called capital.

Performance for private funds with vintage year 2019 is deemed not yet meaningful ("NMF") due to the young age of the underlying investment portfolios, and is therefore not presented. However, performance for private funds with vintage year 2019 is included in the calculation of Total DPI, TVPI and Net IRR. Vintage year 2020 private funds have not yet had cash flow or capital account activity as of June 30, 2020.

Committed represents the aggregate client account commitments to underlying funds in each vintage year composite, and are not equal weighted where more than one client account is invested in a fund.

DPI equals the ratio of distributed capital to contributed capital.

TVPI represents the ratio of distributed capital plus remaining value (the capital account balance) to contributed capital.

Net IRR is the discount rate that results in a net present value of zero of a series of cash flows, and considers both cash flow timing and amount.

### Risk of Loss;

Past Performance is Not a Guarantee: Prospective investors must be aware that investments in private equity funds such as the Fund are speculative and involve a substantial risk of loss. No assurance can be given that the Fund will achieve its investment objectives or avoid substantial losses. Information about other investments made by Franklin Park, including the past performance of other Franklin Park vehicles and investments, is provided solely to illustrate Franklin Park's investment experience, and processes and strategies used by Franklin Park in the past with respect to other Franklin Park vehicles and investments. The performance information relating to Franklin Park's previous investments is not intended to be indicative of the Fund's future results. Past performance is not necessarily indicative, or a guarantee, of future results. There can be no assurance that the Fund will achieve comparable results as those presented or that investors in the Fund will not lose any of their invested capital.

### Potential Future Returns:

There can be no assurance that investments with an unrealized value will be realized at the valuations shown, as actual realized returns will depend on, among other factors, future operating results, the value of the assets and market conditions at the time of disposition, any related transaction costs, and the timing and manner of sale, all of which may differ from the assumptions on which the valuations contained herein are based. Accordingly, the actual realized return of these unrealized investments may differ materially from the returns indicated herein.

### No Investment Advice:

References to the portfolio funds in this Presentation should not be considered a recommendation or solicitation for the portfolio funds mentioned, nor should individual portfolio fund performance be considered representative of portfolio funds held, or to be held, by the Fund.

## Franklin Park Associates, LLC

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Bala Cynwyd, PA 19004

For more information, please contact us at [info@franklinparkllc.com](mailto:info@franklinparkllc.com)

Franklin Park Associates, LLC is an SEC registered investment advisor pursuant to the Investment Advisors Act of 1940

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 West Third Street  
Little Rock, Arkansas 72201**

**RESOLUTION  
No. 2021-10**

**Approving Investment in Franklin Park Corporate  
Finance Access Fund, L.P. with Imminent Need**

**WHEREAS**, the Board of Trustees (Board) of the Arkansas Teacher Retirement System (ATRS) is authorized to invest and manage trust assets for the benefits of its plan participants; and

**WHEREAS**, the ATRS Board has reviewed the recommendation of its private equity consultant, Franklin Park Associates, LLC, along with the recommendation of the Investment Committee and ATRS staff regarding a potential investment in **Franklin Park Corporate Finance Access Fund, L.P.**, a fund of funds managed by Franklin Park investing in smaller buyout, growth, and turnaround funds; and

**WHEREAS**, the ATRS Board approves an investment of up to **\$30 million dollars (\$30,000,000.00)** in **Franklin Park Corporate Finance Fund, L.P.**, and the Board, after its review of the timing in which the closing of the investment in **Franklin Park Corporate Finance Access Fund III, L.P.** may need to occur, has determined that there is an imminent need to immediately enter into the partial equity ownership agreement prior to the next scheduled meeting of the Arkansas Legislative Council. The Board also deems it financially appropriate to enter into the partial equity ownership agreement and concludes that to forego the opportunity to promptly implement its investment directives under the prudent investor rule would be inconsistent with its fiduciary duty of care to the members and annuitants;

**NOW, THEREFORE, BE IT RESOLVED**, that the ATRS Board approves an investment of up to **\$30 million dollars (\$30,000,000.00)** in **Franklin Park Corporate Finance Access Fund, L.P.** and agrees to immediately move to close and subscribe the approved ATRS limited partnership interest in **Franklin Park Corporate Finance Access Fund, L.P.** The total investment amount is to be determined by the private equity consultant and ATRS staff based upon the allocation available to ATRS and the overall investment objectives set by the Board; and

***FURTHER, BE IT RESOLVED***, that the ATRS staff is hereby authorized to take all necessary and proper steps to implement this investment using the Imminent Need process, if acceptable terms are reached.

**Adopted this 1st day of February 2021**

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**Mr. Danny Knight, *Chair***  
**Arkansas Teacher Retirement System**



# Franklin Park International Fund X, L.P.

January 2021

## Disclaimer

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# International Strategy

Franklin Park targets investable non-U.S. markets and less competitive strategies

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## Market Criteria

- Acceptable country risk
- Sufficient liquidity – private equity deal volume, active exit market
- Pockets of inefficiency

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## Strategy Criteria

- Seek to at least double earnings over a 5-year holding period
  - Attractive deal pricing relative to earnings growth
- 

### Underweight

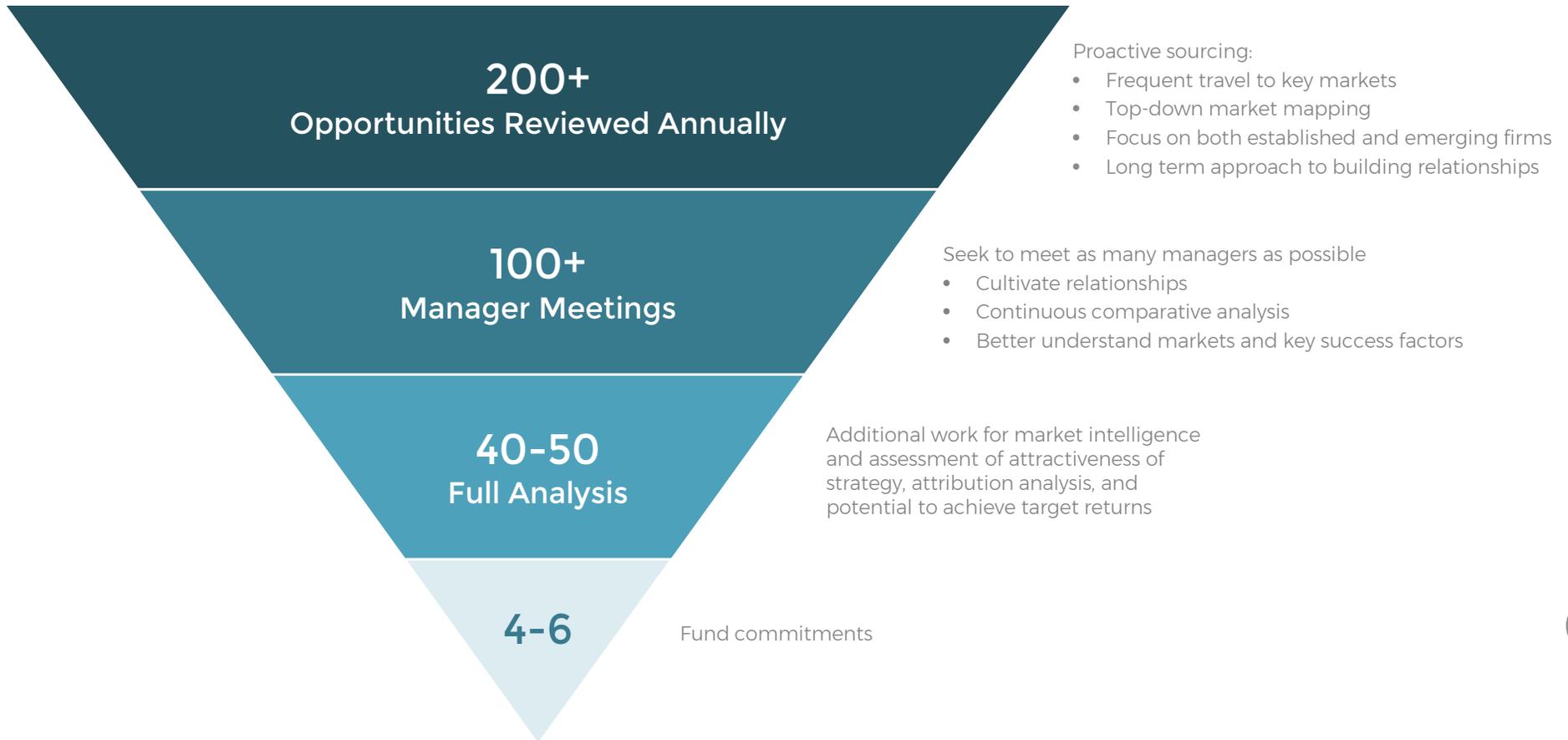
- Pan-European
- Pan-Asian
- India (growth equity)
- Indonesia (growth equity)
- ROW (Africa, Latin America)

### Overweight

- China (growth equity/ buyout)
- Europe (small/lower mid-market buyout)
- Australia (small/lower mid-market buyout)
- Canada (small/lower mid-market buyout)
- Japan/S. Korea (small/lower mid-market buyout)
- Europe (turnaround)
- Australia (turnaround)

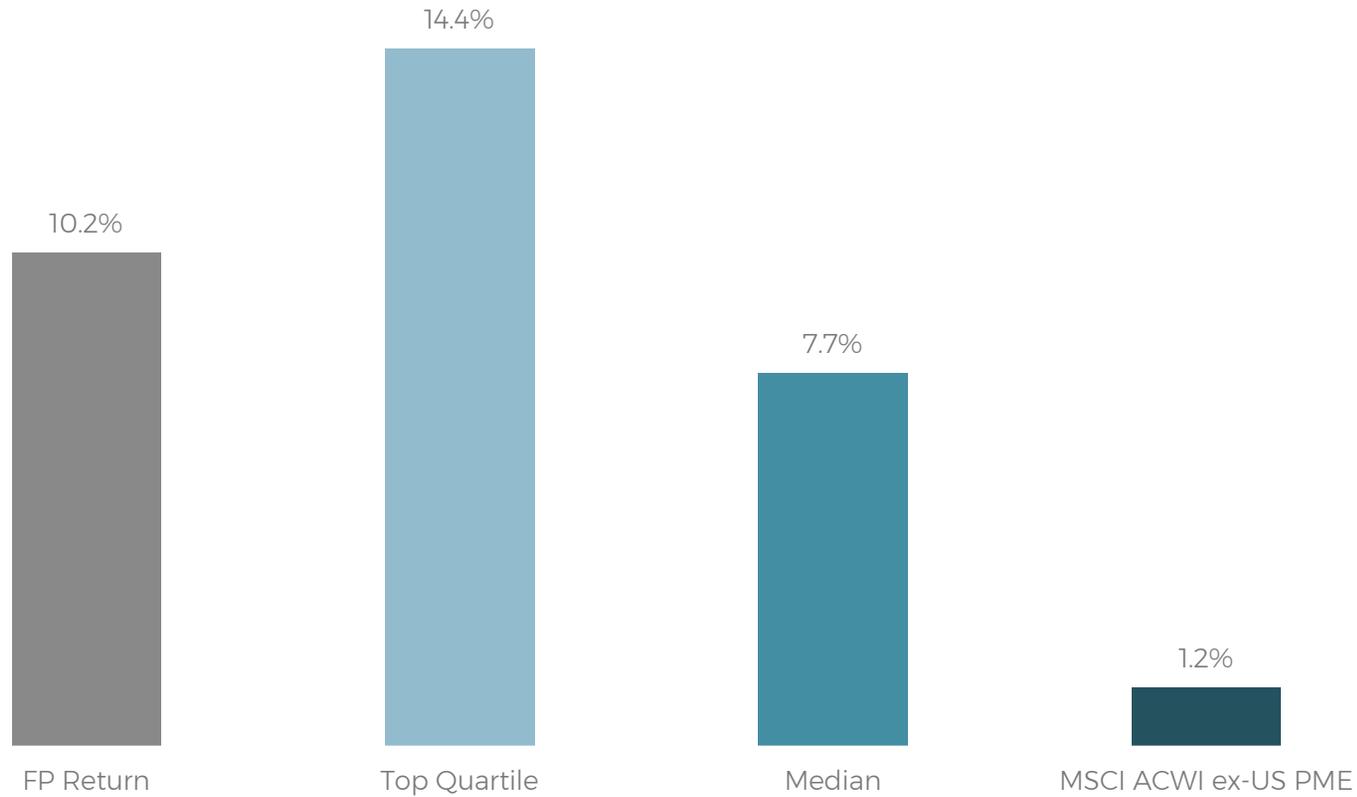
# Manager Research Approach

Broad market coverage with highly selective decision making



# Historical Performance: Aggregate

Performance for FPI 2011-2019 relative to market benchmarks

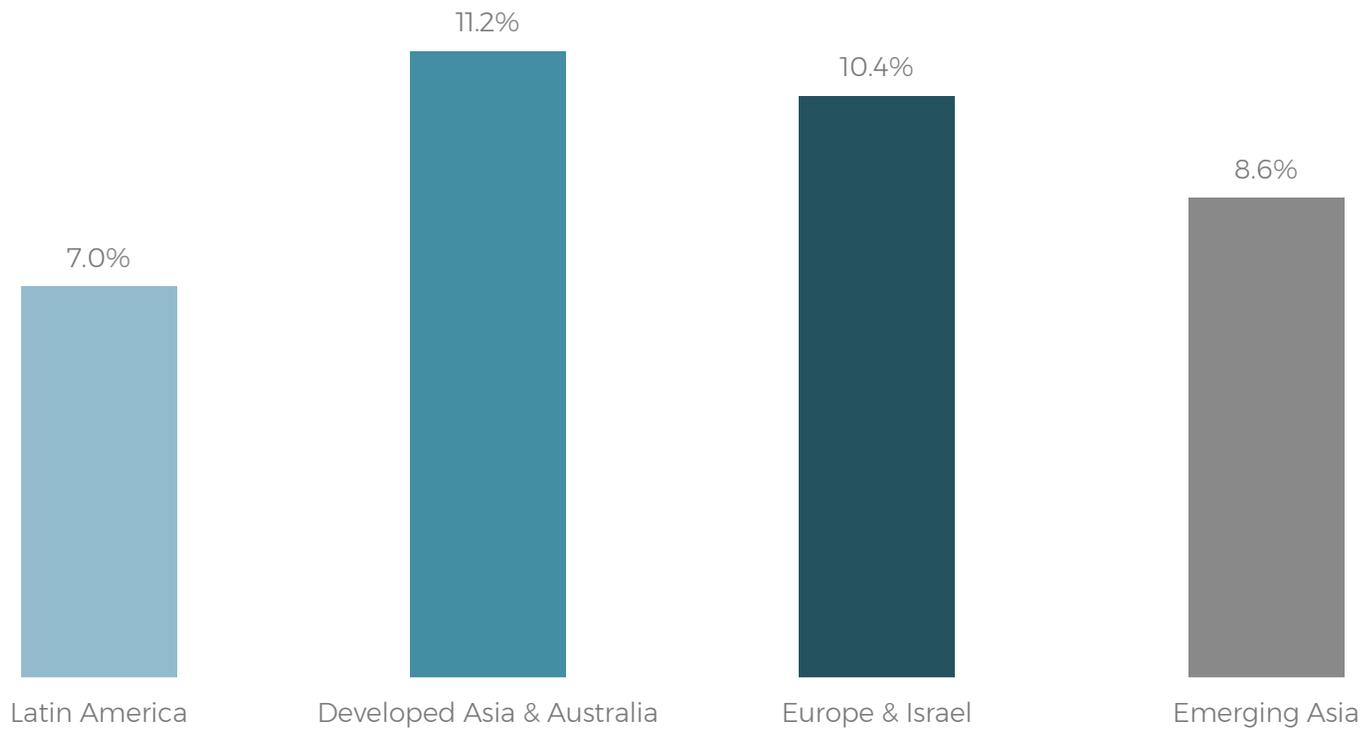


*Data is as of September 30, 2020. Past results are not necessarily indicative of future performance. Wherever there is potential for profit, there is also potential for loss. See additional important information in the Track Record Footnotes.*



# Historical Performance: By Region

Performance for FPI 2011-2019 by region



Notes: Data is as of September 30, 2020. Past results are not necessarily indicative of future performance. Wherever there is potential for profit, there is also potential for loss. See additional important information in the Track Record Footnotes.

\*Latin America includes Brazil Capital Growth II, Alothon III and Brazil Opportunity Growth III.

\*Developed Asia & Australia includes Archer Growth 2, Anchorage II, Hahn II, Growth Fund 3, Anchorage III, Aspirant III and Potentia I.

\*Europe & Israel includes Fortissimo III, German Equity IV, Mid-Europa IV, Kerogen Energy II, Quantum I, Fortissimo IV, OpCapita II, Procuritas VI, Kerogen Expansion, Quantum II, Keensight V, Main Capital VI and Phi III.

\*Emerging Asia includes Prax III, North Haven PE Asia IV, Falcon House I, CDH Parallel III, Falcon House II, Legend VII, GenBridge I, C Bridge IV, CITIC PE III, Xiang He II, CDH VGC II and GenBridge II.

\*Funds based in Canada (Novacap TMT V and VI) are excluded.

## Historical Performance: By Vehicle

Franklin Park has raised 10 vehicles focused on international private equity investments

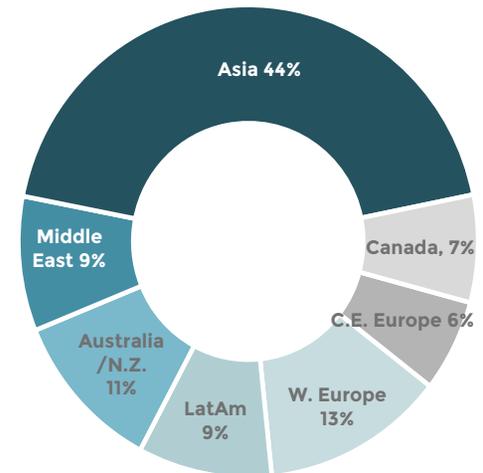
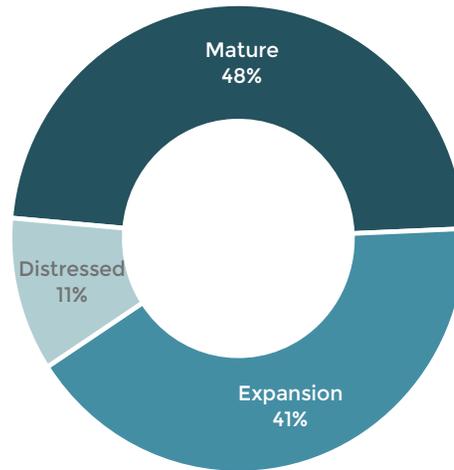
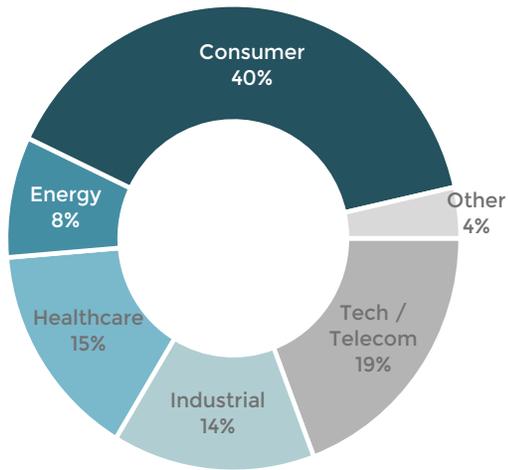
- ▶ FPI 2011-2015 funds have underperformed expectations in part due to currency fluctuations and a prolonged j-curve
- ▶ FPI 2016-2019 are still relatively young and performance is not yet meaningful

VEHICLE	FUND SIZE	TVPI	NET IRR
FPI 2011	\$45.0	1.4x	7.8%
FPI 2012	70.0	1.3x	8.1%
FPI 2013	97.0	1.5x	10.3%
FPI 2014	97.0	1.3x	10.9%
FPI 2015	113.0	1.2x	6.4%
FPI 2016	97.0	1.2x	7.3%
FPI 2017	98.0	1.4x	21.4%
FPI 2018	65.5	1.2x	18.0%
FPI 2019	70.5	NMF	NMF
FPI X	85.5	NMF	NMF

*Data in the table is as of September 30, 2020. \$ in millions. The returns presented are net of underlying private fund manager fees, transaction expenses and carried interest charges, as well as expenses incurred by the Franklin Park International Fund Series vehicles. Past results are not necessarily indicative of future performance. There can be no assurance that investments recommended by Franklin Park will realize the rates of return indicated in this presentation. Wherever there is potential for profit, there is also potential for loss. See additional important information in the Footnotes section in the Appendix.*

# Portfolio Diversification

Activity weighted towards expansion and mature consumer companies across Asia and Europe



Note: Chart data is based on the unrealized value of the underlying portfolio funds' holdings as of September 30, 2020 for Franklin Park International Fund Series 2011-2019 (FPI). Values are based on the respective FPI Fund's interest in the underlying portfolio funds. Values reported in currencies other than USD have been converted to USD as of September 30, 2020.

# Initial Commitments

FP International X has closed on two fund commitments



Novacap TMT VI, LP, a \$1.7 billion fund

- \$20 million commitment closed in December 2020
- Acquisitions of mid market technology, media and telecom companies, primarily based in Canada
- Existing manager; founded in 1981, based in Montreal, Quebec



Genbridge II, LP, a target \$650 million fund

- \$20 million commitment closed in January 2021
- Growth equity investments in Chinese consumer companies
- Strategic relationship with JD.com in China.
- Existing manager; founded in 2016, based in Beijing

## Forward Calendar

Funds expected to raise in the next 12-18 months

### Europe and Israel

Fund	Expected Size (M)
Blixt I	€250
CMP IV	€250
Elaghmore III	£100
Elvaston V	€400
ExploreEquity II	€200
Keensight Small Cap I	TBD
Main VII	€650
Main Foundation I	€150
Monterro IV	SEK 2,500
Procuritas VII	€300
Summa Equity III	SEK 7,000

### Developing Asia and Australia

Fund	Expected Size (M)
Advantage VII	\$750
Anchorage IV	AUD 350
Growth Fund IV	AUD 450

### Emerging Asia

Fund	Expected Size (M)
CITIC IV	2,500
Falcon House III	500

### Latin America

Fund	Expected Size (M)
Alothon IV	\$300
Axxon IV	\$400

# Proposal

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**Consider committing an additional \$30 million to Franklin Park International Fund X, L.P. (“FP International X”)**

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**ATRS (and other existing FP clients) will pay no management fees or carried interest in FP International X**

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## Footnotes

### Track Record:

Based in Bala Cynwyd, Pennsylvania, Franklin Park was formed in April 2003. Franklin Park is an independent, registered investment adviser with the U.S. Securities and Exchange Commission. Franklin Park assists its clients in building and managing customized investment portfolios of private market investments.

The returns represent the performance of each Franklin Park International Fund Series 2011-2020 vehicles based upon client cash flows and capital account balances. The performance results are measured in U.S. dollars from the inception date of each vehicle's activities through September 30, 2020. FP International X has not yet called capital from investors as of September 30, 2020.

The returns presented are net of underlying private equity fund manager fees, transaction expenses and carried interest charges, as well as expenses incurred by the Franklin Park International Fund Series vehicles. No investment advisory fees or carried interest are charged by the Franklin Park International Fund Series 2011-2019 vehicles to any investor; provided that, the calculations exclude investment fees and expenses paid through other Franklin Park accounts and vehicles, including amounts paid to Franklin Park and its affiliates under separate investment management agreements.

Vintage represents the year in which each Franklin Park International Fund Series vehicle first called capital.

DPI represents the ratio of distributed capital to contributed capital.

TVPI represents the ratio of distributed capital plus remaining value (the capital account balance) to contributed capital.

Net IRR is the discount rate that results in a net present value of zero of a series of cash flows, and considers both cash flow timing and amount.

Performance for the Franklin Park International Fund Series 2019 is deemed not yet meaningful ("NMF") due to the young age of the underlying investment portfolio, and are therefore not presented. However, performance for the Franklin Park International Fund Series 2019 is included in the calculation of the Total Net IRR.

Risk of Loss; Past Performance is Not a Guarantee: Prospective investors must be aware that investments in private equity funds such as the Fund are speculative and involve a substantial risk of loss. No assurance can be given that the Fund will achieve its investment objectives or avoid substantial losses. Information about other investments made by Franklin Park, including the past performance of other Franklin Park vehicles and investments, is provided solely to illustrate Franklin Park's investment experience, and processes and strategies used by Franklin Park in the past with respect to other Franklin Park vehicles and investments. The performance information relating to Franklin Park's previous investments is not intended to be indicative of the Fund's future results. Past performance is not necessarily indicative, or a guarantee, of future results. There can be no assurance that the Fund will achieve comparable results as those presented or that investors in the Fund will not lose any of their invested capital.

Potential Future Returns: There can be no assurance that investments with an unrealized value will be realized at the valuations shown, as actual realized returns will depend on, among other factors, future operating results, the value of the assets and market conditions at the time of disposition, any related transaction costs, and the timing and manner of sale, all of which may differ from the assumptions on which the valuations contained herein are based. Accordingly, the actual realized return of these unrealized investments may differ materially from the returns indicated herein.

No Investment Advice: References to the portfolio funds in this Presentation should not be considered a recommendation or solicitation for the portfolio funds mentioned, nor should individual portfolio fund performance be considered representative of portfolio funds held, or to be held, by the Fund.

## Franklin Park Associates, LLC

251 St. Asaphs Road  
Three Bala Plaza, Suite 500 West  
Bala Cynwyd, PA 19004

For more information, please contact us at [info@franklinparkllc.com](mailto:info@franklinparkllc.com)

Franklin Park Associates, LLC is an SEC registered investment advisor pursuant to the Investment Advisors Act of 1940

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 West Third Street  
Little Rock, Arkansas 72201**

**RESOLUTION  
No. 2021-11**

**Approving Investment in Franklin Park International  
Fund X, L.P. with Imminent Need**

**WHEREAS**, the Board of Trustees (Board) of the Arkansas Teacher Retirement System (ATRS) is authorized to invest and manage trust assets for the benefits of its plan participants; and

**WHEREAS**, the ATRS Board has reviewed the recommendation of its private equity consultant, Franklin Park Associates, LLC, along with the recommendation of the Investment Committee and ATRS staff regarding a potential investment in **Franklin Park International Fund X, L.P.**, a fund of funds managed by Franklin Park investing in international private equity funds; and

**WHEREAS**, the ATRS Board approves an investment of up to **\$30 million dollars (\$30,000,000.00)** in **Franklin Park International Fund X, L.P.**, and the Board, after its review of the timing in which the closing of the investment in **Franklin Park International Fund X, L.P.** may need to occur, has determined that there is an imminent need to immediately enter into the partial equity ownership agreement prior to the next scheduled meeting of the Arkansas Legislative Council. The Board also deems it financially appropriate to enter into the partial equity ownership agreement and concludes that to forego the opportunity to promptly implement its investment directives under the prudent investor rule would be inconsistent with its fiduciary duty of care to the members and annuitants;

**NOW, THEREFORE, BE IT RESOLVED**, that the ATRS Board approves an investment of up to **\$30 million dollars (\$30,000,000.00)** in **Franklin Park International Fund X, L.P.** and agrees to immediately move to close and subscribe the approved ATRS limited partnership interest in **Franklin Park International Fund X, L.P.** The total investment amount is to be determined by the private equity consultant and ATRS staff based upon the allocation available to ATRS and the overall investment objectives set by the Board; and

***FURTHER, BE IT RESOLVED***, that the ATRS staff is hereby authorized to take all necessary and proper steps to implement this investment using the Imminent Need process, if acceptable terms are reached.

**Adopted this 1st day of February 2021**

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**Mr. Danny Knight, *Chair***  
**Arkansas Teacher Retirement System**



**Recommendation Report  
Greenbriar Equity Fund V, L.P.**

## Executive Summary

<b>Fund</b>	Greenbriar Equity Fund V, L.P. (the “Fund”)
<b>General Partner</b>	Greenbriar Equity Group (the “General Partner” or “Greenbriar”)
<b>Report Date</b>	January 2021
<b>Fundraising</b>	The General Partner is targeting capital commitments of \$1 billion, with a cap of \$1.5 billion. The General Partner has closed on \$514 million in commitments to date and will hold additional closes in January and February 2021.
<b>Source</b>	The General Partner retained Evercore to assist with fundraising.
<b>Investment Strategy</b>	The Fund is being formed to make investments in advanced manufacturing and business services companies across logistics, aerospace & defense, and transportation sub-sectors in the U.S. The Fund will primarily make control investments but may occasionally make minority investments and target companies with enterprise values greater than \$100 million. The Fund will opportunistically pursue a buy-and-build strategy.
<b>Management Team</b>	Based in Rye, NY, the General Partner was founded in 1999 by Joel Beckman, Gerald Greenwald, and Reginald (“Regg”) Jones (the “Founders”). The Fund will be managed by five senior investment professionals including Mr. Jones (the “Principals”). The Principals will be supported by ten investment professionals, three operating resources, including Mr. Greenwald, and five finance & administrative professionals, including a CFO.
<b>Track Record</b>	The General Partner has raised four prior funds. The following chart summarizes the performance of the prior funds, as of September 30, 2020.

Aggregate Performance Summary		(USD 000)					
Fund (Vintage)	Fund Size	Realized Deals / # Deals	Invested	Realized	Unrealized	Gross ROI	Gross IRR
Fund I (2001)	456,000	8 / 8	231,010	731,921	0	3.2x	55.3%
Fund II (2007)	1,012,000	8 / 8	726,245	1,368,915	0	1.9x	16.1%
Fund III (2013)	1,104,000	6 / 12	1,031,529	1,587,066	877,132	2.4x	27.2%
Fund IV (2018)	815,000	0 / 6	489,448	0	704,288	1.4x	28.2%
<b>Total</b>		<b>22 / 34</b>	<b>2,478,232</b>	<b>3,687,901</b>	<b>1,581,420</b>	<b>2.1x</b>	<b>39.9%</b>

*Note: Gross of fees and carried interest expenses. The unrealized investments are valued by the General Partner.*

<b>Investment Evaluation</b>	<p>1. <b>The Fund will pursue a compelling investment strategy and the General Partner is well-positioned in the target market.</b> While many generalist private equity firms invest in transportation, logistics, and distribution businesses, there is limited competition from private equity firms dedicated to the space. The General Partner has an established brand in the space due to its tenure and track record. Further, the General Partner’s established sourcing approach can position it to acquire companies outside formal sale processes or through limited auction processes. Over half of the General Partner’s historic deals have been proprietary sourced and negotiated.</p>
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- 2. The General Partner's team is deep and experienced.** The Principals average more than 17 years of private equity experience and have worked together since 2008 at the General Partner. Further, the General Partner has a history of promoting from within and Ms. Raker, Mr. McComiskey, and Mr. Weiss all started as junior investment professionals at the firm.

**However, the General Partner's team has recently evolved.** Four prior Principals or Co-Founders have either retired or stepped back their time commitment to the General Partner over the last five years. Joel Beckman, co-founder, formally retired in 2017 and Gerald Greenwald, co-founder, is still involved with the General Partner in a reduced capacity. Two prior Principals, John Daileader and Raynard Benvenuti, have retired since 2016. Both Messrs. Daileader and Benvenuti had not been very active with leading investments over the last two funds.

- 3. The General Partner has a deep and attractive track record.**
  - In aggregate, the General Partner's 34 prior investments have produced a 2.1x ROI and 40% gross IRR.
  - The General Partner's 22 realized deals to date have produced a 2.3x ROI and 41% gross IRR.
  - Funds I, III, and IV have performed well, with net IRRs, DPIs and TVPIs that each rank in the first or second quartile, as compared to buyout funds of the same vintage.

**However, Fund II ranks in the 3rd quartile, on a net IRR basis, as compared to buyout funds of the same vintage.** The General Partner attributes the underperformance of Fund II to the shift towards more stable, slower growth companies given the volatility of Fund I. This resulted in an inefficient capital deployment pace as well as lower returns. Fund's III and IV are most relevant to the Fund's strategy.

- 4. The Fund's size represents a material increase from Fund IV.** At a potential cap of \$1.5 billion, the Fund would be 84% larger than Fund IV. However, the General Partner does not expect a significant change in its investment strategy with a larger fund. The General Partner originally targeted \$1.25 billion for Fund IV but encountered difficulties with the fundraise and only raised \$815 million. Further, the General Partner has utilized over \$960 million in co-investment over the last two funds.

**Recommendation** Franklin Park recommends a commitment of up to \$30 million to the Fund, subject to satisfactory negotiation of final documentation, based on the following:

- The Fund's investment strategy is compelling and the General Partner is well-positioned in the target market;
- The General Partner's team is deep and experienced; and
- The General Partner has a deep and attractive track record.

**ARKANSAS TEACHER RETIREMENT SYSTEM  
1400 West Third Street  
Little Rock, Arkansas 72201**

**RESOLUTION  
No. 2021-12**

**Approving Investment in Greenbriar Equity  
Fund V, L.P. with Imminent Need**

**WHEREAS**, the Board of Trustees (Board) of the Arkansas Teacher Retirement System (ATRS) is authorized to invest and manage trust assets for the benefits of its plan participants; and

**WHEREAS**, the ATRS Board has reviewed the recommendation of its private equity consultant, Franklin Park Associates, LLC, along with the recommendation of the Investment Committee and ATRS staff regarding a potential investment in **Greenbriar Equity Fund V, L.P.**, a buyout fund that will invest in advanced manufacturing and business services companies across the logistics, aerospace and defense, and transportation sub-sectors; and

**WHEREAS**, the ATRS Board approves an investment of up to **\$30 million dollars (\$30,000,000.00)** in **Greenbriar Equity Fund V, L.P.**, and the Board, after its review of the timing in which the closing of the investment in **Greenbriar Equity Fund V, L.P.** may need to occur, has determined that there is an imminent need to immediately enter into the partial equity ownership agreement prior to the next scheduled meeting of the Arkansas Legislative Council. The Board also deems it financially appropriate to enter into the partial equity ownership agreement and concludes that to forego the opportunity to promptly implement its investment directives under the prudent investor rule would be inconsistent with its fiduciary duty of care to the members and annuitants;

**NOW, THEREFORE, BE IT RESOLVED**, that the ATRS Board approves an investment of up to **\$30 million dollars (\$30,000,000.00)** in **Greenbriar Equity Fund V, L.P.** and agrees to immediately move to close and subscribe the approved ATRS limited partnership interest in **Greenbriar Equity Fund V, L.P.** The total investment amount is to be determined by the private equity consultant and ATRS staff based upon the allocation available to ATRS and the overall investment objectives set by the Board; and

***FURTHER, BE IT RESOLVED,*** that the ATRS staff is hereby authorized to take all necessary and proper steps to implement this investment using the Imminent Need process, if acceptable terms are reached.

**Adopted this 1st day of February 2021**

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**Mr. Danny Knight, *Chair***  
**Arkansas Teacher Retirement System**

SUMMARY OF DISABILITY APPLICATIONS SUBMITTED  
FOR CONSIDERATION BY THE MEDICAL COMMITTEE

The Medical Committee met in executive session in the first floor conference room at 9:30 a.m. on December 9, 2020. Those members present were Dr. Eddie Phillips, Dr. Hoyte Pyle, and Dr. Jim Morse. Anne Marie Lehman Berardi of the Teacher Retirement System was also in attendance.

A total of thirteen disability applications were considered. Of the thirteen applicants, ten were approved. Two were denied. One had more information requested.

Respectfully Submitted,



Eddie Phillips, CMO  
Medical Committee Chairman

Respectfully Submitted,



Anne Marie Lehman Berardi  
Retirement Benefits Counselor

SUMMARY OF DISABILITY APPLICATIONS SUBMITTED  
FOR CONSIDERATION BY THE MEDICAL COMMITTEE

The Medical Committee met in executive session in the first floor conference room at 9:30 a.m. on January 6, 2021. Those members present were Dr. Eddie Phillips, Dr. Hoyte Pyle, and Dr. Jim Morse. Anne Marie Lehman Berardi of the Teacher Retirement System was also in attendance.

A total of five disability applications were considered. Of the five applicants, four were approved. One was denied.

Respectfully Submitted,



Eddie Phillips, CMO  
Medical Committee Chairman

Respectfully Submitted,



Anne Marie Lehman Berardi  
Retirement Benefits Counselor